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FOREWORD

2016 has witnessed a peculiar spectre making its frightful entrance into our reality. This time it is haunting not merely the Good Old Europe, but the greater part of the world. It came to be known as the “post-truth era” or, otherwise, referred to as an “age of untruth”. Our childlike faith in the significance of science and evidence-based or even knowledge-based society was hit hard. Although awakening from dreams could really be painful, it’s high time we admitted that in the understanding shared by a large part of society the notion of knowledge-based or evidence-based activity has undergone a continual transformation into a buzz word rather than a principle to abide by. Somewhat like the so-called quality property about ten years ago, the last time the real estate bubble burst, that everybody was selling, despite the fact that no one had ever seen it with their own eyes.

The blame for such a course of events is sometimes laid on the prolonged stagnation of the world economy. A backward view and a glance into the surrounding world confirm that a well-functioning ecosystem of science is a necessary – but not sufficient – precondition for the social and economic well-being of the advanced countries (and the sustainability of welfare states in particular). The description of its essentials is plain and simple: the cutting edge science is standing on the bottom side of a well-funded broad-based pyramid, groping for and shifting knowledge boundaries of the humankind and contributing to the development of the entire world. Those countries that had invested more into frontier research and innovation were according to statistically significant evidence (if not with a hundred percent certainty) considerably better off in coping with economic stagnation.

For a small country Estonian cutting-edge science has gained an extremely strong position in that context. The best indicator of the cultural depth is often deemed to be the extent of retrospective information known to us about our distant ancestors. Researchers of the Estonian Biocentre have grown into the world’s leading experts in population genetics. An accomplishment that was reached under their leadership – influential advancement of knowledge about the spatio-temporal expansion dynamics of early humans, i.e. the *Homo sapiens* species, from Africa – was placed by

the journal *Science* among the groundbreaking scientific achievements of 2016. Such recognition is unique in the whole history of Estonian science. Hopefully it will likewise materialise in the form of increased research funding in the near future.

Presenting research excellence to a wider society has turned into a core imperative. Extensive press coverage of the national science prize nominations and award recipients is becoming the rule. Also, a considerable part of the society is getting into the habit of being well-informed about the doings and intentions of the Academy. A few examples will suffice to illustrate the point. In a live TV programme dedicated to Estonia's 98th birthday celebrations broadcasting of the ceremonies was framed between interviews with Members of the Academy. On the initiative of the Estonian TV the award-winning clips from the competition of three-minute lectures were complemented with a review programme titled "A Three-Minute Challenge". Elections of new Members to the Academy were reflected in detail by the portal *Novaator* (Innovator).

Discussions over meta-scientific questions are gradually turning into an integral part of the Academy's activities. The Saturday Supplement AK (Opinion and Culture) of the daily *Postimees* may be decoded, with perhaps only slight overstatement, as "(The Academy's) opinion and culture." It is rather unusual that a daily of a small country regularly publishes editorials and guest columns discussing the relevance of science to society.

However, we are continually inept at translating research excellence into economic success and/or competitive edge. A peer-review of the Estonian research and innovation system prepared by experts of the European Commission (Ruttas-Küttim, R., Stamenov, B. 2016. RIO Country Report 2015: Estonia; EUR 27869 EN; European Union, 79 pp., doi:10.2791/092522) commends the strong system of Estonian research organisation. The document maintains that Estonian science is excellent, on the other hand, admitting its practical uselessness for the country.

The tendency of forgetting the important role played by science in practical life as well as in passing economic and political decisions is not a peculiarity specific to Estonia alone. It can be cured by consistent partnership with top-level scientists. There's room for improvement on both sides. According to Carlos Moedas, European Commissioner for Research, Science and Innovation at European Commission, the most shocking revelation during his first year in office was the fact that scientists tend to undervalue their knowledge, analysing ability and collateral effects. He underlined that it was highly necessary for scientists to turn more visible and audible.

They could influence the society, economy and policy much more than they currently did.

The concept for academies of sciences as a collective brain is gradually taking root, all over Good Old Europe. It is founded on simple ideas: one scientist for advice provision is not enough and we should orient ourselves towards an interdisciplinary panel. Likewise, it is more important to do the right things than to make hasty decisions. For realisation of those ideas the European Commission launched a Scientific Advice Mechanism (SAM). The SAPEA (Science Advice for Policy by European Academies) project was initiated to aggregate the heterogenous expertise from various academies of sciences. In light of these developments the greatest challenge for the Estonian Academy of Sciences in the foreseeable future is to design a version of that system most applicable in Estonia that would enable us to convert the potential of research excellence into a prop to public governance and a booster of economy.

Tarmo Soomere
4 March 2017

CHRONICLE 2016

January 6 – Academy House hosted a conference for young researchers working or studying abroad.

January 14 – Academy was visited by Georgian ambassador to Estonia H.E. Tea Akhvlediani. President Tarmo Soomere had a meeting with the guest, where they considered the broad picture of research and innovation landscapes in Estonia and Georgia. Among topics were options for further advancement of scientific cooperation between Estonia and Georgia as well as setting priorities and drafting relevant measures.

January 19 – Board at its meeting elected three new Research Professors: Anne Kahru – Research Professor at the National Institute of Chemical Physics and Biophysics; Kaupo Kukli – Leading Researcher at the Institute of Physics, University of Tartu; Rainer Kattel – Professor at Ragnar Nurkse School of Innovation and Governance, Tallinn University of Technology. Agenda items also included digitalisation of scholarly journals and updating of the Academy Publisher’s Statutes. The new structure of the Academy Office was approved.

January 20 – President Tarmo Soomere represented the Academy at the constitutive meeting of the European Marine Board (EMB) in Brussels.

January 28 – Members of the National Science Prize Committee held a meeting at the Academy House. Based on nominations from the committee, the Government of the Estonian Republic approved and announced the names of 2016 National Science Prize Laureates on February 11.

February 12 – Academy House was the venue for a Science Morning on the topic “Population Movements in Estonia and Worldwide”. Presentations by Tiit Tammaru, Professor of Urban and Population Geography and Rein Ahas, Professor of Human Geography (both from the University of Tartu) were followed by a discussion. Among other participants, the discussion was joined by Ruth Annus, Head of the Migration and Border Policy Department at the Ministry of the Interior.

February 16 – President Tarmo Soomere participated in the Open Meeting of the Latvian Academy of Sciences Senate dedicated to the 70th anniversary of the academy.

February 19 – Member of the Academy Raivo Uiibo represented the Academy at a meeting of the ALLEA (European Federation of Academies of Sciences and Humanities, ALL European Academies) Permanent Working Group on Science and Ethics in Stockholm.

February 24 – National Science, Sports and Culture Awards of the Republic of Estonia and the F. J. Wiedemann Language Prize were handed over at a conferral ceremony in the Academy House.

February 25 – Academy House was the venue for a meeting dedicated to thematic items placed on the following meeting agenda of the Research and Development Council scheduled for March 1, 2016. The Academy was represented by Members of the Board and Heads of the Divisions. Among participants were Vice Rectors for Research of larger universities in Estonia as well as Directors of several research and development institutions. Invited speeches were given by Indrek Reimand, Chancellor of Higher Education and Research at the Ministry of Education and Research; Meelis Kitsing, Strategy Unit Adviser at the Government Office of Estonia; Maris Lauri, Economic Affairs Committee member at the Riigikogu and Liisa Oviir, Minister of Entrepreneurship.

February 25 – President Tarmo Soomere had a meeting with Lauri Lugna, Secretary General at the Ministry of the Interior to address possible spheres of cooperation with particular emphasis on aspects relating to the positions of Scientific Adviser and Thematic Research Professor.

March 2 – SCIENCE DAY at Võru Gymnasium was jointly organised by the Academy and the Estonian Society for the Study of Religions.

March 8 – Board at its meeting in Tartu considered and approved the Academy's budget implementation in 2015, the 2016 budget and the agenda for the Annual General Meeting. Also, it was decided to propose that the General Assembly announce five Academy Membership vacancies (four for scientific disciplines and one for creative persons) and to present the Karl Schlossmann Memorial Medal to Eero Vasar.

March 8 – Members of the Board visited Tartu University Hospital as a post meeting activity. They were hosted by Head of the Neurology Clinic

Toomas Asser (also an Academy Board Member), who gave a talk on the topic “Brain scans assisting in the reorientation process”.

March 15 – Academy submitted to the Estonian Research Council (ETAg) its positions concerning the document “Open Science in Estonia” prepared by the Open Science Expert Group at ETAg.

March 16 – Academy was visited by Austrian ambassador to Estonia H.E. Doris Danler. An introductory insight into the history of the Academy was followed by a discussion addressing major areas of action currently underway. The focal issue was how to build and maintain effective working relations with the Riigikogu and ministries, especially in view of the designed knowledge-based advice provision structure and thematic Research Professor positions. Communication activities as well as bilateral cooperation in science and technology were considered as well.

April 1 – Seaplane Harbour was the venue for a seminar “Marine Science and Maritime Culture in Estonia” jointly organised by the Academy and the Estonian Maritime Museum.

April 3-5 – President Tarmo Soomere and Executive Director Galina Varlamova attended a series of events in Bucharest marking the 150th anniversary of the Romanian Academy.

April 6 – President Tarmo Soomere and President Ionel-Valentin Vlad of the Romanian Academy signed a cooperation agreement between the academies.

April 18-19 – Member of the Board Jüri Engelbrecht represented the Academy at the ALLEA General Assembly Meeting in Vienna and participated in the preceding scientific symposium “The Freedom of Scientific Research in the Face of Political and Societal Demands”.

April 20 – Annual General Meeting of the Academy commenced with conferral of the Karl Schlossmann Memorial Medal on Eero Vasar. The opening keynote was delivered by invited speaker Siim Kallas, who focused on interdependencies between wisdom, information and competence on the political arena. Member of the Academy Richard Villems gave a lecture “In search for lost time”. Heads of Divisions Jaak Aaviksoo, Jakob Kübarsepp, Toomas Asser, Urmas Varblane and President Tarmo Soomere provided information about the results of the past year for the Academy. Secretary General Margus Lopp reported on implementation of the budget.

April 21 – Academy House was the venue for a Science Afternoon on the topic “Research Funding: Traditional Expense or Investment into the Country’s Future?” The primary goal of the gathering was to outline the peculiar features, bottlenecks and hidden opportunities manifested in the functioning of the value chain research–higher education–economy that are typical of our society. Among the invited speakers were representatives of the Academy management, Vice Rectors for Research from universities, representatives of the Riigikogu’s Cultural and Economic Affairs Committees as well as the Research and Innovation Support Group, (science) advisers from the Government and ministries, representatives of ETAg and the media.

April 26-28 – President Tarmo Soomere participated in a meeting of the EMB Executive Committee and spring plenary meeting in Sopot (Poland).

April 26 – Academy House hosted a seminar under the title “Innovation, research and development in the energy sector” jointly organised by WEC-Estonia (Estonian Member Committee of the World Energy Council) and the Academy’s Energy Council.

May 6 – Academy was visited by Finnish ambassador H.E. Kirsti Narinen. A meeting at the Academy House was introduced by a concise overview of the Academy – its building, history, membership and focal points in the recent activities. The following discussion focused on the forthcoming official visit of Finnish President to Estonia, collaboration between government advisory bodies of both countries, membership in the European Marine Board, cooperation options for studies in kindred languages, especially considering the publishing of the journal *Linguistica Uralica*.

May 11-13 – President Tarmo Soomere participated in the work of the European Academies’ Science Advisory Council (EASAC) Environment Steering Panel and attended together with Secretary General Margus Lopp several events marking the 15th anniversary of EASAC.

May 17 – Board of the Academy conducted a meeting via teleconference. The agenda items included new Academy membership vacancies, the schedule of elections, recommendations of the Academy addressed to the Research and Development Council (RDC) meeting on science policy, proposed amendments to the Aliens Act and a strategy for international communication of Estonian science.

May 19-20 – Member of the Board Jüri Engelbrecht represented the Academy at an international conference “Technology + Society =?” Future

organised by the Montenegrin Academy of Sciences and Arts in Podgorica. He presented an invited lecture on the topic “Complex society and values”.

May 24 – President Tarmo Soomere had a meeting with Secretary General of the Estonian National Commission for UNESCO Kerli Gutman. The major aim of their discussion was to identify possible options for making L’Oréal Research Scholarships available in Estonia.

June 2 – Academy House was the venue for a Science Afternoon offering a follow-up forum to continue discussion of ideas under the theme “Research Funding: Traditional Expense or Investment into the Country’s Future?” Robert Kitt, Chairman of the Board and Head of Swedbank in Estonia presented his vision, additional comments were provided by economic expert Kristjan Lepik. Among invited guests were Vice Rectors for Research of larger Estonian universities, representatives of the Riigikogu’s Cultural and Economic Affairs Committees as well as the Research and Innovation Support Group, (Science) Advisers to the Government and ministries, representatives of ETAg and the media.

June 9 – Academy House hosted a meeting with policy makers dedicated to the topic “Climate Change as a Research Topic and an Object of Political Debate” organised in the framework of the TeaMe+ programme. The keynote speech was given by President of the Estonian Academy of Sciences Tarmo Soomere. Debate participants included Toomas Kivimägi, Chairman of the Riigikogu’s Economic Affairs Committee and Silja Kikerpill, a member of Pärnu City Council’s Committee on Education and Culture.

June 10-14 – Vice President Mart Kalm participated at the invitation of the Academy of Sciences of Turkmenistan in an international conference “Science, Technology and Innovative Technologies in Prosperous Epoch of the Powerful State” in Aşgabat. He gave a talk on the topic “The architecture of Estonian collective farms during the late-Soviet period”.

June 14 – Academy House was the venue for a meeting with media representatives organised in the framework of the TeaMe+ programme. Participants included members of the Estonian Association of Science Journalists and invited guests. Manager of Communication at the Estonian Genome Center Annelly Allik and a member of the Estonian Association of Science Journalists Arko Olesk briefed on the Global Conference on Science Communication held on April 26-28 in Istanbul under the title “Public Communication of Science and Technology”. Opportunities for bringing up various topics of Science Communication in the programme of the forthcoming Opinion Festival in Estonia to be held in the summer of 2016.

June 18 – Presentation of several books authored by Foreign Member of the Academy Cornelius Hasselblatt was held at the Writers’ House in Tallinn.

June 20 – President Tarmo Soomere gave a talk on “Challenges for science: from providing services towards driving the society” at the Sofia Earth Forum in Helsinki.

June 21 – Board at its meeting decided to add new members to the Editorial Board of the journal *Trames* and to announce Academy membership vacancies. Agenda items included information on restructuring of the Academy Divisions, about the Academy office in Tartu, establishment of a committee on agricultural sciences, proposals for amendments to the Statutes of the Science Prizes, scholarly journals published in Estonia, a merger between the Student Research Paper Contest of the Academy and the National Contest for University Students and initiation of a Memorial Lecture Series to be named in honour of Endel Lippmaa, a recently deceased high-ranking Member of the Academy.

June 21 – Presentation of a new book in the yearly series “National Awards of the Republic of Estonia” (II). A Letter of Appreciation from the Estonian Academy of Sciences was handed over to *Professor Emeritus* Tiit-Rein Viitso in recognition of his long-standing and resultful commitment to promoting the journal *Linguistica Uralica* in the positions of Editorial Board Member as well as Editor in Chief.

July 26 – President Tarmo Soomere represented the Estonian Ministry of Education and Research at a meeting in Manchester (Great Britain) aimed at partners in the Scientific Advisers’ Network of European Union Member Countries.

August 3 – President Tarmo Soomere and Dr. John P Boright, Executive Director of International Affairs at the US National Academy of Sciences (NAS) had a meeting in Washington. Their discussion focused on the experiences of the NAS in providing scientific advice to the government, the need to promote the involvement of younger generation of scientists in academic affairs and ways to get their voice better heard as well as cooperation perspectives for the US and Estonian academies of sciences.

August 5 – President Tarmo Soomere gave a lecture on “Smart use of currents for environmental management of maritime activities” in the Civil and Environmental Engineering Faculty at Massachusetts Institute of Technology (MIT, Boston/Cambridge).

August 15 – President Tarmo Soomere presented the lecture “Smart use of currents for environmental management of maritime activities” at the Department of Geodesy and Geomatics Engineering on the Fredericton campus of the earliest university in Canada – the University of New Brunswick.

August 18 – President Tarmo Soomere gave a lecture “Wave-driven sediment transport and wave climate change in the Baltic Sea” at the Institut des sciences de la mer de Rimouski (ISMER) at Université du Québec à Rimouski in Québec (Canada).

August 22 – President Tarmo Soomere and Member of the Board Jüri Engelbrecht had a meeting with President of the the Royal Society of Canada Prof. Maryse Lassonde in Montréal (Canada). The core topics of discussion were: organising the provision of scientific advice to the government and parliament, promoting evidence based decision-making, experiences in involvement of young scientists and options to elaborate the research career model.

August 23 – Academy House was the venue for a reach out event arranged by an Estonian biotechnology company Icosagen Group aimed at media and investors. The delegation of the company was headed by Member of the Academy Mart Ustav, Founder and CEO of Icosagen.

September 16 – Academy was visited by Prof. Sir Martyn Poliakoff, Vice President and Foreign Secretary of the Royal Society, London. President Tarmo Soomere had a meeting with the guest, also attending were Secretary General Margus Lopp and Member of the Board Jüri Engelbrecht. Discussion topics included: providing scientific advice, enhancing research career development, supporting research integrity, but likewise the potential impact of Brexit.

September 23 – Academy House hosted the 2016 Finals & Gala Evening of the “Three Minute Lecture Competition”.

September 27 – President Tarmo Soomere participated as an invited guest in the “World Science Day” in Paris organised within the programme of events marking the 350th anniversary of the French Academy of Sciences.

October 4 – Board at its meeting held at the University of Tartu (UT) *Chemicum* building decided to accept all the proposals (40) that had been received by the Academy. The candidacies of 33 scientists and creative persons to the previously announced vacancies were registered and

submitted to the General Assembly for election during the forthcoming meeting on December 7. The Board affirmed amendments to the Statutes of the Academy Publishers and submitted the Statutes to the General Assembly for approval, appointed members to the L'Oréal-UNESCO Fellowship Selection Panel, approved the Endel Lippmaa Memorial Lecture Statutes and the agenda for the General Assembly Meeting. Information concerning the Student Research Paper Contest, projected formation of the Estonian Academy of Young Researchers and the Lindau Nobel Laureate Meeting (Chemistry) was briefly considered.

October 4 – UT *Chemicum* building was the venue for a seminar-discussion dedicated to Estonian Centers of Excellence in Research 2008-2015 and 2016-2023.

October 12 – Academy House hosted a meeting aimed at media representatives, organised in the framework of the TeaMe+ programme. Participants included members of the Estonian Association of Science Journalists and invited guests. Introductory speech was given by President of the Association Priit Ennet. Chief Science Editor of the daily *Postimees* (Postman) Riin Aljas talked about the formation of a special editorial board for science in the structure of *Postimees* as well as its first working months and plans for the future. Possible cooperation with the Estonian Research Council was a core topic of subsequent discussions.

October 18 – Academy was visited by representatives of the American Chemical Society Christoph Schneider and Veli-Pekka Hyttinen. A meeting with Secretary General Margus Lopp was chiefly devoted to product introduction, namely a research discovery application. SciFinder is a single-source tool providing easy, instant access to integrated databases of scholarly (chemistry) publications and patents, citations, chemical substances and reactions.

October 18-20 – President Tarmo Soomere participated in a plenary meeting of the European Marine Board and a meeting of the EMB Executive Committee in Glasgow.

October 20-21 – President Tarmo Soomere had several meetings with representatives of the Royal Society of Edinburgh, including President Joselyn Bell Burnell. The meetings held on the premises of the Royal Society were focused on a range of topics relating to provision of scientific advice, experiences in advancing relations with policy makers and the activities of the Young Academy of Scotland.

October 24 – President Tarmo Soomere participated in an Extraordinary General Assembly of the International Council for Science (ICSU) in Oslo.

October 26 – Academy House was the venue for a Science Afternoon (VIII) dedicated to the topic “Engineering Sciences in Estonia and Worldwide”. Among discussion participants were Member of the Academy Jakob Kübarsepp, civil engineering constructor Tõnu Peipman, large scale entrepreneur Heiti Hääl, Tallinn University of Technology Professors Malle Krunks, Mart Min, Jaan Raik and Arvi Hamburg (concurrently, President of the Estonian Association of Engineers). The meeting was also attended by Maive Rute, Deputy Director-General of the European Commission’s science and knowledge service, the Joint Research Centre (JRC).

October 27 – Academy was visited by a delegation from the Azerbaijan National Academy of Sciences headed by President Akif Alizade. The delegation included Vice President Ibrahim Guliyev, Director of the Institute of Physics Nazim Mammadov, Head of International Relations Esmira Alirzayeva and Head of Public Relations and Science Communication Zulfugar Farzaliyev. H.E. Dr. Murad N Najafbayli, ambassador of Azerbaijan in Tallinn, also attended the event. An agreement of cooperation was signed between the academies.

October 31 – Member of the Academy Raivo Uiibo represented the Academy at a meeting of the ALLEA Permanent Working Group on Science and Ethics in Oslo.

November 9 – Academy Division of Biology, Geology and Chemistry organised a Science Day at Põlva Hospital. Presentations were provided by Toomas Asser, Member of the Academy; Kati Toom, neurologist at Tartu University Hospital and Member of the Estonian Headache Society’s Board; and Mart Einasto, Member of the Executive Board of Tartu University Hospital. The following panel discussion on “Organisation of health care in South-Eastern Estonia: Experiences and perspectives in hospital networking” was moderated by County Governor Igor Taro. Discussion participants included Koit Jostov, Managing Director of Põlva Hospital; Arvi Vask, Member of the South-Estonian Hospital Board; Mart Einasto and Toomas Asser. The second part of the day was held at Väraska Sanatorium (spa and waterpark), where Toomas Asser talked about stroke in front of an audience composed of the professional staff working at the the Spa health centre. A general overview of the therapeutic facility was provided by Vello Saar, Väraska Spa Manager.

November 10 – Academy House was the venue for a meeting organised in the framework of the TeaMe+ programme to mark the 25th anniversary of the Estonian Association of Science Journalists.

November 14 – Academy was visited by a delegation from the National Academy of Sciences of the Republic of Kazakhstan headed by President Murat Zhurinov. President Tarmo Soomere had a meeting with colleagues from Kazakhstan, where the options for research collaboration between their counties were considered.

November 17 – President Tarmo Soomere had a meeting with Prof. Yerlan Sydykov, Member of the National Academy of Sciences of the Republic of Kazakhstan and Rector of the L. N. Gumilyov Eurasian National University, and Prof. Assemgul Moldazhanova, Vice Rector for Academic Affairs of the University.

November 17-18 – Secretary General Margus Lopp participated in a meeting of the European Academies' Science Advisory Council (EASAC) in London.

November 25 – Academy submitted to the Minister of Education and Research a concise analysis titled “The peculiarities and bottlenecks in Estonian research funding” that was composed as a result of large-scale discussions.

November 28 – Estonian Association of Engineers and the Academy's Division of Informatics and Engineering hosted a roundtable discussion under the title “From Science to Entrepreneurs” at the Academy House.

November 30 – Academy House was the venue for a seminar “How Can We Infuse New Vigour into the Economy?”

December 1 – President Tarmo Soomere participated in a public ceremony at the Estonian House in Stockholm and gave a lecture “Estonian coastal waters in tumultuous times”. The gathering was arranged by the Estonian Learned Society in Sweden to mark the 97th anniversary of the Estonian-language university.

December 6 – Academy House was the venue for an introduction seminar of the database Infotechnological Mobility Observatory (IMO).

December 7 – Meeting of the General Assembly started with an invited speech by Gunnar Okk “Worldwide networks of international financial institutions and their relations with Estonia”. Thereafter, the Statutes of the

Estonian Academy Publishers were approved and three new Members of the Academy were elected: Jaan Eha – Professor of Cardiology, Maarja Kruusmaa – Professor of Biorobotics and Anu Raud – *Professor Emeritus* and Estonian folk art investigator.

December 13 – Board at its meeting established a preparatory team tasked to establish the Endel Lippmaa Memorial Lecture series. Among agenda items considered at the meeting were: information about the forming process of the Estonian Academy for Young Researchers, appointing reviewers to Research Professors, the Academy’s Schedule of Activities for 2017, updating the Statutes and the Development Plan of the Academy.

December 14 – Estonian Academy of Sciences together with the Board of the Estonian Association of Engineers and the Academy’s Energy Council conducted a joint visit to the Auvere Power Plant.

December 15 – Academy House was the venue for the “Student Research Paper Contest Laureates Conference” and award ceremony, where the names of the winning recipients were unveiled. Special President of the Estonian Academy of Sciences Awards were conferred for the first time.

December 19-20 – Vice President Mart Kalm and President Tarmo Soomere attended a conference on “Development of Scientific Relations, Dialogue and Cooperation in the New Stage” in Baku under a recently signed co-operation agreement between the Estonian Academy of Sciences and the Azerbaijan National Academy of Sciences.

MEMBERSHIP OF THE ACADEMY

Three new Members of the Academy were elected by the General Assembly on 7 December 2016:



Maarja Kruusmaa
(in engineering)



Jaan Eha
(in natural sciences and medicine)



Anu Raud
(in art)

The membership of the Estonian Academy of Sciences was composed of 77 Members and 20 Foreign Members as of March 2017. Their distribution among four divisions was the following:

DIVISION OF ASTRONOMY AND PHYSICS

(18 Members, 6 Foreign Members)

Members: Jaan Aarik, Jaak Aaviksoo (Head of Division), Jaan Einasto, Ene Ergma, Vladimir Hižnjakov, Arvi Freiberg, Georg Liidja, Ülo Lumiste, Tšeslav Luštšik, Ergo Nõmmiste, Eve Oja, Martti Raidal, Enn Saar, Peeter Saari, Mart Saarma, Arved-Ervin Sapar, Gennadi Vainikko, Richard Villems.

Foreign Members: Jonathan (John) R Ellis, Richard R Ernst, Charles Gabriel Kurland, Jaan Laane, Jaak Peetre, Alar Toomre.

DIVISION OF INFORMATICS AND ENGINEERING

(19 Members, 4 Foreign Members)

Members: Olav Aarna, Hillar Aben, Jüri Engelbrecht, Ülo Jaaksoo, Maarja Kruusmaa, Valdek Kulbach, Jakob Kübarsepp (Head of Division), Rein Küttner, Ülo Lepik, Enn Lust, Enn Mellikov, Leo Mötus, Arvo Ots, Tarmo Soomere, Enn Tõugu, Raimund-Johannes Ubar, Tarmo Uustalu, Jaak Vilo, Andres Öpik.

Foreign Members: Steven R Bishop, Antero Jahkola, Michael Godfrey Rodd, Esko Ukkonen.

DIVISION OF BIOLOGY, GEOLOGY AND CHEMISTRY

(23 Members, 6 Foreign Members)

Members: Toomas Asser (Head of Division), Jaan Eha, Jaak Järv, Ain-Elmar Kaasik, Dimitri Kaljo, Mati Karelson, Ilmar Koppel, Urmas Kõljalg, Hans Küüts, Agu Laisk, Ülo Lille, Margus Lopp, Udo Margna, Jüri Martin, Andres Metspalu, Ülo Niinemets, Anto Raukas, Valdur Saks, Martin Zobel, Raivo Uibo, Mart Ustav, Eero Vasar, Mihkel Veiderma.

Foreign Members: Carl-Olof Jacobson, Ülo Langel, Pekka T. Männistö, Matti Saarnisto, Helmut Schwarz, Jānis Stradiņš.

Hans-Voldemar Trass passed away on 14 February 2017.

DIVISION OF HUMANITIES AND SOCIAL SCIENCES

(17 Members, 4 Foreign Members)

Members: Jüri Allik, Mihhail Bronštein, Mart Kalm, Arno Kõörna, Valter Lang, Lauri Mälksoo, Karl Pajusalu, Arvo Pärt, Anu Raud, Jaan Ross, Hando Runnel, Huno Rätsep, Karl Siilivask, Tõnu-Andrus Tannberg, Jaan Undusk, Urmas Varblane (Head of Division), Haldur Õim.

Foreign Members: Juri Berezkin, Cornelius Theodor Hasselblatt, Päiviö Tommila, Endel Tulving.

Arvo Krikmann passed away on 27 February 2017 and Peeter Tulviste on 11 March 2017.

During 2016 the majority of Members of the Estonian Academy of Sciences proceeded with their research and academic activities as leading experts in their fields of study.

Complementary to their principal occupation they followed the tradition of acting as experts and advisers both at home and abroad. Several Members sat on expert panels and councils of national significance:

- President's Academic Advisory Board – Peeter Saari, Richard Villems;
- Board of President of the Republic's Cultural Foundation – Jaan Undusk;
- Government of the Republic Research and Development Council – Jaak Aaviksoo, Mart Saarma, Tarmo Soomere;
- Government of the Republic Sustainable Development Committee – Margus Lopp;
- National Science Prize Committee – Tarmo Soomere (Chair), Jaan Aarik, Toomas Asser, Maarja Kruusmaa, Valter Lang, Jüri Martin, Lauri Mälksoo, Ülo Niinemets, Karl Pajusalu, Eero Vasar (Vice Chair);
- Board of Estonian Research Council – Mart Ustav;
- Estonian Research Council's Evaluation Committee – Lauri Mälksoo, Ergo Nõmmiste, Eero Vasar, Richard Villems, Jaak Vilo;
- Estonian Science Communication Award Appraisal Panel at Estonian Research Council – Enn Tõugu (Chair);
- Estonian National Contest for University Students Appraisal Board at Estonian Research Council – Jaan Aarik;
- Supervisory Board of Eesti Pank – Urmas Varblane;
- Fiscal Council – Urmas Varblane.

A considerable number of Members were involved in the work of expert panels reporting to a particular ministry.

Ministry of Education and Research:

- Research Policy Advisory Committee – Ülo Niinemets and Ergo Nõmmiste;
- Internationalisation of Estonia's Higher Education and Research Advisory Council – Jüri Engelbrecht;
- Steering Council for Research and Innovation Policy Monitoring Programme – Jüri Engelbrecht and Urmas Varblane;

Working Group and Steering Committee for Research Programme – Jüri Engelbrecht;
Steering Committees of National R&D Programmes: Language Technology Support for the Estonian Language (2011-2017) – Jaak Vilo (Chair); Supporting Terminology in Estonian (2013-2017) – Valter Lang; Compilation and Publishing of Textbooks in Estonian for Higher Education (2013-2017) – Margus Lopp;
Programme Board of the National Programme: Values Development in Estonian Society (2015-2020) – Olav Aarna and Jüri Engelbrecht;
Estonian Lifelong Learning Strategy 2020 Steering Group – Olav Aarna;
Estonian Language Council – Karl Pajusalu.

Ministry of Finance:

Cohesion Policy Operational Programme Monitoring Committee – Tarmo Soomere (permanent member), Margus Lopp (substitute member).

Ministry of the Environment:

Gene Technology Committee – Eero Vasar;
Environmental Monitoring Advisory Committee – Anto Raukas.

Ministry of Social Affairs

Advisory Professional Committee for Neurosurgery – Toomas Asser;
Advisory Professional Committee for Cardiology – Jaan Eha;
Advisory Professional Committee for Allergy and Immunology – Raivo Uibo;
Health Research and Innovation Council – Eero Vasar.

Estonian Centres of Excellence in Research were headed by five Members of the Academy:

Martti Raidal – Dark Side of the Universe; Ülo Niinemets - Ecology of Global Change: Natural and Managed Ecosystems; Enn Lust – Advanced Materials and High-Technology Devices for Energy Recuperation Systems; Andres Metspalu – Centre of Excellence for Genomics and Translational Medicine; Maarja Kruusmaa – EXCITE, Excellence in IT in Estonia.

Two Members of the Academy belonged to decision making bodies of doctoral schools: Karl Pajusalu (Chairman of the Council) – Graduate School of Linguistics, Philosophy and Semiotics; Eve Oja (Chairman of the Council) – Estonian Graduate School in Mathematics and Statistics.

Similarly to previous years, Members of the Academy were widely represented in international scientific organisations and editorial boards of scholarly journals.

Ülo Lepik and Raimund Ubar were granted the National Science Prize for Outstanding Achievements in Research and Development, while Maarja Kruusmaa was recognised with the Annual Award in the category of engineering, Martin Zobel (as research team leader) in the category of geo- and biosciences and Tõnu-Andrus Tannberg in the category of the humanities (see p. 74–78).

Ergo Nõmmiste was awarded the Order of the White Star, 3rd class (see p. 79).

Members of the Academy also gained recognition from various institutions, associations and organisations:

Jaan Aarik was awarded the University of Tartu Badge of Distinction; Urmas Kõljalg received a Motivation Prize in the Estonian Science Communication Award Contest as leader of the team for preparing the display of the new permanent exhibition at the University of Tartu Natural History Museum;

Ülo Lille received a Letter of Appreciation from Tallinn University of Technology;

Enn Lust was granted the Small Medal of the University of Tartu; Tšeslav Luštšik was awarded the E. F. Gross Medal of the D. S. Rozhdestvensky Opical Society;

Andres Metspalu was granted the Grand Medal of the University of Tartu;

Ergo Nõmmiste was granted the Grand Medal of the University of Tartu;

Arvo Ots received a Letter of Appreciation from Tallinn University of Technology;

Karl Pajusalu was awarded an Honorary Doctorate by the University of Latvia;

Arvo Pärt was awarded an Honorary Doctorate in music by the University of Oxford, 2016 Estonian Music Golden Disc Award in the album of the year category, special award titled “From Heart to Heart” from the Lasering music store, Estonian Cultural Endowment annual award for outstanding contributions to the musical culture of the world in 2015; he was nominated the first Honorary Citizen of Keila Parish;

Peeter Saari was elected the OSA Fellow by the Optical Society of America;
Jaan Undusk received the Estonian Cultural Endowment annual award;
Urmas Varblane was granted the Small Medal of the University of Tartu;
Jaak Vilo was granted the Small Medal of the University of Tartu.

Three Members – Ülo Niinemets, Martin Zobel and Andres Metspalu earned the distinction to be included among the top influential names in science according to the Thomson Reuters listings of Highly Cited Researchers.

Foreign Members continued participating in the activities of the Academy and research institutions of Estonia in compliance with time-honoured collegial relationships, scientific collaborations and research alliances.

GENERAL ASSEMBLY

The General Assembly of the Academy convened twice in 2016:

April 20 – Annual Meeting

- Siim Kallas “Wisdom – information, capabilities, politics”
- Richard Villems “*Á la recherche du temps perdu*”
- Reports from Heads of Divisions Jaak Aaviksoo, Jakob Kübarsepp, Toomas Asser, Urmas Varblane and President Tarmo Soomere on the activities of the Academy in 2015
- Report from Secretary General Margus Lopp on the financial activities of the Academy in 2015 and the 2016 budget
- Assigning of the Members’ allowances for the period 1.05.2016-30.04.2017
- Forthcoming election of new Members to the Academy

December 7 – Meeting

- Gunnar Okk “Worldwide networks of international financial institutions and their relations with Estonia”
- Approval of the Statutes of the Estonian Academy Publishers
- Election of new Members of the Academy

The Annual Meeting in April focused on summing up the activities of the Academy in 2015. Detailed data concerning those activities were presented in the “Estonian Academy of Sciences Year Book” XXI (48), mailed to all Members in advance.

President Tarmo Soomere conferred the Karl Schlossmann Memorial Medal on Member of the Academy Eero Vasar – one of the main instigators in the preparation process of the Research, Development and Innovation Strategy for the Estonian Health System 2015-2020 “Research and Innovation for Health”.

The former Vice-President of the European Commission Siim Kallas gave a keynote speech “Wisdom – information, capabilities, politics”.

The Karl Ernst von Baer Memorial Medal Laureate, Member of the Academy Richard Villems delivered his medal lecture on the topic “*Á la recherche du temps perdu*”.

Heads of Divisions Jaak Aaviksoo, Jakob Kübarsepp, Toomas Asser and Urmas Varblane reported on the activities performed by their Divisions in 2015. President Tarmo Soomere summarised the reports. Based on the reports and supplementary information in the Year Book, the General Assembly, on the proposal of Secretary General, approved the Academy's annual report 2015.

Secretary General Margus Lopp reported on implementation of the 2015 budget and presented the 2016 budget. Both were approved by the General Assembly.

Secretary General Margus Lopp introduced a plan for assigning member allowances for the period 01.05.2016-30.04.2017. The General Assembly decided to keep on distributing the allocated amount among all Members of the Academy on an equal basis.

President Tarmo Soomere presented to the General Assembly the Board's decision to call an election of five new Members: one from each Division, plus one additional vacancy for an outstanding creative person specialising in art.

Under the authority of the General Assembly, Dimitri Kaljo as the oldest Member present at the meeting signed President Tarmo Soomere's service contract on behalf of the Academy.

The second Meeting of the General Assembly was held on December 7. An introductory invited speech was made by Vice-President of the Nordic Investment Bank Gunnar Okk, who talked on the topic "Worldwide networks of international financial institutions and their relations with Estonia".

Secretary General Margus Lopp gave a general outline of amendments to the Statutes of the Estonian Academy Publishers and the General Assembly approved the Statutes.

The next item on the agenda was election of new Members of Academy to five vacancies that had been previously announced. From among 34 candidates nominated by higher educational institutions and research institutes, three new Members were elected as a result of the ballot. Maarja Kruusmaa was elected in the area of engineering from among 7 nominated candidates (Alvo Aabloo, Irina Hussainova, Malle Krunks, Maarja Kruusmaa, Ülo Mander, Jaan Raik and Väino Sammelselg); Jaan Eha was elected

in the area of natural sciences and medicine from among 14 candidates (Jaan Eha, Anne Kahru, Mihkel Kaljurand, Maia Kivisaar, Maris Laan, Ivo Leito, Irja Lutsar, Andres Merits, Mari Moora, Tiina Nõges, Pärt Peterson, Tõnis Timmusk, Margus Viigimaa and Mihkel Zilmer); Anu Raud was elected in the area of art from among 5 candidates (Elmo Nüganen, Priit Pärn, Anu Raud, Ene-Liis Semper and Aili Vint).

In the area of physics, neither of the nominated two candidates (Marco Kirm and Urmas Nagel) obtained the required number of votes. Similarly, from among 6 candidates (Talis Bachmann, Rainer Kattel, Tiina Randma-Liiv, Anu Realo, Rein Taagepera and Maaja Vadi) nominated in the the area of social sciences, none were elected. The vacancies in physics and in social sciences remained unfilled.

BOARD

The Board of the Estonian Academy of Sciences worked in 2016 in the following composition:

President	Tarmo Soomere
Vice-President	Ergo Nõmmiste
Vice-President	Mart Kalm
Secretary General	Margus Lopp
Head of Division of Physics and Astronomy	Jaak Aaviksoo
Head of Division of Informatics and Engineering	Jakob Kübarsepp
Head of Division of Biology, Geology and Chemistry	Toomas Asser
Head of Division of Humanities and Social Sciences	Urmas Varblane
Non-Executive Members Jüri Engelbrecht, Jaak Järv, Valter Lang, Ülo Niinemets, Karl Pajusalu, Martti Raidal, Peeter Saari, Andres Öpik	

The Board held six working meetings during the year. On three occasions, the decision was passed under the procedure of electronic poll.

The Board continued with holding some of its meetings as field sessions outside the Academy House. They were combined with an accompanying event or a visit to the hosting institution. The Board Meeting in March was followed by a get-together and acquaintance tour at Tartu University Hospital. Members of the Board were given a genial welcome by Margus Lember, Dean of UT Faculty of Medicine and Head of Internal Medicine Clinic. The Board Meeting in October was held at the University of Tartu *Chemicum*. The meeting was accompanied by a seminar and discussion devoted to the activities of Estonian Centres of Excellence in Research.

Various details relative to membership vacancies were considered on several occasions, owing to the forthcoming elections of new Academy Members. In the beginning of the year, the Board decided to propose that the General Assembly announce five Academy membership vacancies. The Divisions of the Academy were subsequently asked to present their preferences concerning specialties of the announced vacancies. In June, the Board settled on opening vacancies in the following specialties: physics; engineering; natural sciences and medicine; social sciences; art. The election schedule was determined as well. 34 candidates nominated

by Members of the Academy, higher educational institutions and research institutes were registered in October.

Chairman of the Research Professor Appraisal Panel Mart Kalm presented the recommendations of the panel at the meeting of the Board in January. Three new Research Professors were elected: Anne Kahru, Research Professor at the National Institute of Chemical Physics and Biophysics; Kaupo Kukli, Leading Researcher at the Institute of Physics, University of Tartu; Rainer Kattel, Professor at Ragnar Nurkse School of Innovation and Governance, Tallinn University of Technology. The Board appointed reviewers to Research Professors on the part of the Academy.

Practical preparations to establish the Estonian Young Academy of Sciences were commenced in 2016. The Board formulated the main principles, the number of members and called on Estonian universities and research establishments to nominate candidates to the initiating group.

Resulting from negotiations with the Estonian Research Council, the Board decided to merge the Academy's Student Research Paper Contest with the National Contest for University Students conducted by the Ministry of Education and Research. It was resolved that henceforth three Special Prizes, the so-called π -prizes, would be conferred by the President of the Academy within the framework of the national contest.

Discussion and decision-making in daily work issues composed a significant part in the functions of the Board. Careful consideration was given to the Academy's Action Plan for 2017, the report on the financial activities of the Academy in 2015 and the 2016 budget as well as the Amendments to the Statutes of the Estonian Academy Publishers. The last three were submitted to the General Assembly for approval. The Board appointed two additional members to the Editorial Board of the journal *Trames*, namely Daniele Monticelli, Professor of Italian Studies and Semiotics at Tallinn University and Tiina Randma-Liiv, Professor at Ragnar Nurkse Department of Innovation and Governance, Tallinn University of Technology. Andres Õpik was nominated to the new composition of the University of Tartu Council. The Karl Schlossmann Memorial Medal was awarded to Member of the Academy Eero Vasar. The Board initiated a Memorial Lecture series to be named in honour of a recently deceased high-ranking Member of the Academy Endel Lippmaa. The corresponding Statutes were approved and an *ad-hoc* panel (chaired by Mart Kalm) was established. Members of the Board also agreed upon the leading principles for updating the Statutes of the Academy and considered the Development Plan of the Academy. The new structure of the Academy Office was authorised

and possible changes to the structure of the Academy were discussed with a view to achieving smoother coherence with the research landscape in Estonia.

A trilateral agreement was signed between the Academy, L'Oréal Baltic and the Estonian National Commission of UNESCO on broadening the L'Oréal-UNESCO fellowship programme FOR WOMEN IN SCIENCE to include Estonia. The target group are female scientists with PhD or higher degree. The Board approved the composition of the Appraisal Panel (Chairman Ergo Nõmmiste) for determining the fellowships.

The Board organised a get-together with associated societies, gained a closer insight into their activities and established principles for the funding of societies. After considering information on digitalisation of scholarly journals, open access and user rights presented by Director of the Academic Library of Tallinn University Andres Kollist, the Board suggested that access to digitised materials should be as wide as possible. Particular attention was given to information about the status of preparations for the events planned to mark the anniversaries Republic of Estonia 100 and the Estonian Academy of Sciences 80 provided by Jüri Engelbrecht.

A fresh gathering format was introduced by the Academy in 2016 – regular round-table consultations preceding the meetings of the Government of the Republic Research and Development Council (RDC, www.tan.ee). The main target has been to develop a common position of the Estonian research community concerning the items placed on the agenda of the forthcoming RDC meeting. Participants include the Academy leadership, Vice-Rectors for Research from larger Estonian universities, representatives of research institutions and governmental authorities. Recommendations of the Academy on science policy submitted to the RDC meeting were considered and formulated.

The Monday meetings of the Academy leadership were pursued similarly to the previous year – the agenda themes covered a broad range of topics from science policy issues to organisational matters within the Academy.

DIVISIONS¹

DIVISION OF ASTRONOMY AND PHYSICS

In 2016, there were two Division assemblies, the first on June 3 and the second one on November 25.

The meeting of June 3 discussed in which field the vacancy of an Academy Member belonging to the Division should be announced. The Division reached a consensus on physics. The Division also discussed the possible field of the cross-Academy vacancy and reached a consensus on theatrical art. Under consideration was the issue of representation of the Academy in Tartu. In view of the contemplated changes, the activities of the prevalent majority of Members of Academy working in Tartu were apparently under-administrated. Member of Academy Arved-Ervin Sapor suggested meetings of the Tartu-based Members of Academy to be launched, so that they could familiarise themselves with the work of colleagues, in the process of a series of academic discussions.

The meeting of November 25 elected the Vice Rector of the University of Tartu Marco Kirm as the favoured candidate from the Division in the area of physics. The Division also discussed the letter by Secretary General Margus Lopp as regards the amendments to Statute; however it found that the subject could not be discussed at length, absent the respective frame of reference. The key question for planning the activities was funding of the Academy on the level acceptable for the work as to its substance. It was deemed important to find a special role in the activities of the Academy and the acceptable working conditions also for the Tartu representation and for Members of Academy operating in Tartu. The contemplated meetings to hear the work of colleagues however could not be started due to lack of suitable premises, by reason of protracted repairs of the Library of the University.

Members of the Division represented the Academy in several decision-making and advisory bodies for science administration (see “Membership”).

DIVISION OF INFORMATICS AND ENGINEERING

In the reporting year there were two regular Division Assembly meetings.

¹ Composed according to materials submitted by Heads of Divisions Jaak Aaviksoo, Jakob Kübarsepp, Toomas Asser and Urmas Varblane.

At the meeting of June 7, the Division discussed the field of the vacancy of an Academy Member belonging to the Division and the activity of the Estonian Association of Engineers. Given the age structure of members of the Division, it was decided to make a proposal to Board of the Academy to open the vacancy in engineering. Review about the activities of the Association was submitted by its president Arvi Hamburg.

On agenda of the meeting of November 29 was formation of preferences as regards candidates for Member of Academy and taking positions on important issues related to research. The preferences on engineering, natural sciences and medicine were made basing also on hearing candidates for Member of Academy at a video conference held on November 7 and 8. The preferences of the Division as per specialties were the following: in engineering – three candidates winning the majority vote were Maarja Kruusmaa, Malle Krunks and Jaan Raik; in physics – all candidates won equal support; in natural sciences and medicine – Anne Kahru, Tõnis Timmusk and Margus Viigimaa; in social sciences – Tiina Randma-Liiv and Rainer Kattel; in arts –Anu Raud. Members of the Division deliberated on other pertinent issues, e.g. the new concept of funding research; the report of the working group of economic development; the scientific journals in Estonia; compiling of the collection “Research in Estonia 100” in connection with the 100th anniversary of the Republic of Estonia; relevance of research in society and its presentation to wider readership in Estonia.

Members of the Division contributed to organisation of many events in Estonia and were promoters of quite a few events held abroad. Raimund Ubar was General Vice-Chair at the conference 14th IEEE East–West Design & Test Symposium (Yerevan, Armenia) and carried out the international summer school on the topic “Design for Testability” at Darmstadt University of Technology in Germany. Tarmo Uustalu worked as member of action committees and programme committees of several conferences and workshops. Andres Õpik was member of research committee of the international conference “Baltic Polymer Symposium 2016” (Klaipėda, Lithuania); etc.

A number of members of the Division spoke up in Estonian media for popularising research and speciality, by writing in Estonian dailies or going on air in TV and radio (J. Kübarsepp, R. Ubar, T. Uustalu). The largest contribution in that respect was made by President Tarmo Soomere. T. Soomere also delivered a series of invited and public lectures on marine and coastal research issues within the Estonian context (see Committee on Marine Sciences pp. 43–47) and took the floor as an invited speaker at several science policy and other conferences. Members of the Division also delivered various papers.

DIVISION OF BIOLOGY, GEOLOGY AND CHEMISTRY

There were two Division assemblies, on May 30 and November 16, mainly discussing the questions of broadening the scope of the Academy in connection with announcing vacancies for candidacy of Member of Academy. The name of vacancy of the Division “Natural sciences and medicine” was found to encompass all aspects of research of the Division. The General Assembly of the Academy on December 7 elected Head of the Heart Clinic of the University of Tartu Jaan Eha as Member of Academy.

Jointly with the Division of Informatics and Engineering a common meeting was held to hear candidates for Member of Academy over video-bridge in the premises of the Estonian Research Council in Tartu and Tallinn on November 7 and 8, with 20 candidates attending, out of the total of 21.

On March 8 the Academy Board meeting was held in the new building of *Clinicum* of the University of Tartu. The work of the *Clinicum* was presented by Head of Board of the Foundation “*Clinicum* of the University of Tartu” Urmas Siigur. Member of Academy Toomas Asser delivered a public lecture “Brain maps help re-orient”. Afterwards the participants toured the departments of the *Clinicum*.

On November 9, within framework of regional policy of the Academy, a Science Day was held in Põlvamaa titled “Our health and medicare”. The introductory speech was made by county governor of Põlva Igor Taro. Member of Academy Toomas Asser gave a talk “Plasticity of brain or how brain pardons our mistakes”. Kati Toom, neurologist of the Foundation “*Clinicum* of the University of Tartu”, member of the NGO Estonian Headache Society spoke on the topic “Studying headache with the help of e-solutions”. The topic of paper by Mart Einasto, member of Board of the Foundation “*Clinicum* of the University of Tartu” was “How the countries provide for health of their citizens”; a review of medicare in South-East Estonia was provided by Arvi Vask, member of Board of the Foundation South-Estonian Hospital. The experience of networking of hospitals and its perspectives was the topic of Koit Jostov from the Põlva Hospital Ltd.

The Science Day continued at Väraska Sanatorium, with Member of Academy Toomas Asser delivering a talk to medical personnel and management about the necessity and importance of preventing stroke. Thereafter the participants looked at the building of Sanatorium and introduced themselves to its work.

At the international conference held in Tartu in the University Hall on December 9, Professor Vladimír Beneš (the Prague Charles University), former President of the European Association of Neurosurgeons was handed over the Ludvig Puusepp Medal; he delivered the traditional

Lecture of Laureate “Where Do We Come From? What Are We? Where Are We Going?” Presentations were also delivered by Professor Tambet Teesalu “Targeted drug delivery to mouse models of glioma” and Dr. Jaan Aru “Using intracranial EEG to understand visual processing in the human brain” from the University of Tartu.

DIVISION OF HUMANITIES AND SOCIAL SCIENCES

In 2016, the Division held two meetings, on May 31 and November 15. The main topic was determining the specialities necessary for Division in connection with announcing vacancies for Member of Academy. The Division reached a consensus on the fields “social sciences” and “arts”. Also on agenda were working conditions of the representation in Tartu and the issue of who would hold the respective office.

February 19 – the international conference in the hall of the University of Tartu to celebrate the 160th birthday anniversary of Emil W. M. G. Kraepelin, Professor in Psychiatry of the University of Tartu and the 130th anniversary of the inception of his Professorship at the University of Tartu.

March 2 – the follow-up of the Science Day in cooperation with the Võru County Government, tackling the topics of Islamist studies. Speaking were researchers of the University of Tartu Elo Süld on the topic “Pluralist Islam”, Urmas Pappel on the topic “History and politics of China” and representative of College of World Languages and Cultures of the University of Tartu Eri Miano, who focussed on Japanese and the culture of Japan. The participants were also engaged in a linguistic and musical game.

November 21 – the follow-up of the Science Day at Võru Gymnasium, in cooperation with the Võru County Government tackling the umbrella topic “Realising the importance of Asia today”. Speaking were Member of Academy Urmas Varblane on the topic “Changing role of Asia in the world economy”, Professor of International Relations of the University of Tartu Eiki Berg on the topic “Peaceful emergence of China and the regional conflicts casting shadows over it” and Head of Asian Centre of the University of Tartu Elo Süld on the topic “Changes in Islamic countries and their relation to religion”.

General Assembly on December 5 elected Professor Emeritus of the Estonian Academy of Arts, researcher in popular arts Anu Raud as a Member of the Academy.

COUNCILS, COMMITTEES

COMMITTEE ON METEORITICS

Set up in 1954

Chairman Jüri Plado, PhD

In 2016 the research in meteoritics concentrated in the Department of Geology of the University of Tartu. In July, field works (Jüri Plado, Argo Jõelet, Anna Łosiak and Mateusz Szyszka) were carried out in Ilumetsa and Kaali structures. Four air holes were drilled into the outward sides of the Ilumetsa structures; from beneath of the extrusion matter at the depth of ~1 m grains of coal came to light, for the first time. Discovery of the buried coal dispelled doubts about the glacial origin of Ilumetsa structures. Coal has been dated at Vienna University. Its age is in conformity with the previous age-estimate of the Ilumetsa structures, with the coal's coefficient of reflection implying the relatively low coalification temperatures, unlike those of the coal deriving from forest fires. Air holes were also drilled in the circumvallation and inner slope of the Kaali twin crater 2/8. The excavation corroborated the hypothesis of existence of coal also in smaller craters, beside the main crater. The matter of the meteoritic origin found in the extruded material (the so-called Kaali iron i.e. meteoritic shrapnel) was delivered to the Museum of Natural History of the Tartu University.

Mart Gaškov defended his master's thesis on the topic "Zonal sphalerite in hydrothermal sulphide mineralization occurrences at Kärđla" at the Department of Geology of the University of Tartu.

In January, the Museum of Natural History of the University of Tartu put on display (as a part of its permanent exhibition) the showcase on meteorites and traces of falling meteorites (Juho Kirs and Tõnu Pani). Tõnu Pani recorded in the database of meteorites of The Meteoritical Society the adjustment respecting the falling place of the Tännassilm (Tennasilm) meteorite.

During the year the employees of the Museum of Natural History and Department of Geology (University of Tartu), Institute of Geology (Tallinn University of Technology) and Geological Survey of Estonia gave consultations on various meteoritics-related issues to a score of citizens

and officials (the possible link of happy finds to meteorites, the possible link of rotund structures to meteorite craters).

COMMITTEE ON NATURE CONSERVATION

Set up in 1955

Chairman Urmas Tartes, Professor

The Committee on Nature Conservation at the Estonian Academy of Sciences continued working on the premises of the Baer House (Veski Street 4) belonging to the Estonian University of Life Sciences. At the end of reporting year the Committee comprised 24 members. The Committee suffered a sad loss – its longtime active member, Professor Emeritus of Tallinn University of Technology Enn-Aavo Pirrus departed.

March 18 – the Committee organised jointly with the Ministry of the Environment a night of talks dedicated to the Year of Conservation of the Estonian Landscapes. It was moderated by Urmas Tartes, the keynote speaker being Professor Emeritus of the University of Tartu Ivar Arold – researcher of Estonian landscapes, mastermind of borders of several landscape conservation areas and conservation programmes. He delivered a paper on zoning of the Estonian landscapes. Professor Kalev Sepp from Estonian University of Life Sciences provided an overview of Arold's 40-year-long career as lecturer and researcher. Hanno Zingel, chief specialist in nature conservation of the Ministry of the Environment deliberated on the role of Ivar Arold in research of our landscapes and handed over the token of recognition of the Ministry – the silvery nature conservation badge. Piret Palm presented the events of the current Year of Conservation of the Estonian Landscapes. Urmas Tartes projected topical staggering landscape views. The participants also enjoyed the exhibition "Arold's landscapes" composed by Vaike Hang.

May 9 – in Tallinn Zoo the Estonian ultimate recognition for nature conservation – the Kumari Nature Conservation Prize with the Gold Badge of Distinction for nature conservation was handed over to Mati Kaal. That event ushered in the nature conservation month of the reporting year "Estonian nature – our own or alien". As a follow-up to recognition of Kaal's invaluable work, Vaike Hang composed the exposition on his travels and works in the Baer House in Tartu.

June 8 – the traditional colloquium "Local self-government and nature conservation", inspired also by the administrative reform in progress.

Papers were delivered by Urmas Tartes, Kalev Sepp – Estonian University of Life Sciences; Kaja Lotman, Leelo Kukk, Kaili Viilmaa – Environmental Board; Tarmo Tüür – Estonian Nature Foundation; Karin Kangur – Tallinn City Government and Arno Peksar, the Hanila parish elder.

November 5 – festive celebration in the newly inaugurated Estonian National Museum (in Tartu) of the 50th anniversary of the Estonian Nature Conservation Society on the topic “How is Estonia – our nature and culture to be cherished”. The Society was presented with a bulky folder composed by Vaike Hang with materials reflecting mutual cooperation (200 photos, copies of articles and manuscripts, descriptions of events, the holdings relating to Jaan Eilart, Endel Varep, Eerik Kumari, Gustav Vilbaste etc.). Founding members of the Society President Arnold Rüütel and Jaan Riis gave talks. On agenda were papers on Rail Baltic (writer Valdur Mikita, editor in chief of the magazine *Akadeemia* Toomas Kiho and others). The letter of 101 against the present Rail Baltic project was signed by members of the Committee Toomas Kukk, Urmas Tartes and Hans Trass.

November 17 – in cooperation with the Estonian Nature Conservation Society, meeting in the Baer House with the longstanding Professor of the Estonian University of Life Sciences, silviculturist and nature conservation activist Ülo Tamm, speaking about his scientific concern – the research of poplar and aspen. On display in the Baer House was an exhibition about Ü. Tamm’s life and work, composed by Vaike Hang.

The Committee welcomed back the exhibition dedicated to the 130th anniversary of the author and teacher Mats Mõtslane (Mart Kiirats), which had been on display in the Pärnu-Jaagupi central library. The Estonian Agricultural Museum plans to transform that heritage of Mõtslane collected by V. Hang into a travelling exhibition, dedicated to the centennial of the Republic of Estonia.

Daily work of members of the Committee is prevalently nature conservation or closely related matters.

In the outgoing year, attention was focussed around our place names. On July 9, on the Day of Native Place Vaike Hang spoke about the Tõhela area place names. There was also an exposition on popular place names per hamlets, with most intriguing place names picked out. A similar exposition was organised by V. Hang at the Tõstamaa parish days on August 12-14. The interested parties had an opportunity to look at exposition of place names of several hamlets (basically those surrounding the borough).

Member of the Committee Kuulo Kalamees is engaged in the topic Agarics contained in the Estonian Red Book. He has participated in composing an overview of species and taxonomy in Estonia included into the Red Book. In the reporting year he was twice a guide to the Museum of Natural History of the Tartu University and at large mushroom exhibitions on display at Lille St Nature House, teaching to visitors how to protect mushrooms and to differentiate them.

Upon proposal of the longstanding member of the Committee, the well-known botanist Vilma Kuuse lodged with the Pärnu Environmental Board, the protection regulations of the nature conservation area the Pärnu waterfront hayfield were changed: now the conservation area includes the habitat of the second conservation category *Herminium monorchis* behind the water treatment plant beside the waterfront alley. The alley used to be the border of the conservation area, but now the border runs at 10 m from the centre line of the alley. In that year V. Kuuse counted 334 *Herminium monorchis* plants there. It is also the habitat of the third conservation category *Epipactis palustris* and occasionally the *Dactylorhiza baltica* – the latter outside the fence of corral in the waterfront hayfield. The habitat has been cleaned up and the hay scythed in common effort with the Environmental Board and by Vilma Kuuse, reaching out her helping hand.

Heiki Tamm continued research in Estonian yew tree populations to find out the path of their migratory inroads into Estonia. He delivered two papers: at seminar of Estonian botanical gardens “Types of coniferous trees on Mediterranean beach” (March) and “The largest trees in the world” (August). H. Tamm also supervised the study excursion of Friends of Tallinn Botanical Garden Society to the Botanical Garden of Helsinki University and Haaga rhododendron park (June) and to Põlvamaa to look at the tallest trees in Estonia (September). He also organised twice with the Friends of Botanical Garden the cleaning-up bee in Pirita primordial valley (in May and October).

Urmas Tartes delivered lectures in various places of Estonia – Estonian Nature Museum, Vapramäe nature house, Jõgevamaa schools and Lilli nature house. He also worked on evaluation panel of contests Nature Photo of the Year, photo competition Estonian Nature, photo competition organised by VVV “Notice me!”. In the Sagadi forest museum he completed the exhibition on *Culicidae*. The highlight event was supervising of the nature trip of the President of Finland and his spouse in Loodi during the state visit.

The Committee cooperates with the Ministry of the Environment and its structural institutions, Estonian Ornithologists' Society, Estonian Naturalists' Society, and Estonian Nature Conservation Society.

ENERGY COUNCIL

Set up in 1998

Chairman Arvi Hamburg, Professor

The Energy Council held four meetings in 2016: on April 26, June 11, November 3 and December 14.

April 26 – the meeting on topic “Innovation, research and development in the energy sector” in cooperation with Estonian National Committee of the World Energy Council (WEC-E). Entrepreneurs of the energy sector, scientists, representatives of organisations in profession and operatives of public sector were invited, to analyse the options how the cooperation between companies and research institutions could be enhanced by state policies, in order to elevate the competitiveness of Estonian economy. Topical papers were delivered by heads of energy companies and energy scientists. Participants of the meeting reached the following positions:

- There are some success stories of cooperation between energy sector, science and entrepreneurship, however involvement of the state in the development activity is by and large missing;
- Elaboration of the research and development (R&D) vision and securing of the implementation plan with resources, calls for the state's initiative;
- National priorities of the energy economy and its relation to the development of society must be set down and the prerequisites of cooperation between parties must be secured;
- The research subsidies must be followed up by tests of prototype and by the substantiated distribution of expenses between parties, for entering the market;
- R&D investments of state and private sector into priority projects must be systemic and proportionate;
- The goal of cooperation of various sectors is creating the technology push and the market pull. The state must first create the infrastructure favourable to the companies' R&D activity (the technology push), whereafter the market pull must be created, making marketable technologies competitive in the market.

The positions of the Energy Council of the Academy of Sciences and WEC-E were forwarded to the Ministry of Education and Research and

Ministry of Economic Affairs and Communications, adding the proposal to launch the second stage of energy technology in cooperation with entrepreneurship and the third sector.

With participation by a representative of the Estonian Academy of Sciences, on August 31 the WEC-E called the contest of research works in the energy area targeted at the students of the University of Tartu, the Estonian University of Life Sciences and Tallinn University of Technology.

November 3 – the meeting on “National Development Plan of the energy sector until 2030 with the bearing on 2050”. Invited speaker was Ando Leppiman, Deputy Permanent Secretary for Energy and Construction of the Ministry of Economic Affairs and Communications. He elaborated on the goal of the development plan to ensure the energy supply available to the consumers at a reasonable price and with acceptable environmental impacts while observing the terms and conditions established in the long-term energy and climate policy of the European Union. The new plan will also draft the benchmarks for renewable energy and energy saving operational programmes and the vision for the renovation of buildings. Members of the Energy Council emphasised that no allowance must be made in the plan for unmotivated distortions of market, and the measures to be applied must provide economical competitiveness to all actors in the market and the economy as a whole.

December 14 – the field session of the Energy Council in Auvere. The meeting was attended by Members of Academy from Tartu and Tallinn, who discussed whether the investments into the Auvere Power Plant were justified and deliberated on applications of ENEFIT 280 technology. The paper “Activity of Eesti Energia AS in Auvere and the topical engineering aspects” was delivered by member of board of *Eesti Energia AS* (EE), production manager Raine Pajo. His message was: the goal of the five-year strategy plan of EE is to increase the sales revenue and profitability, even if the energy prices do not improve significantly. Meeting participants analysed the challenges facing EE, options for their solution and the share of scientists in that. The positions of participants at the meeting were:

- EE has employed novel technologies in cooperation with energy researchers, and the jointly designed activities have been successful. The industrial applications are efficient in both the electricity and oil production;
- Challenges facing EE pose to scientists the tasks on substance of the matter, calling for solution. The Estonian scientific potential is adequate to meet the challenge;

- Involvement of the state is urgently needed in planning the long-term development of the energy economy, both at establishing the resource and environmental taxes and co-financing the cooperation projects.

COMMITTEE ON PHYLOGENY AND TAXONOMY

Set up in 2007

Chairman Urmas Kõljalg, Member of Academy

Committee on Phylogeny and Taxonomy (FS) participated actively in the work of the Consortium of European Taxonomic Facilities (CETAF AISBL, www.cetaf.org). CETAF is concerned with coordination European research and development (R&D) of collections related to biological diversity and geosciences. The Committee plays essentially the same role in Estonia. The Committee coordinates the work of natural sciences collections, incl. their digitisation.

INTERNATIONAL ACTIVITY

Chairman of the Committee, Member of Academy Urmas Kõljalg represented Estonia at CETAF 39th general meeting in Budapest (May 3-4, 2016). The most important items on agenda were: 1) report for 2015 and its approval; 2) general report for CETAF activities and the secretariat from April 2015-April 2016; 3) discussion of the new CETAF communication plan; 4) review of CETAF working teams and development plan; 5) election of the CETAF Executive Committee for 2016-2019; 6) application of the concept of Responsible Research & Innovation within CETAF framework.

Elected in responsible offices of the new Executive Committee were Michelle Price (Chairman, Geneva), Thierry Bourgoïn (Deputy Chairman, Paris) and Erik Smets (Treasurer, Leiden). The meeting discussed the composition and activities of the CETAF working teams and approved the list of working teams as follows: European Journal of Taxonomy, CETAF Strategy Group, CETAF European Initiatives Advisory Group, CETAF e-learning and taxonomy training group, CETAF Information Science and Technology Committee, CETAF Earth Science group, CETAF Legislation and Regulations Group and CETAF Digitisation group.

The meeting elected as full member of CETAF, the Czech National Taxonomic Consortium, comprised of the Institute of Botany of the Czech Academy of Sciences and the Czech Museum of Natural History. That consortium was set up after example of Estonia, where a consortium of institutions had joined CETAF, not an individual institution. The Institute

of Botany of the Czech Academy of Sciences that had belonged to CETAF earlier, had withdrawn, to rejoin as a member of a Czech consortium.

An important topic at the Budapest meeting was creation of the consortium of Pan-European Research Infrastructure for Natural Science Collections. The first gathering of the action committee was in Leiden in March 2016, considering the draft application for infrastructure and approving the time schedule of preparing the application. Estonia will participate through Estonian Research Infrastructure Roadmap NATARC. The main contribution of Estonia will be planning of the development of Pan-European e-infrastructure.

The 40th general meeting of CETAF was held on October 18-19 in Madrid. It was followed by the CETAF Day on October 20, directed at public and marking the 20th anniversary of setting up the CETAF. Estonia was represented by project leader of Estonian Research Infrastructure Roadmap NATARC Vallo Mulk. Beside general questions, an important issue was composing the European Strategy Forum on Research Infrastructures (ESFRI) roadmap application, with Estonian vigorous presence. The title of the project is DiSSCo – Distributed System of Scientific Collections. The main coordinators of the application are Vince Smith (London) and Dmitri Koureas (Leiden). For successful submitting of the project, financial support from at least three countries is needed, and letters of intent from other countries. The goal is to obtain the infrastructure proposal to renovation of ESFRI in 2018. The application will be submitted in August 2017. The main topics of the infrastructure are: climate changes by distribution and development of species, carriers of the Ebola virus, bio-technology, medicine technology, hobby science, acts of God etc.

The application comprises three major areas: access to collections and common use, public data – development and use of digi-archives, development of skills – data, taxonomy and other skills, personnel training. The support in moneys is available from the UK, Germany, France, Greece and the Netherlands. The other countries (Estonia included) can contribute by political support.

INTRA-ESTONIAN ACTIVITY

The Committee continued active participation in composing the application of Estonian Research Infrastructure Roadmap NATARC (natarc.ut.ee). Member of Academy Urmas Kõljalg and Olle Hints (Tallinn University of Technology) belong to the NATARC Council. The NATARC application acquired support from the state in 2016; the final approval of the project will evidently fall at beginning of 2017. Two components of electronic

infrastructure of Estonian science collections, i.e. PlutoF (plutof.ut.ee) as biology database and SARV (geokogud.info) as geology database system were developed. There were training events for involved staff held in Tartu and Tallinn. In 2016, in cooperation with the Ministry of the Environment's subunit KEMIT, practical steps were taken to make available the information related to Estonian living and still nature. The goal is to create software solutions that will integrate the academic and national databases and will enable access to the whole existing information from one place.

Members of the Committee participated in the work of expert panel for the national programme Collections for the Humanities and Natural Science at the Ministry of Education and Research. Olle Hints chairs the panel. The panel is tasked with advising the ministry on improving and funding the work of natural science collections.

COMMITTEE ON MARINE SCIENCES

Set up in 2007

Chairman Tarmo Soomere, Member of Academy

The goal of the Committee on Marine Sciences is representation of Estonia in the European Marine Board (EMB) and the activities as a national advisory body.

The Committee followed the regular routine of electronic meetings in daily work. Members of Committee were currently kept in picture of the information received from EMB and its plenary sessions, also about the specific events like CommoOCEAN 2016 (2nd International Marine Science Communication Conference, December 6-7, 2016, Bruges) and high-level training course (December 8, 2016, Ostend).

There were five electronic polls:

- January 22 – the report of the Committee for 2015 was despatched electronically to the members.
- January 27 – the conference, considering upon request of the Ministry of the Environment, within the framework of strategic estimate of environmental impact of the spatial planning of the Latvian aquatic area, the possible cross-border environmental impacts. No unobserved important impacts were identified.
- February 19 – the conference, considering the possibilities to pinpoint and recommend experts to composition of EMB working team “Strengthening Europe’s capability in biological ocean observation”. No available Estonian experts were identified.

- July 12 – the conference, considering the idea to organise, within framework of presidency of Estonia in the European Union, the following conference in the series EurOCEAN in spring 2018. Due to the shift of the Estonian presidency to the second half of 2017, that idea was dismissed.
- July 15 – the conference, considering nomination of experts from Estonia to the IPCC report on climate changes in ocean and cryosphere.

At the end of the year, a decision was passed to organise the next conference on trilateral cooperation on Gulf of Finland in autumn 2017 as an event of the Committee on Marine Sciences in premises of the Estonian Academy of Sciences. The Estonian promoter is Dr. Robert Aps from Estonian Marine Institute of the University of Tartu, on part of Finland – Dr. Kai Myrberg from the Finnish Environmental Institute.

In the reporting year, Chairman of Committee T. Soomere continued as Vice Chairman and member of the Executive Committee of the European Marine Board. In January 2016, the European Marine Board was incorporated as a legal entity in its own right under the Belgian legal system. The Estonian Academy of Sciences was invited as its founding member. The incorporation documents were signed at the plenary session of the Executive Committee in Brussels on 20 January 2016. T. Soomere also participated at meeting of the Executive Committee on April 26, at the spring plenary session in Sopot (Poland) on April 27-28, at meeting of the Executive Committee on 18 October and at the autumn plenary session on October 19-20 in Glasgow (the UK / Scotland).

Due to crowded time schedule the Committee could not continue Sparkling Seminars focussing on marine, lake and coastal science started in 2013. Nor were the scientific efforts of the Committee represented in media as vigorously as in the earlier years. It still went on air in several TV and radio broadcasts. It also received many invitations to deliver papers on marine and coastal science related topics. T. Soomere delivered a series of invited and public lectures on marine and coastal science problem range in the Estonian context: “The weather of this summer: reflection of global changes?” at Palmse Hotel (15 January), “The intriguing mathematics of extreme water levels of the Baltic Sea” at the Union of Estonian Insurance Companies (29 January), “The sea is an eloquent reminder of climate changes” at National Library (30 March), “Coasts of the Baltic Sea in disturbance” within the Museum Night 2016 (at the Särghaua Study Centre of the Tallinn University of Technology, 14 May), “Marine music at Estonian coasts” to gymnasium students at Tallinn Central Library (16 May), “The heaving coastal sea of a marine country” at the general meeting

of the Free Party in Estonian Art Museum (5 June), “Climate change as a research topic and an object of political debate” in the Academy Hall at a meeting with teachers and politicians of Pärnu (9 June), “Noticing climate changes by just looking properly” to 8th and 9th grade students of Tallinn Modern School within the Year of Marine Culture and project Art/Mosphere (Sea Museum, Suur Tõll, 9 June), “The heaving coastal sea of a marine country” at a joint meeting of the male club KARRU and the Ida-Viru club of public servants at Jõhvi (9 November), “Marine science reveals hidden signals of climate change” to students from Greece, Turkey, France, Rumania, Italy and Portugal, participants in Erasmus+ international ecological study project at Tallinn Downtown Russian Gymnasium (30 November), “The Estonian coastal sea in the time of disturbance” at the festive meeting organised by the Estonian Learned Society in Sweden on the 97th anniversary of the Estonian-language university education (the Estonian House in Stockholm, 1 December).

Chairman of Committee T. Soomere sits on EASAC (European Academies of Science Advisory Council) Environmental Panel as representative of the Estonian Academy of Sciences and founding member of the panel. One of his tasks is to liaise with EMB, facilitating exchange of information between those organisations and harmonizing their work. T. Soomere participated at spring session of EASAC Environmental Panel (Oslo, Norway, 11 June) and at festive session of EASAC Council (Oslo, Norway, 12–13 June). In January, the report “Marine sustainability in an age of changing oceans and seas” composed by the working team of EASAC (including T. Soomere) was made available to public.

Ongoing was the work on initiation of an action that had started in 2013 to accede to Joint Programming Initiative [JPI] Oceans, Climate, and Water. Vice Chairman of the Committee Kalle Olli is one of Estonian representatives in the JPI Oceans, within context of Joint Initiative “Water”. Member of Committee Professor Urmas Lips had coordinated events of the Gulf of Finland Year 2014 on part of Estonia. In August, the Ministry of the Environment referred to the Academy of Sciences in connection with the plan to build larger sluiceways in the dike of Väike Strait. The conference held in the Ministry on September 9 was attended by T. Soomere, K. Olli and Georg Martin. The topics discussed and the recommendations and solutions offered were extensively covered by the daily *Postimees*; the topic was considered by the parliamentary Environment Committee, with G. Martin representing the Committee on Marine Sciences.

T. Soomere represented the Academy of Sciences at various forums, palavers and committees, delivering the papers concerning the scientific policy in marine science. Of particular note among them are:

- The opening paper “The intriguing pattern of climate changes. Marine changes as a buffer and indicator” at Meteorology Day 2016 “Hotter, drier, more humid. Facing the future” (Environment Agency, Tallinn, 23 March).
- Opening address and paper “The troubled coastal sea” at the seminar “Estonian marine science and marine culture” (Sea Museum, Tallinn, 1 April).
- The paper “The intriguing world of extreme water levels of the Baltic Sea” at the conference of the 95th anniversary of the Estonian statistical system “Official Statistics in a Changing World” (Tallinn, the Estonia theatre hall, 25 April).

T. Soomere presented an invited paper “Grand Challenge for science: from providing services towards driving the society” on the opening day of the Sofia Forum (Helsinki, June 20-22), considering mainly the challenges facing marine science.

Since summer 2009 the Chairman of Committee T. Soomere has been sitting as an observer on inter-ministerial coordination committee on issues of marine studies, marine conservation and pollution control set up with the Ministry of the Environment. Since end 2016 T. Soomere has belonged to the working team for setting up the national geology service. Members of the Committee have been invited by Marine Environment Department of the Ministry to counsel the drafting of concept of the Marine Environment Use and Conservation Act.

The Committee has continually fulfilled its main tasks, representing the Estonian marine science in the European Marine Board, and excellence of marine science at the European academic landscape, and also forwarding messages about the marine science to the society. In the reporting year the opportunities presented themselves to advise the Government, efficiently used in the issue of larger sluiceways in the dike of Väike Strait.

European Marine Board has become one of the most reliable advisory institutions of the European Committee. It rests on balanced representation of research funding organisations, research institutions and university education landscape. Through the Marine Board we can transform the present strong position of Estonian marine science into science-policy decisions affecting the whole Baltic Sea area, and also make the message of Estonian scientists heard on the European scale. Every member has

one vote. The vote cast by Estonia is often decisive in issues of the Baltic Sea marine science policy. Besides that we have excellent opportunities to present the scientific research done in Estonia and to achieve funding from European sources for the ideas born here.

On the Estonian scale, we have managed to maintain visibility of marine science for quite a few years on an excellent level. On scientific landscape, in media and society there is unabated interest to subject matters concerning marine, lake and coastal science. Certain areas of sea, lake and coastal science have made it among prominent research directions of all large universities. Meeting with success was the application for the new object of science infrastructure roadmap titled “Information technology mobility observatory”, with considerable share assigned to analysis of movements witnessed in sea. Organisation of various events (incl. under aegis of the Academy of Sciences) has heightened awareness of the potential of Estonian sea and coastal science and limnology, also to consolidate the existing competence and make it heard loud and strong.

In the previous years the overriding objective was to develop the Committee into the assembly coordinating and consolidating the activities of different areas of marine, lake and coastal science, amplifying the voice of those areas in the Estonian science landscape and the system of funding science. Because a significant change in the logic of funding science is pending, it is reasonable to reformulate the said objective subject to new situation.

Conspicuously outstanding is the need to modernise the membership of the Committee. It has worked in the same composition nine years, generally fraught with an impending danger to get entrenched in routine and underestimate the changes in Estonian research and university landscape (e.g. consolidation of science landscape, structural changes in universities and designation of their areas of responsibility etc.). Some original members of the Committee have proceeded to work in other areas. In those years, viable research teams not represented in the Committee have put up their appearance on the science landscape.

STANDING COMMITTEE ON MEDICAL SCIENCE AND HEALTH STRATEGY

Set up in 2011

Chairman Eero Vasar, Member of the Academy

In 2016 the Health Research, Development and Innovation Council was set up with the Ministry of Social Affairs. Members of the Standing Committee (U. Siigur, M. Lember and E. Vasar) sit on that Council. Hence the further role of the Standing Committee consists in counselling the activities of the Council.

In 2016, two meetings of the Council were held (on February 29 and December 6). At the first meeting, the Estonian Health Research, Development and Innovation Strategy for 2015-2020 was discussed. There were presented the application of research topics on RITA action 1 to be submitted by the Ministry of Social Affairs. Under discussion was the national programme 2017-2020 for development of Estonian personal medicine and application in health care.

The second meeting discussed the management of personal medicine programme by the Ministry of Social Affairs in 2017-2018. The methods part of the clinic lead projects was considered. Reports about infrastructures of the University of Tartu were heard (the Centre of Estonian Gene Project and Clinical Medicine Researches).

The role of the Standing Committee in discussion of the above questions was rather unpretentious, but hopefully the contribution of the Committee will increase in 2017.

COUNCIL FOR ESTONIAN CENTRES OF EXCELLENCE IN RESEARCH

Set up in 2012

Chairman Andres Metspalu, Member of Academy

Heads of Estonian centres of excellence gathered in Tartu on October 4 and decided to continue the activity of Council for Estonian Centres of Excellence in Research at the Academy, combining their knowledge and experience for promoting science in Estonia.

The Council decided to elect Member of Academy Andres Metspalu as Chairman.

At the meeting the potential objectives of the Council were discussed, with the following opted for:

- To develop and strengthen excellence in research;
- To convey to Government of the Republic and society the positions of top scientists and opinions for promoting research in Estonia.

The Council will next meet in the first half of 2017.

The following centres are members of the Council:

- Dark Side of the Universe
Head Martti Raidal, martti.raidal@cern.ch, mob: +372 5164854
- Emerging orders in quantum and nanomaterials
Head Urmas Nagel, urmas.nagel@kbfi.ee; mob: +372 56901425
- Ecology of global change: natural and managed ecosystems
Head Ülo Niinemets, ylo.niinemets@emu.ee; mob: +372 53457189
- Advanced materials and high-technology devices for energy recuperation systems
Head Enn Lust, enn.lust@ut.ee, mob: +372 5112030
- Centre of Excellence for Genomics and Translational Medicine
Head Andres Metspalu, andres.metspalu@ut.ee; mob: +372 5063088
- Centre of Excellence in Molecular Cell Engineering
Head Tanel Tenson, tanel.tenson@ut.ee, mob: 372 53445202
- Centre of Excellence in Estonian Studies
Head Mare Kõiva, mare@folklore.ee, mob: +372 56218119
- Zero energy and resource efficient smart buildings and districts
Head Jarek Kurnitski, jarek.kurnitski@ttu.ee, mob: +372 58664370
- Excellence in IT in Estonia
Head Maarja Kruusmaa, maarja.kruusmaa@ttu.ee, mob: +372 5183074

ACADEMY EVENTS

CONFERENCES

January 6 – Academy House hosted a conference under the title “Estonian young researchers abroad”. 16 young researchers (PhD students, postdoctoral fellows, early independent scientists) studying at the top universities in the world gave an insight into their research interests. The intention behind organising such a conference was to create a forum, where young Estonian researchers studying/working outside Estonia could present their work and establish new contacts with other Estonian researchers, both at home and abroad. The conference was supported by the TeaMe+ programme and the European Regional Development Fund (ERDF). Opening speeches were given by President of the Estonian Academy of Sciences Tarmo Soomere and Minister of the Foreign Affairs of the Republic of Estonia Marina Kaljurand. Papers were presented in four panels:

Panel I, moderated by Member of the Academy Jüri Engelbrecht

Random geometry

Juhan Aru, ETH Zurich, postdoc

Microfluidic platform for biotech applications

Kadi Liis Saar, University of Cambridge, PhD student

MRT, polynomials and approximation theory

Heiki Niglas, University of Cambridge, PhD student

Industry engaged academic scientist – all work and no play?

Rainer Küngas, Haldor Topsøe A/S, Denmark, industrial sector

Organisation of research and development system in Estonia

Margus Lopp, Tallinn University of Technology, Estonian Academy of Sciences

Panel II, moderated by Member of the Academy Peeter Saari

Factors determining the elemental composition of planets

Mihkel Kama, University of Leiden, postdoc

Using the Higgs boson to search for new physics

Joosep Pata, ETH Zurich, PhD student

Superconducting quantum computers and four-qubit entanglements

Johannes Heinsoo, ETH Zurich, PhD student

Nuclear physics, photon scattering from heavy hydrogen

Bruno Strandberg, University of Glasgow, PhD student

Panel III, moderated by Prof. Katrin Niglas

The importance of randomness in a movie and in philosophy: a dialogue between an American drama film titled *Thirteen Conversations about One Thing* and the thought of Jacques Rancière

Teet Teinema, University of Warwick, PhD student

E-health programme for young people in Estonia: personal development and preventing addiction

Silja-Riin Voolma, University of Cambridge, PhD student

What is the position of women in the European Human Rights system?

Liiri Oja, European University Institute, PhD student

My life was a living hell: Domestic violence experienced by immigrant women in England and Sweden

Halliki Voolma, University of Cambridge, PhD student

Lexical interpretation of *Braille writing* in real time

Anneli Veispak, KU Leuven, postdoc

Panel IV, moderated by Prof. Tõnis Timmusk

Diffusion obstacles in the heart muscle cells

Marko Vendelin, TUT Department of Cybernetics, Head of Laboratory (earlier Université J. Fourier, Université Paris-Sud, postdoc) – guest speaker

Estimating methane emissions from cattle based on the level of feed intake

Marko Kass, Swedish University of Agricultural Sciences, postdoc

Gene expression, genetic factors in human immune response

Kaur Alasoo, University of Cambridge, PhD student

Genome engineering with the CRISPR/Cas9 system

Leopold Parts, University of Cambridge, Head of Laboratory

October 14 – 3rd conference in a series approaching topical issues in science policy with a collective title “Science as an engine of progress for advancing Estonia’s quality of life” was held at the Conference Hall of the Riigikogu. This time, the main theme was “In Search of a Common Ground”. The highlighted problems and challenges were stemming from efforts to find common ground between science and industry that would

give our economy considerable leverage in its progress towards better paying jobs and higher level of economic value added. Among the questions posted at the discussion were: What are entrepreneurs expecting from scientists and scientists from entrepreneurs? How can the government facilitate better communication between them? What are the expectations of entrepreneurs, scientists and policy makers towards each other in order to enhance the competitiveness of companies and the role of science in society? President Tarmo Soomere made an opening speech and Member of the Academy Jaak Vilo gave a talk on “How does the promotion of research in the information technology field actually contribute to the improvement of business performance.” The conference was jointly organised by the Estonian Research Council, Estonian Rectors’ Council, Estonian Academy of Sciences and Ministry of Education and Research in association with the Cultural Affairs Committee of the Riigikogu.

SEMINARS

April 7 – Seaplane Harbour was the venue for a seminar “Marine Science and Maritime Culture in Estonia” that was jointly organised by the Estonian Academy of Sciences and the Estonian Maritime Museum. The talks in the programme were chosen with a view to reflecting science, art, literature, language, sea travel and maritime education as components in the aggregate Estonian maritime culture. The opening remarks were made by President Tarmo Soomere. Presentations included:

Tumultuous motion of coastal waters

Tarmo Soomere, Tallinn University of Technology (TUT), Institute of Cybernetics

Assessment of the state of the seas. What and how?

Jüri Elken, TUT, Department of Marine Systems

Working as a meteorologist in Antarctica

Priit Tisler, Finnish Meteorological Institute

The role of Estonian sea captains in promoting the maritime culture

Captain Rein Õnnis, President of the Estonian Sea Captains’ Club

Speaking clear and efficient Estonian in marine related topics

Captain Uno Laur, F. J. Wiedemann Language Prize 2016

Maritime education as a carrier of maritime culture

Roomet Leiger, Estonian Maritime Academy

Six marine paintings from Estonian artists with commentaries

Tiina Abel, Estonian Academy of Arts

A glimpse of the sea: Examples of the bathing resort style in Estonian architecture of the 1920s and 1930s

Mart Kalm, Estonian Academy of Arts

Independence of Estonia – a view from the seaside

Jaan Undusk, Under and Tuglas Literature Centre

Year of Maritime Culture in Estonia: accompanied by travels in time and space

Urmas Dresen, Estonian Maritime Museum

October 4 – University of Tartu *Chemicum* building was the venue for a seminar and discussion devoted to “Estonian Centres of Excellence in Reseach in 2008-2015 and 2016-2023”. Member of the Academy Jüri Engelbrecht reported on the activities of the Council for Estonian Centres of Excellence in Reseach during the period from 2008 to 2015. Heads of Estonian CoE-s in Reserach Maido Remm, Eero Vasar, Tanel Tenson, Valter Lang, Ülo Niinemets, Martti Raidal, Andres Metspalu, Mare Kõiva and Maarja Kruusmaa entered into the discussion. Heads of Estonian CoE-s in Reserach for the period 2016-2023 determined that the Council continue under the auspices of the Academy. They agreed on aggregation of their activities and expertise for the advancement of science in Estonia. Member of the Academy Andres Metspalu was elected Chairman of the Council.

November 30 – Academy House was the venue for a seminar “How Can We Infuse New Vigour into the Economy?” jointly organised by Tallinn University of Technology, Estonian Employers’ Confederation, Estonian Trade Union Confederation and Estonian Academy of Sciences. The seminar was opened by Rector of Tallinn University of Technology, Member of the Academy Jaak Aaviksoo. Head of the Prime Minister’s Economic Development Working Group Erkki Raasuke gave a talk on “Proposals suggested in the WG report and exactly why they had been spotlighted”. Participants in the panel discussion included Taavi Veskimägi (from the Estonian Employers’ Confederation), Peep Peterson (Estonian Trade Union Confederation), Ardo Hansson (Eesti Pank) and President of the Academy Tarmo Soomere. The discussion was moderated by Eeva Esse, Editor-Presenter at Estonian Public Broadcasting.

MEETINGS-DISCUSSIONS

February 25 – Academy House was the venue for a meeting dedicated to thematic items placed on the following meeting agenda of the Research and Development Council scheduled for March 1, 2016. The Academy was represented by Members of the Board and Heads of the Divisions. Among participants were Vice Rectors for Research of larger universities in Estonia as well as Directors of several research and development institutions. Invited speeches were given by Indrek Reimand, Chancellor of Higher Education and Research at the Ministry of Education and Research; Meelis Kitsing, Strategy Unit Adviser at the Government Office of Estonia; Maris Lauri, Economic Affairs Committee member at the Riigikogu and Liisa Oviir, Minister of Entrepreneurship.

March 2 – Science Day was jointly organised by the Academy and the Estonian Society for the Study of Religions at Võru Gymnasium. The programme included the following papers: “Visible and invisible religion around us” – Katre Koppel (PhD student, Department of Estonian and Comparative Folklore, University of Tartu); “Pluralistic islam” – Elo Süld (Lecturer in Islamic Studies, School of Theology and Religious Studies, UT); “History and politics of China” – Urmas Pappel (PhD student, Institute of Government and Politics, UT); “A speck of Asia is awaiting you in Tartu” – Kätlin Lehiste (Assistant to the Director, College of Foreign Languages and Cultures, UT) and Eri Miyano (Teacher of Japanese Language from Japan, Department of Languages of the Asian Region, UT). The Science Day was organised by the Department of Education and Social Services of the Võru County Government in collaboration with the Academy, Union of Võru County Municipalities and Võru Gymnasium.

March 8 – Members of the Board visited Tartu University Hospital. They were hosted by Head of the Neurology Clinic Toomas Asser (also an Academy Board Member), who gave a talk on the topic “Brain scans assisting in the reorientation process”. He pointed out that the work of the brain may be illustrated by radically different models of brain processes. The presentation was supplemented with historical photos deriving from the St. Petersburg period in the practice of Professor L. Puusepp. It was also noted that December 3, 2015 had marked 140 years since the birth of the world’s first professor of neurosurgery – Estonian surgeon and medical scientist Ludvig Puusepp.

November 9 – Academy Division of Biology, Geology and Chemistry organised a Science Day at Põlva Hospital. Presentations included: “Plasticity

of brain or how the brain relieves our mistakes” by Toomas Asser, Member of the Academy; “Studying headache with the help of e-solutions” by Kati Toom, neurologist at Tartu University Hospital and Member of the Estonian Headache Society’s Board; “How countries provide for health of their citizens” by Mart Einasto, Member of the Executive Board of Tartu University Hospital. The following panel discussion on “Organisation of health care in South-Eastern Estonia: Experiences and perspectives in hospital networking” was moderated by County Governor Igor Taro. Discussion participants were Koit Jostov, Managing Director of Põlva Hospital; Arvi Vask, Member of the South-Estonian Hospital Board; Mart Einasto and Toomas Asser. The Science Day was covered in media by Estonian Public Broadcasting, Põlva newspaper *Koit* (Dawn) and South-Estonian weekly *Lõunaleht*. The second part of the day was held at Väraska Sanatorium (spa and waterpark), where Toomas Asser talked about stroke in front of an audience composed of the professional staff working at the the Spa health centre. A general overview of the therapeutic facility was provided by Vello Saar, Väraska Spa Manager.

November 28 – Academy’s Division of Informatics and Engineering together with the Estonian Association of Engineers hosted a roundtable discussion under the title “From Science to Entrepreneurs” at the Academy House. The moderator of the event was Prof. Arvi Hamburg. Speeches were made by Arno Kolk, General Manager of the Estonian Electronics Industries Association; Jüri Jõema, Executive Manager of the Estonian Association of Information Technology and Telecommunications; Milko Milatskov, representative of Stoneridge Electronics Estonia; Enn Kerner, representative of the Association of Estonian Printing Industry; and Prof. Toomas Rang, Acting Director, T. J. Seebeck Department of Electronics, TUT.

December 14 – Estonian Academy of Sciences in collaboration with the Board of the Estonian Association of Engineers and the Academy’s Energy Council organised a joint visit to the most efficient and newest power plant of Eesti Energia at Auvere. The delegation was hosted by Tõnu Aas, Chairman of the Management Board, Enefit Energy. Raine Pajo, Member of the Management Board at Eesti Energia Group gave a concise outline of electricity and shale oil production in Estonia and a more detailed survey of the Auvere Power Plant. Guided tours were made to the heat and power station and a new generation Enefit280 oil factory. Three Members of the Academy Andres Metspalu, Arvo Ots and Anto Raukas took part in the visit.

ACADEMY, MEDIA, SOCIETY

SCIENCE IN 3 MINUTES

Estonian Academy of Sciences organised, for the second time the contest of three-minute lectures for doctoral students and young scientists of universities and research institutions under public law. The contest culminated in the gala night held in the Hall of the Academy of Sciences on 23 September 2016. 17 young scientists picked out at run-up contests made it to the finale. They were supposed to confine their present research within a three-minute presentation of a simple but intriguing format, disclosing the subject matter and implication of their pursuit, enabling the broad public to discern the true and underlying nature of the work done. The panel selected six winning lectures, which went on air in the national TV channel ETV in autumn-winter. The gala night was broadcast live in the web by the web-based portal *Novaator* of the Estonian national broadcast service *Eesti Rahvusringhääling*.

The contest was preceded by roundtables for popular science held in Tartu and Tallinn. President of the Academy Tarmo Soomere spoke to the young scientists about the meaning of scientific communication in the modern society and about how the message of a scientist could be conveyed to the listener and viewer. The project manager of the event Margus Maidla highlighted the scientist's imperative urge to connect the society and emphasised the need to preserve Estonian as a minor language of science in the world. Head of the Drama School, Estonian Academy of Music and Theatre, Peeter Raudsepp spoke about the art of performance and presented a survey on speaking as a psychophysical activity, and about psychology of speaking. The training consisted of a lecture and practical exercises.

PANEL (alphabetically): Ruth Annus, Hans H. Luik, Ülle Madise, Riina Rõõmus, Tarmo Soomere (Chairman), Artur Talvik, Luisa Värk. The gala night was moderated by Margus Maidla.

The project was supported by TeaMe+ and the European Regional Development Fund.

LAUREATES (alphabetically):



Juri Ess (Tallinn University of Technology, specialty: transport planning) – **Traffic organisation and traffic accident prevention**



Katre Juganson (Institute of Chemical and Biological Physics, specialty: chemistry and gene technology) – **Nanomaterials – a new danger?**



Kristi Krebs (University of Tartu, specialty: molecular and cell biology) – **Medicine prescription – signed by genetics**



Rain Kuldjärv (Tallinn University of Technology, specialty: food technology) – **The wildness of natural yeast and the culturedness of pure-culture yeast**



Sander Paekivi (Tallinn University, specialty: physics) – **Modelling of dynamics of human language**



Ragnar Saage (University of Tartu, specialty: archaeology) – **Non-ferrous iron-age cast metal**

The winning clips went on air in ETV as the series “Science in 3 minutes” in the period from 16 November - 28 December (programmes are to be repeated in spring 2017). Besides that ETV broadcast the half-an-hour combined programme “Three minute challenge” about mini-portraits of young scientists and the contest as a whole. The programme was first on air at night of 22 December and it was watched by 47 000 viewers (of the target group 4-year old and older residents of Estonia). The winning clips were also shared by the science portal of the daily *Postimees*.

SCIENCE BREAKFASTS AND NIGHTS

Since spring 2015 the Academy has been regularly inviting to the roundtable representatives of media, academic circles and various social-political stakeholders. The aim is to consider the socially vital problems, doing it in an intimate, relaxed and academically unrestrained and inspiring atmosphere (at morning coffee or refreshments served in the late afternoon), to seek options for cooperation and to generate smart initiatives, while holding in vision the broadest possible integral picture.

The meetings were supported by TeaMe+ and the European Regional Development Fund.

February 12 – science breakfast: “Migration in Estonia and world.” Speaking were Tiit Tammaru (Professor of City and Population Geography of the University of Tartu) and Rein Ahas (Professor of Human Geography of the University of Tartu). Participating at the exchange of opinions was Ruth Annus – Head of Department of Citizenship and Migration Policy of the Ministry for the Interior.

April 21 – science afternoon: “Funding of science: traditional expense or investment into future of the country?” The goal of the meeting was elucidate the specificities, bottlenecks and potential possibilities of operation of the value chain: science–higher education–economy in our society. Invited to participate had been representatives of administration of the Academy, Pro-Rectors for Research of the Universities, representatives of the Cultural and Economic Commission of Riigikogu and the support group of science and innovation of Riigikogu, Counsellors for Research of the Government and Ministries, representatives of Estonian Research Agency (ETA) and media.

June 02 – science afternoon, a follow-up of the topic started in April: “Funding of science: traditional expense or investment into future of the country?” The vision “Comprehensive sustainable economic model” was presented by Robert Kitt – Chairman of Board of Swedbank, Director General in Estonia, in attendance – expert in economy Kristjan Lepik.

June 09 – meeting with political figures: “Climate change as a research topic and an object of political debate”. The main report was delivered by President of the Academy Tarmo Soomere. Participating in discussion were Chairman of the Economic Commission of Riigikogu Toomas Kivimägi and member of the Education and Cultural Commission of the Pärnu Town Council Silja Kikerpill.

June 14 – meeting with representatives of media organised in cooperation with the Estonian Society of Science Journalists. Report about the world science communication conference “Public Communication of Science and Technology” (PCST 26-28 April, Istanbul) was presented by Information Manager of the Estonian Genome Project Anneli Allik and member of Estonian Society of Science Journalists Arko Olesk. Under discussion was treatment of science communication at the opinion festival to be held in Estonia in summer 2016.

October 12 – meeting with representatives of media organised in cooperation with the Estonian Society of Science Journalists. Editor for research of the daily *Postimees* Riin Aljas spoke about creating the editorial board for science at *Postimees*, about the first working months and plans for the future. Under discussion were possibilities of cooperation with the Estonian Research Agency.

October 26 – science afternoon: “Engineering sciences in Estonia and world”. In focus were the topics: Engineering sciences as part of innovation process; Role of engineering and its meaning for the society; Modern engineering culture and education; Expectations of entrepreneurs to engineers and engineering science; Balance between computer-based advice and the sound mind. Participating in exchange of opinions were Member of Academy Jakob Kübarsepp, building designer Tõnu Peipman, entrepreneur Heiti Hääl, Professors of Tallinn University of Technology Malle Krunks, Mart Min, Jaan Raik and Arvi Hamburg (President of Estonian Association of Engineers). Attending as a guest was Deputy Director General of the Joint Research Centre (JRC) of the European Commission Maive Rute.

November 10 – Meeting dedicated to the 25th anniversary of the Estonian Society of Science Journalists. The report on history of the Society was delivered by its founding member and the first chairman Indrek Rohtmets. The observations on possibilities for development of scientific journalism in this country and elsewhere were reviewed by Tiit Kändler. Participating in discussion and delving in remembrances was Ülo Vooglaid. The present day of the Society and the plans for the future were elaborated on by Aare Baumer, Andi Hektor, Tiit Kändler, Ulvar Käärt and Chairman Priit Ennet.

POSTIMEES. THE (ACADEMY) OPINION. CULTURE

In cooperation of the Academy and the daily *Postimees*, since September there has appeared a special column in the weekend cultural annex of *Postimees AK (Arvamus. Kultuur / Opinion. Culture)*. Unlike classic popularisation of science or explanation of background of outcome of research and its meaning, inspiration is being sought from newly published editorials in influential science journals on meaning of science for our world. Members of Academy are giving sense to relations of science and society and explain how the vital issues arisen in the world manifest

themselves in the Estonian context. In 2016, ten opinion articles were released:

Karl Pajusalu “How to sell the books of scientific content?” (*Postimees AK*, 10 December 2016, p. 9).

Tarmo Soomere “How does the distant and cold South Ocean preserve our climate?” (*Postimees AK*, 3 December 2016, p. 12).

Ülo Niinemets “Early demise in a fight against climatic changes: conflict between European and Estonian energy and air pollution policies” (*Postimees AK*, 18 November 2016, p. 8).

Agu Laisk “Three pieces of science news – to people of the Esna bus stop, to a chemist and biologist” (*Postimees AK*, 12 November 2016, p. 8).

Tarmo Uustalu “Can we bring the machine to account?” (*Postimees AK*, 29 October 2016, p. 9).

Maarja Kruusmaa “Doctor’s degree gives a driving license, and not a job” (*Postimees AK*, 22 October 2016, p. 7).

Jaak Järv “Is science the privilege only of the rich?” (*Postimees AK*, 15 October 2016, p. 9).

Interview with Ergo Nõmmiste “The Nobel Science Prizes of this year came as a surprise” (*Postimees AK*, 8 October 2016, pp. 2–3).

Tarmo Soomere “Whether and how science works as engine of the economy?” (*Postimees AK*, 1 October 2016, p. 9).

Andres Metspalu “Precision medicine – healing of man as a dressmaker’s job” (*Postimees AK*, 24 September 2016, p. 8).

ACADEMY MEDALS, AWARDS

MEMORIAL MEDALS OF THE ACADEMY

In 2016 the Board of the Estonian Academy of Sciences decided to award the Karl Schlossmann Memorial Medal to Member of the Academy Eero Vasar.



The medal was conferred during the General Assembly Meeting on April 20.

ACADEMY'S LETTER OF APPRECIATION

The Board of the Estonian Academy of Sciences resolved on awarding the Academy's Letter of Appreciation to Prof. emeritus Tiit-Rein Viitso for long-standing commitment and fruitful contribution to the enhancement of the journal *Linguistica Uralica* as a Member of the Editorial Board and Editor-in-Chief. The Letter of Appreciation was handed over at the presentation of the book "National Awards of the Republic of Estonia (II)" on June 21.

RESEARCH PAPER PRIZES FOR UNIVERSITY STUDENTS

In 2016 the Academy's Student Research Paper Contest was merged with the National Contest for University Students, which is now jointly organised by the Estonian Research Council, Estonian Academy of Sciences and Ministry of Education and Research. The contest is open for all students studying in Estonia (including foreign students studying in Estonia) and Estonian citizens studying abroad. Research papers can be submitted on all university levels: professional higher education and bachelor's studies; master's studies; doctoral studies. The aim of the contest is to promote research among university students, stimulate them to be more active and to acknowledge students who have achieved outstanding results in their academic, scientific and/or publishing activities.

The President of the Estonian Academy of Sciences Special Prizes are awarded in three subcategories:

- at the level of bachelor's or professional degree students: Special Prize For Auspicious Scintillating Sparks – $\pi \times 250$ euro (785.40 euro);
- at the level of doctoral or master's students:
- 1st Special Prize For the Most Elegant Paper – $\pi \times 1000$ euro (3141.59 euro);
- 2nd Special Prize For an Unconventional Paper – $\pi \times 500$ euro (1570.80 euro).

The representative of the Estonian Academy of Sciences on the Appraisal Panel of the National Research Paper Contest for University Students is Jaan Aarik. He is entitled to compose a sub panel for examining selected papers and nominating candidates for the Special Prizes.

The results of the contest were announced at the prize award ceremony held on December 15 at the Academy House.

The President of the Estonian Academy of Sciences Special Prizes were awarded:

- 1) at the level of professional higher education and bachelor studies:
 - Special Prize For Auspicious Scintillating Sparks – Mari Kalma (University of Tartu), BA thesis “The impact of Syrian refugees on the economies of their major target countries in the European Union”;
- 2) at the level of master’s and doctoral studies:
 - 1st Special Prize For the Most Elegant Paper – Arvo Kaldmäe (Tallinn University of Technology), PhD thesis “Advanced design of nonlinear discrete-time and delayed systems”;
 - 2nd Special Prize For an Unconventional Paper – Piret Uustal (Estonian Academy of Arts), MA thesis “Safety device for victims of intimate partner violence”.

ESTONIAN SCIENCE COMMUNICATION AWARD

The Estonian Science Communication Award is an annual state award that has been granted since 2006 for science communication activities aimed at Estonian audience. Funded by the Ministry of Education and Research, prizes are jointly awarded by the ministry, the Estonian Academy of Sciences and the Estonian Research Council. The competition was held in 2016 for the eleventh year.

The Appraisal Panel chaired by Member of the Academy Enn Tõugu reached a decision to award this year’s prizes as follows:

- Tiiu Sild Memorial Lifetime Achievement Award for long-time systematic communication of science and technology:
Tiit Kändler, for long-standing and talented popularisation of science;

In the category science and technology communication via audiovisual and electronic media:

- Grand Prize – “Language clips of the Institute of the Estonian Language”, project managers Tõnu Tender, Tiina Laansalu;
- Motivation Prize – “Estonian Science Photo Competition”, leader Ivo Kruusamägi.

In the category science and technology communication via printed media:

- Grand Prize – article series popularising brain science “Thinking machinery”, authors Jaan Aru, Andres Laan, Allan-Hermann Pool;
- Motivation Prize – compilation of an experiential book and study set “Adventures in the world of scents and tastes”, author Kristel Vene.

In the category activities/series of activities communicating science and technology:

- Grand Prize – TUT Mektory School of Technology for organising systematic and continual activities to increase public awareness of the science and engineering disciplines, project manager Kristina Piliste;
- Motivation Prize – new permanent exhibition “Earth. Life. Story” at the University of Tartu Natural History Museum, leader Urmas Kõljalg with a team.

In the category best researcher, journalist, teacher communicating science and technology:

- Grand Prize – Peeter Lorents, for versatile and dynamic popularisation of science and longtime steering of the Young Scientists’ Association;
- Motivation Prize – Veljo Runnel, for enhancement of Estonian hobby science and for recording nature sounds.

In the category best new science and technology communication initiative:

- Grand Prize – H₂O visiting game conducted at Nature and Science Centres in Tartu and Jõgeva Counties, main organisers Maris Mägi (Tartu Environmental Education Centre), Sigrid Sepp, Kaidi Randpõld (Ice Age Centre);
- Motivation Prize – Innovation Centre INNOKAS, for raising public interest towards the entrepreneurial activity and science in Lääne County, leader Angela Leppik.

The total amount of the competition’s prize money in 2016 was 21 500 EUR. The Lifetime Achievement Award was worth 6500 EUR, accompanied by Stanislav Netchvolodov’s brass tabletop sculpture Mobius strip. The winners in every other category were granted: Grand Prize – 2200 EUR and Motivation Prize – 800 EUR. All prize recipients are entitled to use the Nationally Recognised Science Communicator logo image, which is a prestigious token of quality and reliability in this area.

Results of the competition were announced and prizes were handed over during the science communication conference “*Teadus meediastunud maailmas*” (Science in a media conquered world) held at the Estonian National Museum on November 23.

NATIONAL CONTEST OF YOUNG SCIENTISTS

In 2016 the Estonian Academy of Sciences granted special awards to participants in the National Contest of Young Scientists. The aim of the National Contest of Young Scientists is to motivate and encourage young people to conduct meaningful and high-quality research already before pursuing higher education. The contest gives a good opportunity to challenge oneself, gain new knowledge and skills and to meet others with similar interests from the same age group from all over Estonia, Europe and other parts of the world. The special awards of the Academy were conferred on:

- Aksel Allas (Hugo Treffner Gymnasium), for the paper “Application of reflectance spectroscopy in determining the calorific value of oil shale”;
- Taimo Priinits, Andres Anissimov (Viljandi Gymnasium), for the paper “Age determination of Estonian amphibians by skeleto-chronology method”;
- Kerstin Vestel (Pärnu Sätevaka Humanitarian Gymnasium), for the paper “Sleep disorders in young people belonging to the age group of high school students.”

PUBLICATIONS OF THE ACADEMY

Books published by the Academy in 2016:

- “Estonian Academy of Sciences Year Book” XXI (48) in Estonian and English.
- “*Eesti Vabariigi preemiad 2016*” (Awards of the Republic of Estonia) – compiled articles presenting recipients of the Science, Culture and Sports Awards and the F. J. Wiedemann Language Prize through brief biographical sketches and reflections of their major achievements – brought together into one book.

Electronic versions of all the publications are available at www.akadeemia.ee.

INTERNATIONAL SCIENTIFIC RELATIONS

The Estonian Academy of Sciences represents Estonia in several international scientific organisations bringing together science policy makers and researchers with high level of excellence on trans-disciplinary issues.

The European Academies' Science Advisory Council (EASAC; www.easac.eu) unites the national science academies of the EU member states, enabling their collaboration in building science into EU policy. The Estonian Academy of Sciences is a member since 2004. The Estonian Academy of Sciences has nominated Secretary General Margus Lopp to EASAC Council. EASAC's work of providing independent science-based advice for policy-makers is divided into three programmes: Biosciences, Energy and Environment. Each of these is run by a Steering Panel. Chairman of the Academy Committee on Marine Sciences, President of the Academy Tarmo Soomere continues as a member of the Environment Steering Panel. He also acts as a liaison between the Panel and the European Marine Board (EMB; www.marineboard.eu), working towards harmonisation of their activities and better communication between them. Enn Lust represents the Academy in the Energy Steering Panel.

Expert groups consisting of nominees by the academies analyse the topics (incl. EU document drafts) that have been scoped and recommended by the panels. The resulting reports forecast trends and potential implications of these trends on the society, aiming to incline policy-makers towards evidence-based decisions. In 2016, altogether four reports and statements have been endorsed and made public; the topics range from circular economy to antimicrobial resistance. A good example of such a report addressing key questions and challenges regarding a specific discipline, is "Marine sustainability in an age of changing oceans and seas" prepared by EASAC in collaboration with the Joint Research Centre (JRC) of the European Commission in Ispra (Italy) and EMB experts and made publicly available in January 2016. The report singles out as the greatest priority the need to translate the existing knowledge on the functioning of marine ecosystems from theory to practice and to integrate that knowledge into

the policy making process. Tarmo Soomere was among co-authors of the report as a member of the Marine Sustainability Working Group. All reports are available at <http://www.easac.eu/home/reports-and-statements.html>. The Academy communicates the reports to the Estonian policy-makers and stakeholders.

To advance national interests and objectives, more Estonian experts should participate in the working groups. Regrettably the Academy cannot afford to subsidise such assignments due to a restricted budget.

The European Federation of Academies of Sciences and Humanities (ALL European Academies, ALLEA; www.allea.org) brings together scientific academies from more than 40 European countries. Estonian Academy of Sciences is a founding member from 1994. ALLEA focuses on key issues in science strategy and policy (incl. research career path, research integrity, different autonomy facets of research institutions, copyright, open access to research data and digitisation problems, science education, etc.). ALLEA's policy work is assisted by several permanent working groups and *ad hoc* task forces. Raivo Uibo is a member in ALLEA Permanent Working Group on Science and Ethics.

EASAC and ALLEA together with their partner organisations (*Academia Europaea*, FEAM and EuroCASE) signed a Memorandum of Understanding to pull together timely, independent and evidence-based scientific expertise for the highest policy level in Europe. For this purpose, the consortium initiated a project "Science Advice for Policy by European Academies" (SAPEA) that won a funding within Horizon 2020.

Reverberations of the long transformation process of the European Science Foundation (ESF; www.esf.org) touched also the year 2016. The Academy had withdrawn from the ESF back in 2012. However, we continue as a member in two organisations that were formerly under the ESF umbrella, but after discussion of options and casting a final choice started their fully independent paths – European Marine Board (EMB; www.marineboard.eu) and European Polar Board (EPB; www.europeanpolarboard.org). National activities and membership in those Boards are coordinated by Academy Committees on Marine Sciences and Polar Research respectively.

The Estonian Academy of Sciences had been invited to participate as a founding member in the establishment of the European Marine Board's legal entity as an international non-profit association in January 2016. EMB is an independent non-governmental advisory body whose primary mission is to advance cooperation in marine sciences across Europe and

to bridge the gap between science and policy. EMB's principal partner and stakeholder in science policy is the European Commission. The priority goals include designing marine science-policy agenda by identifying new challenges and opportunities, consolidating efforts into collective actions and translating proactive competencies into practice in order to bring European marine research to the forefront of the marine science arena worldwide. EMB provides a platform for its member organisations (28 institutions from 18 countries) to develop common research priorities and strategies, both at national and EC level. President of the Academy Tarmo Soomere is one of the eight EMB founding directors and continues as Vice-Chair (2016-2017).

Mandated by four Estonian institutions holding natural science collections (University of Tartu, Estonian University of Life Sciences, Tallinn University of Technology and Estonian Museum of Natural History), the Academy has entered the Consortium of European Taxonomic Facilities (CETAF; www.cetaf.org). The Academy Committee on Phylogeny and Taxonomy (chaired by Urmas Kõljalg) is responsible for coordination of national activities.

The *Union Académique Internationale* (UAI; www.uai-iaa.org) unites academies engaged in the so-called soft sciences, mostly the humanities. Member of the Academy Jaan Undusk is our delegate in the UAI.

The Academy also takes part in the work of several other worldwide scientific organisations, such as International Council for Science (ICSU; www.icsu.org), a global partnership of science academies IAP (www.inter-academies.net), etc. Quite a few Members of the Academy have been elected into international science academies and participate in their work.

The Academy continued supporting the contacts of the Estonian scientific community with international scientific unions, whose mission is to provide a forum, synergy, strategy and voice in their areas of knowledge. The Academy gives priority to ICSU member organisations. By means of a targeted allocation from the Ministry of Education and Research, the Academy organised payment of membership fees and supplied the Ministry with a review on the activities of respective national committees and contact points (see the list in Appendix 2, p. 235). Cooperation activities exercised under the auspices of scientific unions are intertwined with collaborative projects within EU Framework Programmes (FPs). The first-mentioned component quite frequently helps to create the environment and preconditions for constructive preparation of a collaborative

research project. Vigorous activities of Estonian representatives in European and worldwide scientific organisations lead to greater visibility and effective image building. On the other hand, they secure the Estonian research community with a gateway to decision-making processes at the European level and, likewise, give them access to international discussion forums with scientific approaches to issues vital for Estonia.

The Estonian Academy of Sciences, similarly to multiple other European academies, supports and finances international mobility of researchers through a scientific exchange programme.

Bilateral cooperation agreements (full list of partners is presented in Appendix 3, p.237) serve as the formal basis for exchange of scientists. President Tarmo Soomere and executive director Galina Varlamova attended the 150th anniversary celebrations of the Romanian Academy in April. The Presidents of both Academies also signed a cooperation agreement. In October, a delegation of the Azerbaijan National Academy of Sciences headed by President Akif Alizade visited Tallinn with the aim of signing an agreement.

The scientific exchange programmes are run on the traditional cost-sharing principle: living expenses of visiting researchers in the host country are covered by the receiving party. Reciprocal visits within bilaterally accepted joint projects are given preference over individual research; the sending Academy selects the visitors to be nominated to the host Academy, as a rule. In 2016, renewed cooperation agreements with the Polish and Hungarian Academies of Sciences took effect, enabling to activate new three-year joint research projects (2016-2018). The lists of jointly supported projects are available at www.akadeemia.ee/en/international/.

The quantitative dimension of the exchanges displayed a modest increase by comparison with the previous year. General figures are the following. Estonian scientists and scholars made 72 (2015 – 61) study and conference visits in 2016, using a total of 453 (420) days. The total expenditure to cover the living costs of visitors was 20 381 (19 221) EUR. The number of hosted researchers was 64 (51); the visitors worked at Estonian universities and research institutions for 393 (358) days in total. The average daily expenses were 51.86 (2015 – 53.69) EUR. Larger Estonian universities upheld their position as the most frequent users of the exchange scheme in both directions (outbound from Estonia – inbound to Estonia): the share of the University of Tartu constituted about a third of the visits, that of Tallinn University of Technology – a fifth.

Although the list of cooperation agreements currently includes 34 partner organisations (as of January 1, 2017), the exchange programme was in fact employed with about a dozen partners; the largest volume of visits was reached with Polish, Hungarian, Czech, Bulgarian and Latvian partners. At this point we should take into account the fact that the opportunities for researchers to apply for travel grants have significantly multiplied (FPs, programmes cofunded by Structural Funds, national mobility grants, etc.) by now.

The Academy encourages direct contacts of young researchers with top actors in the world of science. For that purpose the Academy has signed a trilateral co-operation agreement with the Council for the Lindau Nobel Laureate Meetings and the Foundation Lindau Nobel Laureate Meeting (the agreement was renewed in June 2016).

The mission of annual meetings that take place in the small town of Lindau (Germany) is to educate, inspire and connect. It is a unique opportunity for young talents all over the world (numbering around 500) to meet the older generation, *crème de la crème* of the academia – Nobel Laureates (about twenty every year). In 2016 the Academy nominated Marta Tarkanovskaja, a doctoral student of the University of Tartu to the 66th Lindau Nobel Laureate Meeting (Physics). In autumn 2016, the Academy organised the national competitions for 2017 meetings in chemistry and in economics and nominated the best candidates for evaluation by the selection panel of the organisers in Lindau.

Representatives of the Academy traditionally visited other academies, for instance US National Academy of Sciences, Royal Society of Canada, French Academy of Sciences (350th anniversary events) Royal Society of Edinburgh, etc. Members of the Academy attended scientific and science policy events as invited speakers, met with delegations and ambassadors visiting the Estonian Academy of Sciences, etc. Sir Martyn Poliakoff, Vice President and Foreign Secretary of the Royal Society of London visited the Academy and voiced the clear wish of the United Kingdom science community to uphold and advance cooperation even against the Brexit in the background. For greater detail see Chronicle (pp. 8–18).

Estonia is a natural part of the European Research Area. Under these conditions it is reasonable to lay emphasis on cooperation with the European Union institutions and on active participation in EU initiatives, programmes and projects.

The Ministry of Education and Research delegated President Tarmo Soomere as the Estonian representative in the pan-EU network of government science advisers. This is an informal network consisting of members who have been nominated by the EU member countries and represent science advice structures of variable degree of formalization. The network works together with the seven members of the EC Science Advisory Mechanism (SAM) High-Level Group of Science Advisers whose mission is to provide high quality scientific advice on specific policy issues to the European Commission. The network held a meeting “Science and Policy-Making: towards a new dialogue” in Brussels (September 2016); T. Soomere attended and also Member of the Academy Ene Ergma spoke on the complexities of relations between scientists, society and policy makers.

The European Union strives to provide researchers with advantageous career opportunities, including support services for those seeking to advance their careers by moving to another country. Together with the Estonian Research Council as the national coordinator and other partners (public universities and scientific institutions), the Academy participates in the EURAXESS network. EURAXESS – Researchers in Motion is an initiative of the European Commission, founded to advise relocating researchers, doctoral students and their family members on administrative and practical issues.

Service centres offer information on a broad range of queries, e.g. visas, residence and work permits, research vacancies, social insurance, availability of medical aid, daily life utilities, etc. The European Commission assembles the network members for European meetings, trainings and conferences, attended among others by the foreign relations staff of the Academy. For greater detail, visit euraxess.ee.

NATIONAL AWARDS TO MEMBERS OF THE ACADEMY

NATIONAL SCIENCE PRIZES

Based on nominations from the National Science Prize Committee, the Government of the Republic of Estonia by Order No. 44 of 11 February 2016 conferred

SCIENCE PRIZE FOR OUTSTANDING ACHIEVEMENTS IN RESEARCH AND DEVELOPMENT

Ülo Lepik



“... the conferral of the National Lifetime Achievement Award in science is definitely an acknowledgement of great significance for me. To achieve a pinnacle that high, anyone would need lots of support from a well-functioning and favourable team. I have been exceptionally fortunate in this regard: the colleagues around me have invariably turned out to be good-hearted and helpful people, both at the Chair of Theoretical Mechanics and at the faculty level ... Thank you all for all the generosity! ...”

“*Eesti Vabariigi preemiad*” (National Prizes of the Republic of Estonia), 2016

SCIENCE PRIZE FOR OUTSTANDING ACHIEVEMENTS
IN RESEARCH AND DEVELOPMENT

Raimund Ubar



“... A considerable contribution into the advancement of that discipline [computer science] has been made by a school that had emerged at the Department of Computer Engineering at Tallinn University of Technology and was composed of the younger generation of my fellow scientists – to my way of thinking this is positively my life’s work in the academic world. Our department has grown into a centre accumulating high-quality research and offering doctoral studies of international repute. My students are regularly leading and coordinating top-level EU projects that engage as partners the best universities in Europe and the preeminent industries of the world. The very best gift for a teacher is beyond a doubt the situation where his students continue the work he had started and outdistance their teacher ...”

“*Eesti Vabariigi preemiad*” (National Prizes of the Republic of Estonia), 2016

ANNUAL AWARD IN ENGINEERING
Maarja Kruusmaa



for series of studies “*Bioloogiast inspireeritud allveerobotite liikumine ja tajud*”
(Movements and perception of biologically inspired robotic fish).

ANNUAL AWARD IN GEO- AND BIOSCIENCES

Martin Zobel (research team leader), John Davison, Mari Moora,
Maarja Öpik



for series of studies “*Taime- ja seenekoosluste mitmekesisust ning nende omavahelisi seoseid mõjutavad tegurid*” (Factors affecting the variation of plant and fungal diversity and plant-fungal interactions).

ANNUAL AWARD IN THE HUMANITIES
Tõnu-Andrus Tannberg



for series of studies “*Eesti sõjaajalugu*” (War history of Estonia) and “*Eesti ajalugu nõukogude perioodil*” (The Soviet era in Estonian history).

ESTONIAN STATE DECORATIONS TO MEMBERS OF
THE ACADEMY

Ergo Nõmmiste

President of the Republic of Estonia by Resolution No. 576 of 4 February
2015 awarded the Order of the White Star, 3rd class.



ANNIVERSARIES



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Ülo Lepik

Ülo Lepik was born on 11 July 1921 in Tartu. He graduated from Hugo Treffner Gymnasium in 1940 and pursued his education in the Department of Mathematics at the University of Tartu. His studies were interrupted twice due the outbreak of war in Europe. Thus, it took him a little longer to complete the academic programme: in 1948 he obtained a graduate diploma in physics.

The professional activities career of Ülo Lepik has been associated with the University of Tartu for more than half a century. He started at the Chair of Theoretical Mechanics in 1947 as an Assistant and continued in positions with progressive responsibility from Senior Lecturer to Professor. Ü. Lepik earned his Candidate of Sciences degree in 1952 with a dissertation on the topic “The effect of material compressibility on the stability of elastic-plastic plates” and was conferred the rank of Associate Professor

in 1956. His doctoral studies at Moscow State University (1956-1958) were finalised with a thesis on “Some equilibrium problems of elastic-plastic plates and rods” that was defended in 1959. In 1959-1990 Ülo Lepik was Head of Theoretical Mechanics Department of University of Tartu. He was awarded Professorship in 1960 and was elected Member of the Estonian Academy of Sciences in 1993 in the area of mechanics. Since 1996 he has been *Professor Emeritus* of the University.

Ülo Lepik is a world-renown scientist in the area of mechanics and optimisation. The main directions of his studies are calculation of elastic-plastic rods, plates and crusts, optimum design of structures, applications of chaos theory and application of linics for solving integral and evolution equations. He has elaborated new calculation methods for statistic and dynamic loads.

While giving lectures in the field of mechanics, Prof. Ü. Lepik also taught several disciplines in mathematics, e.g. calculating variance and theory of probability. In total, 13 dissertations for the Doctor of Sciences and Candidate of Sciences (the latter equivalent to PhD) degrees have been defended under Ülo Lepik’s supervision. He has published nearly 200 scientific articles, three monographic works and he is the author or co-author of numerous higher education textbooks.

Ülo Lepik is a member of several international scientific organisations in his area of research and an editorial board member of the journal *Mathematical Modelling and Analysis* issued in Vilnius. The outstanding scientific contribution of Ülo Lepik has been widely acknowledged. He has received the University of Tartu medal on three occasions (1982, 1989, 1996), the Medal of the Estonian Academy of Sciences (2001) and the Harald Keres Memorial Medal of the Academy (2014). In 2012 he became Honorary Citizen of Tartu and owner of the Tartu Star Order. Ülo Lepik was awarded a high state decoration, the Order of the National Coat of Arms, 4th class in 1998. He is this year’s National Science Prize Laureate for Long Standing Achievements in Research and Development.

On top of job-related activities, Ülo Lepik has always appreciated sports – gymnastics, skiing, swimming, mountain hiking and canoe paddling. He enjoys listening to music and playing bridge in a good company.



Arno Kõörna was born on 2 February 1926 in the Nõo borough of Tartu County and began his education there. In 1947 he graduated from Tartu Secondary School No.1. His family was evacuated to Tatarstan during World War II. After returning to Estonia, Arno Kõörna enrolled at the University of Tartu and completed his studies as a history major in 1955. His academic career proceeded at the University, where he worked as Lecturer at the Department of Political Economy, focusing on a range of topics in economics.

In 1961 Arno Kõörna defended at his Candidate dissertation in economics at the Estonian Academy of Sciences on the topic “Development of public economy in Estonia from the end of the 19th century to the beginning of the 20th century”. In 1970 he earned his doctoral degree in economics at the same place with a dissertation on the topic “The methods of industrial production quality management in economy”. In 1972 he was awarded Professorship. In the same year Arno Kõörna was elected member of the Academy of Sciences in the area of economics.

Between 1965 and 1973 Arno Kõörna was employed with the Institute of Economy at the Estonian Academy of Sciences in the positions of

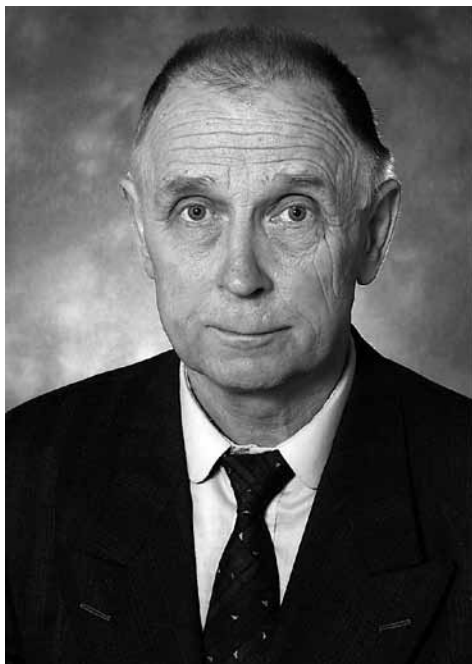
Deputy Director (until 1966) and Director. For over two decades he held offices at the Estonian Academy of Sciences: Scientific Secretary General (1973-1982), Vice-President (1982-1990) and President of the Academy (1990-1994). In 1996-1997 he was Rector of the International University for Social Sciences LEX. From 1998 until 2005 Arno Kõörna worked as Professor at Euroacademy and has been *Professor Emeritus* since 2005.

Arno Kõörna's major research interests have been the history of Estonian economy, comparative analysis of economical mechanisms, quality economics, science economics and innovation. He has published 179 articles in refereed journals, 10 monographic works and three textbooks.

During the process of regaining Estonian independence Arno Kõörna took part in the work of several national institutions as a scientist and expert of economics and in the role of the President of the Academy. He was a Member of the Advisory Council to the Chairman of the Presidium of the Supreme Council and later Member of the Advisory Council to the Prime Minister. He also chaired a Committee at the Supreme Council to declare that the incorporation of Estonia by the Soviet Union in 1940 was occupation. In 1990-1992 he was Chairman of the Estonian Research Council and Chairman of the National Science Prize Committee. He is a member of several international scientific organisations.

Arno Kõörna has been recognised with the National Science Prize for his studies in the history of economics (1970) and the Medal of the Estonian Academy of Sciences (1986). In 2006 he was awarded the Order of the White Star, 3rd class.

Swimming and cross-country skiing have been among Arno Kõörna's favourite leisure activities from a very young age. Almost equally long is his habit of taking part in the activities of various international charity organisations.



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Ülo Lille

Ülo Lille was born on 16 September 1931 in Pärnumaa into a farmer's family with three children. He graduated from Rapla Secondary School in 1950, enrolled at Tallinn University of Technology (TUT) and completed his studies with the qualifications of an engineer-chemist-technologist in 1955. After graduation Ülo Lille worked at Kiviõli Chemical Plant as a production shift foreman and technologist until 1957, when he undertook postgraduate studies at TUT. He defended his dissertation "Deriving unsaturated hydrocarbon gases in the process of oil-shale pyrolysis" for the Candidate of Sciences (PhD) degree in Engineering at the Estonian Academy of Sciences in 1960.

Ülo Lille's employment with the newly established Oil Shale Research Institute in Kohtla-Järve began in 1960 and he worked there for the following fifteen years as senior researcher and research group leader. In 1973 he earned his Doctor of Sciences degree in Chemistry at the Estonian Academy of Sciences with a dissertation on investigation of alkylresorcinols.

The professional career of Ülo Lille has been associated with the Institute of Chemistry for almost 30 years. He started as Head of the Section of Pure Substances in 1975, when the institute belonged into the structure of the

Estonian Academy of Sciences. Shortly, he became Head of the Department of Pure Substances. In 1984 he was awarded the rank of Professor in the specialty of organic chemistry. During the period from 1992 to 1997 Ülo Lille was concurrently heading the Chair of Organic Chemistry at TUT and a corresponding department at the Institute of Chemistry. He continued participating in research projects as senior researcher and has been *Professor Emeritus* of TUT since 1997.

In 1983 Ülo Lille was elected a Member of the Estonian Academy of Sciences in the area of biotechnology.

The main areas studied by Ülo Lille have been the chemistry of prostaglandines and its applications in the human and veterinary medicine. Recently he has returned to investigating the structure and generation of Estonian kukersite kerogen, this time by means of molecular-level simulations. He has also made a notable contribution to the materials science by modelling electron-controlled polymers, which may provide a breakthrough in the future medicine, side by side with the so-called “organic electronics”.

Eight successfully defended dissertations for the Candidate of Sciences (PhD) degree in organic chemistry have been supervised by Ülo Lille during the period 1981-1991. He is the author of over 200 scientific publications. He was a longtime Chairman of the Editorial Board for the chemistry series within the *Proceedings of the Estonian Academy of Sciences* (1993-2007).

Ülo Lille's scientific works have been recognised with the National Science Prize (1987), Medal of the Academy (1991) and the state decoration Order of the White Star, 5th class (2001). In 2011 he was awarded the National Science Prize for Long-Standing Achievements in Research and Development.

Additionally to his professional interests Ülo Lille feels invigorated by having a walk in the countryside and taking a swim. He is keenly interested in Estonian politics and enjoys listening to classical music.



Arvo Ots was born on 26 June 1931 into a schoolteacher's family in Pärnu and got his elementary education in Viljandi. After the end of World War II his family moved to Tallinn, where he acquired secondary education as an extern and graduated from Tallinn Secondary School of Science in 1950. His studies of thermal engineering in the Department of Mechanical Engineering at Tallinn University of Technology (TUT) were completed in 1955. Arvo Ots had started working at the university while he was still an undergraduate. His first position was Senior Laboratory Assistant at the Chair of Thermal Power Engineering. Then he was employed as Junior Researcher with the Institute of Energy Research at the Estonian Academy of Sciences (until 1960). He completed a postgraduate programme and defended his Candidate of Sciences (equivalent to PhD) thesis "The Combustion of Pulverised Oil Shale" in 1958 and was awarded the rank of Associate Professor in 1962. Arvo Ots gained his Doctor of Sciences degree in Engineering at the Estonian Academy of Sciences in 1968. His doctoral dissertation investigated thermophysical and chemical processes in pulverised oil shale combustion chambers. He was awarded the Professorship in 1969.

In 1983 the Estonian Academy of Sciences elected Arvo Ots its Member in the area of power engineering.

The academic career of Arvo Ots has been associated with the Chair of Thermal Power Engineering at TUT for over half a century. He started as an hourly-paid lecturer in 1959 and proceeded in progressively responsible positions of Associate Professor (1960-1966), Senior Researcher (1966-1968) and Professor (1968-2001). At the same time, he worked as the Head of the Chair from 1969 to 1991 and Director of the Department of Thermal Engineering between 1991 and 2001. He continued conducting research at the Department as Professor Extraordinary (until 2003) and Extraordinary Senior Researcher. He became *Professor Emeritus* in 2003.

The main research topics investigated by Arvo Ots include solid fuels combustion technologies, gas phase processes in steam boilers, technology for combined processing of oil shale into oil and gas and generating electricity as a by-product. His studies have laid solid foundations for introducing large capacity oil shale energy production equipment at our power plants.

Arvo Ots taught a range of courses focusing on thermal power equipment and supervised a large number of dissertations for a PhD, Candidate of Sciences and Master's degree in that scientific area of study. He is the author of over 450 scholarly publications, among them four extensive professional monographs and several academic textbooks. Arvo Ots has participated in preparing the Energy Act of the Republic of Estonia and has repeatedly headed the working groups tasked with drafting development plans for the Estonian energy sector. He is a member of the Academy's Energy Council as well as the editorial boards of several academic journals.

Arvo Ots has been granted the State Prize of the ESSR twice (in 1970 and 1980). In 2003 he was awarded the state decoration – Order of the White Star, 4th class of the Republic of Estonia – and in 2006 the Estonian Association of Engineers named him its 2005/2006 Engineer of the Year. In 2010 he received the Science Prize of the Republic of Estonia for long standing achievements in research and development.

Recreational activities, especially orienteering and cross-country skiing, have long been among the favourite pastimes of Arvo Ots. His personal collection of recordings – chiefly symphonic masterpieces and classic jazz, is another source of enjoyment to him.

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Foreign Member

Antero Jahkola



Antero Jahkola was born on 5 February 1931 in Korpilahti, Finland. In 1956 he graduated from Helsinki University of Technology with a degree in power energetics. Subsequently he was employed with the largest Finnish energy enterprise Imatran Voima OY, where he worked until 1974 as an Engineer and Deputy Head of the Planning Department. At the same time, he continued his career in science at Helsinki University of Technology. His academic positions included: Research Fellow at Power Equipment Laboratory in 1957-1963, Assistant Professor of Energy Economics and Power Plants in 1971-1974, Professor and Head of Laboratory since 1974. Antero Jahkola became emeritus in 1994, but he has continued scientific activities at the Laboratory of Energy Economics and Power Plants. His main research topics are associated with burning and gasification of solid fuels and the economics of thermal schemes in power stations. He is the author of more than 150 scientific publications and the owner of two patents.

Professor Jahkola has had close contacts with Tallinn University of Technology and the Estonian Academy of Sciences since 1976. His collaboration with Estonian colleagues has materialised in various forms: delivering lectures, participating in joint research projects, organising Finnish–Estonian joint seminars on power engineering and large-scale conferences devoted to the EU energy policy and its implementation in

the Baltic States. He has taken part in the work of the Estonian–Finnish Inter-Academy Working Group on energy cooperation since it was founded in 1991, and was a long-time Co-chair for the Finnish partner. In 1993 Antero Jahkola received an honorary doctorate from Tallinn University of Technology, in recognition of his outstanding contribution to the investigation of solid fuels and enhancement of scientific cooperation between Finland and Estonia.

The Estonian Academy of Sciences elected Antero Jahkola its Foreign Member in 1998. He is a member of the Finnish Academy of Technology, New York Academy of Sciences, Finnish Union of University Professors and several other Finnish and international scientific organisations in his area of expertise. In 2004 he was awarded the Estonian state decoration – Order of the Cross of Terra Mariana (*Maarjamaa Risti Teenetemärk*), 3rd class.

Foreign Member Charles
Gabriel Kurland

Charles Gabriel Kurland was born on 14 January 1936 in New York. He obtained his BA (Honours) in zoology from Cornell University in 1957 and PhD in biochemistry from Harvard University in 1961. He and passed a post-doctorate programme at the University of Copenhagen and Stanford University. From 1964 to 1971 he worked as Assistant Professor, Associate Professor and Professor of Zoology at the University of Wisconsin. After that he became the first Professor of Molecular Biology in Sweden (and Scandinavia as well). Charles G Kurland's further scientific path was chiefly associated with Uppsala University, where he has headed the Institute of Molecular Biology for decades. In those years he was also Head of the Genome Centre under the umbrella of Lund University. Later he continued participating in projects conducted by the microbial ecology research group in the Department of Biology. He has been *Professor Emeritus* of Lund University since 2001.

Charles G Kurland's scientific works belong to the area of molecular biology, with emphasis on research in ribosome structure and precision of translation of genetic code. In parallel with Hopfield he developed the present-day understanding of molecular mechanisms providing for the precision of translation of genetic code and he provided a qualitative and quantitative explanation for the biological implication of the said process. By reason of new directions in molecular biology his later works

have focused mainly on research of development of endoparasite bacteria and cell organelles. Being among the authors of the EMBO Statement on Genetically Modified Organisms and the Public, Professor Kurland is purposefully engaged in presenting and explaining to broader public the goals, achievements and hazards of scientific activities. He is the author of over 170 scientific publications and one of the most highly cited natural scientists in the world. Partnership with Professor Kurland enabled quite a few Estonian scientists in the 1970s to create cooperation ties all over the world. Thanks to his recommendations, several Estonian molecular biologists gained an opportunity for continuous professional development at prestigious scientific laboratories in the USA, England, Germany and Sweden. In 1991 Charles G Kurland was elected Foreign Member of the Estonian Academy of Sciences in biochemistry.

Charles G Kurland is Foreign Member of the Royal Swedish Academy of Sciences, Royal Danish Academy of Sciences and Letters, member of the European Molecular Biology Organisation (EMBO) and chairman of several EMBO committees, member of the Royal Science Society in Uppsala and the Royal Physiographic Society in Lund. He has been recognised with numerous academic awards and prizes.

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Leo Mõtus



Leo Mõtus was born on 15 December 1941 in Järvamaa to a farmer's family. He acquired his primary education at Kuigatsi School in Valga County. His family then moved to Tallinn and L. Mõtus graduated from the Gustav Adolf Gymnasium in 1960. His path of education continued at Tallinn University of Technology (TUT), where he enrolled in a newly established specialty of automatics and completed the programme with a diploma in 1965. He earned his Candidate of Sciences (PhD) degree in engineering at the Estonian Academy of Sciences in 1973 with a thesis on "Stochastic control of systems with incomplete information". His dissertation "Software engineering for distributed embedded systems" for the Doctor of Sciences degree in engineering was defended at the Moscow Institute of Control Sciences in 1990.

In 1964, while still an undergraduate student, Leo Mõtus started his professional career at the Institute of Cybernetics in a team tasked with automation of industrial processes. He subsequently worked in the positions of an engineer, senior engineer, post-graduate student, researcher and senior researcher until 1979. In 1979-1992 he was project manager at the Special Design Office of Computer Engineering. Between 1975 and 1988 he also worked as a lecturer at the TUT Chair of Automatics and during 1990-1992 as Professor and Head of the Chair of Cybernetics. Since 1992 Leo Mõtus has been Professor of Real Time Systems at the TUT Institute of

Automatics. At the same time he was also Dean of the Faculty of Systems Engineering (1994-2001) and Head of the Research Laboratory for Proactive Technologies (2007-2011).

In 1993 Leo Mõtus was elected Member of the Estonian Academy of Sciences in informatics. During 2004-2014 he was Secretary General of the Academy. He is active in several specialty organisations and editorial boards of scientific journals. Professor Mõtus was among proponents for reestablishing the Estonian Association of Engineers after Estonia regained independence and President of the association during 1994-2000. He was also one of the initiators and actuators of the certification and registration system for accredited (chartered) engineers in Estonia.

Main areas studied by Leo Mõtus are involved in theoretical aspects of self-organising of proactive artificial systems, modelling and verification of their behaviour. His work has been twice (1980 and 1996) recognized with the National Science Prize. In 1999 he was awarded a reputed state decoration – the Order of the White Star, 4th class.

The favourite activities that Leo Mõtus enjoys during leisure hours are house-building, meditating, swimming, dancing, taking a sauna, travelling and reading fiction.



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Raimund-Johannes Ubar

Raimund Ubar was born on 16 December 1941 in Tallinn. He graduated from the Westholm Gymnasium in 1960. Among other things he played guitar in the school orchestra. During 1959-1967 he also belonged to the Estonian select gymnastics team. He pursued his undergraduate studies in the field of automatics at Tallinn University of Technology and completed the programme in 1966.

In 1965 Raimund Ubar proceeded to work as an engineer at the Design Office of Radio-Electronics. In 1968 he enrolled in the post-graduate studies at Baumann University of Technology in Moscow, focusing on diagnostics of complex systems, related to testing the electricity systems of spacecraft Venus and the Lunar Rover. In 1971 Raimund Ubar defended his thesis for the Candidate of Sciences (PhD) degree in engineering at the same University, returned to Estonia and has ever since been associated with Tallinn University of Technology (TUT). In 1986 he defended his dissertation for the Doctor of Sciences degree in engineering at Riga Institute of Computer Machinery in research and development of methods of diagnostics of digital systems. He was awarded professorship in 1987 and elected Member of the Estonian Academy of Sciences in the area of computer engineering in 1993.

At the university Raimund Ubar has dedicated the greater part of his energy to teaching. He has worked at the Chair of Electronic Computers

as assistant, senior lecturer and Associate Professor, Head of the Chair and Professor. He has also been Head of the Laboratory for Design and Diagnostics of Digital Systems at the Department of Computer Engineering. On top of that, Professor Ubar is the founder and Head of the Centre of Excellence in Electronics at TUT (1993-1997). Between 2002 and 2004 he was Research Professor at the Estonian Academy of Sciences. Since 2005 he Raimund Ubar has been affiliated with the Chair of Computer Systems Test and Verification at the TUT Department of Computer Engineering, in the positions of Professor and Head of the Chair.

The most influential contribution that Raimund Ubar has made to Estonian science is undoubtedly the founding of his school that has already gained world-renown. The binary resolution diagrams he took to use nearly 40 years ago have become important theoretical models at designing and diagnostics of digital systems. Raimund Ubar has intensively used his knowledge also in economy. With his participation the spin-off Testonica Lab was born, featuring among its products also the tester of communication channels of the large hadrons collider BERT commissioned by CERN.

Besides fruitful scientific activities Raimund Ubar has voiced thought-provoking ideas in writings addressed to public on topical issues of science culture and science policy as well as various aspects of science philosophy. He has considered problems relating to the development of higher education and pedagogy, his home university and engineering sciences, etc.

Scientific works of Raimund Ubar have been twice recognised with the National Science Prize – in 1999 the annual award in engineering and in 2016 the Prize for Long-Standing Achievements in Research and Development. In 2002 he was awarded the Order of the White Star, 3rd class.



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Foreign Member
Yuri E Berezkin

Yuri Berezkin was born on 27 December 1946 in Saint Petersburg. He is coming from an educationalist family of Russian and Estonian descent. In 1970 he graduated from Saint Petersburg State University, majoring in historical archaeology. After passing compulsory army service by 1973 he proceeded to work in the Department of America at the Museum of Anthropology and Ethnography (Kunstkamera) of the Russian Academy of Sciences. From 1987 to 2002 Y. Berezkin was professionally associated with Saint Petersburg Institute of Archaeology. In 2003 he returned to Kunstkamera, where he still works as Head of Department of America. In 1996 Y. Berezkin started delivering lectures at Saint Petersburg European University, doing it now as Professor at the Department of Ethnography. At the same University, he defended the thesis of candidate in history (1977) and doctor of history (1990).

In 1966-1994 Y. Berezkin participated in numerous archaeological excavations: he has passed ca 60 months doing the field work. His earlier scientific topics were related to Central Asian archaeology (incl. South-Turkestan Neolithicum and Bronze Age). Further on his core directions of research involved comparative mythology and history of settlement of

the American continent, more specifically reconstruction of the history of settlement of American continent basing on data of geographical distribution of ancient mythological motives, and also the treatments of iconography of American indigenous people and pre-state complex societies. The empirical basis of his mytho-geographical works has been the databank ruthenia.ru/folklore/berezkin, developed over scores of years and still being replenished, containing ca. 50 000 texts with references to sources and data on origin.

He is a scholar of extraordinary erudition, who has actually established a separate multidiscipline, using data of folklore texts and human geography for research of historical processes. He has authored over 350 researches and has delivered papers at scores of international summits. The scope of his works translates to cultural theory, history of arts, sociology, political science, human geography, population science, philosophy etc. Prof. Berezkin has delivered general courses of ethnology and archaeology at Saint Petersburg European University and Saint Petersburg State University and many special courses, incl. cultural anthropology theory and history, pre-history of early civilisations, non-classical mythologies, comparative cultural researches and Middle East pre-historic archaeology. Many of his scientific monographs are also in use as university textbooks.

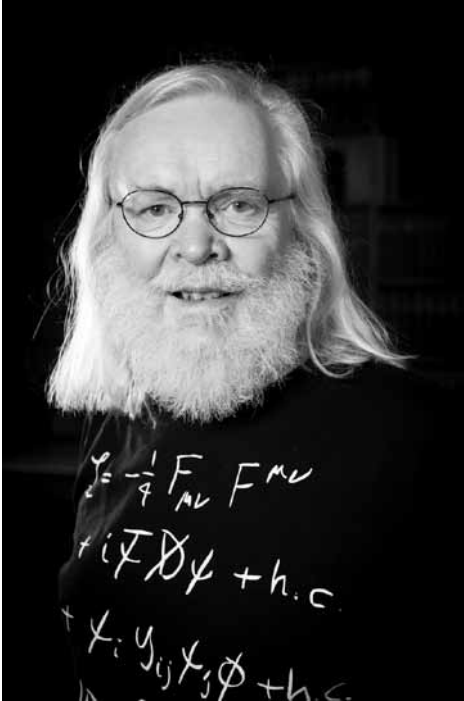
Professor Berezkin has had long contacts with Estonian folklorists, archaeologists, linguists and geneticists, in particular with scholars of the Estonian Literary Museum. He has provided graduate studies to Russian doctoral students at the University of Tartu and has been reviewer at defending of the Estonian archaeology-related doctoral works.

In 2012 the Estonian Academy of Sciences elected Yuri Berezkin its Foreign Member in ethnography.

And note well, Yuri Berezkin – an archaeologist, anthropologist, historian and folklorist of world-renown – is proficient in Estonian and spends his summer holiday with the family in South Estonia.

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Foreign Member
Jonathan (John) R Ellis



Jonathan (John) Richard Ellis was born on 1 July 1946 in London, the United Kingdom. In 1971 he was awarded the degree of Doctor of Philosophy in the Cambridge University in theoretical high energy physics. He proceeded to scientific work at King's College of the same University. His long cooperation with CERN, the European Organization for Nuclear Research near Geneva in Switzerland started in 1970, when he was the research fellow; in 1973 he became full-time researcher and from 1974-2011 he was member of the Theory Division (TH). In those years he held several responsible administrative positions in CERN: in 1979-1982, 1984-1987 Deputy Head of TH, in 1988-1994 Head of TH, in 1999-2011 Counsellor to Director General for Relations with non-Member States. Since 2010 he has been Professor of Theoretical Physics at King's College of the London University.

Being an outstanding researcher of his generation in theoretical physics J. Ellis is evidently the best known researcher in the world of the phenomenology of physics of elementary particles. Among his main areas of research are also astrophysics, cosmology and quantum gravitation. He has made a significant contribution to research of the Higgs Boson and Supersymmetry. Having authored over 970 scientific publications, he is

the second most cited expert in theoretical physics in the world. He has worked as research fellow or professor at many universities and research laboratories both at home and abroad (incl. Stanford, Berkeley, Melbourne, and Vienna). Presently he is Visiting Professor at two colleges within the University of London: University College (since 2006) and Imperial College (since 2010).

The connection of Prof. Ellis with Estonian science has worked along two lines: first through scientific cooperation with Estonian scientists and second – thanks to his role as Counsellor to Director General of CERN, coordinating the relations of CERN with non-Member States, incl. Estonia. In the process of renovation of cooperation agreement between the Republic of Estonia and CERN he made, as Counsellor to the management his best efforts to get about the agreement which would be in the interests of Estonia.

In 2015 the Estonian Academy of Sciences elected J. Ellis its Foreign Member in theoretical physics. He is member of the London Royal Society and Institute of Physics (IoP), Honorary Doctor of several universities (Southampton, Uppsala, Bitola, and Cape Town), Member of the Academy of Sciences of Ukraine, and Honorary Member of London and Cambridge King's Colleges. IoP recognised him with the Maxwell Medal (1982) and the Paul Dirac Prize (2005). In 2012 he was awarded the honorary title of Commander of the Most Excellent Order of the British Empire (CBE).

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Foreign Member
Pekka Männistö



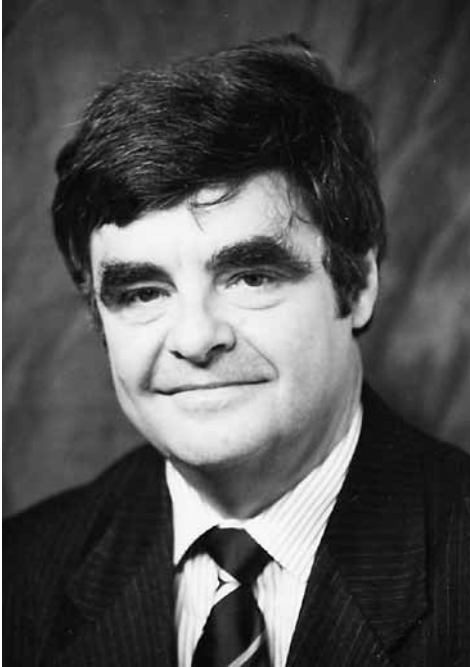
Pekka Topias Männistö was born on 18 December 1946 in Tampere, Finland. He studied medicine at Helsinki University and completed his undergraduate studies in 1972. He earned his doctorate at the same university in 1974 and was awarded Associate Professorship two years later.

In 1969 P. T. Männistö started to give lectures at the University of Helsinki, holding the positions of instructor and Assistant Professor. From 1981 to 1986 he worked as Director for Research in the pharmaceuticals company Orion Pharmaceutica. His academic career continued as Professor of Pharmacology and senior researcher at the University of Helsinki between 1987 and 1995. Within that period of time (1993-1995) he was also senior research fellow at the Academy of Finland. His affiliation with the Chair of Medical Pharmacology at Uppsala University began in 1994 and lasted until 1996. Then he worked as Head of Chair of Pharmacology and Toxicology and Professor of Pharmacology on the Kuopio campus of the University of Eastern Finland University up to 2005. After that he has been Professor and since 2013 *Professor Emeritus* at the University of Helsinki.

His main area of research is the role of catecholaminergic systems in the pathogenesis of Parkinson disease and in the effects of antiparkinson medication. He has created and thoroughly researched the catechol-o-methyltransferase inhibitor (entacapone), which is presently one of the most widely used antiparkinson drugs in the world.

Professor Männistö is member of the Finnish Society of Clinical Pharmacology and the Finnish Brain Research Society. He has published over 400 scientific articles in pharmacology, quite a few of them are co-authored by numerous researchers affiliated with the Institute of Pharmacology and Physiology at the University of Tartu. His long-time cooperation with the University of Tartu has been composed of delivering lectures to students and conducting scientific seminars, and creating opportunities for Estonian scientists to work and prepare their dissertations in the laboratories headed by Prof. Männistö. He was given an honorary doctorate by the University of Tartu in 2010.

In 2012, the Estonian Academy of Sciences elected P. T. Männistö its Foreign Member in pharmacology.



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Foreign Member

Michael Godfrey Rodd

Michael Godfrey Rodd was born on 21 June 1946 in the Republic of South Africa. He acquired academic education at Cape Town University majoring in electrical engineering and defended his doctoral dissertation at the same University in 1979 on the topic of industrial computers basing on real-time control system. He got valuable experience when working as engineer for Rhodesian Railway Ltd and engineer of computer systems at the company NIDeFR. In 1972 he was granted the professional qualification of Chartered Engineer. M. Rodd embarked on the teaching career in 1973 as lecturer of electrical engineering in Cape Town University; in 1979-1986 he was Professor of Electronics at Witwatersrand University in Johannesburg. In 1986 he proceeded to work as Professor to the Swansea College at the University of Wales in the United Kingdom, where he headed the Department of Electrical Engineering and Electronics (1986-1992) and the School of Engineering (1992-1995). In those years he established two spinoff companies, namely i2it Ltd and MiTime in the organisational structure of the University. In 1998-2012 M. Rodd was Head of Knowledge Services at the Institution of Electrical Engineers located in London, the present Engineering and Technology Union.

Professor Rodd has been foreign examiner in many universities of the world (Queen Mary College of the London University, Royal Engineering Institute

of Sweden, Tallinn University of Technology and Gent, Groningen and Singapore Universities), he has belonged to advisory bodies counselling governmental institutions and has long supervised the activities of the British Computer Society (BCS) respecting the knowledge-based society and international relations, embracing BCS forums, publications and stakeholders, accreditation of higher schools etc. He set up, under aegis of the International Federation of Automatic Control (IFAC) the internationally acclaimed journals *Control Engineering Practice* and *Engineering Applications of Artificial Intelligence*, and was long their editor in chief. M. Rodd has released over one hundred scientific articles, he has authored and edited 12 books and supervised more than 30 doctoral theses. The keywords of his scientific work are real-time computer systems and software, monitoring systems of real-time processes, applications of cohesive system with real-time view function etc.

Prof. M. Rodd developed close relations with Estonian scientists through colleagues of Tallinn University of Technology and those of the Institute of Cybernetics in the first place. Since 1988 the research group headed by him has been engaged in cooperation with Estonian researchers in the area of elaborating real-time software and research of distributed real-time artificial intellect, as a result of which four doctoral works and a monograph have appeared. He has delivered crash courses to master students of Tallinn University of Technology and has presented Estonian science in Europe and, as a visiting Professor, in the USA.

In 1995 Michael Godfrey Rodd was elected Foreign Member of the Estonian Academy of Sciences in information technology and process control.

In 2009 he decided to devote his attentions to his long-standing hobby – the historical canals of England, putting them in proper order and organising shipping-traffic along canals. He became CEO in the canals-restoring foundation Kennet & Avon Canal Trust. Presently he advances the Foundation by *pro bono* work as chairman of its supervisory council.

In 2012 Professor Rodd was elected among members of the Witwatersrand University's Hall of Fame in the field of electricity and information technology. He holds honorary professorships at Swansea, Cardiff, Warwick, State of Pennsylvania and Cranfield Universities. He is also a member of several professional associations for engineers in the United Kingdom, USA and the Republic of South Africa.

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Jaak Vilo



Jaak Vilo was born on 14 November 1966 in Tallinn. He graduated from Tallinn Secondary Science School in 1984 and from the University of Tartu in 1991, majoring in applied mathematics. He defended his doctoral dissertation on computer science at Helsinki University in 2002.

The professional life of Jaak Vilo was on several occasions associated with the Institute of Computer Science at the University of Helsinki: as a lecturer (1989-1990, 1991-1993) and as an assistant and research assistant (1993-1999). During 1999-2002 he was employed as senior researcher with the European Bioinformatics Institute. From 2002 to 2006 he worked as Director for Informatics at the company EGeen Inc and as extraordinary senior researcher at the Estonian Biocentre. In 2004 Jaak Vilo continued his academic career at the University of Tartu, working as associate professor, senior researcher and extraordinary senior researcher at the Institute of Computer Science. From 2007 onward he has been Professor of Bioinformatics and since 2011 Head of the Institute of Computer Science as well. Jaak Vilo is a Board Member of OÜ Quretec (since 2006) and Manager for Research of the Software Technologies and Applications Development Centre (since 2009).

In 2012 Jaak Vilo was elected Member of the Estonian Academy of Sciences.

Jaak Vilo's scientific work in informatics and its applications (e.g. bioinformatics) has been on the front line of global science. He has worked out new algorithms and efficient software, enabling to carry out successful data

analyses in bioinformatics and to obtain novel results even in molecular biology. Vilo has pioneered the search from texts of (new) patterns, the research of gene regulation mechanisms, gene expression analysis, G-protein receptors analysis and development of web-based tools and environments. His research is related to implementation of best methods of informatics in different areas. It has been particularly successful in bioinformatics, medicine informatics and language technology, as well as in social networks. Jaak Vilo has created his own research team BIIT, educating a new generation of Estonian computer scientists and experts in bioinformatics. Besides that he is socially and administratively vigorous, participating at Estonian computer science and IT-education and wider in education and research discussion and management and promotion of cooperation between universities and the Estonian IT-sector. Jaak Vilo has jointly set up several IT-companies, incl. Teleport, Meediamaa, Keelevara, EGeen and Quretec.

Professor Vilo is Chairman of the Steering Committee for the programme “Language Technology Support for the Estonian language (2011-2017)” and a member of the Estonian Research Council’s Evaluation Committee. Jaak Vilo sits on assessment panels of several international conferences and international scholarly journals. Seven doctoral dissertations have been defended under his supervision.

In 2013 Jaak Vilo was awarded the state decoration, the Order of the White Star, 3rd class. In 2014 he was nominated the Person of the Year 2013 by the Estonian Association of Information Technology and Telecommunications.

MEMBERS OF THE ACADEMY

As of March 2017²

Jaan Aarik, born 1.01.1951, elected 2013, exact sciences. University of Tartu 1974. Professor of Solid State Technology (2009), Head of Laboratory of Thin-Film Technology, Institute of Physics, University of Tartu (2008); W. Ostwaldi 1, 50411 Tartu ESTONIA, Tel: +372 737 4674, Fax: +372 738 3033, jaan.aarik@ut.ee. HOME ADDRESS Mõisavahe 60-41, 50707 Tartu ESTONIA, Tel: +372 5690 3295. Divorced, daughter and son.

Olav Aarna, born 4.11.1942, elected 1990, informatics. Tallinn University of Technology 1965. Vice Rector for Research and Development, Estonian Business School (2014); Lauteri 3, 10114 Tallinn ESTONIA, Tel: +372 501 1897, olav.aarna@ebs.ee. HOME ADDRESS Nooruse 1-45, 76901 Tabasalu, Harku vald, Harju maakond ESTONIA, Tel: +372 603 2060. Cohabitant, three sons and daughter.

Jaak Aaviksoo, born 11.01.1954, elected 1994, exact sciences. University of Tartu 1976. Rector, Tallinn University of Technology (2015); Ehitajate tee 5, 19086 Tallinn ESTONIA, Tel: +372 620 2003, Fax: +372 620 2020, jaak.aaviksoo@ttu.ee. HOME ADDRESS Weizenbergi 4-12, 10150 Tallinn ESTONIA. Married, two sons and daughter.

Hillar Aben, born 3.12.1929, elected 1977, mechanics. Tallinn University of Technology 1953. Consultant, Laboratory of Solid Mechanics, Department of Cybernetics at Tallinn University of Technology (2016); Akadeemia tee 21b, 12618 Tallinn ESTONIA, Tel: +372 620 4180, Fax: +372 620 4151, aben@cs.ioc.ee. HOME ADDRESS Hiiu-Maleva 30-2, 11619 Tallinn ESTONIA, Tel: +372 657 2407. Married, two sons.

Jüri Allik, born 3.03.1949, elected 2010, psychology. University of Tartu 1973. Professor of Experimental Psychology, Head, Institute of Psychology, University of Tartu (2002); Näituse 2, 50409 Tartu ESTONIA, Tel: +372 737 5905, Fax: +372 737 6152, juri.allik@ut.ee. HOME ADDRESS Palu tee 20A, 61505 Tartu ESTONIA, Tel: +372 744 2119. Married, three children.

2 * Research institutions and universities are referred to by their current names.

Toomas Asser, born 14.07.1954, elected 2011, neurosurgery. University of Tartu 1979. Professor of Neurosurgery, University of Tartu (1995); L. Puusepa 8, 51014 Tartu ESTONIA, Tel: +372 731 8500, toomas.asser@kliinikum.ee. HOME ADDRESS Kastani 30a, 50409 Tartu ESTONIA. Married, two sons and daughter.

Mihhail Bronštein, born 23.01.1923, elected 1975, agricultural economics. St. Petersburg State University 1949. Professor emeritus, University of Tartu (1993). HOME ADDRESS Kolde pst. 104-44, 10316 Tallinn ESTONIA, Tel: +372 5662 9275. Widower, son and daughter.

Jaan Eha, born 12.06.1950, elected 2016, natural sciences and medicine. University of Tartu 1974. Professor of Cardiology, University of Tartu (2004); L. Puusepa 8, 51014 Tartu ESTONIA, Tel: +372 731 8404, Fax: +372 731 8404, jaan.eha@kliinikum.ee. HOME ADDRESS Ülikooli 66-7, 51003 Tartu ESTONIA, Tel: +372 5331 8403. Married, daughter.

Jaan Einasto, born 23.02.1929, elected 1981, astrophysics. University of Tartu 1952. Scientific Advisor, Tartu Observatory (2016); Observatooriumi 1, 61602 Tõravere, Tartu maakond ESTONIA, Tel: +372 696 2538, Fax: +372 696 2555, jaan.einasto@to.ee. HOME ADDRESS Tiigi 6-3, 61602 Tõravere, Tartu maakond ESTONIA, Tel: +372 741 0151. Widower, son and two daughters.

Jüri Engelbrecht, born 1.08.1939, elected 1990, mechanics. Tallinn University of Technology 1962. Professor emeritus, Tallinn University of Technology (2016); Akadeemia tee 21b, 12618 Tallinn ESTONIA, Tel: +372 620 4160, Fax: +372 620 4151, je@ioc.ee. HOME ADDRESS Trummi 34j, 12617 Tallinn ESTONIA, Tel: +372 672 6045. Married, son and daughter.

Ene Ergma, born 29.02.1944, elected 1997, exact sciences. Moscow University 1969. Professor emeritus, University of Tartu (2015). HOME ADDRESS Aleksandri 35-14, 51004 Tartu ESTONIA, Tel: +372 738 1874, ene.ergma@gmail.com. Single.

Arvi Freiberg, born 28.06.1948, elected 2009, exact sciences. Tallinn University of Technology 1971. Professor of Biophysics and Plant Physiology, University of Tartu (2003); W. Ostwaldi 1, 50411 Tartu ESTONIA, Tel: +372 5645 3175, arvi.freiberg@ut.ee. HOME ADDRESS Aardla 154-5, 50415 Tartu ESTONIA, Tel: +372 5645 3175. Married, daughter and son.

Vladimir Hižnjakov, born 25.05.1938, elected 1977, physics. University of Tartu 1960. Senior Researcher, Institute of Physics at University of Tartu (2004); W. Ostwaldi 1, 50411 Tartu ESTONIA, Tel: +372 737 4759,

Fax: +372 738 3033, hizh@fi.tartu.ee. HOME ADDRESS Aardla 154-6, 50415 Tartu ESTONIA, Tel: +372 747 5290. Married, son and two daughters.

Ülo Jaaksoo, born 16.04.1939, elected 1986, informatics. Tallinn University of Technology 1962. Chairman of Supervisory Board, Cybernetica AS (2013); Mäealuse 2/1, 12618 Tallinn ESTONIA, Tel: +372 639 7991, Fax: +372 639 7992, ulo.jaaksoo@cyber.ee. HOME ADDRESS Mägra 6, 10917 Tallinn ESTONIA, Tel: +372 672 6009. Widower.

Jaak Järv, born 05.11.1948, elected 1997, natural sciences. University of Tartu 1972. Acting Secretary General, Estonian Academy of Sciences (2017); Kohtu 6, 10130 Tallinn, Tel: +372 644 5810, +372 737 5246, Fax: +372 737 5247, jaak.jarv@ut.ee. HOME ADDRESS E. Wiiralti 1, 51011 Tartu ESTONIA. Married, son and two daughters.

Ain-Elmar Kaasik, born 2.08.1934, elected 1993, neurology. University of Tartu 1959. Professor emeritus, University of Tartu (1999). HOME ADDRESS Supluse pst. 5-1, 11911 Tallinn ESTONIA, Tel: +372 742 5426, ain-elmar.kaasik@kliinikum.ee. Widower, son.

Dimitri Kaljo, born 12.10.1928, elected 1983, geology. University of Tartu 1953. Paleontology Specialist, Department of Geology, TUT (2016); Ehitajate tee 5, 19086 Tallinn ESTONIA, Tel: +372 5648 5523, Fax: +372 620 3011, dimitri.kaljo@ttu.ee. HOME ADDRESS Raja 7a-6, 12616 Tallinn ESTONIA, Tel: +372 672 6551, adkaljo@gmail.ee. Married, son and daughter.

Mart Kalm, born 3.09.1961, elected 2010, art history. University of Tartu 1984. Vice President, Estonian Academy of Sciences (2014); Estonia pst. 7, 10143 Tallinn ESTONIA, Tel: +372 626 7302, Fax +372 626 7350, mart.kalm@akadeemia.ee. HOME ADDRESS Ravi 19-13, 10138 Tallinn ESTONIA, Tel: +372 644 0846. Married, son and daughter.

Mati Karelson, born 27.12.1948, elected 2007, natural sciences and medicine. University of Tartu 1972. Professor of Molecular Technology, University of Tartu (2005); Ravila 14a, 50411 Tartu ESTONIA, Tel: +372 737 5255, Fax: +372 737 5264, mati.karelson@ut.ee. HOME ADDRESS Mõisatamme 27, Vahi, 60534 Tartu maakond ESTONIA, Tel: +372 734 8399. Married, two sons.

Ilmar Koppel, born 16.01.1940, elected 1993, natural sciences (physical chemistry). University of Tartu 1963. Lead. Research Fellow, Institute of Chemistry, UT (2008); Ravila 14a, 50411, Tartu ESTONIA, Tel: +372 737 5263,

Fax: +372 737 5264, ilmar@chem.ut.ee. HOME ADDRESS Kaunase pst. 16-10, 50704 Tartu ESTONIA, Tel: +372 748 4351. Married, son.

Maarja Kruusmaa, born 4.01.1970, elected 2016, engineering. Tallinn University of Technology 1994. Head, Centre for Biorobotics; Professor, Tallinn University of Technology (2008); Akadeemia tee 15a, 12168 Tallinn ESTONIA, Tel: +372 518 3074, maarja.kruusmaa@ttu.ee.

Valdek Kulbach, born 6.04.1927, elected 1986, mechanics. Tallinn University of Technology 1951. Professor emeritus, Tallinn University of Technology (1998); Ehitajate tee 5, 19086 Tallinn ESTONIA, Tel: +372 620 2408, Fax: +372 620 2405, valdek.kulbach@ttu.ee. HOME ADDRESS Rõõmu 14-9, 10921 Tallinn ESTONIA, Tel: +372 677 8207, valdek.kulbach@gmail.com. Widower, two daughters.

Urmas Kõljalg, born 24.02.1961, elected 2011, biosystematics and ecology. University of Tartu 1988. Professor of Mycology (2001), Director of Natural History Museum and Botanical Garden (2014), UT; Ravila 14a, 50411 Tartu ESTONIA, Tel: +372 737 6235, Fax: +372 737 6222, urmas.koljalg@ut.ee. HOME ADDRESS Elva 6, 50404 Tartu ESTONIA. Married, son and three daughters.

Arno Kõörna, born 2.02.1926, elected 1972, economics. University of Tartu 1955. Professor emeritus, Euroacademy (2005); Mustamäe tee 4, 10621 Tallinn ESTONIA, Tel/Fax: +372 650 5120. HOME ADDRESS A. Kapi 9-22, 10136 Tallinn ESTONIA, Tel: +372 662 0628, arno.koorna@mail.ee. Widower, son and daughter.

Jakob Kübarsepp, born 9.02.1947, elected 2011, materials engineering. Tallinn University of Technology 1970. Vice Rector for Academic Affairs, Tallinn University of Technology (2013); Ehitajate tee 5, 19086 Tallinn ESTONIA, Tel: +372 620 2006, Fax: +372 620 2020, jakob.kubarsepp@ttu.ee. HOME ADDRESS Rännaku pst 56, 10921 Tallinn ESTONIA, Tel: +372 672 2281. Married, four daughters.

Rein Küttner, born 25.11.1940, elected 1997, engineering. Tallinn University of Technology 1965. Professor emeritus, Tallinn University of Technology (2010). HOME ADDRESS Mooni 107-58, 13424 Tallinn ESTONIA, Tel: +372 620 3257, +372 5887 8889, rein.kuttner@ttu.ee. Married, son.

Hans Küüts, born 20.12.1932, elected 1994, agricultural sciences. Estonian University of Life Sciences 1956. Professor emeritus, Estonian University of Life Sciences (1995); Aamisepa 1, 48309 Jõgeva alevik, Jõgeva maakond

ESTONIA, Tel: +372 776 6901, Fax: +372 776 6902, ylle.tamm@etki.ee. HOME ADDRESS Tihase 11, 48309 Jõgeva alevik, Jõgeva maakond ESTONIA, Tel: +372 772 1375. Married, three daughters.

Agu Laisk, born 3.05.1938, elected 1994, natural sciences. University of Tartu 1961. Senior Researcher of Plant Physiology, University of Tartu (2014); Nooruse 1, 50411 Tartu ESTONIA, Tel: +372 736 6021, agu.laisk@ut.ee. HOME ADDRESS Haagejärve 2, 61401 Tähtvere vald, Tartu maakond ESTONIA, Tel: +372 749 3228. Married, three sons.

Valter Lang, born 26.01.1958, elected 2010, historical sciences. University of Tartu 1981. Professor of Archaeology, University of Tartu (1999); Ülikooli 18, 50090 Tartu ESTONIA, Tel: +372 737 5652, valter.lang@ut.ee. HOME ADDRESS Kuu 12a-2, 50114 Tartu ESTONIA, Tel: +372 529 1843. Married, son and daughter.

Ülo Lepik, born 11.07.1921, elected 1993, mechanics. University of Tartu 1948. Professor emeritus, University of Tartu (1996) HOME ADDRESS Lunini 3, 50406 Tartu ESTONIA, Tel: +372 738 0023, ulo.lepik@ut.ee. Married, two sons and daughter.

Georg Liidja, born 4.08.1933, elected 1987, physics. University of Tartu 1957. HOME ADDRESS K. Kärberi 41-43, 13919 Tallinn, ESTONIA, Tel: +372 635 5878, georg.liidja@kbfi.ee. Married, daughter.

Ülo Lille, born 16.09.1931, elected 1983, biotechnology. Tallinn University of Technology 1955. Professor emeritus, Tallinn University of Technology (1997); Akadeemia tee 15, 12618 Tallinn ESTONIA, Tel: +372 620 4383, Fax: +372 620 2828, lille@chemnet.ee. HOME ADDRESS Trummi 32p, 12617 Tallinn ESTONIA, Tel: +372 672 6032. Married, two daughters.

Margus Lopp, born 11.09.1949, elected 2011, chemistry. University of Tartu 1973. Professor, Department of Chemistry and Biotechnology, TUT (1997); Akadeemia tee 15, 12618 Tallinn ESTONIA, Tel: +372 620 2808, margus.lopp@ttu.ee. HOME ADDRESS Trummi 32s, 12617 Tallinn ESTONIA, Tel: +372 672 6034. Married, son and two daughters.

Ülo Lumiste, born 30.06.1929, elected 1993, mathematics. University of Tartu 1952. Professor emeritus, University of Tartu (1996); J. Liivi 2-427, 50090 Tartu, ESTONIA, Tel: + 372 737 6419, ulo.lumiste@ut.ee. HOME ADDRESS Turu 19-28, 51004 Tartu ESTONIA, Tel: +372 734 4280, +372 515 1664. Married, two sons.

Enn Lust, born 22.10.1956, elected 2010, energy technology. University of Tartu 1980. Professor of Physical Chemistry (1997), Director, Institute of Chemistry (2008), UT; Ravila 14a, 50411 Tartu ESTONIA, Tel: +372 737 5165, Fax: +372 737 5264, enn.lust@ut.ee. HOME ADDRESS Leesika 8, 50304 Tartu ESTONIA. Married, two daughters and son.

Tšeslav Luštšik, born 15.02.1928, elected 1964, solid state physics. St. Petersburg State University 1951. Consultant, University of Tartu (2014); W. Ostwaldi 1, 50411 Tartu ESTONIA, Tel: +372 737 4619, Fax: +372 738 3033, luch@fi.tartu.ee. HOME ADDRESS Aardla 130-7, 50415 Tartu ESTONIA, Tel: +372 747 6608. Married, son.

Udo Margna, born 18.11.1934, elected 1987, plant physiology. University of Tartu 1957. Extraord. Lecturer, Pharmacy Department, Tallinn Health Care College (2008); Kännu 67, 13418 Tallinn ESTONIA, Tel: +372 671 1725, udo.margna@ttk.ee. HOME ADDRESS Instituudi tee 16-10, 76902 Harku alevik, Harju maakond ESTONIA, Tel: +372 656 0630. Married, two daughters.

Jüri Martin, born 29.09.1940, elected 1990, ecology. University of Tartu 1964. Rector, Euroacademy (1997); Mustamäe tee 4, 10621 Tallinn ESTONIA, Tel: +372 611 5804, Fax: +372 611 5811, jmartin@euroakadeemia.ee. HOME ADDRESS Liiva tee 2, Rohuneeme, Viimsi vald, 74012 Harju maakond ESTONIA, Tel: +372 503 1794. Married, three sons and daughter.

Enn Mellikov, born 1.04.1945, elected 2003, technology of materials. Tallinn University of Technology 1968. Professor emeritus (2016), Tallinn University of Technology; Ehitajate tee 5, 19086 Tallinn ESTONIA, Tel: +372 620 2798, enn.mellikov@ttu.ee. HOME ADDRESS Teaduse 10-15, Saku 75501 Harju maakond ESTONIA, Tel: +372 604 1076. Married, two sons.

Andres Metspalu, born 11.03.1951, elected 2010, biotechnology. University of Tartu 1976. Professor of Biotechnology, University of Tartu (1992); Director, Estonian Genome Center (2008); Riia 23b, 51010 Tartu ESTONIA, Tel: +372 737 5066, Fax: +372 744 0221, andres.metspalu@ut.ee. HOME ADDRESS Kalevi 65, 50103 Tartu ESTONIA, Tel: +372 734 3256. Married, four sons.

Leo Mõtus, born 15.12.1941, elected 1993, informatics. Tallinn University of Technology 1965. Professor of Realtime Systems, Tallinn University of Technology (1992); Ehitajate tee 5, 19086 Tallinn ESTONIA, Tel: +372 620 2118, Fax: +372 620 2101, leo.motus@ttu.ee. HOME ADDRESS Roosi 7, 10922 Tallinn ESTONIA, Tel: +372 672 4024. Married, two daughters.

Lauri Mälksoo, born 28.01.1975, elected 2013, law. University of Tartu 1998. Professor of International Law (2009), Head of Institute of Public Law (2014), University of Tartu; Näituse 20, 50409 Tartu ESTONIA, Tel: +372 737 6042, lauri.malksoo@ut.ee. Married, son.

Ülo Niinemets, born 19.03.1970, elected 2013, natural sciences. University of Tartu 1992. Professor of Plant Physiology, Estonian University of Life Sciences (2009); Kreutzwaldi 1, 51014 Tartu ESTONIA, Tel: +372 731 3140, Fax: +372 731 3738, ylo.niinemets@emu.ee. HOME ADDRESS Pallase 6, 51011 Tartu ESTONIA, Tel: +372 5345 7189. Married, 3 daughters.

Ergo Nõmmiste, born 27.06.1956, elected 2012, physics, University of Tartu 1979. Vice President, Estonian Academy of Sciences (2014); W. Ostwaldi 1, 50411 Tartu, ESTONIA, Tel: +372 737 4606, Fax: +372 738 3033, ergo.nommist@akadeemia.ee. HOME ADDRESS Aardla 132-2, 50415 Tartu ESTONIA, Tel: +372 747 7832. Married, son and daughter.

Eve Oja, born 10.10.1948, elected 2010, mathematics. University of Tartu 1972. Professor of Functional Analysis, University of Tartu (1992); J. Liivi 2, 50409 Tartu ESTONIA, Tel: +372 737 6407, +372 737 5863, eve.oja@ut.ee. HOME ADDRESS Ropka 19-25, 50111 Tartu ESTONIA, Tel: +372 747 0795. Married, son.

Arvo Ots, born 26.06.1931, elected 1983, power engineering. Tallinn University of Technology 1955. Professor emeritus, Tallinn University of Technology (2017); Ehitajate tee 5, 19086 Tallinn ESTONIA, Tel: +372 620 3904, aots@ttu.ee. HOME ADDRESS Metsa 62b, 11620 Tallinn ESTONIA, Tel: +372 657 6034, +372 501 2217. Married, son and daughter.

Karl Pajusalu, born 20.06.1963, elected 2011, linguistics. University of Tartu 1986. Professor of Estonian Dialectology and History of the Estonian Language, University of Tartu (2000); Jakobi 2-425, 51014 Tartu ESTONIA, Tel: +372 737 6124, karl.pajusalu@ut.ee. HOME ADDRESS Nooruse 54, 50411 Tartu ESTONIA, Tel: +372 526 7733. Married, two sons and daughter.

Arvo Pärt, born 11.09.1935, elected 2011, music. Estonian Academy of Music and Theatre 1963. Freelance composer; International Arvo Pärt Centre, Aliina, Laulasmaa 76702 Keila vald, Harju maakond ESTONIA, Tel: +372 604 0470, larefa@paert.com. Married, two sons and two daughters.

Martti Raidal, born 26.02.1968, elected 2011, exact sciences. University of Helsinki 1995. Research Professor, National Institute of Chemical Physics and Biophysics (2012), Professor of High Energy Physics, University

of Tartu (2012); Rävåla 10, 10143 Tallinn ESTONIA, Tel: +372 645 4711, Fax: +372 644 0640, martti.raidal@cern.ch. HOME ADDRESS Vene 10-3A, 10123 Tallinn ESTONIA. Married, two sons.

Anu Raud, born 10.05.1943, elected 2016, art. Estonian Academy of Arts 1967. Estonian folk art investigator, tapestry artist; Professor emeritus, Estonian Academy of Arts (2009); Käärõiku talu, Raudna küla, Viljandi vald, 71102 Viljandimaa ESTONIA, Tel: +372 523 4586, raudanu.k@gmail.com.

Anto Raukas, born 17.02.1935, elected 1977, geology. University of Tartu 1958. Senior Researcher, School of Natural Sciences and Health, Tallinn University (2015); Uus Sadama 5, 10120 Tallinn ESTONIA, Tel: +372 619 9833, Fax: +372 619 9801, anto.raukas3@mail.ee. HOME ADDRESS Trummi 32n, 12617 Tallinn ESTONIA, Tel: +372 672 6031. Married, two daughters.

Jaan Ross, born 5.04.1957, elected 2003, humanities. Estonian Academy of Music and Theatre 1980. Professor of Musicology Department, Estonian Academy of Music and Theatre (1995); Tatari 13, 10116 Tallinn ESTONIA, Tel: +372 522 6886, jaan.ross@gmail.com. HOME ADDRESS Koidu 122-61, 10139 Tallinn ESTONIA, Tel: +372 648 1544. Married, daughter.

Hando Runnel, born 24.11.1938, elected 2012, literature. Freelance writer (1971); katre@ilmamaa.ee. Married, five sons and daughter.

Huno Rätsep, born 28.12.1927, elected 1981, Estonian language. University of Tartu 1951. Professor emeritus, University of Tartu (1994). HOME ADDRESS Uus 36-74, 50603 Tartu ESTONIA, Tel: +372 742 3974, hunoratsep@gmail.com. Married, son and daughter.

Enn Saar, born 04.03.1944, elected 2010, astronomy. University of Tartu 1967. Lead. Researcher, Tartu Observatory (2012); Observatooriumi 1, Tõravere, 61602 Tartu maakond ESTONIA, Tel: +372 5344 0899, enn.saar@to.ee. HOME ADDRESS Tiigi 2-2, Tõravere, 61602 Tartu maakond ESTONIA, Tel: +372 741 0462. Widower, daughter.

Peeter Saari, born 2.06.1945, elected 1986, physics. University of Tartu 1968. Professor of Wave Optics, University of Tartu (1997); W. Ostwaldi 1, 50411 Tartu ESTONIA, Tel: +372 737 4602, peeter.saari@ut.ee. HOME ADDRESS Fortuuna 1-45, 50603 Tartu ESTONIA, Tel: +372 510 9018. Married, two daughters.

Mart Saarma, born 29.06.1949, elected 1990, molecular biology. University of Tartu 1972. Professor, Institute of Biotechnology, University of

Helsinki (1990); P.O. Box 56, Viikinkaari 5D, FI-00014, Helsinki, FINLAND, Tel: +358 29 415 9378, Fax: +358 29 415 9366, mart.saarma@helsinki.fi. HOME ADDRESS Kulosaaren puistotie 38A4, FI-00570 Helsinki, FINLAND, Tel: +248 9 684 5721. Cohabitant, son and daughter.

Valdur Saks, born 3.09.1943, elected 1993, biochemistry. Moscow State University 1967. Senior Research Fellow, National Institute of Chemical Physics and Biophysics (2015); Akadeemia tee 23, 12618 Tallinn ESTONIA, Tel: +372 639 8363, vsaks@ujf-grenoble.fr. HOME ADDRESS Rävåla pst. 13-3, 10143 Tallinn ESTONIA, Tel: +372 644 8643. Married, daughter.

Arved-Ervin Sapar, born 7.02.1933, elected 1990, astrophysics. University of Tartu 1957. HOME ADDRESS Tiigi 6-6, 61602 Tõravere, Tartu maakond ESTONIA, Tel: +372 741 0335, arved.sapar@to.ee. Married, son and daughter.

Karl Siilivask, born 20.01.1927, elected 1977, history. University of Tartu 1951. HOME ADDRESS Näituse 22-13, 50407 Tartu ESTONIA, Tel: +372 5802 7190. Married, son.

Tarmo Soomere, born 11.10.1957, elected 2007, informatics and engineering. Moscow State University 1980. President, Estonian Academy of Sciences; Kohtu 6, 10130 Tallinn ESTONIA, Tel: +372 644 2129, tarmo.soomere@akadeemia.ee. Professor of Coastal Engineering (2005), Lead. Research Scientist, Head, Wave Engineering Laboratory (2009), Department of Cybernetics, TUT; Akadeemia tee 21, 12618 Tallinn ESTONIA, Tel: +382 620 4176, Fax: +372 620 4151, soomere@cs.ioc.ee. HOME ADDRESS Trummi 30g, 12617 Tallinn ESTONIA, Tel: +372 502 8921. Cohabitant, two sons.

Martin Zobel, born 25.02.1957, elected 2010, ecology. University of Tartu 1980. Professor of Plant Ecology, University of Tartu (1992); Lai 40, 51005 Tartu ESTONIA, Tel: +372 737 6223, Fax: +372 737 6222, martin.zobel@ut.ee. HOME ADDRESS Vikerkaare 36, 51006 Tartu ESTONIA. Cohabitant, son and three daughters.

Tõnu-Andrus Tannberg, born 22.09.1961, elected 2012, history. University of Tartu 1986. Professor of Estonian Recent History, University of Tartu (2013); Lossi 3, 51003 Tartu ESTONIA, Tel: +372 737 5650, Fax: +372 737 5345, tonu-andrus.tannberg@ut.ee. HOME ADDRESS Pikk 90-9, 50606 Tartu ESTONIA, Tel: +372 748 1288. Married, son and two daughters.

Enn Tõugu, born 20.05.1935, elected 1981, informatics. Tallinn University of Technology 1958. Professor emeritus, Tallinn University of Technology (2017); Akadeemia tee 21, 12618 Tallinn ESTONIA, Tel: +372 620 4212,

tyugu@ieee.org. HOME ADDRESS Lossi 18/Soone 3-18, 12616 Tallinn, ESTONIA, Tel: +372 672 6526. Married, son and two daughters.

Raimund-Johannes Ubar, born 16.12.1941, elected 1993, computer science. Tallinn University of Technology 1966. Professor, Department of Computer Systems, TUT (2005), Akadeemia tee 15a, 12618 Tallinn ESTONIA, Tel: +372 620 2252, Fax: +372 620 2253, raiub@pld.ttu.ee. HOME ADDRESS Öismäe tee 45-77, 13514 Tallinn ESTONIA, Tel: +372 657 4732. Married, daughter.

Raivo Uiibo, born 21.12.1948, elected 2003, medicine. University of Tartu 1973. Professor of Immunology, University of Tartu (1992); Ravila 19, 51014 Tartu ESTONIA, Tel: +372 737 4231, Fax: +372 737 4232, raivo.uiibo@ut.ee. HOME ADDRESS Taara pst. 28, 51006 Tartu ESTONIA, Tel: +372 742 1150. Married, two daughters.

Jaan Undusk, born 14.11.1958, elected 2007, humanities. University of Tartu 1982. Director, Under and Tuglas Literature Centre, Estonian Academy of Sciences (2000); Roosikrantsi 6, 10119 Tallinn ESTONIA, Tel: +372 644 3147, jaan@utkk.ee. HOME ADDRESS Lätte 5-10, 10116 Tallinn ESTONIA, Tel: +372 644 7565. Married, three daughters and son.

Mart Ustav, born 16.07.1949, elected 2001, biomedicine. University of Tartu 1972. Director (2012), Professor of Biomedical Technology (2007), Institute of Technology, UT; Nooruse 1, 50411 Tartu ESTONIA, Tel: +372 737 5047, mart.ustav@ut.ee. HOME ADDRESS Jaama 58A, 50604 Tartu ESTONIA, Tel: +372 740 3312. Married, son and three daughters.

Tarmo Uustalu, born 19.01.1969, elected 2010, computer science. Tallinn University of Technology 1992. Lead. Research Scientist, Department of Software Science, Tallinn University of Technology (2009); Akadeemia tee 21b, 12618 Tallinn ESTONIA, Tel: +372 620 4250, Fax: +372 620 4151, tarmo@cs.ioc.ee. HOME ADDRESS Kalda 60a-5, 10922 Tallinn ESTONIA, Tel: +372 672 1215. Married, son and two daughters.

Gennadi Vainikko, born 31.05.1938, elected 1986, mathematics. University of Tartu 1961. Professor emeritus, University of Tartu (2006); J. Liivi 2, 50409 Tartu ESTONIA, Tel: +372 737 5490, gennadi.vainikko@ut.ee. HOME ADDRESS Kivi 23-19, 51009 Tartu ESTONIA, Tel: +372 510 7101. Widower, two sons and daughter.

Urmas Varblane, born 20.07.1961, elected 2009, economics. University of Tartu 1984. Professor of International Business and Innovation, University

of Tartu (2001); Narva mnt. 4, 51009 Tartu ESTONIA, Tel: +372 737 6361, Fax: +372 737 6327, urmas.varblane@ut.ee. HOME ADDRESS A. Starkopfi 11-6, 51011 Tartu ESTONIA, Tel: +372 733 1006. Married, son and two daughters.

Eero Vasar, born 17.09.1954, elected 2010, medical science. University of Tartu 1979. Head of Department of Physiology (1991), Professor of Physiology (1992), University of Tartu; Ravila 19, 50411 Tartu ESTONIA, Tel: +372 737 4331, Fax: +372 737 4332, eero.vasar@ut.ee. HOME ADDRESS Hurda 27, 51005 Tartu ESTONIA. Married, four sons.

Mihkel Veiderma, born 27.12.1929, elected 1975, inorganic chemistry. Tallinn University of Technology 1953. Professor emeritus, Tallinn University of Technology (1997). HOME ADDRESS Jääraku 54, 12015 Tallinn ESTONIA, Tel: +372 623 8757, mihkel.veiderma@akadeemia.ee. Widower, two daughters.

Richard Villems, born 28.11.1944, elected 1987, biophysics. University of Tartu 1968. Professor of Archaeogenetics, University of Tartu (2005), Lead. Researcher, Estonian Biocentre (2014); Riia 23b, 51010 Tartu ESTONIA, Tel: +372 737 5064, rvillems@ebc.ee. HOME ADDRESS Pallase pst. 126-3, 51013 Tartu ESTONIA. Married, son and daughter.

Jaak Vilo, born 14.11.1966, elected 2012, informatics. University of Tartu 1991. Professor of Bioinformatics, University of Tartu (2007); J. Liivi 2, 50409 Tartu ESTONIA, Tel: +372 737 5483, Fax: +372 737 5468, jaak.vilo@ut.ee. HOME ADDRESS Kalevi 4-26, 50409 Tartu ESTONIA. Married, son and two daughters.

Haldur Õim, born 22.01.1942, elected 1994, humanities and social sciences. University of Tartu 1965. Professor emeritus, Extraord. Senior Researcher, University of Tartu (2007); J. Liivi 2, 50409 Tartu ESTONIA, Tel: +372 505 8214, Tel/Fax: +372 737 5224, haldur.oim@ut.ee. HOME ADDRESS Hiie 12, 51006 Tartu ESTONIA, Tel: +372 742 2272. Married, son and two daughters.

Andres Õpik, born 4.05.1947, elected 2013, engineering. Tallinn University of Technology 1970. Member of Governors Board (2015), Professor of Physical Chemistry (1992), Tallinn University of Technology; Ehitajate tee 5, 19086 Tallinn ESTONIA, Tel: +372 620 2802, andres.opik@ttu.ee. HOME ADDRESS Trummi 21-8, 12617 Tallinn ESTONIA, Tel: +372 511 6538. Married, two daughters.

FOREIGN MEMBERS

Yuri E Berezkin (Russia), born 27.12.1946, elected 2012, ethnography. Head, American Department, Museum of Anthropology & Ethnography (Kunstkamera), Russian Academy of Sciences (2003). University Emb. 3, St. Petersburg 199034, RUSSIA, Tel: +7 812 328 0712, +7 921 352 7477, Fax: +7 812 328 0811, berezkin1@gmail.com. HOME ADDRESS Kazanskaya 23, apt. 29, St. Petersburg 190000, RUSSIA, Tel: +7 812 314 0603. Married, two daughters.

Steven Richard Bishop (UK), born 18.10.1955, elected 2012, nonlinear dynamics. Professor of Nonlinear Dynamics, University College London (1984). Gower Street, London WC1E 6BT, UNITED KINGDOM, Tel: +44 207 679 3082, s.bishop@ucl.ac.uk.

Jonathan (John) R Ellis (United Kingdom), born 1.07.1946, elected 2015, theoretical physics. Professor of Theoretical Physics, King's College London (2010); Dept. of Physics, King's College London, Strand, London WC2R 2LS, UNITED KINGDOM, Tel: +41 22 76 74142, John.Ellis@cern.ch. HOME ADDRESS 5 Chemin du Ruisseau, Tannay, 1295 Switzerland, Tel: +41 22 77 64858. Married, son and daughter.

Richard R Ernst (Switzerland), born 14.08.1933, elected 2002, physical chemistry. Professor emeritus, Swiss Federal Institute of Technology, Zürich (1998). Laboratory of Physical Chemistry, ETH-Hönggerberg HCI, CH-8093 Zürich, Switzerland, Tel: +41 44 632 4368, Fax: +41 44 632 1257, ernst@nmr.phys.chem.ethz.ch. HOME ADDRESS Kurlistrasse 24, CH-8404 Winterthur, SWITZERLAND, Tel: +41 52 242 7807. Married, son and two daughters.

Cornelius Theodor Hasselblatt (Netherlands), born 17.08.1960, elected 2015, literature and culture. Freelance scholar of Finno-Ugric languages and culture (2015). HOME ADDRESS Boslaan 7a, 9801 HD Zuidhorn, NETHERLANDS, cornelius@hasselblatt.com. Married.

Carl-Olof Jacobson (Sweden), born 24.04.1929, elected 1995, developmental biology. Professor emeritus, Uppsala University (1994). HOME ADDRESS Norra Rudbecksgatan 13, SE-75236 Uppsala, SWEDEN, Tel: +46 18 501 123, carl-olof.jacobson@ebc.uu.se. Married, two sons and daughter.

Antero Jahkola (Finland), born 05.02.1931, elected 1998, energy research. Professor emeritus, Helsinki University of Technology (1994).

HOME ADDRESS Hiisikuja 4 D 24, FI-00730 Helsinki, FINLAND, Tel: +358 9 724 9144; +358 400 102302, antero.jahkola@elisinet.fi. Married, son and daughter.

Charles Gabriel Kurland (USA/Sweden), born 14.01.1936, elected 1991, biochemistry. Professor emeritus, Uppsala University (2001). HOME ADDRESS Munkarpsväg 21, SE-24332 Höör, SWEDEN, Tel: +46 41 322 856, kurland@tele2.se. Married, three daughters.

Jaan Laane (USA), born 20.06.1942, elected 1995, chemical physics. Professor, Texas A&M University (1976); Department of Chemistry, College Station, TX 77843-3255, USA, Tel: +1 979 845 3352, Fax: +1 979 845 3154, laane@mail.chem.tamu.edu. HOME ADDRESS 1906 Comal Circle, College Station, TX 77840, USA, Tel: +1 979 693 5171. Married, two daughters.

Ülo Langel (Sweden/Estonia), born 2.03.1951, elected 2015, neurochemistry. Professor of Neurochemistry and Molecular Neurobiology, Stockholm University (2001), Professor of Biotechnology, University of Tartu (2007); Dept. Neurochemistry, Stockholm University, S. Arrheniusv. 16B, room C466, S-10691 Stockholm, SWEDEN, Tel: +46 8161 793, Fax: +46 8161 371, ulo@neurochem.su.se. HOME ADDRESS Tegnérlunden 4, S-11359 Stockholm, Sweden, Tel: +46 707 905 284. Married, son.

Pekka T Männistö (Finland), born 18.12.1946, elected 2012, pharmacology and drug development. Professor emeritus, University of Helsinki (2013). HOME ADDRESS Harmaapaadentie 5A, FI-00930 Helsinki, FINLAND, Tel: +358 40 586 6752, pekka.mannisto@helsinki.fi. Married, son and daughter.

Jaak Peetre (Sweden), born 29.07.1935, elected 2008, mathematics. Professor emeritus, University of Lund (2000). Widower, cohabitant, two sons and daughter.

Michael Godfrey Rodd (UK), born 21.06.1946, elected 1995, process control and infotechnology. HOME ADDRESS 16 The Garlings, Aldbourne, Marlborough, Wiltshire SN8 2DT, UNITED KINGDOM, Tel: +44 1672 541 571, +44 783 186 0199, mrodd@btinternet.com. Married, son and daughter.

Matti Saarnisto (Finland), born 11.11.1942, elected 2008, geology. Member, Finnish Academy of Science and Letters (1995). HOME ADDRESS Mikonkatu 22 D 46, FI-00100 Helsinki, FINLAND, Tel: +358 400 209 351, matti.saarnisto@saunalahti.fi. Married, son and daughter.

Helmut Schwarz (Germany), born 06.08.1943, elected 2002, chemistry. President, Humboldt Foundation (2008); Professor, Technical University of Berlin (1978). Institut für Chemie, Sekr. C 4, Technische Universität Berlin, Strasse des 17. Juni 135, D-10623 Berlin, GERMANY, Tel: +49 30 3142 3483, Fax: +49 30 3142 1102, helmut.schwarz@mail.chem.tu-berlin.de. HOME ADDRESS Patschkauer Weg 15, D-14195 Berlin, GERMANY, Tel: +49 30 832 5246. Married, son.

Jānis Stradiņš (Latvia), born 10.12.1933, elected 1998, physical chemistry and history of science. Chairman of Senate (2004), Latvian Academy of Sciences. Akadēmijas laukums 1, LV-1050 Riga, LATVIA, Tel: +371 67 213 663, Fax: +371 67 821 153, stradins@lza.lv. HOME ADDRESS K. Valdemara 99-7, Riga LV-1013 LATVIA. Married, two sons.

Päiviö Tommila (Finland), born 4.08.1931, elected 1991, history. Professor emeritus, University of Helsinki (1994), Fellow of the Academy of Finland (2004). HOME ADDRESS Kylätie 8A, FI-02700 Kauniainen, FINLAND, Tel/Fax: +358 9 505 1523, paivio.tommila@aka.fi. Married, three sons and two daughters.

Alar Toomre (USA), born 05.02.1937, elected 2012, applied mathematics. Professor emeritus, Massachusetts Institute of Technology (2010). HOME ADDRESS 55 Hillside Avenue, West Newton MA 02465, USA, Tel: +1 617 969 9596, toomre@math.mit.edu. Married, two sons and daughter.

Endel Tulving (Canada), born 26.05.1927, elected 2002, psychology. Professor emeritus, University of Toronto (1992). HOME ADDRESS 45 Baby Point Crescent, Toronto, Ontario M6S 2B7, CANADA, Tel: +1 416 762 3736, tulving@psych.utoronto.ca. Widower, two daughters.

Esko Ukkonen (Finland), born 26.01.1950, elected 2015, computer science. Professor of Computer Science, University of Helsinki (1985), Dept. of Computer Science, PO Box 68 (Gustav Hällströmin katu 2b), FIN-00014 University of Helsinki, FINLAND, Tel: +358 294 151 280, Fax: +358 294 151 120, Esko.Ukkonen@cs.helsinki.fi. HOME ADDRESS Mäensyrjä 11C, 02160 Espoo, Finland. Married, two children.

ESTONIAN ACADEMY PUBLISHERS

Established in 1994

Address: Kohtu 6, 10130 Tallinn, ESTONIA

Internet address: www.kirj.ee or www.eap.ee

Director: Ülo Niine, Tel: +372 645 4504,

Fax +372 646 6026, niine@kirj.ee

Estonian Academy Publishers continued in 2016 regularly issuing seven scientific journals that are all peer-reviewed, indexed and abstracted in major international databases. All journals have an international editorial board. In the Estonian Research Information System ETIS administered by the Estonian Research Council, all journals have been placed in the category of internationally recognised research journals.

The Publishers' mission has been to maintain a high standard as regards the contents of journals, their typographic performance, and their timely release both electronically and in hard copy.

In 2016 the journals were issued in the following volume:

Title	Number of issues per year	Total volume in pages	Format of journal
<i>Acta Historica Tallinnensia</i>	1	142	168×240
<i>Estonian Journal of Archaeology</i>	2	184	168×240
<i>Estonian Journal of Earth Sciences</i>	4	258	210×285
<i>Linguistica Uralica</i>	4	320	168×260
<i>Oil Shale</i>	4	392	168×255
<i>Proceedings of the Estonian Academy of Sciences</i>	4	474	210×285
<i>Trames. A Journal of the Humanities and Social Sciences</i>	4	430	168×240
IN TOTAL	23	2200	

Estonian Academy Publishers employes so-called full open access model: Full texts of articles having appeared in all journals since 2006 are freely available on the Publishers' website www.kirj.ee. Full texts are distributed also by well-known electronic publishers and portals EBSCO, C.E.E.O.L., The Gale Group Inc., ProQuest LLC, H.W. Wilson (merged with EBSCO), Digital Publication with the Leading Asian Distributor (Airiti Inc.) and Join CNKI Scholar (China). The Publishers produce for the articles the following electronic versions: pdf-files, sgml-files of two types, xml-files of three types and a special file for the electronic library C.E.E.O.L.

All scientific articles of the journals have been supplied with the doi-indexes (Digital Object Identifiers).

For the benefit of the readers, full texts of articles of earlier vintages of our journals have been digitised and placed in Internet through mediation of Google. Respective links have been made from the Publishers' website.

Academic Library of Tallinn University has digitised the publications of the Estonian Academy of Sciences in the time interval 1945-1991. Originally they were only available in the intranet of the Library, because the Publishers *Periodika* was holding the copyright. However the company is no longer there. In 2016 its legal successor allowed the Library to make all digitised issues public.

All seven journals issued by the Publishers have been included in Elsevier BV Bibliographic Database SCOPUS® used in many countries as the benchmark of efficiency of the research work. Six journals are reflected in the database of Thomson Reuters Web of Science® Core Collection often used as basis of bibliometric information at evaluating research:

Acta Historica Tallinnensia
Estonian Journal of Archaeology
Estonian Journal of Earth Sciences
Proceedings of the Estonian Academy of Sciences
Oil Shale (included in Current Contents®)
Trames. A Journal of the Humanities and Social Sciences

Two journals are in the database ERIH:

Estonian Journal of Archaeology
Linguistica Uralica

In 2016 there was one special issue of a journal and one topical issue. It is an internationally recognised way to publish the materials of international

conferences, providing an opportunity to document in a compacted way the results of research in certain problems related to Estonia.

There were the following special and topical issues:

- *Proceedings of the Estonian Academy of Sciences* 65/2: Selected papers of the 24th International Baltic Conference on Engineering Materials and Tribology, BALTMATRIB 2015. Guest editor Priit Kulu.
- *Trames. A Journal of the Humanities and Social Sciences* 20/4: topical issue dedicated to “Emil Kraepelin 160/130”.

In 2016, in total 162 pieces of writing were released in 23 issues of seven journals, of them 145 scientific articles and 17 other contributions. All journals in hard copy appeared as scheduled. The electronic version appeared on average one month prior to the date set for the hard copy.

The number of authors totalled 302, of whom 179 were Estonian authors and 122 foreign authors. The majority of articles appeared in English, except the journal *Linguistica Uralica*, featuring also articles in Russian and German. There were 11 contributions to *Linguistica Uralica* in English (9 research papers and 2 reviews; 38% of the volume), 26 in Russian (56% of the volume), and 3 in German (2 scientific articles and 1 survey; 6% of the volume). The majority of authors of the journal being linguists of Russia’s Finno-Ugric peoples, the prevalence of the Russian language is natural. *Acta Historica Tallinnensia* appears in Estonian with comprehensive summaries in English; there appeared one article in English.

Besides journals, there was a publication:

- *Emakeele Seltsi aastaraamat* 61 (The Yearbook of the Estonian Mother Tongue Society). Editor-in-Chief Mati Ereht. Format 143’215, volume 312 pp., hard cover. Full text of the book is also available electronically on the Publishers’ website.

UNDER AND TUGLAS LITERATURE CENTRE OF THE ESTONIAN ACADEMY OF SCIENCES

Established in 1993 (affiliate Museum Department in Nõmme, the former Friedebert Tuglas Museum Department, established in 1971)

Personnel: 16, including 11 researchers

Address: Roosikrantsi 6, 10119 Tallinn, ESTONIA, utkk@utkk.ee

Museum Department: Väikese Illimari 12, 11623 Tallinn,
ESTONIA, tuglas@utkk.ee

Internet address: www.utkk.ee

Director: Jaan Undusk, Tel: +372 644 3147, Fax +372 644 0177,
jaan@utkk.ee

Academic Secretary: Maarja Kalmet, Tel: +372 644 3147,
maarakalmet@utkk.ee

Under and Tuglas Literature Centre of the Estonian Academy of Sciences is an institution of research and development of the Estonian Academy of Sciences. Its mission is to study Estonian literature and the local written culture in general, both in historical and theoretical perspectives, within the context of historically multilingual Baltic space as well as world literature. It promotes literary and cultural thought in line with contemporary trends in textual research (discourse analysis, rhetorico-narratological models of culture, postcolonial theory and the theory of cultural transfer, the concept of “entangled histories”, memory and gender studies). Under scrutiny beside fiction and theatrical texts are various historiographical, philosophical, publicist and scientific modes of self-expression in Estonian and German, insofar as they have played a decisive role in the Baltic literary space, as well as relevant texts of European history of ideas, which have influenced the course of thinking both in the universal embrace and in the Baltic. In this context, the history of certain basic concepts and models of thought of the whole of Europe is considered (tradition of antithetic thinking, the concept of infinity, decadence, soliloquy-style of writing, grotesque).

In the process of its development activities, the Literature Centre publishes original researches and source materials of Estonian written culture,

maintains the library and art collection of historical value, organises conferences, exhibitions and cultural events of general importance (the ceremony of Friedebert Tuglas prize for the best Estonian short story, annual prizes of the literary magazine *Looming*, events of the Scientists' House etc.). The Museum Department of the Literature Centre in Nõmme administrates the legacy of the writer F. Tuglas and other collections (incl. the Tuglases' literary and art collection, and the library and art collection of Artur Adson and Marie Under, which arrived in Estonia in 1996, the art collection of the Estonian Cultural Foundation in the USA, Paul Reets' literary and art collection), as well as the house and garden of dendrological value attached to it; it carries out lecture-excursions and serves individual researchers and visitors.

The major areas of research of the Literature Centre are:

- Estonian literature and culture in the 20th c. (including the works of F. Tuglas, M. Under and A. Adson),
- Older Estonian and Baltic German written culture in the 13th-19th cc., German legacy in the development of modern Estonian culture,
- Mechanisms of cultural identity (autogenesis, cultural transfer, entangled histories),
- Baltic literary space and Estonian–Latvian–Finnish literary relations,
- Rhetorical and discursive models for description of European and Estonian culture,
- Drama and theatre research.

Since 2014 the Literature Centre has been fulfilling the institutional research topic “Entangled Literatures: Discursive History of Literary Culture in Estonia” (2014-2019, project leader J. Undusk). The emergence and development of literary culture on the Estonian territory is seen as an entangled process (*histoire croisée*), reflecting intertwined relationships between manifold ethnic, colonial, cultural, etc. impulses, involving criss-cross patterns, resistances, and inertias. The character of investigation is predominantly discourse-based and follows the lines of important ‘territories of speech’ (history, religion, language, environment etc.) apparent in multilingual society. In cooperation with international body of authors, a comprehensive rewriting of the literary history of Estonia (and Latvia) in the 13th-19th cc. is aimed at, while integrating into it the rich German component. Modernity is examined in tension with national strivings as a time of diverse emancipations; attention is paid both to the social figures (decadent, upstart, artist etc.) as well as the figures of thought (autonomy, time, infinity). In the post-Soviet period, the ‘multidirectionality’ of memory culture is exemplified by fiction, film and theatre.

Since 2014, the Museum Department of the Literature Centre has carried out the research project of the national programme “The Estonian language and cultural memory II” titled “Intellectual heritage of Friedebert Tuglas, Marie Under and Artur Adson in the spatial-temporal context” (2014-2018, project leader Elle-Mari Talivee). The goal is to mediate the legacy of Tuglas, Under and Adson through preparation and publication of academic editions, by organising art exhibitions, conferences, seminars, cultural events and through museum-pedagogic work. A major goal of the project is completion of the series of F. Tuglas “Collected works”, edited textual-critically and supplemented with scholarly forewords and commentaries. In 2016, the “Scientific collections (cultural history collections) of the Under and Tuglas Literature Centre” of the Museum Department were supplied with funds as before, to maintain their scientific-cultural value, to guarantee their organisation, and creation of user-friendly environment in the database MuIS. In 2016, the Literature Centre engaged in the project “Development of the Museum of the Under and Tuglas Literature Centre into a modern international research centre” (2015-2020, project leader E.-M. Talivee) financed through “An institutional package measure for R&D institutions and higher education institutions” (ASTRA) of the European Regional Development Fund. Under the package, support will be provided to improve the conditions of use of the Museum Department to meet the requirements of modern international research centre, digitising the cultural collection of the Literature Centre and making it available to Estonian universities and researchers, as well as to international scientific community; organisation of international scientific events and exhibitions for introduction of the cultural collection of the Literature Centre and for its more efficient employment in the digital environment. Within framework of ASTRA, the team of the Literature Centre was joined by Kri Marie Vaik, taking up the office of digitizer of the collections.

In 2016, the researchers of the Literature Centre released four larger scientific works. The Publishers Ilmamaa issued J. Undusk’s comprehensive monographic collection “World view of Estonian authors” in the series “Estonian history of thinking”. The book contains 32 studies and essays on authors writing in Estonian, German or Latin and having been active in Estonia. The book was awarded the grand literary prize of the Estonian Cultural Endowment. Besides that, the Neputns Publishers (Riga) released J. Undusk’s monograph in Latvian *Boļševisms un kultūra* (“Bolshevism and culture”), containing five studies on the essence of Soviet philosophy, culture and literature. An outcome of the work in 2012-2015 of the grant team headed by Ulrike Plath (U. Plath, Anu Kannike, Inna Põltsam, Ester Bardone), the reference book appeared titled “101 Estonian dishes and foodstuffs”, containing scholarly glimpses at Estonian food culture in

its temporal, spatial and cultural varieties. U. Plath was awarded, jointly with the environmental scientist Diana Mincyte, the AABS prize for the best special issue of the *Journal of Baltic Studies* (“Food Culture in the Baltic States”).

Also released in print 2016 was the collection of articles “World War I in Estonian culture”, bringing together the papers of an international joint seminar under the same name organised by the Literature Centre and the Institute of the Estonian Language and Culture of Tallinn University in spring 2015. The book contains the introductory article from editors of the collection Mirjam Hinrikus and Ave Mattheus, the opening article by plenary speaker of the seminar, Professor of History of the Toronto University Jüri Kivimäe and eight essays by scientists of Estonian universities and research institutions (incl. by researchers of the Literature Centre J. Undusk and Ö. Kepp). The electronic edition of the collection was issued. In 2016, compiled and edited for the printers were two volumes of abstracts: “The text sticking to landscape” (edited by E.-M. Talivee, Kadri Tüür, Risto Järv) and “Texts and birds” (edited by E.-M. Talivee, K. Tüür, Riho Kinks).

In 2016 the Literature Centre participated at organising several international scientific events. On September 16, the Literature Centre organised in cooperation with the Academic Library of Tallinn University the day with papers dedicated to the centennial of Kyra Robert, the expert in librarianship and researcher of Tallinn libraries titled “Making it from teacher to a scientist – Kyra Robert 100. Work of researcher in the cultural-historical Baltica collection”. 11 researchers from Estonia, Germany and Finland delivered papers in the Hall of the Academy of Sciences (Literature Centre was represented by J. Undusk and Martin Klöcker). On September 21-23 the Literature Centre organised, in cooperation with the Centre for Environmental History of Tallinn University, the Estonian Union of Ornithology, the University of Tartu and the Turku University an international seminar “Texts and birds” (moderator E.-M. Talivee). Topical papers were presented by 19 researchers from Estonia, Finland and England.

Besides international events the Literature Centre organised several Estonian conferences worthy of note. On June 9-11 there was a three-day conference “Text sticking to landscape” (moderators E.-M. Talivee and U. Plath). It was held in cooperation with the Estonian Literary Museum and the Centre for Environmental History of Tallinn University (KAJAK). On June 9 there was a day of papers at Museum Department of the Literature Centre, on June 10-11 there was an environmental

history-related outing, carried out within framework of the conference, to Kurgja, the Carl Robert Jakobson Homestead Museum and to Särghaua, the Study Centre of Geography and Environmental Technology of Tallinn University of Technology. The papers were presented by 15 researchers from various Estonian research institutions (the Literature Centre was represented by E.-M. Talivee and U. Plath). On October 25, there was held, in cooperation with the Estonian Centre of Children's Literature the fourth seminar in the series "Child in literature" in Tallinn, with the sub-topic "School in children's literature, the children's literature at school" (moderator E.-M. Talivee). It focussed on teaching literature at school and presenting school in children's literature. The topical papers were presented by 8 children's literature researchers, teachers and compilers of textbooks (the Literature Centre was represented by E.-M. Talivee). On October 14 there was the VII Modern Estonian Literature seminar "Paul-Eerik Rummo's "Snow whiteness ... Snow darkness"" in the Museum Department of the Literature Centre, with 8 researchers considering the poetry by P.-E. Rummo published in his collection of verses "Snow whiteness ... Snow darkness" in 1966 (moderator Aare Pilv). In September 2016, a permanent exhibition was opened in the Estonian National Museum titled "Man and natural environment", with senior researcher of the Literature Centre U. Plath being one of the curators.

Ongoing in 2016 were regular working seminars of researchers of the Literature Centre in the Roosikrantsi house and in Nõmme at Museum Department of the Literature Centre. U. Plath carried out a seminar with the historian Kaarel Vanamõlder titled "Chameleonic people: national indolence as a social category" (04.05). Eneken Laanes and Professor of Italian Research and Semiotics of Tallinn University Daniele Monticelli delivered a paper "Putting up fight for exception: Andrei Ivanov in Estonian literature" (16.05). A. Pilv spoke on the topic "(;)Kivisildnik's trans-sarcasm" (14.06). The research seminar by Rein Undusk carried the title "*Antiqui and moderni*: observations in line of a cultural topos" (30.09). Piret Kruuspere spoke on the topic "National theatre as medium of cultural memory" (02.11). At the outgoing scientific seminar of 2016 – "Children of the "Flowers of evil": insight into Estonian decadent art and literature" – papers were delivered by M. Hinrikus and doctoral student of Tallinn University Lola Annabel Kass (09.12).

In 2016, researchers of the Literature Centre delivered 48 scientific papers, 21 of them at international scientific events, among others the following conferences: conference of the Association for the Advancement of Baltic Studies (AABS) "Global, Glocal, and Local: Distinction and Interconnection in the Baltic States" in Philadelphia (E. Laanes), joint conferences of Estonian

and German scientists “August von Kotzebue im estnisch-deutschen Dialog” and “Kotzebue-Gespräch V” in Berlin (J. Undusk), “Noises And Voices. Languages, Media, the Arts In Nordic Literatures” in Turku (E.-M. Talivee), conference of the Swedish Literature Science journal TFL “The Baltic Seas” in Stockholm (E. Laanes), “Multilingualism in Northern European Literatures” in Turku (E. Laanes), “42. Baltische Kulturtag” in Braunsbach (U. Plath), “Geschichtsschreibung im frühneuzeitlichen Livland” in Göttingen (M. Klöker), “Adelskulturen im Baltikum. Identitäten, Konzepte, Praktiken” at Klaipėda (M. Klöker), “Inter-mediality, Decadence and Estonian literature before and during the First World War”- “Popular Culture at the Turn of the 20th Century” in Riga (M. Hinrikus), “Baltische Bildungsgeschichten” at Tartu (J. Undusk, M. Klöker, U. Plath). From January 5 to June 16 the senior researcher Mirjam Hinrikus sojourned, as the post-doctoral stipendiary of the Visby programme of the Institute of Sweden, in the Göteborg University.

Among the national conferences, meriting special mention is participation of researchers of the Literature Centre at the seminar of the Estonian Academy of Sciences and the Estonian Sea Museum “Estonian naval science and naval culture”, at the event dedicated to the 60th anniversary of Indrek Jürjo, at the conference dedicated to the 70th anniversary of Rein Veidemann and at celebration of the 80th anniversary of Mats Traat in the Union of Writers (J. Undusk), at the annual conference of the Association of Estonian Theatre Researchers and Critics (P. Kruuspere), at seminar of the Estonian National Library “Fright and valour” (E. Laanes), at the spring conference dedicated to the 20th anniversary of the Association of Estonian Biographies (M. Hinrikus), at the manor heritage conference in Raikküla manor, and at seminar “Cattle in mediaeval and early modern Estonia and Livonia” (U. Plath).

Among popularising presentations, of singular note were the paper by E.-M. Talivee “Study track in the writers’ garden” to librarians at the information day of the Ministry of Culture (05.05), the paper by E. Laanes “Recent history in fiction” at Jõhvi Central Library (16.03), the paper by U. Plath “The Baltic German environmental history – what is it?” at Mustamäe Gymnasium (22.06), P. Kruuspere’s interventions at the days with papers organised within Panso Days “History-of-theatre class at the stage performance school” in the Särev theatre study of the Museum of Theatre and Music (28-29.11) and deliberations of J. Undusk on air in Estonian TV and the Estonian Radio, incl. at the Night University.

In 2016 researchers of the Literature Centre authored one monograph in a foreign language, six scientific articles in a foreign language and

25 articles in Estonian. They published 17 research reviews, scientific abstracts and other short pieces of writing. Researchers of the Under and Tuglas Literature Centre are involved in co-operation with Estonian universities in supervising and reviewing BA, MA and PhD theses (M. Hinrikus, P. Kruuspere, E. Laanes, U. Plath, A. Pilv, E.-M. Talivee, J. Undusk). As members of faculty, they deliver courses of lectures and seminars (M. Hinrikus, P. Kruuspere, E. Laanes, U. Plath). Researchers participate in the work of academic council of the Academic Library of Tallinn University and in completion of the collections of the Library as well as those of the Estonian National Library (J. Undusk). J. Undusk is member of the Cultural Fund of President of the Republic of Estonia (since 2008), member of Prize Panel of National Science Prizes (2011-2016), member of National Students' Papers Prize Panel (since 2011), and Chairman of Board of F. Tuglas "Collected works". E. Laanes is member of Literature Foundation of the Cultural Endowment of Estonia and coordinator of the research network of the Nordic Summer University "Narrative and Memory: Ethics, Aesthetics, Politics". U. Plath is the head of Estonian Centre for Environmental History (KAJAK) and representative of the Baltic States in the European Society for Environmental History. The Literature Centre is member of editorial boards of various scientific issues and participates in peer-reviewing of contributions to journals, and attends several panels on fiction (F. Tuglas short story prize, Jaan Kross literature prize) and theatre pedagogy and research panels (Priit Põldroos prize).

The Museum Department continued public lectures and held literary events. On February 3, at the 127th anniversary of Artur Adson, senior researcher Õne Kepp organised the traditional dialectal poetry morning, dedicated to Raimond Kolga's work. The paper was presented by Tiia Allas from the Võru Institute; the participants saw the film by Vallo Kepp on R. Kolga titled "I believe in the withering of flowers" (Estonian TV 1996). On February 20, the Museum was the venue of the run-up round of the II National Koidula Adults Recitation Contest (moderators E.-M. Talivee and Õ. Kepp). On March 2, at the 130th anniversary of Friedebert Tuglas, winners of the the 45th Tuglas short story prize were announced. The panel, where the Literature Centre was represented by Foreign Member of the Estonian Academy of Sciences Cornelius Hasselblatt, accorded its preference to short stories by Maimu Berg and Jüri Kolk. On April 27 the annual prizes of the magazine Looming were handed over in the Museum Department. On June 9 there was the memorial event "Comeback home" in connection with the reinterment of the the ashes of Marie Under, Artur Adson, Hedda Hakker and Berta Under in the Rahumäe cemetery. On December 1, the poet Veronika Kivisilla spoke about her work within the series of lectures "The reading Nõmme"; on December 8, deliberating

was the author of travelogues Tiit Pruuli (moderator E.-M. Talivee). On December 28, the meeting with papers dedicated to the 70th anniversary of Toomas Liiv was held in the Museum Department (moderator Elo Lindsalu).

In 2016, four works of the arts collections of the Literature Centre were on display at exhibition of the Estonian Arts Museum “Ants Laikmaa. Vigala and Capri” (11.09.2015-15.01.2016), four works at the exhibition organised by the Estonian Arts Museum “The town of light: Estonian artists in European cities” (22.02-21.08) and (17.08.2016-26.06.2017).

The Museum continued digitising the collections necessary for modernizing the infrastructure for educational and research work, which made brisk headway thanks to the generous support by ASTRA. All materials needing digitising were gone over, and the work was distributed in stages; the bids were updated and the schedule of digitising works was drawn.

In 2016, part of the photo collection was digitised and described. Accessioned retrospectively into MuIS and described by K. M. Vaik were 306 photos with digitised pictures. 351 recordings from 1955-2012 of the sound record collection of the Museum Department were digitised. Recordings were converted into MP3 and WAV file format and on the recording media SD/SDHC card. In 2016, the Museum started recording into MuIS of the description of entry words of the sound files. Ilona Rosenvald entered into the catalogue of the sound-library the data of 69 recordings. Accessioned to the art collection in MuIS were 120 works of art together with their digital image. The library was replenished by 35 donated and 46 purchased pieces of printed matter. In 2015-2016 Õ. Kepp and I. Rosenvald took the inventory of the book and art collection of the Museum Department, with the stock of 13 724 pieces of printed matter and 1890 works of art. As of 2016, the database of MuIS contained 21 753 archival holdings.

In 2016, E.-M. Talivee was engaged with editing for print of the volume 14 of F. Tuglas’ “Collected works”, the text-critically edited and commented research “Ado Grenzstein’s departure”. The book was supplied by postscript by the historian Jaanus Arukaevu; the historian Anu Pallas composed commentaries to the work and language editing will be by Tiina Hallik. The book will be designed and laid out by the graphic artist Tiiu Pirsko. The volume will appear in print in the first half of 2017. Being edited is the 15th volume of F. Tuglas’ “Collected works”: Selection of letters. The 16th volume of F. Tuglas’ “Collected works”: Selection of speeches (E.-M. Talivee and K. M. Vaik) has been tentatively edited. Composing and editing of the volume of articles by M. Under has been finalised, ongoing is writing of the scientific commentaries. The book will appear in 2017 (compiler and

editor Õ. Kepp). Finalised have been the preparatory works at Paul Reets' "Book of life". The work will appear in 2017 (compilers J. Undusk, J. Hain).

In 2016, two series of lectures were carried out in the Museum Department "Life of M. Under, A. Adson and the Tuglases in Nõmme: the epoch's literary and cultural-historical background" (with E.-M. Talivee and Õ. Kepp speaking); and "The authors' garden: relations of literature and natures" (with E.-M. Talivee speaking). There were topical book exhibitions composed for study groups visiting the Museum. In 2016, the Museum Department was visited for research 35 times, and 579 archival holdings were delivered to use by researchers. In 2016 the Museum Department was visited by 535 interested parties, the seminars held elsewhere were attended by 120 people. The study trail supported by the Environmental Investment Centre was visited by 241 people. The Estonian campaign for cleaning-up "Let's do it" held in spring at the garden of the Museum Department (07.05) was attended by 40 people.

ASSOCIATED INSTITUTIONS

Estonian Academy of Sciences Act passed by the *Riigikogu* in 1997 stipulates that the research, development and cultural institutions and scientific societies outside the structure of the Academy, whose activities and objectives however conform to those of the Academy may associate themselves with the Academy. The association is effected under bilateral agreements that specify the aims, tasks and commitments for the parties.

One form of cooperation between the Academy and the associated institutions is the reciprocal exchange of information. Surveys of the activities of such institutions have been published in the Academy Year Book since 1998. Included are reviews in structural composition, exposition and scope. They are presented practically as submitted, with minor modifications, suggested by the editorial board and kindly accepted by respective institution.

Reviews on the 2016 activities of the institutions associated with the Academy have been presented in the chronological order of their association date:

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TARTU OBSERVATORY

Associated with the Estonian Academy of Sciences

8.05.1998

Founded in 1808

Personnel: 93, of whom researchers and engineers engaged in research 77

Address: Observatooriumi 1, 61602 Tõravere, Tartu maakond, ESTONIA

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Director: Anu Reinart, Tel: +372 696 2505, Fax +372 696 2555, anu.reinart@to.ee

With his research of the recent years into galactic filaments in space web, the senior researcher Elmo Tempel was bestowed the National Science Prize in Exact Sciences in 2017 – it was a decade ago when a researcher of Tartu Observatory had received that highest national acknowledgement. All the more reason to take a pride in our team! Our domain of cosmology will be bolstered up by a new foreign researcher Heidi Lietzen, under whose leadership a research was carried out in the Institute of Astrophysics of the Canaries, detecting the largest known assembly of super clusters in the Universe. The diameter of the system discovered is ca. one billion light years.

It was the highlight event for the stellar physicists when the ESA made public the first data sample basing on present observations of the space telescope Gaia. In 2014 Gaia launched regular work, to prolong at least five years. Preparation for the large scale astronomic mission started in mid-1990s. Scientists of Tartu Observatory have been involved in it since 2001. The first sample contains the precise data on 1.1 billion celestial objects (mainly our Galaxy, Milky Way, and stars). The previously inconceivable stupendous accuracy of measurements portends a major breakthrough in understanding the structure and life course of our stellar system. Due to disclosure of data, everybody has now access to research, ushered in by tentative review articles, co-authored by senior researcher Indrek Kolka of Tartu Observatory.

A remarkable achievement is the making by the Observatory of a public procurement contract with the European Space Agency, the first and currently the only one in Estonia made by the Agency. During the following two and a half years the scientists of Tartu Observatory will supervise an international team, working to secure reliability of satellite remote sensing measurements. The team will organise a number of reference

measurements both in the new optical laboratories of the Observatory and in the Mediterranean Sea and on Atlantic Ocean (www.frm4soc.org). The investments made to refurbish the laboratories, and the excellence in research, have enabled our scientists to display their competence in international space cooperation. Partners of Tartu Observatory are leading European research centres – the National Physical Laboratory and the Plymouth Marine Laboratory of the United Kingdom, the Royal Belgian Institute of Natural Sciences and the long-standing business partner of the ESA, ACRI-ST of France.

The Estonian Remote Sensing Day held in October attracted more interested parties than ever before because the three new Sentinel satellites of the EU and ESA Earth monitoring programme Copernicus are now operating; there are a host of public high quality data available. For reference a volume of articles was composed, providing a thorough overview of ongoing activities of Estonian remote sensing in the Estonian language, seconded by synopses in English (https://to.ee/download/m58579e977135#kaugseire_Estonians_2016). There were more international gatherings in Tõravere of Earth Observation enthusiasts: COST Action ES1309 (OPTIMISE: Innovative Optical Tools for Proximal Sensing of Ecophysiological Processes) work meeting on measurement of refraction and fluorescence for support of the ESA FLEX mission; in summer Tartu Observatory was visited by two teams of Finnish scientists. We met with colleagues from Tampere University of Technology to discuss enhancing our cooperation; our laboratories were visited by specialists of radiometry laboratory of the Finnish Institute of Metrology. In that connection, the annual Nordic Ozone and UV-radiation team colloquy the Nordic Ozone Group meeting (NOG 2016) was held in Tõravere. Such an event was last organised in Estonia only in 2009.

The team of the student satellite ESTCube was concerned, in cooperation with the University of Tartu, with creating two new camera systems for the European Space Agency student satellite and preparation for the ESTCube 2 and 3 missions.

The major public undertakings were related to membership in the ESA. In September Tartu Observatory hosted the ESA research missions information day attended by the ESA Director for Research Prof. Alvaro Giménez Cañete and Dr. Fabio Favata. Two weeks later Tõravere hosted the public colloquy organised by ESA simultaneously in all Member States over vistas of the space domain titled “Citizen debate” http://www.citizensdebate.space/en_GB.

Scientists of the Observatory contributed to space education by training students and hosting guests in Tõravere and by celebrating the international space week on October 4-9, delivering over 60 lectures in schools over Estonia. There were held the international Summer Academy and the regular Research Brigade supported by Tartu Hansa and Tartu Toome Rotary Clubs. They also supervised young astronomers. As a result of their dedicated efforts, the final ceremony of the X International Olympiad of Astronomy and Astrophysics (IOAA) divided the history of Estonian Olympiads of Astronomy into two distinctive epochs – the 12 years run-up to 2016, when Estonia won tokens of recognition, bronze and silver medals, and December 18, 2016, marking affiliation of Estonia to the states, winning the gold medals.

In 2016, the Tartu Observatory continued fulfilling one target-funded research topic and three institutional research grants:

Quantitative remote sensing of vegetation covers (principal investigator A. Kuusk);

Galaxy evolution in the hierarchical Universe (principal investigator G. Hütsi);

The role of dark matter filaments in large-scale structure and assembly of galaxies (principal investigator E. Tempel);

Variability and evolution of massive stars in the Gaia era (principal investigator I. Kolka).

Coordinated by the National Institute of Chemical and Biological Physics, the new Centre of Excellence “Dark Side of the Universe” started.

In 2016 four personal research grants were funded by the Estonian Research Council:

PUT232: J. Pisek – Forest understory structure and seasonal dynamics by multi-angle remote sensing;

PUT246: J. Nevalainen – Where have half the baryons gone?;

PUT645: E. Jakobson – Aerosols and greenhouse gases contribution to the climate change in the Baltic Sea region and in the Arctic;

PUTJD5: T. Tuvikene – Automated extraction of stellar spectra from digitised photographic plates: methods and application.

There were two new personal research grants acquired, one enabling Indrek Vurm, having long studied and worked abroad, where he defended his scientific degree, to return to Estonia, the other supporting Mihkel Pajusalu’s post-doctorship in Massachusetts Institute of Technology in astrobiology, the innovative research area in space domain.

Besides that we carried out seven international cooperation projects (FP7: GLaSS, FORMIT, MULTPLY, AHEAD; H2020: EOMORES; ESA: MVT and FRM4SOC); we participate with CGI in the PRIA applied research, and several lesser Estonian and international agreements.

The Observatory budget had 62% of government budgetary research funding, besides 10% of the ESF funds for the project KOMREET of the development programme ASTRA of research facilities.

The doctoral theses were defended by three scientists of the Observatory: Rain Kipper on modelling of galaxies, Karlis Zalite on radar remote sensing applications for monitoring forest floods and agricultural grasslands, and Krista Alikas on sensing of optically complex waters. One more doctoral thesis was supervised in the field of radar remote sensing applications (Aire Olesk).

There were published 120 articles of various type with 61 released in international peer reviewed journals (ETIS 1.1 category).

A thorough overview of activities of Tartu Observatory was published in Tartu Observatory Annual Report 2016 and also in the traditional Observatory Calendar 2017.

ACADEMIC LIBRARY OF TALLINN UNIVERSITY

Associated with the Estonian Academy of Sciences 17.06.1998

Founded in 1946

Personnel: 112, of whom 2 researchers

Address: Rävåla pst. 10, 15042 Tallinn, ESTONIA

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Web site: www.tlulib.ee

Director: Andres Kollist, Tel: +372 665 9401, Fax +372 665 9400,
andres.kollist@tlulib.ee

Number of registered users: 44 664

Number of copies in the circulating collection: 2 630 891

In 2016, 70 years passed from the founding of Central Library of the Academy of Sciences, current Academic Library of Tallinn University. The anniversary celebration was the great event of a year. A number of thematic events focussing on old books were held, IX Day of Bibliography was organized, the 20th anniversary of ELNET Consortium was celebrated, events during national library days were organized, successful cooperation with Estonian and the foreign partners continued.

The 70th anniversary of the Academic Library was celebrated on April 5th, international conference was organized. Presentations were made by Kristian Jensen (British Library), Aira Võsa and Aija Sakova (Academic Library of Tallinn University), Tõnu Viik (Tallinn University), Martin Hallik (University of Tartu). The conference finished with panel discussion moderated by Aija Sakova, panellists were Priit Pirsko (state archivist), Andres Kollist (director of Academic Library of Tallinn University), Martin Hallik (director of University of Tartu Library).

An exhibition "Selected pearls from the collections of the Academic Library of Tallinn University" was composed and opened in April to celebrate library's anniversary. Exhibition posters were later shown also at Tartu Art College and Central Library of Saare County. Creation of the exhibition was funded by Cultural Endowment of Estonia.

Under the aegis of the old book centre, the series of presentation days were continued. Within the series of lectures "Introducing the Baltica collections", the head specialist of research and communication Harry Liivrand gave an overview of the postcard collection and library's calendar "Tallinn on old postcards 1953-1955". Historian Lauri Frei gave a short

lecture about disguised literature – books having wrong imprint to hide original issuing data.

Within the second series of events “Researcher in the Baltica Reading Room”, specialist of rare books Kairit Kaur gave a presentation about correspondence of a Courland lady Sophie Becker-Schwarz and Elise Reimarus of Hamburg. The 100th birth anniversary of bibliologist Kyra Robert was celebrated in September with a presentation day. Altogether seven presentations were given both in Estonian and German languages.

On February 16th, the traditional IX Day of Bibliography was held, which was dedicated to the 100th birth anniversary of bibliographer Endel Annus. On behalf of the Library, a paper was presented by the head of information technology service Peeter Kondratjev. In the end of the day, a bibliography award was issued in cooperation with Estonian Librarians Association.

In 2016, the third Baltica scholarship competition was announced and amongst many applications three scholars were chosen: PhD Iveta Leitane (Latvia), PhD Dominik Gutmeyr (Austria), PhD Michele Vangi (Italy). The research interest of Iveta Leitane is the role of schools and universities in Livonia in mediating Judaism knowledge, Dominik Gutmeyr explores the development of ethnographic illustrations and photos in Russian Empire, Michele Vangi focuses on space views and Daniel Chodowieck’s graphic materials during the turn of the 18th-19th century. In 2016, an article by former Baltica scholarship winner Michael Rocher was published in article collection *Vana Tallinn* (Old Tallinn). The Baltica scholarship to international researchers is designed to attract the scientists doing research outside Estonia, to the cultural-historical Baltica collections.

The Library held numerous tours for various target groups: students of Tallinn University, international students, lecturers, and experts in the profession. The Library hosted visitors from different foreign countries. There was ongoing cooperation with Tallinn German Gymnasium, Haabersti Russian Gymnasium, Tallinn English College, Gustav Adolf Grammar School, Rocca al Mare School, University of Tartu and Tallinn University of Technology. New cooperation agreements were made with Tallinn Secondary School of Science and International School of Estonia.

The reading rooms of the Library and the open access literature are continually renewed. In connection with reorganizations, the home lending service point was liquidated and professor Rein Müllerson’s collection (mainly law) was relocated among related topics at reading rooms. On the second floor, an art sciences reading room was opened and also put

into use as an evening study room. From now on, the entire second floor works as a late night study room.

In May and December the Night Library events were organized in cooperation with University students union. The Study Centre was open until 23.00. Each time, the centre was visited by more than 200 readers. The event was sponsored by HeyDay, Löffbergs, Estrella, SAKU, PuskuPusku and cafe Oaas.

In 2016, Estonian Expatriate Literature Centre was allocated 12 400 euro to the project “Preservation and making available of cultural heritage of Estonians in exile” by the Ministry of Education and Research Compatriots Programme. The extra funds enabled the Library to recruit additional labour for input of data into personal databases and to complete organizing the collection of the off-prints of research works.

Developing the digitization centre continued and work processes were improved. All digitized materials are made available through digital library ETERA, by the end of the year 28 140 items (almost 2 million pages) were uploaded. ETERA was used 40 306 times in a year.

Academic Library is a member of international organisations *Bibliotheca Baltica* (Association of Libraries of Baltic Countries), CERL (Consortium of European Research Libraries), EAHIL (European Association for Health Information and Libraries), ICOM (International Council of Museums), IFLA (International Federation of Library Associations), LIBER (Association of European Research Libraries), HIBOLIRE (Nordic-Baltic-Russian Network on the History of Books) and Nonprofit Organisation Consortium of Estonian Libraries ELNET.

INSTITUTE OF THE ESTONIAN LANGUAGE

Associated with the Estonian Academy of Sciences

11.05.1999

Founded in 1947

Personnel: 63, of whom 17 researchers

Lexicographers, terminologists and language planners 28

Address: Roosikrantsi 6, 10119 Tallinn, eki@eki.ee

<http://www.eki.ee>

Director: Tõnu Tender, Tel: +372 617 7500, tonu.tender@eki.ee

Academic Secretary: Jelena Kallas, Tel: +372 617 7513,
jelena.kallas@eki.ee

Institute of the Estonian Language has seven departments:

- Department of the History and Dialects of the Estonian Language and the Finno-Ugric Languages, Head Tiina Laansalu;
- Department of Language Resources and Technology, Head Tõnis Nurk;
- Department of Speech Research and Technology, Head Meelis Mihkla;
- Department of Language Planning, Head Peeter Päll;
- Dictionary Department, Head Margit Langemets;
- Terminology Department, Head Tiina Soon;
- Personnel and Administration Department, Head Kai Oro.

Department of the History and Dialects of the Estonian Language and the Finno-Ugric Languages

Within a framework of the personal research project “The Cultural Shift in Estonian in the 17th and 18th centuries (2014-2017)”, the Department continued developing the database created for linguistic analysis of Lutheran hymns and runosongs. Lemmatization and morphological analysis of the hymnal of 1656 and runosongs from the area of the Mulgi dialect has been started.

Within the framework of the national programme “The Estonian Language and Cultural Memory II” the Department carried out the project EKKM14-316 “Completion of the concordance of Estonian Bible translations (2014-2018)”. Added was one sub-corpus (Georg Müller’s biblical quotes). The editing reached the letter L. The rough manuscript of biblical translation of 1739 “Proverbs and the Book of Job” was made available to public. Within the framework of the Centre of Excellence in Estonian Studies, technical solution for using the database was developed in order to apply it for composing of the dictionary of runosongs.

The main activity of the Department was compiling the Scientific Etymological Dictionary and Dictionary of Estonian Dialects. Of the latter, the 28th fascicle was prepared for print (*mütsatama–ninaõrs*). The 26th fascicle (*mehine–muska*) and the 27th fascicle (*muskama–mütsakas*) appeared in print. At the end of 2016, the material of the 28th fascicle was added to the web dictionary (<http://www.eki.ee/dict/ems/>).

The Department continued compiling and editing the new Scientific Etymological Dictionary. The note “End of compilation” has been added to 704 entries. Besides that, ca. 270 entries were delved in to a greater length. The Department replenished the electronic collection of literary sources, and improved the structure of database of the dictionary (presentation of first mentioning and derivations).

The following dictionaries were released in 2016:

- *Idamurde sõnastik* (Eastern Dialect Dictionary, <http://www.eki.ee/dict/ida/>). Added to entries are words from stock Estonian lexis (e.g. temporal words and numerals); total 7000 entries.
- *Seto sõnastik* (Seto dictionary, <http://www.eki.ee/dict/setosonastik/>). Total over 6000 entries.
- *Kihnu sõnaraamat* (Kihnu dictionary, <http://www.eki.ee/dict/kihnu/>). The dictionary presents the stock lexis of the Kihnu dialect and dialectal words from Kihnu and Manija; total over 6000 entries. The dictionary was compiled jointly with other institutions.
- *Alamsaksa laensõnad eesti keeles* (Low German Loanwords in Estonian, <http://www.eki.ee/dict/asl/>). The dictionary is the first attempt to sum up the Low German loanwords perpetuated in Estonian, which constitute the most numerous group of loanwords in Estonian. Total 1150 words.

In cooperation with other institutions, the Department started or continued compiling small regional dialectal vocabularies (“Mulgi dictionary”, “Coastal dialect’s dictionary”, “Seto dictionary”, “Saaremaa dictionary”).

The Department organised and replenished the Archive of the Estonian Dialects and Finno-Ugric Languages at the Institute of the Estonian Language (EMSUKA); added were approx. 3000 place name notes, and 3.5 hrs of sound files. The Department checked and arranged over 500 hrs of digital sound files, scanned 389 volumes (13 491 pp.) of fascicle collections and ca. 80 000 cards of the card collections, incl. completion of the bulk of Wiedemann card index. The combined card index of terminology was moved to archival depository (576 000 cards altogether). The web database

<http://emsuka.eki.ee> was replenished by 1658 new entries, the existing entries were corrected and updated; 1052 files were put in concord with the database entries. For the website search system of the place name card index, over 163 000 notes were indexed.

The Department continued composing the comprehensive “Grammar of Estonian dialects”. It completed the reviews of the use of simple and compound numerals and pronouns and declination of compound words, and started review of verb morphology (concepts, conjugation).

The Department participated in organising two international Finno-Ugric seminars: seminar of the Institute of the Estonian Language “Syntax of the Uralic languages” (7.11.2016) and within the framework of PhD school – the international autumn seminar “Vocabulary and etymology of the Finno-Ugric languages” (28.-29.11.2016).

Department of Language Resources and Technology

The Department was engaged in its main task – developing and maintaining of dictionary writing system and terminology management software.

Within a framework of the Institutional Development Programme for R&D and Higher Education Institutions (ASTRA), the Department launched the project EKI-ASTRA. It is concerned with three main activities:

- The Dictionary and Terminology Management Software EELex2; in 2016 the preliminary analysis of EELex2 was carried out jointly with users and developers of the present systems;
- Improvement of quality and efficiency of PhD studies; the seminar “Vocabulary and etymology of the Finno-Ugric languages” was organised;
- Improvement of international competitiveness of the Institute, by supporting mobility of scientists and inviting foreign experts.

Within the framework of the project “The Centre of Estonian Language Resources” (1.1.2016-31.12.2021), the Department was engaged in licensing of the existing language resources. It has elaborated the principles, under which the data can be delivered, or adapted to the user requests. Also metadata for the resources was collected, complemented and updated.

Within the framework of the national programme “The Estonian language technology (2011-2017)”, the Department carried out the project “Tools for Lexical Resources”. The structure of the “Dictionary of Standard Estonian” (ÕS 2013) was restructured and standardised. Basing on Dictionary of the Estonian Language (one volume, 2018/2019), the Department composed the

template for “Estonian–Finnish Dictionary”, wherein Finnish equivalents have been incorporated automatically, derived from the “Finnish–Estonian Dictionary” (2003). Basing on the “Basic Estonian Dictionary” (2014), the template of the Estonian–Chinese dictionary has been developed. The interface of the web dictionaries has been enriched with functionality, which allows to display in search window the search results drawn from the index (entry, place names, word class etc.). Inquiries may be multiwords.

Department of Speech Research Technology

The Department works as project-based. In its first year of activity it focussed on speech research and development of Estonian speech synthesis and its applications.

The Department fulfilled the Institutional Research Funding IUT35-1 “Speech styles, sentence prosody, and phonological variation: description, theory and modelling (2015-2020)”. It created the corpus for study of the link between appeal of the voice and the speech style. Under consideration were the following topics: expression of the narrow focus in spontaneous dialogue, impact of status of referent on sentence stress, declination in the read-out and spontaneous speech, prosody of phrasal verbs. Among phonologically variable phenomena the researchers studied duration (quantity), palatalization, ingressive *h*. In field work the speech corpus was replenished with recordings, aimed at creating a separate corpus, to study more closely the official and unofficial speech situation and regional origin of the speaker and his or her living place as affecting the phonological variation.

The Department fulfilled the national programme “Estonian language technology (2011-2017)” projects “Speech Synthesis Improvements and Extension of Applications” (2015-2017) and “Publishing e-books in the form of multimedia” (2016-2017).

The work within the project “Speech Synthesis Improvements and Extension of Applications” improved the quality of HTS-synthetic sound signal and preliminary processing of text and joint operation of HTS-sounds and Windows screen readers. There was composed a Võru-language speech-basis with 1133 utterances and there were completed the Ossian-synthesis sounds, basing on GlottHMMi method. The Department completed the text basis consisting of 4000 utterances to record a large speech corpus and started development of synthesiser in Estonian basing on neuron networks (<https://github.com/CSTR-Edinburgh/merlin>).

Results of the Project “Publishing e-books in the form of multimedia” are as follows:

- There was elaborated the logic of data flows and file change and build-up and testing of security between the speech centre of the Institute and the servers of partners;
- The module of lexical analysis of text and text articulation was worked out, to prognosticate the right case of numerals when transforming the figures to a text;
- There was compared the suitability of synchronising units of speech and texts of different length for smooth presentation of media;
- An editor interface was created for presentation of e-books in ePub3-format as an additional function to sound system Vox Populi (<http://heliraamat.eki.ee/voxpathuli>);
- The Estonian Centre for Digibooks researched the autonomous and server-based formats of presentation of ePub-books and found for them the most suitable audio-files server-based presentation in streaming format (EDRK);
- For marking the text articulation in synthesis speech, there were studied the excerpts of audio books read by professional actors.

Within the Direct Funding project “Identification of speech emotionality (2016)” the Department started transfer of the emotional speech corpus into cloud; it carried out emotional speech corpus development works for identification of emotionality and the voice likability.

The most important results of 2016 are:

Research (speech styles, sentence prosody and phonologic variation) at service of speech technology applications: the connections of voice appeal and speech style, aspects of sentence prosody and phonologically variable speech phenomena. There were published 8 articles and the papers delivered at 8 international and national conferences;

Work in the Centre of Excellence in Estonian Studies (CEES) provided IUT35-1 research team significantly better prerequisites for doing internationally recognized science and the widened scope for national and international cooperation;

Completed was the Võru-dialect two speech synthesisers <http://www.eki.ee/~indrek/voru/index.php>;

In cooperation with Elisa Eesti AS the first commercial application of speech synthesis in Estonian was completed (Elisa Application Self-Reader) (<https://www.elisa.ee/et/eraklient/teenused/elisa-raamat/elisa-raamatust>);

The converter for e-books synthesis-speech presentation into ePub3-format sound system as the Vox Populi complementary function.

Department of Language Planning

The main work in 2016 was the Dictionary of Standard Estonian and compilation of the Handbook on Standard Estonian (planned for 2018). The orthology part was basically completed. The Dictionary was supplemented by a list of new words and the Institute's interim base of new words and meanings (the Department added 1126 new words). There appeared M. Raadik's "Orthology crib" and 3 publications on language planning (incl. the rule of first letter of historical events and on exonyms – external names for a geographical place, group of people, or language/dialect).

32 publications were issued on language planning and care, mainly in the column "Language school" of the newspaper *Postimees*, besides that in magazines *Oma Keel*, *Õiguskeel* and others; there were 43 public presentations on language planning and care. Over telephone, language advice was provided to 5587 referrals, an answer was supplied to 3588 e-mails and mailed letters, in total for 9176 queries. Language advice database contains 165 389 entries, 7610 entries are available to public (*Keelenõuvakk*). The database of personal names was replenished.

To mark the 50th anniversary of Language Advice Service in Estonia, a symposium was held on 15 September 2016 titled "Future of the language advice services", attended by language advisers from Estonia, Lithuania, Latvia, Finland, Sweden and Russia. On November 15, 2016, a web broadcast was organised titled "Language Advice Night", presenting the history of the Language Advice Service, main topics of language advice and future plans.

The Department was engaged in the EU language planning and continued the respective events. The EU translators and interpreters were provided the language advice, incl. in terminology. In September 2016, language training event "Terminology ABC" was organised in Luxembourg and Brussels for Estonian interpreters and terminologists. A next brochure of articles on eurolanguage is underway. The EU language planning website has been updated.

The Department also continued with the events dedicated to plain language principles; on May 26, 2016 seminar on clear communication was held in Tallinn; together with the Estonian representation of the European Commission, the Department delivered the Clear Message Prize. There is a plan to provide plain language training courses to officials and other interested parties.

“The Dictionary of Estonian Place Names” was released in June (6211 entries, 1112 pp). The database of normative place names KNAB was replenished with 3315 entries. The Department started compiling “The Book of Estonian Surnames” in cooperation with other institutions and name researchers. Studies of the Department were involved in many terminology committees (e.g. botany, gardening, laboratory medicine, aviation, military domain, seafaring, names of mammals, handicraft.)

Dictionary Department

The activities of the Department belong almost fully to the activities funded by an administrative agreement. One dictionary work (“Collocation Dictionary of Estonian”) was also supported in 2016 by the programme “The Estonian language and cultural memory II”.

Work with the dictionaries continued:

- 1) Dictionary of the Estonian Language (one volume, 2018/2019), contains 80 000-100 000 headwords. The dictionary is compiled on the basis of the biggest Estonian corpus EstonianNC (563 M), which contains also Estonian web corpus etTenTen13. For corpus analysis Corpus Query System Sketch Engine is used;
- 2) “Estonian Collocations Dictionary”, contains 10 000 headwords. Project started in 2014 and the dictionary will be completed in 2018 (as web dictionary and possibly on paper). The target group of the dictionary are learners of Estonian (both as first language and as the second or foreign language);
- 3) The database of new words and meanings (in cooperation with lexicographers from Department of Language Planning). By end of 2016 the database contained ca. 10 000 entries;
- 4) “Estonian Association Dictionary” (to be completed in 2019). The Dictionary contains ca. 800 headwords.

All dictionaries are compiled in the Dictionary Writing System EELex; in cooperation with language technologists its functionality is being developed.

Researchers of the Department participated in organisation of several international conferences: EURALEX 2016, conference of young applied linguists “Re:Thinking applied linguistics: mobility, diversity and communication”, the 15th Conference of Applied Linguistics (two latter jointly with other institutions). In 2016, Ene Vainik’s monograph “Estonian emotions. Word profiles” was released.

Terminology Department

In 2016, the main directions of work of the Terminology Department comprised updating and streamlining of the terminology databases Esterm, Militerm and Dictionary of Education, participation in the work of terminology committees, counselling terminology committees and development of EU terminology.

In the process of updating and streamlining of the Esterm, 1542 new entries were added, 5477 entries were reviewed. The terminology database Militerm was replenished by 216 new entries, reviewed were 960 entries. The education terminology committee discussed 730 term entries. Through Esterm, inquiries were received for 223 terms, through Militerm – for 46 terms; the education commission received 21 inquiries.

Terminologists of the Department were engaged in the working groups or committees on veterinary, geology, medicine, military, security and defence policy; also in NATO Military Committee Terminology Board. The Department advised a number of terminology working groups or committees, who deal with terminology in the fields of archaeology, museology terminology, sign language, legal terminology, policy and government, occupational therapy, radiation safety. Also specialists of *State Gazette* of the Ministry of Justice were counselled on the issues of translation of legal acts and terminology.

Papers on terminology studies were delivered at the Wiedemann Language Day and at the Tallinn University ELU (“Innovation integrating specialties”) course; terminologists trained Estonian translators and terminologists of the EU institutions in Brussels and Luxembourg and made a presentation at summer seminar of the Institute of the Estonian Language.

The terminologists participated at training events held in Copenhagen: the 12th International Conference on Terminology and Knowledge Engineering and the “Workshop on Terminology Teaching & Training”. They also advised terminology committees in the use of terminology management software Termeki.

The Department started cooperation with IATE (InterActive Terminology for Europe) compilers, in order to reciprocally notify one another about the contradictions between Esterm and IATE databases, and with the company “Tilde” for creating the machine-translation consortium, in order to merge the termbases created in Estonia with the automatic translation platform eTranslation (2016 CEF Telecom Call – Automated Translation (CEF-TC-2016-3)). The Department continued cooperation with the College

Mainor at creation of interactive environment for development of business language.

Personnel and Administration Department

In 2016 the Department connected to the programme SAP (Enterprise Resource Planning), and it joined the public servants self-service portal (RTIP). RTIP is used for the arrangement of training events, holidays etc. Since programmes SAP and RTIP do not cover all needs of personnel accounting, it was decided to keep also ongoing personnel programme Taavi. Basing on the results of a corporate image survey, a PR specialist was employed to organise the PR of the Institute.

Two joint events were organised for personnel (summer seminar, Christmas party) and several events concerning the Institute's work organisation (e.g. election of the trustees of work environment).

In 2016, two public tenders were held: for travelling services and air tickets. The cooperation partners were elected for three years.

In 2016 the researchers of the Institute participated at many job and innovation related trainings.

The Library of the Institute was supplemented with new donated books. The Institute continued systematisation of literature on history of the Estonian language, dialects and Finno-Ugric languages and their integration into database of literature of the Institute.

ESTONIAN LITERARY MUSEUM

Associated with the Estonian Academy of Sciences

11.05.1999

Founded in 1909 as the Archival Library of the Estonian National Museum

Personnel: 107, of whom researchers 40, librarians and bibliographers 12

Address: 42 Vanemuise St., 51003 Tartu, ESTONIA;

kirmus@kirmus.ee

Director: Urmas Sutrop, Tel: +372 5207188,

Urmars.Sutrop@kirmus.ee

In 2016, the structural units of the Estonian Literary Museum were the following:

- Archival Library with the Department of Bibliography, headed by Merike Kiipus
- Estonian Cultural History Archives, headed by Vilve Asmer
- Estonian Folklore Archives, headed by Risto Järv
- Department of Folkloristics, headed by Mare Kõiva

Estonian Literary Museum is supervising the activities of the Centre of Excellence in Estonian Studies (CEES).

The first three departments administer the collections important in terms of cultural history, Department of Folkloristics being focused on digital archives, whereas the archival library has no independent research topic. Research in the remaining three units is carried out on the basis of funds from institutional grants and one personal research grant.

PUBLICATIONS. In 2016, the Scholarly Press of the Estonian Literary Museum published 24 books and journal issues, 11 co-publications with other publishing houses and 18 e-publications. According to the Estonian Research Information System (ETIS), 189 publications were related to the Literary Museum, of which 51 were research articles.

The highlight event of 2016 was launching of the Centre of Excellence in Estonian Studies.

The Literary Museum has been since 2016 the partner institution of the object of the Estonian Research Infrastructures Roadmap – Centre of Estonian Language Resources. There was also launched the project

“Development of the Estonian Literary Museum into a centre for digital humanities on international level”, aimed at digitising and making available of unique source materials (printed matter, manuscripts, sound and video recordings, photos, and art heritage) and enhancing quality of research by ICT devices. The project is funded from “The institutional package measure for R&D institutions and higher education institutions” (ASTRA) of the European Regional Development Fund. Within framework of the ASTRA project the Museum is also a partner institution of the “Doctoral School of Linguistics, Philosophy and Semiotics” at the University of Tartu. The Museum organised an international autumn school designed for doctoral students in the humanities “Dialogues with subcultures” at Jäneda manor on November 17-18, focusing on the defining and research of subcultures from the angle of view of different research areas and the representatives of subcultures.

Centre of Excellence in Estonian Studies (CEES)

Coordinating partner: Estonian Literary Museum; partners: Estonian Academy of Music and Theatre, Institute of the Estonian Language, Tallinn University, the University of Tartu, Tallinn University of Technology.

The application round of 2015 was successful for the Centre of Excellence in Estonian Studies (CEES), engaged in complex study of linguistic and cultural phenomena of ethnic groups in Estonia. Under scrutiny beside emblematic cultural phenomena are impact mechanisms of transnational ideas and processes, while developing implementation of computational, statistical and other digital tools in the areas of the humanities.

Clearly interlinking areas were identified in literary criticism, linguistics, computational linguistics, folkloristics, philosophy and musicology, in order to reach out and start a dialogue between them. According to the idea set out in the application, 12 teams started work with interdisciplinary topics: research of historical expression and cultural practices, biographics, digital technology of the humanities and language, ethics, linguistic and spiritual philosophy, studies of literary culture and literature, corpora-based language, literature and folklore studies, speech and music research, migration and diaspora research, narrative research, studies of modern culture (incl. media), gender studies, and studies of beliefs and myths.

Within framework of the Centre of Excellence large joint conferences were held:

April 28-29 – conference “Interdisciplinary dialogues of Estonian studies” at Jõgeva Trofee centre (http://www.folklore.ee/CEES/2016/konve_1.htm);

December 12-13 – multilingual international joint conference “Oral and written in culture: connections and collisions” (<https://www.folklore.ee/CEES/?id=6&sid=1>).

That year 22 conferences, 18 seminars, five panels at science forums, a doctoral school were organised and/or attended; 11 peer-reviewed journal issues were composed and published, nine doctoral works were defended. Researchers of the CEES participated in international science events outside Estonia with approximately 190 papers.

Eleven peer-reviewed journals were issued, also 19 collections of articles and monographs on the research results of the scholars of CEES were published. 68 publications came out in publications registered in ISI WoS and ERIH PLUS databases; 64 articles were published in other international collections. Popularising of the research results of the CEES occurred via articles, public presentations in the media, and training events.

The first year of activities of the CEES can be estimated as resultful and successful. Three scientists of the Centre of Excellence were elected as members of *Academia Europaea* (Jüri Talvet, Marina Grišakova, Helle Metslang).

ARCHIVAL LIBRARY AND DEPARTMENT OF BIBLIOGRAPHY

The archival library continued work with the strategic preservation of national publications and scientific collections of old books, making them available to the general public. Currently recorded were legal deposit copies and donations (ca 16 000 copies). Accessioned to e-catalogue ESTER were 22 000 copies. As of December 31, 2016, the number of publications in the collections of the archival library amounted to 1 092 400. Of these, the e-catalogue of Estonian libraries, ESTER, includes 711 537 copies (65.1%).

The project “Collections of the Estonian Cultural History Archives and Old Books” supported the scientific description of old books collection. Supported by the compatriots programme, work with the selected collections of Enn and Helga Nõu was completed; processing of the memorial collections of Mati Unt and Betti Alver / Mart Lepik and making available the baltica/estica materials in e-catalogue ESTER continued.

Within framework of the project “Older press and the cultural memory of information society” of the national programme “Estonian language and cultural memory”, compilation of bibliographies was completed for the newspapers *Postimees* (year 1938) and *Sädemed* (year 1938). The compilation

of bibliographies for the issues of the newspaper *Postimees* (years 1939-1940) was continued.

Under the ASTRA programme, 2460 pages of older periodicals and 24 280 pages of rare books were digitised as TIF files. Made available in the information system KIVIKE were files of 360 items of printed matter, linked to e-catalogue ESTER, with entries of www-copies made.

In 2016 several expositions were staged: “The year of marine culture: facing the sea”, “And yet an ESTONIAN”, “The fiction of North American indigenous people translated into Estonian”, “The elusive arts – month of September speaks with wisdom”, “Debora Vaarandi 100”. The Museum held an exposition of the best illuminated books of 2015 and the best books of 1965 at Tartu Arts College. It deposited to the standing exposition of the Estonian National Museum 71 books from the staple stock and donated 38 books from the reserve stock. The items of printed matter were also deposited and donated to standing expositions of the National Archives.

April 5 – memorial conference of the 100th anniversary of long-standing head of the Archival Library Leida Laidvee.

October 25 – XXVI Conference of Estonian BiblioScience, the Oskar Kallas Day. Speakers were from Tallinn University and Academic Library of Tallinn University, the University of Tartu, Tartu Arts College and Estonian Literary Museum.

Estonian Cultural History Archives (ECHA)

The ECHA continued to study the sources of Estonian literature and cultural history, to collect them, organise, describe scientifically and make them available to public recording of data and digitising.

The accessions for the year consisted in ca. 10 000 new archival holdings. As of December 31, 2016 there were registered over 522 000 archival holdings in the form of manuscripts, photos, works of art and films of cultural history and sound recordings. The major collections received were: archives of Ivar Ivask, Kristjan Kalmet, Madis Kõiv, Heljo Mänd, Hain Rebas, Sri Rama Michael Tamm, Ülo Tedre, the Institute of the Estonian Language and Literature in Stockholm and the Publishers Aleksandra. Replenished were earlier accessions from Vello Ederma of the Voice of America archives, the correspondence of Aldo Kalsi and materials of the Museum of the Blind, correspondence and manuscripts of Meinhard Laks, Lea Tormis' manuscripts, manuscripts of novel competitions of the magazine *Looming*

and contributions. There were accessions of around 200 biographies and as individual accessions, several diaries of singular interest, correspondence and manuscripts.

In addition to the photos received with above archival collections, the photo collection was replenished by the follow-up project “Author and his/her environment”, and by records of current literary and cultural history events. Ilmar Kõverik donated to the audio-visual collection of the ECHA 115 recordings with recollections, biographies and interviews with well-known persons coming from the Helme parish, recorded in the series of events “Roots” in 2000-2010. The collection of arts was replenished by works of Vive Tolli and Evi Tihemets.

In 2016 the ECHA organised the personal collections in manuscripts of Ilmar Talve, Laur Tamm, Eha Lättemäe and Uno Laht and illustrative matter and photos of Salme Ekabaum, Voldemar Erm, Ott Arder, Astrid Reinla, Boris Kabur, and the Literary Museum, collections of expatriate Estonians’ illustrative matter and photos. The database ELLEN was replenished by 8230 new entries. Within the ASTRA project “Development of the Estonian Literary Museum into a centre for digital humanities on international level” the expatriate Estonians’ audio-visual recordings were digitised, as target-financed by collection of arts and compatriots’ programme.

The travelling exhibition of the photographer Alar Madisson “Half-hour with an author”, composed on the basis of the ECHA project of taking photos of authors, was exposed at the EU Estonian representation in Brussels and in Jõhvi Culture and Hobby Centre. On occasion of the Mother Tongue Day, an exposition was staged of original materials of K. J. Peterson deposited at ECHA; his regular anniversary was marked by an exhibition of manuscript recollections, biographies and photos. At the end of the year the memorial exposition of Vello Paatsi was staged.

The working group on sources of cultural history and literature of the ECHA continued its studies under institutional research grant of the Ministry of Education and Research “Formal and informal literature networks based on sources of cultural history” (IUT22-2, supervisor M. Laak) and under personal research grant of Epp Annus (started in 2016) “National intimacies and cultural imaginaries: home and culture in late Soviet Estonia” (PUT1218). The applied research was supported by national programme “The Estonian language and cultural memory II”: project for study of Estonian biographies (R. Hinrikus), F. R. Faehlmann (K. Metste) and expatriate Estonian authors (J. Kronberg, B. Melts)

and for development of web-based information environment “Century of Kreutzwald” (M. Laak, M. Mikkel).

A highlight event was the release of the special issue of the *Journal of Baltic Studies* “A Postcolonial View on Baltic Cultures of the Soviet era” (Vol. 47, No.1) compiled by E. Annus. Two doctoral dissertations were defended on Estonian literature: M. Hollo “The romantic subject, memory and trauma in Bernard Kangro’s post-war work” and B. Melts “Literary Mindscapes (*Umwelten*) and their Autobiographical Roots”. The researchers of the ECHA participated actively in the work of the Centre of Excellence in Estonian Studies, incl. migration and diaspora research (L. Kurvet-Käosaar), gender research (E. Annuk) and biographics (M. Hollo) as supervisors of working groups.

In addition to numerous articles they released three collections of articles and the journal *Methis. Studia Humaniora Estonica* no. 17/18, the special issue of study of literature (compiled by L. Lukas, K. Kurvet-Käosaar; editor-in-chief M. Laak). The series “Works of Estonian Cultural History Archives on literature and cultural history” released the collection of articles by R. Hinrikus “In Between. Articles on Literature and Biographies” (no. 8) and by J. Kronberg “Friends well chosen” (no. 9), containing new treatments of Karl Ristikivi and other expatriate Estonian authors. Completed by the end of year was the peer-reviewed substantial collection of articles basing on outcome of the Estonian Science Foundation grants (ETF9035, ETF9160) “Dynamics of Address and the Fields of Connectivity in Estonian Literature” (compiled by L. Kurvet-Käosaar, M. Laak), providing critical insights into the present foci of scholarship on literature, life writing, archival research and diaspora research. The ECHA continued preparation for printing of the monumental text-critical publication about the correspondence of Johannes Semper and Johannes Barbarus (T. Saluvere) and anthology of Estonian biographical writings (R. Hinrikus).

Leena Kurvet-Käosaar continued productive international cooperation within the framework of IABA Europe, the association of European life-writing scholars, and the European Journal of Life Writing. E. Annus is continuing her activities in the networks of Postcolonial Initiative and Nordic Summer University. E. Annuk participates in Nordic Gender Research networks, engaged in collaboration with the Office of Estonian Gender Equality Commissioner. M. Laak participated in creation of the digital literature research network “E-Letters”. T. Saluvere participated in preparation of the international doctoral school “Dialogues with subcultures”.

Completed was the 3-year cooperation project with National Library, carried out by support of the Ministry of Culture: as a result of the project, 233 e-pubs of the Estonian literature classics were finalised, available freely in the National Broadcast database DIGAR (M. Mikkel, M. Laak, K. Ojasaar). A new collection competition was announced for Estonian biographies titled “Republic of Estonia 100. My life and love” (R. Hinrikus), with over 100 contributions, the best of which will be published in 2018.

A new focus was research of specificity of photos as sources of biography writing and explanation of impact of diseases on author’s work (E. Annuk). Research in biography writing, literature and diaspora was innovatively integrated into fundamental research of (travelling) memory and trauma theory (L. Kurvet-Käosaar, M. Hollo, K. Kuusk). The ECHA continued the studies of cultural policy, exile society and literature of the Western Estonian diaspora (T. Ojamaa, J. Kronberg, R. Hinrikus), incl. the impact in the homeland on culture of global communication networks under formation (M. Laak, T. Saluvere). Several case studies (Ojamaa) have demonstrated that in 1950s, hyphenated identity (sense of belonging to the country of origin as well as host country) began to develop among WWII refugees. In connection to that, the culture ideologists set up the main goals: to advance the culture of origin in exile; to create a positive image of the refugees via public cultural events; to mediate Western culture trends to the creative people in the isolated Soviet Estonia.

The Estonian Folklore Archives (EFA)

The activity of EFA is characterised by close linkage between research and archival work. The primary goal of research is to analyse the materials found in EFA collections, and also the history of obtaining and study of collections reflecting the societal processes, and to intelligibly communicate the acquired knowledge to international science community and to Estonian public. On the other hand, the development of archival collections, systematising and publishing depends on scientific competence of research team and the work must provide convenient use of scientific collection to both scientific community and the public.

Research in EFA was carried out within framework of the institutional research project “Folklore in process of cultural communication: ideologies and communities” (supervisor Mari Sarv), supported by projects of national programmes for composing databases and academic publications. The most important results of research are two publications: Aado Lintrop’s folk poetry monograph “Songs of Creation Period”, complementing the book on Finno-Ugric studies “Stories of Creation Period” of 2014, and the thorough study by Guldžahon Jussuf “Musical heritage of Kandle-Juss

alias Johannes Rosenstrauch”. EFA also continued compiling of source publications basing on research. In 2016, the Scholarly Press of the Museum released Ingrid Rüütel’s “Muhumaa songs and stories”, Mall Hiiemäe’s “Little book of birds in folklore”, Helen Kõmmus’ “Sailor of Hiiumaa is recounting” and in cooperation the folk storybook compiled by Risto Järv “Help from the Spirit of the Forest” in Varrak Publishers. The opus “Anthology of Estonian Traditional Music” became a web issue (Herbert Tampere, Erna Tampere and Otilie Kõiva, edited by Janika Oras and Kadi Sarv).

The Journal of Ethnology and Folkloristics, issued jointly with Department of Estonian and Comparative Folklore of the University of Tartu and Estonian National Museum, is now published jointly with the De Gruyter Open. International cooperation is effected within framework of both the heritage archives working group of the International Society for Ethnology and Folklore (Secretary Ave Goršič) and cooperation network of heritage archives of the Nordic countries and the Baltics (A. Goršič and R. Järv).

In 2016 several scientific events were organised, the most important among them being the 11th folklorists’ winter conference “One’s own and the aliens. Adaptation and melting” (moderators Anu Korb and Andreas Kalkun) and the 9th runosong conference (moderators Mari Sarv and Liina Saarlo), a joint forum of Estonian and Finnish runosong researchers. In cooperation with Department of Folklore of the Museum, there was organised the 4th annual conference in digital humanities (Mari Sarv and Liisi Laineste) and two panels at international conferences in digital humanities: DH 2016 in Cracow and EUSN 2016 in Paris.

The collection of manuscripts attained the magic figure: recorded in archives was the 1 500 000th manuscript page, the major accessions being the contributions of collection of competition of 2015 “My landscapes” (2128 pages), as well as the field-work materials of natural sacral places of the Võnnu parish transferred by the University of Tartu. The information system KIVIKE was replenished by archival holdings in all EFA collections – manuscript collection (8265 pp, 269 archival holdings), photo collection (4000 photos, mainly digital), sound collection (109 sound archival holdings, 1041 pieces) and video collection (29 film archival holdings). Information entries in KIVIKE of several collections were organised (manuscript series RKM, KP, sound series EKRRK, Fon. etc). Archiving, digitising, and making the materials available has been supervised by the archivist Kadri Tamm, digital archivist Olga Ivaškevitš, newly engaged photo archivist Aivo Põlluäär. The digital studio carried on with digitising all collections, incl. over 23 500 manuscript pages. In cooperation with the

University of Tartu, the EFA continued organisation of archival holdings in Oskar Loorits' original Livonian folklore collection (LF), their describing and digitising; scans were imported to information system KIVIKE (7046 files). In the community portal of KIVIKE there were created the Virumaa web-gate, the Laiuse heritage, the Central Estonian music and the devil heritage communities; the community of KIVIKE was replenished by Kodavere web-gate.

Department of Folkloristics

Scholars of the Department continued basic research into Estonian belief systems and religious diversity (Tõnno Jonuks, Reet Hiiemäe, Mare Kõiva, Andres Kuperjanov, Katre Kikas), focussing on religions in the pre-historic period and phenomena of nature religion; roots, beliefs, and practices of Neo-Paganism in the 20th-21st centuries, and materiality of religion (spaces, texts, practices, and religious objects). Researchers examined also relations between contemporary health behaviour and magical practices, astromedical data, and trends in complementary medicine in the 19th-21st centuries.

The team members monitored biocultural phenomena, incl. pet culture, changes in human-animal relations, and trends in food culture within the Eastern European territory.

The ethnobotany research team (Renata Sõukand, Raivo Kalle) gradually evolved from its original position on the periphery of folkloristics into an independent and internationally recognized research group, the leader of which was awarded the most prestigious European Research Council (ERC) Starting Grant in 2016. The ethnobotany research group conducted qualitative and semi-quantitative research into the local ecological knowledge, perception of wild plants and the use of edible plants, fermentation, chronological changes in the use of plants, etc.

Research into narrative theory, figurative speech, linguistics (Anneli Baran, Liisi Laineste, Piret Voolaid, Eda Kalmre, Mare Kalda; Nikolay Kuznetsov) yielded ample results, investigating the influence of rumours in the contemporary political and social discourses and new tendencies in language use. The focus was also on the adaptation of global web phenomena such as memes, various expressions and contexts of humour (e.g. in verbal versus visual narratives and visual forms of humour), as well as analysis of catchphrases. The Department's researchers initiated observations of colour names in folklore and the investigation of written folklore genres, their consistency, patterns, and specific features. The team also continued research into specific terminology in folkloristics, and

re-evaluation of the source material related to religion and folklore, to adopt a source-critical approach.

To promote interdisciplinary approaches in different disciplines and cooperation with partners in the international networks, joint research was developed with folklorists from different states (the common research areas are religion, mythology, sacred places, ethnobotany, communication styles, phraseology, etc.): Belarus (the cooperation is supported by the Academies of Sciences of both countries, as well as the Estonian-Belarus development cooperation programme, partner of the Culture, Language and Literature Research Centre of the Belarus Academy of Sciences), Udmurtia, Karelia, and Komi Republic (the Udmurt Institute of History, Language and Literature, the Komi Institute of History, Language and Literature, the Karelian Institute of History, Language and Literature).

Estonian–Bulgarian and Estonian–Polish projects are supported by the Academies of Sciences of both countries. The new mythology project (“Mythological actors of Baltic-Finnic (Estonian) and Perm (Udmurtian) traditions: History and contemporary status”) is supported by Kindred Peoples’ programme of Estonia; a European working group for meteo-prognostic paroemias was also established. The visiting researchers, to name a few, were Tatjana Valodzina, Tsimafei Avilin, Aleksei Glushko, Julia Prakofjeva and others from Belarus, Peter Grzybek from Austria, Alexey Arzamazov, Irina Panina, Galina Glukhova and Tatjana Vladykina from Udmurtia; Wladyslaw Chlopicki and Dorota Brzozowska from Poland; Ekaterina Anastasova from Bulgaria, etc.

International cooperation continued within the framework of the working groups The Ethnology of Religion and The Ritual Year of SIEF: Charms, Charmers and Charming (committee member M. Kõiva), Databases (committee members P. Voolaid, M. Kõiva), Belief Narratives (committee member M. Kõiva), Contemporary Legend (committee member E. Kalmre), etc.

In 2016, scholarly journals *Folklore: Electronic Journal of Folklore* and *Mäetagused* celebrated their 20th anniversary of continuous publication. This is the result of excellent work of the editorial staff (esp. Asta Niinemets, Tiina Mällo, Diana Kahre, Andres Kuperjanov) with authors and articles. The most important publications to be mentioned were “Changes in the Use of Wild Food Plants in Estonia: 18th-21st Century” by Renata Sõukand and Raivo Kalle, published by *Springer*, and a collection by Ljudmila Lobanova and Nikolay Kuznetsov, titled “Folkloristics of Komi: Research and Materials”, which was released as an issue of the ELM Scholarly Press.

The Department organised ten international conferences-seminars in Estonia and abroad, participated in large international forums and permanent working groups. The novel results and the outstanding tasks of the humanities were presented by conference “Oral and written in culture: connections and collisions” (December 12-13, 2016) held in cooperation by the Estonian Literary Museum, Centre of Excellence in Estonian Studies and the University of Tartu on the 60th Kreutzwald Days.

The department conducted fieldwork in Estonia (Saaremaa), Ukraine, Belarus, Kosovo, and Bulgaria.

In autumn the Research archives of the Department (EFITA) were established, boasting digital (incl. social) media data (comprising 500 000 digital texts, over 4000 photos, etc.). Pending digitising are the compound archives (200 pp. of manuscript matter, numerous video-audio recordings, large systems of card files – approx. 400 000 items). The corpora were supplemented by ca 15 000 digitised new folk story texts; digital versions of ten treatments of O. Loooris were completed for history of Estonian folkloristics. The analysis environment *Skriptoorium* was being developed.

ESTONIAN NATIONAL MUSEUM

Associated with the Estonian Academy of Sciences

21.12.2006

Founded in 1909

Personnel: 142 (as of 31.12.2016), of whom researchers 18

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The year of 2016 was the time of major upheavals for the Estonian National Museum (ERM). On October 1, the new building was opened to visitors. Besides the premises and territory, the functions and the scope of embrace of the Museum broadened. Approximately 100 000 people visited the Museum in the first three months. The interest of the public focussed on permanent exhibitions that had been prepared in parallel with completion of the new building.

Research activities

ERM is concerned mainly with studies of Estonian and Finno-Ugric ethnology and museology. In 2016, special attention was given to permanent exhibitions, to be followed by introduction of the expositions to specialist circles and training of staff of the Museum's educational centre, for competent presentation of the expositions.

Permanent exhibition of the Estonian cultural history "Encounters", the preparation of which was started as long ago as in 2008, is planned around the daily life of the Estonian-area dwellers since the rise of settlements until today. It is knowledge-based, dialogue-centred and draws on man's everyday experience, as its guiding principles. The spectrum of areas of research underpinning the exposition was broad. Besides ethnologists, the completion of the permanent exhibition was directly or indirectly furthered by representatives of many other areas of research, allowing considering it a cooperation-based trans-disciplinary exposition. Many researchers belonged to the team of curators, or else the preparatory work of setting up the exposition drew heavily on results of their research. For instance, involved were scientists of the humanities, researchers in social, natural and exact sciences of the University of Tartu, as well as those of the Viljandi Academy of Culture of the University of Tartu, Tartu Arts College, Tallinn University of Technology, Tallinn University, Estonian Literary Museum, Institute of the Estonian Language, Health Development

Institute, Tartu Observatory and many museums. The output of research of linguists, archaeologists, environmental historians and folklorists has found its due place at the exposition. The exposition has also been enriched and replenished by new source materials and visualising matter and films, in order to disclose the topics to common public. In their treatment of topics, the scientists were supposed to take into account the needs of various audience groups and background systems, helping the visitors to actively connect to exposition materials, to grasp emphatically the ideas conveyed on the substance of case, and not to contemplate them passively.

Completed in cooperation of scientists of ERM and the University of Tartu was the Finno-Ugric permanent exhibition “Echo of the Urals”, recounting the interpretation of the world perception, utility items and traditional life environment of the Finno-Ugric peoples, through female and male visions, opposite but also harmonious. The exposition provides an overview of connections of culture and mentality of those peoples, as well as languages and genes, basing on new materials and the ERM collections.

Concurrently, regular scientific activities were carried out, incl. four international and two national research projects. Researchers of the Museum published 15 scientific articles, of which three with the highest ETIS classifier (1.1), and delivered 14 papers at scientific conferences.

In the area of Estonian ethnology, the pivotal place was held by studies in popular culture. In 2016, within permanent exhibitions, there were opened respective expositions “Rural life and rural beauty” and “The imprint of time on Estonian wraps”, as well as those concentrating on changes of the beginning of the 20th c. “My own abode” and “Modern times”. Separately operating in the premises of the new building of ERM is the information centre of popular culture, designed to deliver consultations and information. Furthermore, there is a folk costume school in ERM, within the framework of which there were carried out 37 workshops and papers delivered at conferences. The researchers of ERM gave lectures on popular culture at Tallinn University of Applied Science, Estonian Arts Academy, Viljandi Academy of Culture of the University of Tartu and Tartu Arts College and supervised and reviewed student research papers. They also participate as consultants in cultural programmes and as experts in the work of specialist councils. The project, studying the second half of the 20th c., paid particular attention to parts of the permanent exhibition “Parallel worlds. Parallel lives” and “Life behind the iron curtain”, and in the theoretical aspect to the practice of remembrances. The collection and research project of Estonian museums on everyday culture of the 1990s that had been started in 2015, reached in 2016, as supervised by ERM, the stage of

creating the web-based collection environment (rahvalood.ee), supporting collection activities of 19 Estonian museums; the topical research groups were created. The topics cover media, entrepreneurship and working life, the youth and children culture, the migration and the civil society. The modern studies gave birth to expositions “Time of freedoms” and “Cities within a city”, complementary to the permanent exhibition.

The studies of history of Estonian ethnography and ethnology focused on the period of Soviet Estonia, aiming to analyse the links of power and knowledge. Out of previous topics of the history of science, Marleen Metslaid’s doctoral work “Between the Folk and Scholarship: Ethnological Practice in Estonia in the 1920s and 1930s” grew and was defended in 2016. Respecting the history of ERM, the exposition “Story of the Estonian National Museum” was opened in the new building.

In 2016, the preparations for research topic of food culture were launched: of the one part, opened as part of permanent exhibition was “Food we cook” and of the other part, a positive answer was received to the application lodged with funding programme ASTRA, to develop that direction of research. That year also witnessed the food-culture research-sources conference (speakers: Ülle Sillasoo, Tiina-Mall Kreem, Kaarel Vanamölder, Inna Põltsam-Jürjo, Helgi Põllo, Reet Piiri, Ester Bardone, Anu Kannike, Aivar Jürgenson).

The Finno-Ugric research group has been focusing on the research and collection activity drawing on permanent exhibitions of recent years, also supported by the international conference “Finno-Ugric museums – quo vadis?” (speakers: Art Leete, Kristel Rattus, Svetlana Bandura, Ligita Betiņa, Tatjana Berdaševa, Nikita Djatškov, Ágnes Kerezsi, Madis Arukask, jointly with the non-profit Finno-Ugric association). Finno-Ugric permanent exhibition “Echo of the Urals” was singled out as the best exposition of the year at the contest of museums of 2016. The narrower topics of the academic research were ethnic processes, patriotism and national policy and religion anthropology.

One of the directions of ERM is the museology research, more specifically production of expositions, and visitor research. On the one hand, the Museum’s activity is the object of research, and on the other hand Museum itself carries out communication research. Under consideration are involvement and impact of participation on Museum, and the audience research, reflected in scientific articles and papers at international conferences. ERM carries out complementary further education, training for a specialty and continuous professional development in the area; it is

a partner to the University of Tartu and Tallinn University in museology studies. It also supervised the museum work practice and the bachelor, master and doctoral studies.

Museum activity

There was house-moving in September 2016. Operative since August has been the administrative structure supporting new tasks, fulfilled by departments engaged in collections and conservation, science and education and services.

For the Conservation Department and Department of Collections, the past year was devoted to packing, moving and depositing in new repositories of collections, besides preparing of exposition materials. The systematic nature and innovative approach to relocation was recognized by the Prize of the Deed of Logistics of 2016. In 2017 the library and archival collections will be opened; unpacking of collections and inventory-taking however will continue until 2018. The activity of the Conservation Department will also involve the climate control of the repositories.

The ERM educational centre has gained scope. In the year it trained future guides at the Museum guide school and developed new exhibitions-based educational programmes to schools. The area of exposition and event organisation has also gained scope. Prerequisite to completion and administration of permanent exhibitions are larger technological expectations and potential to create e-solutions and offer additional options to visitors. The cultural programme of ERM was born out of close cooperation with Estonian theatres and concert promoters, replenished by traditional events and those organised by the Museum, for instance World Film Festival – an annual festival of anthropological documentaries.

The Sales and Service Department of ERM, supervising also the new Catering Service, runs the personnel, the largest in the Museum.

The economic significance of ERM and its role in development of Tartu and the region was evidenced by the title of a tourist object of 2016 granted to the Museum.

ESTONIAN CROP RESEARCH INSTITUTE

Associated with Estonian Academy of Sciences

23.09.2008

Established: 1920

Employees: 142, of them researchers 45

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Estonian Crop Research Institute is a state research and development institute in the area of governance of the Estonian Ministry of Rural Affairs. In accordance to its Statute, the Institute is engaged in applied and fundamental research, studying environmentally friendly and efficient technologies of agricultural crops, impact of plant breeding and technologies on crop capacity and crop quality, plant protection, plant health and fertilising. It carries out agro-meteorology monitoring and prognostications. The Institute breeds new varieties and operates the seed centre; it provides for conservation breeding of the varieties, conservation and research of genetic resources in fulfilment of international commitments in the area of genetic resources. The Institute provides support to advisory system, law making and national supervision.

There was launched the large-scale INTERREG project “Reducing nitrogen loss from livestock production by promoting the use of slurry acidification techniques in the Baltic Sea Region”. Baltic Slurry Acidification aims to promote the implementation of slurry acidification techniques throughout the Baltic Sea Region. Slurry acidification techniques (SATs) will reduce the ammonia losses from livestock manure and thus reduce airborne eutrophication of the Baltic Sea. The usage of SATs will provide definite environmental benefits for the region. The use of SATs benefits also farmers by increasing the nitrogen use efficiency of their manure fertilizers and thereby decreasing their dependency on mineral nitrogen.

The Institute plays an important role in the project of the Estonian Chamber of Agriculture and Commerce and the Parliament of Latvian Agriculturalists “GreenAgri” (Environmentally Friendly Management of Organic Fertilizers in Agriculture). The project GreenAgri aims at reducing nutrient losses from agriculture in the Baltic States by introducing and testing environmentally friendly management of organic fertilizers. As agriculture is one of the sources of nutrients eventually entering from surface waters to the Baltic Sea, the project aims to amend the situation.

This is a joint effort of farmers from Estonia and Latvia contributing to the improvement of eutrophication level of the Baltic Sea. During the project period 20 farmers from Estonian and Latvian pilot areas implement innovative technologies and methods in real life, using their own financial resources. Experts and researchers gather and analyse nutrient runoff data and provide the farmers with information about the efficiency of different solutions demonstrating practical results in reducing nutrient losses from farms. For the first time, testing of different technologies in manure management will be arranged in wider area, using financial resources and intellectual capital of Estonian/Latvian farmers, farmers' organizations and research institutions.

In the reporting year cooperation with agricultural producers enhanced and gained diversity. The Institute participates in the activities of the Estonian Crops Innovation Cluster. It is a new measure of the Estonian Rural Development Programme 2014-2020 – the first cluster launched within the framework of the Innovation Clusters. The aim of the Crops Innovation Cluster is to practice implementation of innovative solutions in production of agricultural products or foodstuffs. The Institute participates in the activities related to the use of the advanced film mulcher technology at crop production, and in the research to value potato.

The year of 2016 also witnessed launching of the activities of long-term programmes of the knowledge transfer measure of the Estonian Rural Development Programme 2014-2020. Within those programmes, training events for producers and handlers of agricultural products are organised, information and learning days and conferences are held, field and pilot tests are set up. Results are published as brochures, scientific collections or web-issues. The Institute coordinates the long-term programme on plant production and is involved in fulfilment of programmes of ecological farming and horticulture.

Scientists of the Institute participated actively in drafting the agricultural section of the framework document 2050 Basics of the Climate Policy completed under initiative of the Ministry of the Environment.

At the 31st Congress of the International Seed Testing Association (ISTA), held in Tallinn (in June), Mati Koppel acted as co-chairman of the section of conservation and use of genetic resources in crop forest and wild species. Head of Gene Bank of the Estonian Crop Research Institute Külli Annamaa was elected (as the representative of the Northern European region) member of the Executive Committee of The European Cooperative Programme for Plant Genetic Resources (ECPGR).

Highlight of the crop research activities was publishing of the article by Ingver, A., Koppel, R., Annamaa, K. "The history of wheat breeding in Estonia" in a substantial book that summarises the world wheat breeding: Bonjean, A. P., Angus, W. J., van Ginkel, M. The World Wheat Book. Vol 3. A History of Wheat Breeding. Lavoisier, Paris, 2016, 157-191.

At the end of the year the researcher of the plant breeding department Terje Tähtjärv defended successfully her doctoral work "Cultivar resistance and population studies of late blight pathogen in potato breeding in Estonia" in the Estonian University of Life Sciences.

Recorded in 2016 as new varieties were the spring wheat variety "Hiie" with good baking quality and the medium-ripening late blight resistant potato variety "Tiina".

ART MUSEUM OF ESTONIA

Associated with the Estonian Academy of Sciences

9.06.2015

Founded in 1919

Employees: 146

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Chief Executive Officer: Sirje Helme, Tel: +372 602 6001

The Art Museum of Estonia (EKM) collects, preserves, conducts research on and introduces Estonian and international artistic heritage and contemporary art. Even though research is a precondition for comprehending collections and archives, putting together exhibitions, the Museum does not have any specific job positions for researchers nor does it duplicate the work of academic institutions. Its research and scientific activity relies on the principle that all heads of collections and curators act on a sound art historical basis and are constantly improving their qualifications.

The main principles of research in EKM:

- The fields of research pursued by the Art Museum of Estonia stem from the nature of the collections, with a scope of subjects ranging from medieval to contemporary art. More broadly, the fields of research are determined by the need to continuously contextualize and regenerate the writings on Estonian art. There are seven main fields of research: Estonian medieval and ecclesiastical art; Western European and Russian art from the Early and Late Modern periods; Estonian art from the 17th to the 19th century; Estonian Modernism in the first half of the 20th century; Estonian Modernist and Avant-Garde art after World War II; Estonian art after the year 1991; conservation of art.
- Research projects are organized under corresponding research fields and run usually for 2-4 years. Specific projects are usually associated with exhibitions, except archive based research projects.
- Conferences and seminars related to research fields are held. Conferences may, but not necessarily have to be connected with exhibitional activity. All conferences are international. A selection of the conference papers is published bilingually in the publication *Proceedings of the Art Museum of Estonia*.
- The Art Museum of Estonia cooperates with universities in specific research projects, through the degree studies of the employees, lecture

courses held at universities and supervising the students' research projects, as well as providing museum internship and hosting joint conferences.

A 15-member Research Board has been formed that maintains an overview of the research done, is able to evaluate it and make recommendations. Seminars and discussions are held in connection with the study of the museum's history, as well as current exhibitions analyzed. Texts that need a peer-review are also selected from the Museum's publication plan by the Research Board. The aim of the Research Board is to strategically appreciate the content-related work of the museum and the research activity, to be a competent body in evaluating scientific work.

Every year the journal *Proceedings of the Art Museum of Estonia* is published – a publication with an international editorial board and peer-reviewed bilingual articles. The editor-in-chief of the *Proceedings* is Merike Kurisoo.

EKM supports its workers' degree studies, enabling them to attend lectures and seminars during their working hours; the finalisation of their degree theses has also been supported. In 2016, the number of employees with a PhD increased to six and eight employees are in the middle of their doctoral studies. For all content-related staff members a master's degree is required, so eight young colleagues are currently studying at the master's level in various universities.

Of activities in 2016

Two research projects with an international scope were completed:

- Exhibition project “Between Dresden and Saint Petersburg” (2014-2016), which marked the place of the artist twin brothers Gerhard and Karl von Kügelgen in the art landscape of the Baltics on the axis of Russia and Germany. An article publication / catalogue summarising the research results was published in 2016.
- “Rode Altarpiece in Close-up” (2013-2016), which – using modern technical art research methods – took an in-depth look at the medieval main altar of the Niguliste museum. An article collection was published giving an overview of the results.

Work with two ongoing projects was continued and three new projects were started:

- “Michel Sittow. Estonian Painter at the Courts of Renaissance Europe” (2014-2018);
- “Visual narratives of Estonian history in Art” (2014-2018);

- “Christian Ackermann – Tallinn’s Pheidias, Arrogant and Talented” (2016-2020);
- Archive project “I Truly Suffer when I Cannot Work... Agathe Veeber” (2016-2018);
- Archive project “Lost Estonian sculptors: Linda Sõber and Endel Kübarsepp” (2016-2017).

Conferences and seminars

In 2016 the 3rd seminar in preparation for the Art Museum of Estonia’s 100th Anniversary took place (Kadriorg Art Museum), as well as a seminar at the exhibition “Romantic and Progressive. Stalinist Impressionism in Painting of the Baltic States in the 1940s-1950s” (Kumu Art Museum).

Throughout the year, the employees of the Art Museum of Estonia held presentations at various scientific conferences on 26 occasions.

Publications

The publication of the peer-reviewed bilingual magazine *Proceedings of the Art Museum of Estonia* was continued, the 11th edition appearing in print – “Shared Practices: The Intertwinement of the Arts in the Culture of Socialist Eastern Europe” (editor Anu Allas).

Eight planned art historical and popular scientific catalogues were published:

- “Conductors of Colour. Music and Modernity in Estonian Art” (editor Bart C. Pushaw);
- “Cold Look. Variations of Hyperrealism in Estonian Art” (editor Anu Allas);
- “Kumu Hits. Contemporary Art from the Collection of the Art Museum of Estonia” (editors Eha Komissarov, Kati Ilves, Annika Räim);
- “Conflicts and Adaptations. Estonian Art of the Soviet Era (1940–1991) The 4th-floor permanent exhibition of the Kumu Art Museum” (editor Anu Allas);
- “Romantic and Progressive. Stalinist Impressionism in Estonian Painting in the 1940s–1950s” (editor Eha Komissarov);
- “*Force majeure*. The Destroyed and the Disappeared in Estonian Art” (editor Liis Pählapuu);
- “Diary of Eternal Love” (editors Anu Allikvee, Tiina-Mall Kreem);
- “Juhan Kuus. The Measure of Humanity. 45 Years of Documentary Photography in South Africa” (editors Kersti Koll, Kristel Laur, Toomas Järvet).
- The scientific publications of the staff members (including ones published outside the museum) are usually registered in the database

Estonian Research Information System (ETIS) – in 2016, 38 articles with different classifiers were published by our employees.

Other activities

Five meetings of the Research Board took place, as well as two meetings of the history book working group (composed of the members of the Research Board); five exhibition analyses were held, two of them including the participation of foreign experts.

Awards and recognitions:

- The Estonian Research Council's annual science communication award was gained by the EKM project "Rode Altarpiece in Close-up" (coordinator Hilkka Hiiop, effecters Tarmo Saaret, Merike Kurisoo, Hedi Kard).
- The above project won also the award for Best Science Events at the competition of Estonian Annual Museum Awards, held by the Estonian Ministry of Culture.

Collections and conservation

The goal of EKM is to keep all collections systemised, described and available to a wider audience through different mediums, as well as to ensure their preservation. Therefore, the ongoing photographing and digitalising of collections took place throughout the year.

1329 new works were added to the museum collections. 2605 works were exhibited in temporary and permanent exhibitions in EKM; in addition 673 artworks belonging to the EKM collections were exhibited outside the museum and 63 works in exhibitions outside Estonia. Adding to and organizing the documental and scientific archives is another ongoing activity. The library of EKM acquired 1101 additional books, 1756 books were inserted into the ESTER database throughout the year.

The conservators of the Art Museum of Estonia work actively in order to preserve, restore and conserve the items in the collections. For the exhibitions of 2016, a total of 93 works of the EKM collections were conserved, as well as the 6 works lent for exhibitions from other museums and 23 works belonging to private collections. During the routine check-up of the permanent exhibition, 31 artworks were restored and conserved. 26 artworks of EKM were restored for being sent to exhibitions held by other museums and galleries. During the year, a total of 102 works were conserved for the EKM collections. The conservational work also continued on the project "Rode Altarpiece in Close-up".

Openness to the public

One of the main goals of EKM is to organize and mediate visual art exhibitions of an internationally acceptable standard, as a priority introducing to the public Estonian artistic heritage as well as contemporary art. In 2016, 21 new exhibitions were opened in the branch museums of EKM, eight of which were international and 13 exhibiting artistic heritage. Throughout the year, seven permanent exhibitions were accessible to the public, including the opening of the new permanent exhibition “Conflicts and Adaptations. Estonian Art of the Soviet Era (1940–1991)” on the 4th floor of Kumu, curated by Anu Allas.

In the Kumu Art Museum 15 new temporary exhibitions were opened:

- “*Romantic and Progressive. Stalinist Impressionism in Painting of the Baltic States in the 1940s-1950s*” (January 22-May 1, 2016, 4th floor, B-wing). A new synthesis of classical and modern aesthetics appeared in Baltic art in the 1940s-1950s. The phenomenon known as Stalinist impressionism combined ideological demands with impressionist traditions of plain air painting. Curated by Eha Komissarov.
- “*RAM. Early Estonian Computer Art*” (February 17-September 4, 2016, The Project Space, 4th floor, A-wing). The exhibition presented extracts of Estonian computer art and locally created computer games saved in historical memory. Curated by Tuuli Lepik.
- “*Force majeure. The Destroyed and the Disappeared in Estonian Art*” (March 4-June 26, 2016, 3rd floor, B-wing). There is a hidden side to the visible history of Estonian art: works that were destroyed or lost, which in some cases constitute entire period in the creative lives of artists. The conceptual exhibition presented the stories of dozens of art works that have disappeared. Curated by Liis Pählapuu.
- “*Photorealism. 50 Years of Hyperrealistic Painting*” (March 18-June 12, 2016, The Great Hall). Hyperrealism imitates in painting photographic images, and mediates a perception of the world outlined by virtual realities. The large-scale international exhibition displayed the history of hyperrealism from the 1960s to the present day, including works by Chuck Close, Richard Estes and many others. Curated by Otto Letze.
- “*Kumu Hits. Contemporary Art from the Collection of the Art Museum of Estonia.*” (April 8-August 28, 2016, 5th floor, the Gallery of Contemporary Art). The Art Museum of Estonia is the biggest local collector and buyer of contemporary art. Works that qualify as hits were selected to celebrate the 10th anniversary of the Kumu Art Museum. Curated by Kati Ilves, Eha Komissarov, Annika Räim.
- “*Cold Look. Variations of Hyperrealism in Estonian Art*” (May 13-October 9, 2016, 4th floor, B-wing). In the 1970s, hyperrealism emerged in Estonian art as a paragon of conceptual painting, and skilfully

outwitted the official art policy of the time, which demanded realism. Since the 1990s, hyperrealism, which uses a photographic style of rendering, has become intertwined with various trends of contemporary art. Curated by Anu Allas.

- “*Terra Incognita: Familiar Infinity*” (June 12-September 12, 2016, Inner courtyard). *Terra Incognita* took KUMU’s relatively unused courtyard as its starting point. Architectural garden walks and the cosmodrome-like courtyard create the feeling of a utopian way station – and the location does connect two contrasting areas: a tunnel at one end of the garden leads to a district with Soviet architecture, while stairs at the other end descend to the Kadrioru Park of the 18th century. The exhibition took a look at what the meaning the term of *terra incognita* holds for us in the current moment of time. Curated by Kirke Kangro.
- “*Poetry and Spleen. The Victorian Female Image and Fashion from Alexandre Vassiliev’s Collection*” (July 2-October 30, 2016, The Great Hall). The 19th century was characterised by subdued and controlled femininity. In fashion, this was expressed by a new silhouette, achieved through the use of the crinoline and the corset. Black dresses became fashionable because many people were in mourning due to the high death rate of the era. Curated by Marion Laev, Eha Komissarov.
- “*Marcel Lefrancq and Belgian Surrealist Photography*” (July 8-November 6, 2016, 3rd floor, B-wing). Discovering the unknown in familiar things, Marcel Lefrancq applied unconventional plots, unexpected angles and a collage-like manner of execution to create works that make us see the world unlike it actually is. The exhibition was put together in cooperation with the Charleroi Museum of Photography (Belgium). Curated by Xavier Canonne.
- “*Mare Balticum. An artistic exploration of the underwater soundscape of the Baltic Sea*” (September 9-October 30, 2016, Tunnel in inner courtyard). *Mare Balticum* is an artistic exploration of the underwater soundscape of the Baltic Sea. The sound installation was based on a selection of sounds recorded during a scientific investigation conducted in 2014 and 2015 by BIAS: Baltic Sea Information on the Acoustic Soundscape. Collected from thirty-eight hydrophones, these recordings were made at exactly the same moment every hour, each day, for a year; this sonic map of the Baltic enables scientists to measure the effects of human-induced sound in the ocean. Curated by Torun Ekstrand.
- “*Soviet Midnight. Raul Rajangu*” (September 16, 2016-April 2, 2017, The Project Space, 4th floor, A-wing). The early series by Raul Rajangu “*Soviet Midnight*” (1981-1982) borrows motifs from Soviet state albums, brochures of advertisements and family photos. Mixing Lenin, the Soviet tradition of decorating fir-trees for New Year’s Eve and the Volga

(a Soviet car brand), the artist studies the innumerable paradoxes of the latter period of Soviet life. Curated by Liisa Kaljula.

- *“Between the Archive and Architecture. Neeme Kõlm, Krista Mölder and Taavi Talve”* (September 17, 2016-February 19, 2017, 5th floor, the Gallery of Contemporary Art). “Space is a doubt: I need to keep marking it, defining it; it is never mine, it has never been given to me, I must conquer it” (G. Perec). Installation artists used space as a platform, a starting point for creating new works of art. Curated by Kati Ilves.
- *“Water Music and Other Pictures of Sound. Vladimir Tarasov”* (October 21, 2016-February 12, 2017, 4th floor, B-wing). Vladimir Tarasov is a Russian musician and sound artist who lives in Lithuania. His works are experiments with sound in jazz, as well as art. A number of his best known installations were on display, including “Water Music”. Curated by Kati Ilves.
- *“Conductors of Colour. Music and Modernity in Estonian Art”* (November 18, 2016-August 27, 2017, 3rd floor, B-wing). The exhibition examined, for the first time, how sounds and music, for example peasant folk songs and even the clamour of cabarets, inspired such modern Estonian artists as Konrad Mägi, Eduard Wiiralt and Ado Vabbe to create “singing” landscapes and symphonies of colour. Curated by Bart Pushaw.
- *“Paul Delvaux. A Waking Dreamer”* (November 25, 2016-March 12, 2017, The Great Hall). The dream-like atmosphere of the works by this Belgian surrealist, who had a significant impact on 20th-century art, combines deeply personal motifs with quotations from art history. The exhibition was a cooperative project with the Musée d’Ixelles (Belgium). Curated by Claire Leblanc.

In the Kadriorg Art Museum 2 new exhibitions were opened:

- *“Love. Motifs in Art from the 16th to the Early 20th Century”* (April 16-August 21, 2016). Love is an eternal and universal topic, which has concerned and will continue to concern everyone. Works of art displayed at the exhibition revealed the various types of love: physical and spiritual, caring and forbidden. Curated by Mai Levin and Anu Allikvee.
- *“With a Burin, a Brush and a Pencil. Russian Graphic Art from the 19th-20th Centuries in Estonian Museums”* (September 3, 2016-January 8, 2017). The collections of Estonian museums are rich in Russian prints, including works by internationally renowned artists. This exhibition provided a survey of the history of Russian graphic art, and highlights links between Russian, Baltic-German and Estonian printmaking. A significant number of works were being displayed for the first time in Estonia. Curated by Tiina-Mall Kreem and Anu Allikvee.

In the Mikkel Museum 2 new exhibits were opened:

- *“Patrons of Narva. The Art Collection of the Lavretsovs”* (April 9-October 2, 2016). The Narva Museum houses the second largest foreign art collection in Estonia. Its nucleus is made up of works left to the museum by Sergey and Glafira Lavretsov. Despite the fact that the collection contains works by well-known Russian artists, such as Ivan Aivazovsky, Leo Lagorio and Vladimir Makovsky, it is not widely known. The exhibition provided an overview of the collection. Curated by Aleksandra Murre.
- *“Might and Pain. Works from Margus Punab’s Collection”* (October 15, 2016-March 26, 2017). The art collection of Margus Punab is extraordinary for a number of reasons: the total number of works, the importance of the artists represented and, above all, the principle behind the collection. The focus is not just on art, but on human beings or, to be more exact, on man. The pain and joy of becoming-being-remaining human is what these works by Estonian artists tell us about. Curated by Peeter Laurits and Aleksandra Murre.

In the Adamson-Eric museum 2 new exhibitions were opened:

- *“The City of Light. Estonian Artists in European Metropolises”* (March 11-August 7, 2016). The exhibition paid tribute to the great passion for creating and travelling, which characterised those Estonian artists of the first half of the 20th century who went to Europe to look for inspiration. Through their works, the viewer could experience the lure of big city lights and the buzz of cafes, witness the milieu of slums, and partake in encounters with peculiar characters. Curated by Kerttu Männiste, Kadri Asmer.
- *“Juhan Kuus. The Measure of Humanity. 45 Years of Documentary Photography in South Africa”* (August 19, 2016-January 15, 2017). Juhan Kuus (1953-2015) was an Estonian-born, internationally renowned documentary photographer, and worked in the Republic of South Africa. This was the first time that his creative legacy was on display in Estonia. Juhan Kuus received the prestigious World Press Photo award twice. At the peak of his career, he was a correspondent of the French photo agency SIPA in the Republic of South Africa. The exhibition focused on the three main creative stages in Kuus’s life. Curated by Kristel Laur, Toomas Järvet, Kersti Koll.

In the Niguliste museum the ongoing exhibition “Rode Altarpiece in Close-up” stayed open, in addition one new exhibition project took place:

- *“Kadri Mälk. Testament”* (September 28-October 30, 2016). Graceful and subtle, yet wild and independent – those words describe the work of Kadri Mälk, the founder of an internationally-renowned Estonian

school of jewellery. For her, a jewel is perfectly sufficient as a jewel and she does not strive to be outside its intimacy, its value or its closeness. Everything, which could be called a tradition, allows her to skilfully manage uncontrollable power, desperate passion and the will to life with all its acceptances and refusals, subjections and sovereignties.

Work with the public

Worthy of special recognition is the on-going active work of the Kumu Art Museum's auditorium in cooperation with Estonian and international organizations. The programmes of the auditorium are interdisciplinary and form an integrated part of the exhibition and research activity of Kumu. In the series Kumu Documentary taking place throughout the year, 36 movies were shown during 32 screenings.

From the 29th of September until the 2nd of October the Kumu Art Movie Festival KuFF took place, where throughout the five following days 15 movie screenings were held. In addition, a Super 8 mm analog film workshop was organized as a part of the KuFF program. As a co-production, on the 9th and 10th of December a play called "Cutting Edge" by the Finnish visual theatre WHS was brought to the stage.

In total 206 events were held in the Kumu auditorium in 2016, visited by 26 284 people.

Educational activity of EKM

All EKM branch museums run public programmes for different age and target groups, also educational programmes for students. Throughout the year, 2316 educational and public events took place in the branch museums of the Art Museum of Estonia, number of participants amounted to 50 789. In addition, various summer camps for kids were held.

In the course of the year, 2516 guided tours for adults were carried out, attended by 71 879 visitors, and 56 children's tours with 1215 children participating. 600 other events (concerts, openings, receptions, etc.) took place, with the total of 69 491 participants. The branch museums organised introduction days and carried out advanced training programmes for teachers and tour guides. The art studio belonging to the Kumu education centre made further progress; 444 art courses, studios and workshops with 4250 attendants took place.

As a part of the project "Guiding Children to Art", 259 specifically prepared museum lessons were carried out for 5838 children. All branch museums

put emphasis on designing and expanding programmes for people with special needs.

Close collaboration with higher education institutions also continues; 24 university students were on internship in the EKM museums. The exhibitions and events of EKM are communicated to the public in the Estonian, English and Finnish languages; in addition, the EKM web page was translated into Chinese. In 2016 the branch museums of EKM were visited by a total of 376 351 people.

ASSOCIATED ORGANISATIONS

Organisations from outside the structure of the Academy whose activities and objectives comply with the activities and objectives of the Academy, may associate with the Academy. Association is effected in the form of a bilateral agreement, specifying the aims, duties and commitments of the parties.

Reviews on the 2016 activities of the institutions associated with the Academy have been presented in the chronological order of their association date:

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ESTONIAN NATURALISTS' SOCIETY

Associated with the Estonian Academy of Sciences

23.01.1998

Founded in 1853

Membership: 693 active members, 15 honorary members, 631 trustees

Divisions: 22

Location: Struve 2, 51003 Tartu, ESTONIA

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Estonian Naturalists' Society has 22 divisions that perform as scientific sections: of amateur meteorologists, of anthropology, of botany, of entomology, of forestry, of geology, and of theoretical biology; the Lake Committee, the Estonian Malacological Society, the Estonian Mycological Society, the Estonian Teriological Society and the Jakob von Uexküll Centre; also committees for the history of natural sciences, the library, environmental education, observation networks, the ecological terminology, rare plants and plant names. In addition, the Society comprises assembly of ecology, assembly of honorary members and the round table of nature conservation.

In 2016 ten General Assemblies with scientific presentations were held:

January 28 – Mare Ainsaar: “When do humans go extinct?”;

March 1 – Baer’s Day (in honour of embryologist Karl Ernst von Baer), with talks given by Erki Tammiksaar: “Autobiography of K. E. von Baer in Estonian” and by Martin Kärner: “Sea urchin as a model in developmental biology in Baer’s time and today”;

April 28 – Peep Männil: “The golden jackal – how alien species develop into native species”;

September 29 – Peeter Somelar: “How did Hannibal cross the Alps with war elephants?”;

October 27 – Merle Muru: “Human settlement in Tallinn during the New Stone Age”;

November 24 – Mait Metspalu: “Archeogenetics and human evolution”;

December 16 – Tõnu Viik: “Water outside of the Earth”.

The 39th Naturalists' Day was held in Viljandimaa, in Olustvere, July 2-3. Field trips and workshops were organized to study local vascular

plants, lichens, stem decay fungi and dragonflies. Five scientific talks were presented, most of which focused on the biological diversity and geology of Viljandimaa. An excursion was organized in the neighbourhoods. In total 37 people participated at that event.

The activities of divisions of ENS during 2016 were the following:

Section of geology – the XII Geology Autumn School on the main subject “Sea” was organized at Roosta, Lääne county, on October 14-16. In total 18 scientific talks were presented and an excursion to study the coastal structures of the early stages of the Baltic Sea was organized. The papers were published in the collection *Schola Geologica XII* (135 pp.).

Section of theoretical biology – The XLII Spring School “Life’s hidden patterns” was organized at Ruusa, Põlva county, on May 20-22. 15 scientific talks were given. The papers were published in the collection *Schola Biotheoretica XLII* “Life’s hidden patterns” (172 pp.).

Section of botany – May 28-29 – the annual gathering of ‘friends of mosses’, attended by 25 participants and visiting the Mustoja Nature Reserve, Kuresoo and Lüübnitsa at Setomaa. 76 moss species were registered. The new issue of the internet journal “Friend of mosses, 19” was compiled.

The observers’ network of the **Section of amateur meteorologists** continued their work. The weather observation station at Jõgeva received data from 43 amateur stations. 18 stations measured precipitation in the warmer half of the year only; the others made snow observations also during winter time. The weather data (minimum and maximum air temperature, amount of precipitation, snow thickness and area covered by snow, atmospheric phenomena) were documented, compared and processed provisionally. Based on the collected data, the crucial agro-meteorological indicators were determined, and were subsequently used to update the time-series of observation stations. The collected data was combined with the data from the National Weather Service observation network for composing maps on distribution of precipitation, minimum air temperature, snow thickness and other meteorological indicators. Those maps are available in agro-meteorological reviews on Estonian Crop Research Institute website www.etki.ee. At the end of year, the weather review together with drawings and data received from observation network on hazardous phenomena will be transferred to the library of the Estonian Naturalists’ Society.

The Jõgeva amateur weather observation centre has developed a cooperation with NGO *Miinus 43,5*, responsible for organizing traditional Icicle-Winter Festivals at Jõgeva. Besides entertainment the event also provides insight into weather and climate science.

The meeting of amateur meteorologists and thunder observers (60 participants) was held at Jäneda on August 6. Eight scientific talks were given at the meeting, followed by an excursion.

Estonian Teriological Society – the Teriology Autumn School on the topic “Nature & Capitalism” was held on September 23-25 at Laelatu Biological Station, Lääne county. The programme was made up of ten parts, including lectures, workshops, discussions, hikes, etc. 49 participants (schoolchildren, university students, researchers, huntsmen, environmental activists, officials and hobby naturalists) attended the event.

The section of anthropology organised the Aul’s Day in honour of anthropologist Juhan Aul on October 20, jointly with the Physical Anthropology Centre of the University of Tartu. Five scientific reports were presented, 21 researchers attended the meeting.

Estonian Mycological Society organised two training courses on determination of mushroom species at Pedase in Harju county: the spring camp on May 5-7 (23 participants) and the autumn camp on September 22-25 (42 participants).

Annual meeting of the Mycological Society “Actiones” took place on 10 December in study halls of Natural Museum of the University of Tartu with 33 participants. During this day eight scientific reports were presented.

In cooperation with the University of Tartu *Folia Cryptogamica Estonica* 53 was published.

The section of forestry together with Estonian University of Life Sciences in 2016 organized the seminar “Is forest management sustainable in Estonia?” which took place on January 11th, 2017 (The preparations started already in 2016).

Members of **Estonian Malacological Society** finished the national monitoring sub-programme “Field guide of terrestrial snails”.

Library – as of December 2016, 161 699 printed items were recorded in the ENS library. In 2016, the Library acquired 77 new books and 177 periodicals. The publications were exchanged with 30 institutions and organisations from 14 countries.

Publications of the ENS in 2016:

Laanisto, L., Õpik, M., Vanatoa, A., Tammaru, T., Gimbutas, M., Tinn, O., Kull, K. (eds). *Life's hidden patterns: Schola biotheoretica XLII*. Tartu, 2016, 172 pp. (in Estonian).

Nemliher, R., Nirgi, T., Amon-Veskimeister, L. (eds). *Sea: Schola geologica XII*. Tartu, 2016, 135 pp. (in Estonian).

Folia Cryptogamica Estonica 53. Tartu, 2016, 126 pp. (in cooperation with the Institute of Ecology and Earth Sciences of the University of Tartu and Institute of Mining of the Tallinn University of Technology; in Estonian).

ESTONIAN GEOGRAPHICAL SOCIETY

Associated with the Estonian Academy of Sciences

27.01.1998

Founded in 1955

Membership: 210, 17 honorary members, 5 foreign members

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The Board of Estonian Geographical Society comprised the following members starting from 12 April 2015: Mihkel Kangur (President), Arvo Järvet (Vice-President), Liisa Puusepp (Vice-President), Tiiu Koff, Taavi Pae, Hannes Palang, Tiit Tammaru, Ulvi Urgard, Rein Vaikmäe and Academic Secretary Tiit Vaasma.

Estonian Geographical Society is an organisation uniting geographers and people interested in geography. Main avenues of activities of the Society are the releasing of specialised publications, doing scientific research, organising scientific events and dissemination of knowledge in geography.

The sustainability of the Society is secured by the Society's Youth Club with its active traditional undertakings, aiming to attract the youth into academic communal activities, into learning to know the Estonian geographic conditions, often thereby complementing the internships at the Universities. Youth Club was headed by Dagmar Seppor and Anna-Helena Purre.

In 2016, the Estonian Geographical Society released one collection:

Järvet, A. (ed.) *Eesti Geograafia Seltsi Aastaraamat* (Yearbook of Estonian Geographical Society) 41. Tallinn, 2016, 295 pp.

In connection with the administrative reform currently in progress, the General Meeting of the Estonian Geographical Society (17 April) heard the presentation by Assistant Professor Garri Raagmaa (Department of Geography, Institute of Ecology and Earth Sciences, University of Tartu): "Is it conceivable to administer a territory without geography?" Thereafter Taavi Pae (researcher of the same affiliation) presented the idea and concept of Estonian National Atlas that will be completed by centennial of the Republic of Estonia.

Beside the regular business – report of the activities and issues of the working plans, a one-thousand-euro memorial stipend of the late President of the Society Professor Jaan-Mati Punning was awarded at the General Meeting to doctoral student Anna-Helena Purre (Institute of Natural and Health Sciences, Tallinn University). In her doctoral thesis she considers the factors impacting on restoring vegetation on deserted milled-peat bogs and the carbon streams related to plant canopy on those areas. She is expected to use the stipend to carry out field surveys related to measuring of carbon streams on recycled milled-peat bogs. The Estonian Geographical Society jointly with the Foundation Tartu Cultural Endowment grants that stipend to undergraduates of natural geography and related specialties of bachelor studies, master students, doctoral students and young post-doctoral researchers, in order to enable them to pursue their scientific ambitions.

At the annual meeting, the Society was replenished by two new honorary members.

Elected honorary member was researcher of the Institute of Ecology of Tallinn University, Candidate in Geography Urve Ratas. She is rightfully considered the most reputed researcher of landscapes and development of Estonian isles and islets, being the best expert of all times in the area. Probably the best dedicated expert in distant history of Estonian cartography, a top sportsman in orienteering and a veteran promoter of that field Tõnu Raid was also elected as honorary member.

At the end of May (May 27-29, 2016) the young geographers visited Osmussaar in an annual island hike. They enjoyed the nature, bathed in the sun and made a hiking tour of the island.

On August 2-4, the geographers headed to Setomaa, in an annual summer excursion of the Society, with a detour to Latvia, in order to visit the southernmost spot of the Republic of Estonia in the former Pedetsi (Pededze) parish (the former southern part of the Laura parish) at Kudepi. The detailed history of that area is presented in the article: Tõnisson, A., Pae, T. 2015. Geographer Peeter Päts. In: Järvet, A. (ed.) *Yearbook of Estonian Geographical Society vol. 41*. Tallinn, pp. 106-123.

The trip was moderated by the expert guides Marju Kõivupuu and Taavi Pae, well versed in local lore and sights. The geographers visited the Seto Farm Museum, a regular Seto outfit with all appropriate paraphernalia. Thereafter they proceeded through the Saatse “boot”, an area under control of Russian Federation, a sort of peninsula within the control line dividing

Setomaa, crossed by an ancient road between Värskä and Saatse. In Saatse they visited a cemetery and the 200 years old Orthodox Church of Saint Paraskeva (Saint Parascheva), a miracle-working stone-cross dating from the 15th century. Then they headed through the Koidula border check-point to the Piusa sand quarries, to Obinitsa to remember the Setomaa songsters and to climb up the Meremäe observation tower. On the second day, guided by Taavi Pae, they proceeded to the Luhamaa Church of Holy Spirit erected at the old Riga–Pskov stone road, where Mr Pae shared his impressive knowledge in cultural geography and specifically of graveyards. Followed the conquering of the highest hill of Petserimaa (Maaniidü hill; 225 m above sea level) in the corner of Luhamaa. The day before, the then President of the Republic of Estonia Toomas Hendrik Ilves and Minister of the Interior Hanno Pevkur with retinue had opened the new border pole no. 1, located in the tripoint (also three-country point, where borderlines of three states intersect), so the geographers went to look at it, escorted by the border guard.

In Latvia they visited, besides the above southernmost point of Estonia, also the Ķuršu church and churchyard and the Aluksne town, where the excursion party roamed the sightseeing spots for several hours. On the third day the sightseers made a stop at Rõuge, gazed with wonder at the Hinni canyon, took photos of the Tamme–Lauri oak and indulged in sights of the picturesque South-Estonia. M. Kõivupuu showed them also the Cross-trees. After lunch at Otepää they moved on to Pilstvere, to look at the pre-historic pile of granite and church. In the Kurla hamlet they met with relatives of the Academic Secretary of the Society Tiit Vaasma, active promoters of village society, living in the native homestead of his father. Kurla is also the seat of birthplace of the statesman August Rei and the gate to Hades, known from the Estonian epic poem *Kalevipoeg*. Thereafter the bus of sightseers made straight for Tallinn.

The five-day bicycle trip of the Youth Club (August 3-7) headed from Rakvere via Narva to Jõhvi. It was a next successive leg of a trip round Estonia, which followed the tradition of avoiding the main arteries, meandering along cross-country dirt roads. That leg finalised the tour of the Continental Estonia. The excursion party was not deterred by steady downpour of rain and rough terrain. They caught a glimpse of both beauty spots and desolate industrial landscape. On the banks of the Narva river the sightseers prided themselves on free Estonia and paid a token of honour to those fallen for liberating it.

President of the Estonian Geographical Society Mihkel Kangur and the Academic Secretary of the Society Tiit Vaasma participated at the 33rd

International Geographical Congress held in Beijing on August 21-25. Such congresses have been held since 1871, when geographers gathered for the first meeting in Antwerp, although the International Geographical Union (IGU) was officially established some 50 years later. Those international scientific events are impressive, there were over 5000 participants in Beijing. The plenary papers provided, thanks to a wider level of generalisation and invited speakers, a good review of avenues of development of geographical science as per different disciplines.

The common message of several plenary papers was a call for closer cooperation of branches of science in promotion of flexible organisation of society. It is geography as an essentially interdisciplinary science which may play a pivotal role in providing framework to joint work of various scientists. Without the common efforts in giving meaning to relations between man and environment, without working out new behavioural patterns in all walks and levels of life, the sustainable development of humankind will become ever more complicated, being short of impossible. Development of spatial-temporal thinking and literacy skills is conceived as growingly important in national curricula.

Given the volume of data, collected by man on surrounding environment, drawn on technological progress, the specialists are able to analyse such volumes of data, to realize implications and to implement them for the benefit of society. The increasingly broader employment of geo-information systems has altered the curricula of many countries to mount to focus the geography, having meanwhile relapsed into a supporting status. It was reiterated that Estonia is traditionally a country with a good geographical education, as confirmed by excellent performance of the Estonian youth at the 13th International Geographical Olympiad, held in Beijing on August 16-22, with gold medal winners awarded at Congress.

In the process of Congress, the IGU General Assembly was convened, with Estonia represented by M. Kangur. The status of standing member of the IGU enabled him to have a say in formation of the positions, followed by the IGU representatives when working in international scientific bodies. The General Assembly elected also a new President of the IGU (2016-2020): Professor Yukio Himiyama of Hokkaido University of Education. Professor Michael Meadows of Capetown University will keep the office of the IGU Secretary General. The Estonian geographers know M. Meadows personally, because he visited Estonia and delivered a paper at the EGS 60th anniversary conference in Tallinn in autumn 2015.

President of the Society M. Kangur was elected head of the *Future Earth* Europe Alliance on November 22. Until that time M. Kangur had headed the work of Estonian Committee of the Alliance. *Future Earth* is a cooperation platform of scientists created in 2015, with the goal of developing and promoting within ten years the scientific aspect of the sustainable development. The network embraces scientists of various domains. The activities of the *Future Earth* are closely related to the various goals of the UN sustainable development strategy and international agreements.

On December 9 the Society organised in the grand hall of the Estonian Academy of Sciences a conference dedicated to the 100th anniversary of pollen analysis, moderated by Tiiu Koff. It marked the centenary of the pollen diagram performed by Lennart von Post and its presentation at a meeting of Scandinavian natural scientists. In about a decade the said method was also used in Estonia, with P. W. Thomson describing the pollen composition of Estonian mires, bogs and marshes. Since that period the pollen analysis has been developed and used for solving various palaeo-geographical issues.

The conference exposed different aspects of pollen analysis. Tiiu Koff spoke about the history of pollen analysis in Estonia, with Aivar Kriiska reciprocating with information about Dr. Thomson's bog-geological surveys and links between archaeology and pollen analysis. Siim Veski presented an insight into climate reconstruction by pollen analysis and Anneli Poska submitted a review of development of post-glacial period plant canopy and land tilling in the Karula highland. Because all reconstructions were related to modelling, Shinya Sugita presented the models. Mart Vill spoke about monitoring of pollen in Estonia, with Liisa Puusepp concluding the session with her analyses of pollen in honey.

Members of Society's school geography section participated at organisation of regional and national Geographical Olympiads. They went to a study trip in Finland, carried out study hikes to Tallinn TV tower, Mulgimaa and Harjumaa preserves. They compiled the examination tasks and graded the gymnasium state examinations. The teachers held monthly subject sections.

The Estonian Geographical Society, having considered the public materials of the planned Rail Baltic, having analysed the opinions disclosed in media and having used the knowledge of active Society members in Estonian natural, social and economic geography submitted to the Estonian Parliament (*Riigikogu*) the views and proposals of Society on Rail Baltic.

Complementary to major events and lesser meetings, members of the Youth Club visited the mineral resource division of the Environmental Board at the beginning of May, with the chief specialist Maria Karus presenting her work.

At five club meetings the geographers heard educational travelling impressions, seconded by illustrative material. Mall Kaare spoke about her trip to Oman, the geographers learned what Kalev Kukk experienced in New Zealand and 43 years ago with Leo-Peeter Kullus and others in Central Asia (Kukk exposed the digitised slides dating from that period), Marko Vainu shared his impressions and showed pictures of Georgia, and Tiiu Liblik and Kalev Kukk provided a review of the expedition of the Estonian Geological Society to Portugal.

SOCIETY OF ESTONIAN AREAL STUDIES

Associated with the Estonian Academy of Sciences

27.01.1998

Founded 1939

Membership: 203 members

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Chairman: Andrus Ristkok, Tel: +372 5664 7806

Secretary: Ene Luka, Tel: +372 644 0475

For the fourth time, there was a contest held for the best publications by members of the Society. Among the nominees of the annual prize were Aino-Monika Jõesaar *Narva Kutseõppekeskuse 15 töörohket aastat: 2000-2015* (15 laborious years of the Narva Professional Training Centre: 2000-2015), Vello Kallandi *Metsla küla uutest piiridest* (The Metsla hamlet within new borders) and Eino Tomberg *Asundustalud Vaos, 2015: Vao mõisa maadele rajatud asundustalude lood nende rajamisest kuni lõpuni ja kaasajal* (Homesteads in Vao, 2015: The story of the homesteads established on lands of the Vao manor from their establishment until an end and in modern time). The annual prize was bestowed on Vello Kallandi from Järvamaa.

The regular Society Yearbook was released. It features, beside personal stories of researchers in areal studies and individual research, the overviews of the Days of Native Place of Tõhela during 30 years and hobby days of junior guides and researchers in areal studies, of an equally long history.

The Society held two general meetings in 2016. At the spring general meeting in Tallinn on April 23, held in National Library, Anne Ainz recollected the bibliographer Endel Annus and highlighted his links to areal studies. Ilme Mäesalu presented and compared the graveyard culture in Estonia and elsewhere in Europe. The paper was illustrated by a slide programme. The general meeting held in September approved the Board of the Society for the following three years in the composition: Andrus Ristkok (Chairman), Ene Luka, Ester Kerge and Georgi Särekanno. E. Luka introduced some lesser known digital databases, where researchers in areal studies can find complementary materials.

In mid-July the Board organised a trip to the renovated Natural Museum of the University of Tartu. After visiting the Museum the company travelled to Haaslava. They toured round the Haaslava parish (Lange-Reola-Küti-Villemi-Kurepalu-Sillaotsa), guided by Taivo Kirm, presenting cultural history spots on route and providing an overview of local history and

culture in the Kurepalu community hall, which used to be the seat of the legendary temperance society *Priius*.

On September 30 the Tartu Literary Museum organised a seminar to remember Vello Paatsi, known as a tireless researcher having made numerous generalisations in areal studies derived from Estonian cultural history. The subject matter of the event was the release by Ilmamaa Publishers of a volume of keynote publications by V. Paatsi for the last score of years. Vello Paatsi was also a member of Society. He most sadly died a couple of days before the turn of the year in the prime of his creative life.

On October 25, there was a thanksgiving event – a festive conference held in the Hall of the Academy of Sciences in Tallinn, among others presenting the conspicuously successful participants at the students' contest of creative and research papers "Let's study the history of school!"

This year, the county students' conferences were held in Pärnumaa (on April 21 in the hall of the county administration), in Järvamaa (on May 26 in Tammsaare Museum at Vargamäe), in Raplamaa (on November 2) and after several years also in Lääne-Virumaa (on September 29 at Sõmeru basic school). On November 25 there was held in the Pärnu House of Arts, under auspices of the Pärnu City and County Administration, the 46th National Conference of the Students' Areal Studies, with the programme featuring presentation of 17 works from 15 schools. The state support to that event has been lacking for some years now, therefore the scope was not as it used to be at earlier national conferences, however the areal studies have still been promoted, and the outcomes of studies have been communicated to other students. We can safely assert that the tradition is viable and unbroken.

Members of the Society have continued as active promoters of local cultural events furnishing their subject matter. Of particular note is the regular alertness of the union of Pärnumaa researchers in areal studies. They have organised outings to look at place museums (Audru, Helme, Viljandi), the cultural history sites (Valga/Valka, the Tallinn inner-town cemetery, KuMu Art Museum, the Museum of the Bank of Estonia, the Museum of Architecture, the one-day tour of manors), meetings with papers and colloquy with researchers of areal studies.

There are other examples to the point. Jüri Freimann organised in August the presentation of his review book on history of Lehtse. Georgi Särekanno organised at Jäneda an exposition about Piret Pihel (a well known target shooting sportsman, a promoter of local rural and cultural life, a one-time

parish elder of Tapa). Vaike Hang completed the organising of archives of Erik Kumari, a most reputed ornithologist of Estonia, and its transfer to the Estonian National Archives. She has also re-completed and staged several exhibitions to illustrate the respective events (the life and work of the long-standing head and developer of Tallinn Zoo Mati Kaal, the landscape scientist Ivar Arold and the silviculturist Ülo Tamm; and the place names of hamlets of the Tõhela area).

The past year was a fruitful publishing year of researchers in areal studies. The Board of the Society was informed about at least 18 major works published. References are available at the Society website www.ekus.ee/kodu-uurimine/bibliograafia.

However, the activists organised the topical events also without direct contribution by the Society. The meetings with other enthusiasts of areal studies and history of culture, study hikes and study days, discussions and lectures, and presentations of new books and researchers are a regular and commonplace form of cooperation.

ESTONIAN MOTHER TONGUE SOCIETY

Associated with the Estonian Academy of Sciences

4.02.1998

Founded in 1920

Membership: 370 active members and 15 honorary members

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In 2016 the Society organised three conferences, three meetings with papers, a youth language camp and 10 language days, incl. the Estonian language days abroad (6). In that year, 88 papers were delivered.

Outside Estonia, co-organised by the Ministry of Education and Research, local Estonian societies and teaching centres of Estonian, 6 language days were held (in Oulu, Dublin, Stockholm, Berlin, Vienna, and Saint Petersburg). The topics of papers were widely different, in view of the proposals and expectations of local listeners. As usual, a review of the Estonian language policy belonged among papers. There were also papers delivered on teaching of the Estonian language and culture in foreign universities, the study aids of Estonian, developments in the world of the Estonian language and culture, the outstanding figures of Estonian history, and work of the Mother Tongue Society, the current state of language technology, the Estonian language against the background of European languages, the web application “My people”, bilingualism and its mastering, teaching of Estonian and repatriation to Estonia; besides that recent fiction was presented, incl. children’s literature. Altogether 26 papers were delivered at the Estonian language days abroad and six roundtables were held.

In 2016 the Society organised three conferences, where 19 papers were delivered.

September 16 – The language conference titled “Two centuries with the letter ‘õ’ in Tabivere and Äksi, held in cooperation with the Institute of General Linguistics of the University of Tartu, Learned Estonian Society and the Centre of Excellence in Estonian Studies. There were six papers delivered. Valve-Liivi Kingisepp described the access of the letter ‘õ’ into the Estonian literary language, Kersti Taal provided an overview of the issue of Estonian in Kreutzwald’s correspondence, Fred Puss spoke about

taking of the letter ‘õ’ into use in metrics and personae books of Lutheran congregations in different districts of Estonia, Kristiina Praakli spoke about the õ-sound from the angle of view of socio-linguistics, Piret Teras presented the variation of pronunciation of ‘õ’.

June 27 – The traditional J. V. Veski language conference at Tartu. The topic of the XLIX conference was “History of Estonian and Livonian”. There were 5 papers on agenda. The opening paper “Integral treatment of history of the Estonian literary language” was delivered by Heli Laanekask. Külli Prillop spoke on the topic “The original occurrences of words and forms in old literary language”, Tiit-Rein Viitso “Phonetic history of Estonian against the background of cognate languages”, Miina Norvik and Valts Ernštreits “New grammar of Livonian” and Karl Pajusalu “Eduard Vääri as researcher of the Livonian language and culture”. The presentation of Eduard Vääri’s collection of Livonian studies “The tongue and psyche of the Livonian people” followed. The collection was released as the 74th issue of the series of Proceedings of the Mother Tongue Society.

September 23 – The annual student conference held in the University of Tartu to celebrate the Day of European Languages. Bachelor and master programme students of Tallinn University and the University of Tartu spoke about their language studies, delivering altogether 8 papers in two subject areas: “Language under a magnifying glass” and “Languages on map and in use”.

Mother Tongue Society in cooperation with the Ministry of Education and Research organised the poll for the award of the Linguistic Feat 2015, eventually granted to e-language advice of the Institute of the Estonian Language. The Society co-organised the final event of the Linguistic Feat, held on March 18, 2016 at Jõhvi Gymnasium, with one paper delivered.

April 27 – Annual meeting of the Estonian Mother Tongue Society was held in Tartu, with Arvo Krikmann’s academic paper “Are riddles and conundrums a befitting source of dialectal vocabulary?” Report of the Society for its 95th year of activities (2015) was presented by Academic Secretary Killu Paldrok. Thus the annual meeting heard two papers.

April 28 – Language Day of Ferdinand Johann Wiedemann language prize held at the Väike-Maarja community centre. There were four papers on agenda. Traditionally, the memorial oak was planted by the laureate-elect of the F. J. Wiedemann language prize, in 2016 the ocean-going shipmaster Uno Laur.

At three meetings with papers (one in Tallinn and two in Tartu) 9 papers were delivered.

March 3 – the meeting on names at Tartu, with Marja Kallasmaa, Peeter Päll and Annika Hussar speaking.

May 5 – the meeting at Tartu, marking the 70th anniversary of Reet Kasik, with Helle Metslang, Kersti Lepajõe and Krista Kerge speaking.

October 17 – the meeting in Tallinn, marking the 70th anniversary of Einar Kraudi, with Pire Teras, Hille Pajupuu and Rene Altrov, and Härmo Saarm speaking.

Estonian Mother Tongue Society successfully continued organisation of school language days. In 2016, there were 4 language days held with the total of 14 papers. Speaking at schools were Estonian philologists of different areas and local school students.

The language day held at Tartu in Jaan Poska gymnasium on the topic “Language within smartship?!”, with Martin Ehala speaking about Internet in Estonian and impact of development of digital environment on Estonian, Mark Fišel about machine translation, the professional sign language interpreter Liina Paales about smart applications for those hard-of-hearing (with hearing impairment or auditory disturbance) and Olga Gerassimenko about how human connection is modelled in robot counterparts (homo-logue robots) and dialog systems.

Speaking at Viljandi gymnasium were the student of the 11th form Kristin Kink about homestead names of the Kõpu parish of Viljandimaa, Siim Antso about Estonian dialects as seen by students, Ilmar Tomusk about business names and public information and Marje Joalaid about the new place-name book. At Rakvere gymnasium in science and humanities the language classes were delivered by Margit Kuusk (Finnish), Nikolay Kuznetsov (the Komi language) and Anu Nurk (Hungarian), with Miina Norvik providing a review about similarities and differences of world languages.

Speaking at Põlva were Miina Norvik and Linda Freienthal, introducing the world languages through linguistic tasks.

October 24-26 – A three-day youth-oriented language camp in Viljandimaa at Männiku “Language and style”. It brought together 25 gymnasium students over Estonia, incl. linguists from Mother Tongue Society, Institute

of the Estonian Language, Tallinn University, the University of Tartu and the Viljandi Cultural Academy. Seven papers were delivered, with linguists of different generations presenting their specialty, discussions, games and contests organised, thoughts exchanged. Participants enjoyed connecting. The following topics were given closer consideration: language and style in general by the mother tongue teacher Ilona Võik, officialese as bad style by Tiina Leemets, literature and style by Eva Velsker and Mart Velsker, media language and style by Kersti Lepajõe, visual language of heritage culture by Ave Matsin, style of scientific language by Maigi Vija, issues of style in creating texts by the author Heiki Raudla, Mother Tongue Olympiad on style by Merilin Aruvee.

Maire Raadik has been the elder of the Language Working Group of the Estonian Mother Tongue Society since April 1, 2016. The Language Working Group includes Reili Argus, Reet Kasik, Krista Kerge, Katrin Kern, Einar Kraut, Helika Mäekivi, Urve Pirso, Peeter Päll, Külli Habicht and Arvi Tavast. The Language Working Group held two sessions and one e-mail discussion.

Central topics of discussion in 2016 were the use of punctuation marks; whether the number and percent sign are written without any space in between; the writing of quoted words; the joined-separate writing of numerals; declination of hyphenated compounds, on which a decision was taken on 17 March. Members and elder of the Language Working Group have spoken up at training events designed for students, teachers and language editors, at language and information days, e.g. at a conference of law-making jurists and on days of the language in crucible of change in Tallinn, at teacher training days in Tallinn and Tartu. Public has been notified about the recent language planning topics and positions through Internet, issues of press, magazine *Oma Keel*, collection "Language advice recommends" and oral papers. Researchers have spoken up in newspapers, have gone on air and have answered the inquiries both by individuals and institutions.

The Society continued extending support to completion of academic integral treatments of the Estonian language (composing and editing of history of the literary language of the 9th and 10th periods and treatment of morphology; editing both formally and linguistically of the completed parts of spoken language and morphology and their layout, editing both formally and linguistically of the treatment of syntax, checking out the literature references and compiling the register).

In 2016, two new initiatives were put in place. There was launched the companies' goodwill promotion campaign for generation of the Estonian business

names titled “*Ehe eesti – eesti ettevõttele eesti nimi*” (Unadulterate Estonian – an Estonian name to an Estonian company) and in March we issued four prizes in four categories (an industrial enterprise: *Puupagana OÜ*; service enterprise: *Valge Klaar*; public association: *Sõltumatu Tantsu Lava*; newcomer of the year: *OÜ Tulõtungal*). Secondly, the Society launched the language nights of the youth section at Tallinn University and the University of Tartu.

The Mother Tongue Society upheld the idea of the language cafe at Sillamäe, contributing to preservation and enhancing of mastery in Estonian among the local Russian speaking residents. Besides that the Society supported jointly with the Ministry of Education and Research the completion of methods clips designed for teachers of Estonian.

In 2016, some earlier linguistic undertakings were continued: the dictation of mother tongue in cooperation with the University of Tartu and Estonian National Broadcasting Company; the summary writing competition “Gist in a nutshell” (*Tuum*) in cooperation with the University of Tartu and Estonian Mother Tongue Teachers Society; reciprocal study trips of the University of Tartu and Tallinn University and language quizzes and conundrums in the magazine *Oma Keel* and in the Language Information Sheet.

In cooperation with the Ministry of Education and Research, for the second time in history a one-off lump-sum stipend was granted designed to master students studying under curriculum “Teacher of the Estonian language and literature” (6400 EUR).

Released in print in 2016 were:

- Yearbook of the Mother Tongue Society 61 (2015). Editor in chief Mati Erelt, editor Sirje Mäearu. Mother Tongue Society of the Estonian Academy of Sciences. Tallinn 2016. 343 pp;
- Eduard Vääri’s collection of articles “The tongue and psyche of the Livonian people”. Proceedings of the Mother Tongue Society no. 74. Tallinn 2016. 430 pp;
- Language magazine *Oma Keel* no. 1, 110 pp;
- Language magazine *Oma Keel* no. 2, 134 pp.

The Library of the Society was replenished by 64 items of printed matter, obtained by exchange, donation or purchase. The Library holds 6538 items of printed matter on record. We are steadily digitising earlier publications (Proceedings of the Mother Tongue Society no. 18, 20 and 2), they are available in digital archives “Digar” of the National Library.

ESTONIAN ASSOCIATION OF THE HISTORY AND PHILOSOPHY OF SCIENCE

Associated with the Estonian Academy of Sciences

4.02.1998

Founded in 1967

Membership: 67 active members, 8 honorary members, 6 collective members

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Estonian Association of the History and Philosophy of Science (EAHPS) associated with the Estonian Academy of Sciences is active in Tallinn and Tartu. It is a member of the Baltic Association of the History and Philosophy of Science and a member of both autonomous divisions of the International Union of the History and Philosophy of Science and Technology, of which the first embraces the history of science and technology, and the other the logic, methodology, and philosophy of science and technology.

The Executive Board of the Association met four times (January 5, April 9, August 17 and December 28). The general meeting was held once in Tartu, in the Centre for Science Studies of the Estonian University of Life Sciences (Veski 4) on April 29. The general meeting approved the activities report of the Association for 2015 and the working plan for 2016. The general meeting approved several amendments to the Statutes of the Association. In addition to corrections in the names of international organisations, it adopted new rules of calling the meeting in order to make the process more smooth and effective. The new official address of the Association is Akadeemia tee 3 in Tallinn. The Auditing Commission of the Association was appointed, Raul Veede being its sole member.

The cooperation project between EAHPS and Wikimedia Estonia for integrating “The Biographical Lexicon of Estonian Science” into Wikipedia continued throughout 2016. Majority of biographies from the fourth volume have been inserted into Wikipedia in Estonian.

The Executive Board of EAHPS continued with preparatory work for the XXVIII Baltic Conference on the History of Science that will take place in Tartu in May 2017. The relatively large number of the Board meetings in

2016 was caused by these preparations. The keywords of the conference are the University of Tartu and G. F. Parrot. The focus is on the development of theoretical and practical sciences and areas of life on the western border of the Russian Empire in early 19th century.

The Association was involved in the publication process of the scientific journal *Acta Baltica Historiae et Philosophiae Scientiarum*. In total eight issues have been published since 2013 (two issues per year). The journal was presented to Scopus for evaluation and on November 24, a positive decision was conveyed to the Editor in Chief (Peeter Mürsepp). Scopus has initiated the process of including the journal into its database.

The General Assembly of the International Academy of the History of Science that was held in Liège on December 17 elected the Chairman of EAHPS Peeter Mürsepp and Board member Erki Tammiksaar to the position of Corresponding Members of the Academy.

The members of EAHPS participated in many local and international academic events that were dedicated to the history and philosophy of science throughout 2016. This meant not just giving talks but also organising symposia and even whole conferences. For instance, the annual conference of Nordic Network of Philosophy of Science was held in Estonia for the first time (in Pärnu on April 21-23). The organising team consisted of the members of the Chair of Philosophy of Science at the University of Tartu, all of whom are also members of EAHPS.

The main task of EAHPS for 2017 is successful organisation and holding of the XXVIII Baltic Conference on the History of Science in Tartu on May 18-20. Publishing the journal *Acta Baltica Historiae et Philosophiae Scientiarum* will be continued in cooperation with the School of Business and Governance of Tallinn University of Technology.

ESTONIAN LEARNED SOCIETY IN SWEDEN

Associated with the Estonian Academy of Sciences
19.03.1999

Founded in 1945

Membership: 82 active members and 2 honorary members

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By the end of year the Society numbered 82 regular members, and two honorary members: Prof. Jüri Engelbrecht and Prof. Raimo Raag. In 2016 Dr. Piret Villo from Department of Chemistry of the Stockholm University joined the membership. Departed: Ants Teder, Professor of the Wood Technology; Vello Trepp, Ph.M.; Alar Krepp, pharmacist; Enno Penno, Licentiate in Technology, Chairman of the Society in 1981-1986, a long-standing member of editorial board of the yearbook; Henn Koch, Master in Political Science.

The Board comprised: Evelin Tamm (Chairman), Helena Faust (Deputy Chairman and Secretary), Sirle Sööt (Deputy Chairman), Anu Mai Köll (Treasurer), Piret Villo (Secretary, approved as Member of Board on 12 May 2016), Ants Anderson, Ruth Rajamaa, Ivar Paljak and Tiit Pädam.

Auditing committee: Ülo Kool, Koidu Norén and Maret Paljak (substitute).

Election committee: Mart Lindeberg-Lindvet and Ants Teder (substitute, departed in 2016).

There were seven Board meetings, plus the working bee for distribution of the yearbook in May. The shift of generations evidenced in the Board has been smooth. In March the Board was joined by Piret Villo, who also took over the tasks of the Secretary. Communication with members takes place mainly via e-mail; we have published electronically the notes and articles, among others the press releases on events, and mailed them to Estonia.

On February 24 Evelin Tamm published a lengthy interview with the former Chairman of the Society Ants Anderson in the daily *Eesti Päevaleht* titled “The trip is interesting and seemingly unending”. All Society events have been covered by articles. The basic channel for output used is the *Eesti Päevaleht* in Stockholm and the Society facebook page. The information about the Society is available in the portal of the Union of Swedish Estonians (REL) sverigeesterna.se.

The former chairman Ants Anderson transferred to Evelin Tamm the Society archives (8 dossiers) and other property of the Society, incl. the colour-jet printer. Since September the Society has been sharing with REL and Institute of the Estonian Language and Literature the basement premises in the Estonian House. All Society yearbooks since the beginning to the present day are in safe custody in the basement, so are some other publications. Ants Anderson compiled an accurate list of books, held by the Chairman together with the key to the basement.

The website of the Society <http://etsr.se/> has been updated. Since previous year the application for membership can be filed electronically. The XV Yearbook edited by Ants Anderson was delivered to the Estonian House on May 11, where Tiit Pädam unloaded the crates with books. On May 30 there was a working bee of the Board and the yearbook with the autumnal information brief was mailed to all members of the Society.

On October 8 the Chairman of the Society Evelin Tamm participated at the conference of the 90th anniversary of the Estonian Academic Women's Union at the University of Tartu, delivering a paper “Academic women in exile” and congratulating the Union on behalf of the Society. E. Tamm and Deputy Chairman Sirle Sööt participate in the Estival working group, planning the activities in Sweden in 2018 related to the event “Republic of Estonia 100”. Besides that Evelin Tamm and Sirle Sööt participate in the Baltic cooperation group, planning the organisation of a joint scientific conference in 2018 in connection with the centennial of Estonia, Latvia and Lithuania.

Editor in chief of the XV Yearbook (2010-2014) is Ants Anderson. The book was delivered to members at the beginning of June; it is still being distributed. Presentation of the yearbook is available on website of the Society. Yearbooks can be acquired from the Estonian House, Bureau of the Union of Swedish Estonians, or they can be ordered from the Board. Editorial Board of the XVI Yearbook (2016-2017) comprises: Anu Mai Köll, Helena Faust and Evelin Tamm. Deadline for presenting the manuscripts

is May 1, 2017. Hopefully we get the XVI Yearbook from print by the centenary of the Republic of Estonia.

In 2016 we held four meetings with papers, organised an outing to the Karolinska Institute, an autumn symposium with eight papers and the festive meeting of the anniversary of the university education in Estonian language. The honorary guest of the meeting was President of Estonian Academy of Sciences Professor Tarmo Soomere. All events were held in Stockholm, in the Estonian House, except the outing. In October the Board passed an unanimous decision to become member of the Union of Swedish Estonians.

February 4 – “Epigenetic epidemiology” by Dr. Kristiina Rajaleid, post-doctoral researcher of Stockholm University, plus the annual meeting.

March 10 – “Speech planning and conversation intentions in breathing pattern” by Kätlin Aare, doctoral student of the University of Tartu.

April 7 – “Migration of Estonians in Europe” by Maarja Saar, doctoral student in sociology of Södertörn College.

May 12 – “Differences and similarities of Estonian and Swedish folk music: interpreting the traditional music with a modern instrument” by Tuulikki Bartosik, founder of the specialty of traditional music and lecturer of Estonian Academy of Music and Theatre.

September 14 – Outing to the Huddinge Division of the Karolinska Institute. The scientists of Estonian origin, Helena Faust, Meeli Sirotkina, Taavi Lehto, Helena Sork, Kaarel Krjutskov presented their work and work premises. Members of the Society looked at cells, bacteria, microscope slides, robots and other equipment. They were informed about cancer generating viruses, fight against cervix uteri cancer, classical pathology, molecular genetics of diseases and gene therapy. Around 15 people attended the outing.

October 13 – “Refugees in Sweden 1944-1952: families and daily life” by Prof. Anu Mai Köll.

November 3 – The traditional autumn symposium, initiated in 2014 with eight papers delivered: Kelli Lehto “Depression, anxiety and fateful genes”; Piret Villo “Chemistry – molecular art of building”; Tõnis Lehto “Use of peptides at transportation of gene medicine into cell”; Ivika Jäger “The subject matter of the science of financing”; Liisa Sõmersalu “Role of media

in involvement of citizens”; Sirle Sööt “Juridical aspect of electing the Estonian president”; Ruth Rajamaa “An event on North-Estonian coast in 1376”; Evelin Tamm “The activity in Sweden of the Estonian Academic Women’s Union”.

December 1 – Celebration of the 97th anniversary of the university education in Estonian language. The paper “Estonian coastal sea in the time of disturbance” was delivered by Prof. Tarmo Soomere, President of the Estonian Academy of Sciences. “Sea in Estonian poetry” was presented by Indrek Parts. There was programme of classic music by Liisi Metsvahi (violin) and Linnea Vikström (cello). The festive meeting was followed by a dinner.

ESTONIAN LITERARY SOCIETY

Associated with the Estonian Academy of Sciences

23.01.2001

Founded in 1907

Members: 278 (including 35 lifetime members and 8 honorary members)

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The year 2016 can be characterized as a year of many new experiences and initiatives for the Estonian Literary Society. According to the contract signed with the City Government of Tartu, the Society is now responsible for representing Tartu as UNESCO City of Literature in the UNESCO Creative Cities Network and coordinating various activities on both international and local level. New long-term projects were initiated in 2016 such as the online literary map of *Tartu kirjanduskaart.ee*. The Society has also collaborated with Tartu Public Library and the Association of Estonian Mother Tongue Teachers to prepare for the Children's Literature Festival that will take place in autumn 2017. The Society is also one of the main organizers of the two biggest literary events in Tartu – Tartu International Literary Festival Prima Vista and the International Interdisciplinary Festival Crazy Tartu. At the same time the Society continues to work on other projects – seminars, conferences and various literary events.

In April the traditional session of the annual review of literature took place where the Estonian poetry, prose, drama, translated books and literary criticism were discussed. The speakers were Mihkel Seeder (drama), Kersti Unt (translations of foreign literature), Rein Veidemann (prose) Pille-Riin Larm (criticism), and Sirel Heinloo (poetry).

On April 23 Tartu celebrated the Book and Rose Day as a warm-up event for the literary festival Prima Vista. The programme included a book fair, reading recommendations by writers, announcement of the winner of the Children's Literature Prize as well as the winner of the literary prize First Step.

On May 4-7 Tartu International Literary Festival Prima Vista took place for the 13th time. The main organisers of the festival are the non-profit society

Festival Prima Vista, Estonian Literary Society, the Tartu department of Estonian Writers' Union, Tartu Public Library, and the Library of the University of Tartu. The main theme of the festival was "Mystification" and in accordance with the theme, the name of the patron of the festival remained unrevealed this time. The traditional partner city was Haapsalu where the festival events took place for one day. The main programme featured performances by Estonian authors as well as guests from abroad, the traditional book fair and Park Library, book presentations, lectures, seminars, concerts and film programmes. Their central organizers collaborate with many institutions and organizations and were this time happy to welcome some new partners such as the Researchers' Night Festival and University of Tartu Museum.

In the end of May, the academic secretary of the Society Marja Unt, and member of the board, Krista Ojasaar participated at the annual meeting of UNESCO Cities of Literature in Dublin. At the meeting the representatives of the cities introduced their organizations and main activities; the cities discussed their common priorities and various proposals for joint projects.

On May 4 a conference celebrating the 90th birthday of the honorary member of the Society, the writer, translator and critic Ain Kaalep was organized in cooperation with Tartu Department of the Estonian Writers' Union, the Department of Cultural Research and Arts of the University of Tartu and the cultural magazine *Akadeemia*. The conference took place in two cities, Tartu and Elva. Talks and papers were given by Karl Muru, Liia Hänni, Hando Runnel, Marju Lepajõe, Paul-Erik Rummo, Jüri Talvet, Arne Merilai, Janika Kronberg, Maria-Kristiina Lotman, Märt Väljataga, Toomas Kiho, Ivo Volt, Heli Zink, Jussi Voutilainen, Hans Karro, Helle Mäemets, and Mare Köiva. At the end of the conference a reading of poems by Ain Kaalep took place at Tartu Literature House.

In the beginning of June the chairman of the Society, Toomas Liivamägi participated at the meeting of UNESCO Creative Cities in Beijing, where the mission and the cultural policies of the network were discussed. Toomas Liivamägi gave a presentation introducing the experience and objectives of Tartu as a literary city.

In the middle of June the 9th spring school for the students of literature of the University of Tartu took place in South Estonia. Papers were given by the students of literature and theatre studies and a special panel discussion was dedicated to the 50th birthday of the literary scholar and university lecturer Mart Velsker. The summer school also had guest speakers – theatre director Laura Mets and writer Mehis Heinsaar. The guests were interviewed by students Laura Porovart and Kaisa Ling.

In September the Society assisted the organizers of the 8th annual conference “Alternatives to The Present” of the Association for the Study of the Arts of the Present. The programme consisted of almost 70 papers focusing on the present status of imagining alternative spaces and times in many forms of contemporary art and artistic practice. The conference brought to Tartu scholars from 20 countries, including the top researchers of their respective fields such as the theatre researcher James Thompson, cultural theorist Karen Jacobs, textile artist Kärt Ojavee, literary scholar Brian McHale, and the founder of geocriticism, Bertrand Westphal.

In the end of September the chairman of the Society, Toomas Liivamägi and the academic secretary Marja Unt participated at the annual meeting of the Unesco Creative Cities Network in Östersund. In September a new series of seminars, Description of Nature was initiated in cooperation with Tartu Environmental Education Centre. The seminars aim to popularise studies of both literature and nature and are open to everybody with interest in links between literature and nature, nature descriptions in different genres. The seminars feature guest speakers from among writers, literary scholars and nature specialists. The seminars are conducted by a member of the Society, Kaisa Ling, who is an MA student of comparative literature at the University of Tartu.

On November 10-11, the 7th international interdisciplinary festival Crazy Tartu took place at the Club *Genialistid*. The festival programme brought together writers, musicians and artists from Estonia and abroad. The participant list included Jüri Kolk, Piret Bristol, Mihkel Kaevats, Asko Künnap, Igor Kotjuh, Joanna Ellmann, Kristina Viin, Murca, Indrek Koff, Jan Kaus, Marko Kompus, Ivar Sild, Eda Ahi, Kristjan Haljak, Carolina Pihelgas, Domingo de Ramos (Peru), Esa Hirvonen and Susinukke Kosola (Finland), Chris Stewart (UK), Oskar Hanska and Olivia Bergdahl (Sweden). During the festival the works by Tiit Pääsuke, Laurentsius, Mati Kütt, Kristina Viin, Kudrun Vungi, Kärt Rebane, and Kairo were exhibited. The musical part of the festival included the performance of the ensemble Una Corda and the world premiere of a choir piece by Ülo Krigul performed by Una Corda and the mixed choir MaSk.

In the end of December the project Bus Poetry was continued: the second selection of poems were put on the windows of the public buses of Tartu. This time the selection introduced the works of 12 authors from UNESCO Cities of Literature.

The Society has also continued the publishing project of poetry CDs “The Voices of Writers”. The CD *Pühendus* by Viivi Luik was presented in Tallinn in May and in Tartu in September.

LEARNED ESTONIAN SOCIETY

Associated with the Estonian Academy of Sciences

23.01.2001

Founded in 1838

Membership: 115 active members, 17 honorary members

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At the annual meeting of 2016, one new member was admitted to the Learned Estonian Society (LES): Brita Melts. Hain Rebas was elected as Honorary Member.

In 2016 the Board held three meetings: on January 29, April 27 and November 10. A number of topical issues were settled by e-mail. The discussions tackled preparation for the annual meeting and membership of the Board. The Board was concerned with the issues relating to the publication of the yearbook of the Society and other publications. It also discussed allocating a scholarship of the Society for the best article released in its yearbook, organizing colloquia etc.

Membership of the Society is more numerous than its core – people are actively attending the events and regularly paying membership fees. In 2016, 391 EUR from 54 members was transferred to the Society's bank account. When compared to the previous year, the number of membership fee payers substantially increased (in 2015 – 95 EUR from 15 members, 2014 – 401 EUR from 58 members). As many members pay the fee as a lump sum for two-three or more years, the amount of membership fees collected in different years may vary significantly. However, some members have defaulted on that obligation for over three years.

In the reporting year the Society organised 15 public meetings with papers, one of them in cooperation with the Centre of Oriental Studies (University of Tartu) and the Academic Society of Theology.

The meetings with papers discussed a wide range of topics: the politicizing of the Estonian choir song in the 1950s, the witch processes of the 16th-17th cc., the Baltic German gentry, the Land Reform etc.

On 16 September 2016 the Society organised at Tabivere the conference “Two centuries with the letter ‘õ’”, in cooperation with the Estonian Mother Tongue Society, the Institute of Estonian and General Linguistics of the University of Tartu, and the Centre of Excellence for the Estonian Studies. There were six papers delivered: Valve-Liivi Kingisepp spoke about the coming of the letter ‘õ’ into the Estonian literary language, Kersti Taal about the issue of Estonian in Kreutzwald’s correspondence, Fred Puss about taking the letter ‘õ’ into use in metrics and personae books of Lutheran congregations in different districts of Estonia, Kristiina Praakli about õ-sound from the perspective of socio-linguistics, Piret Teras about the variation of pronunciation of ‘õ’ and Taavi Pae about how the border of ‘õ’ vowel in Saaremaa made its entry into the Regio atlas. The conference was followed by a dinner at Äksi rectory and a cultural-history sightseeing tour in the surroundings of the Äksi church – with accent to activities of Otto Wilhelm Masing. By the time of the event, a booklet presenting the letter ‘õ’ was composed together with the map company Regio.

Meetings with papers and conferences were attended by 321 people, i.e. 20 persons per event, on the average, of them 8.5 members of Society and 11.5 guests, somewhat less than in previous years.

At organising the meetings with papers and other events, the Learned Estonian Society engaged in cooperation with the Estonian Mother Tongue Society, the Institute of Estonian and General Linguistics of the University of Tartu, the Centre of Excellence for the Estonian Studies, the Centre of Oriental Studies, the Academic Society of Theology and the Regio company.

In 2016, the Yearbook of the Learned Estonian Society (2015) was compiled and edited, Tõnu-Andrus Tannberg (Member of Academy of Sciences) being editor-in-chief and Secretary of the Society Freydis Ehrlich the practical manager. The subsidy for activities provided by the Estonian Academy of Sciences (4500 EUR in 2016, as in the previous year) is sufficient to either publish the Yearbook (language editing, layout, printing) or to pay the salary of the Secretary of the Society. The Society has consistently sought support for publishing the Yearbook also from other sources. Thanks to support from the national programme “The Estonian Language and Cultural Memory II (2014–2018)”, the Ministry of Education and Research, and the Estonian Cultural Endowment the Yearbook 2015 could be published.

In 2016, a monograph by Ants Hein “Estonian mediaeval stone manor houses and small castles” was released in the series Proceedings of the Learned Estonian Society. Responsible for its editing and publishing was

Vice-Chairmen of the Society Heiki Valk. The publication was supported by the Estonian Cultural Endowment.

The Society carried out archaeological surveillance at Villa village cemetery (Rõuge parish), near the Varnja Old Believers' conventicle, in Pärnu at 2 Lai Street and in Viljandi at Supeluse Street – the protection zone of the old town. Those works, however, yielded no new scientific information.

The Society also participated in releasing the Estonian Archaeological yearly *Tutulus* 2016, for which support was granted by the Estonian Cultural Endowment.

The Board of the Learned Estonian Society appointed scholarship for the best article in the yearbook of 2014 to Kaur Altkoa, for the text "Saint John's Church in Tartu – a Plague Memorial?" Besides him, also Anu Raudsepp was presented as candidate for the scholarship.

The Board of the Society estimates the work of the Society in 2016 as good. However, the lack of additional steady funding makes the Board worry whether the Society would be able to maintain the level attained.

The report was approved by annual meeting of the Society at Tartu, on January 25, 2017.

ESTONIAN MUSICOLOGICAL SOCIETY

Associated with the Estonian Academy of Sciences

21.05.2004

Founded in 1992

Membership: 91 active members (of whom 4 outside Estonia),
one honorary member (*Professor Emeritus* of Lund University
Folke Bohlin)

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Chairman: Kerri Kotta, Tel: +372 5288781,
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Estonian Musicological Society brings together researchers in music and people entertaining the interest to scholarly study of music and supports research in all fields of musicology in Estonia.

The achievement of 2016 was releasing the eighth issue of the musicological yearbook *Res Musica* that introduces several articles in the field of ethnomusicology, in cooperation with Department of Musicology of Estonian Academy of Music and Theatre. *Res Musica* is a periodical issue with international editorial board, publishing peer-reviewed scientific articles from all areas of musicology. The yearbook is open to international cooperation. The issue is prevalently in Estonian; however, it includes extended abstracts of articles in English or German.

Upon organisation of the Society, two meetings with papers are regularly held every year: in spring at Tartu and in autumn in Tallinn. The Society's Day of Tartu on April 23, 2016 took place in the Heino Eller Hall of Heino Eller Music School in Tartu. It was dedicated to the memory of professor Urve Lippus (1950-2015), a leading figure in the Estonian musicology. The papers focused on issues which interested Urve Lippus as a musicologist including nationalism and authenticity in music, musical modernism and musical encounters. The papers were held both in Estonian and English. The papers were offered by Mark Lawrence, Anu Kõlar, Linda Kaljundi, Brigitta Davidjants, Andreas Waczkat, Janika Oras, Mart Humal, Mimi Daitz and Helena Tyrväinen.

In the autumn Leichter Day in Tallinn on November 28, 2016, two papers were given by Ignazio Macchiarella (Cagliari University) and Mart Humal (Estonian Academy of Music and Theatre). Ignazio Macchiarella concentrated on multipart music as a conceptual tool in ethnomusicology. Mart Humal discussed some generally unknown aspects of death

of Mozart. In addition, the eighth issue of *Res Musica* and the seventh issue of *A composition as a Problem* (Proceedings of the 7th music theory conference in Tallinn) were presented.

It has been a long tradition of the Society to organise a culture-lore trip at the beginning of September. In 2016 the Society visited the places of Pskov county in Russia.

ESTONIAN PHYSICAL SOCIETY

Associated with the Estonian Academy of Sciences

14.06.2005

Founded in 1989

Membership: 193 active members, 4 honorary members

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Chairman: Kaido Reivelt, Tel: +372 737 4623, kaido.reivelt@ut.ee

The traditional Estonian Physics Days were held in the Physicum of the University of Tartu on March 18 – the Science Day, and on March 19 – the Day of Education in Physics. Within framework of the Physics Days, the general meeting of the Society was held on March 18, approving the activities' and economic report of the Board of Society. The working day was consummated with the traditional social evening. On March 19 there was the general meeting of the Division of Teachers of Physics.

At Physics Days the annual prize of the Society was announced. The laureate “For outstanding work as lecturer, scientist and populariser of science, and for organising the METOBS 150 events” was the Researcher of the Institute of Physics of the University of Tartu Piia Post. We also bestowed recognition on Ülle Kikas for longstanding achievements in directing natural science education, on Heli Lätt for launching the visiting centre of Tartu Observatory and for organising the Light Festival, on Matti Selg for compiling the textbook in quantum theory in Estonian, on Kristel Uiboupin for successfully carrying out the Ilmapall project, on Ly Sõõrd for promoting and carrying out the physics quiz *Spekter*, on laboratory of physical optics of the Institute of Physics of the University of Tartu for initiating the Photonics Club and Assembly of Young Scientists, on Eerik Reiter and Romi Mankin for compiling the textbook in statistical physics in Estonian, on Andres Juur for successful work in heading the Science Centre AHHAA, on laboratory of theoretical physics of the Institute of Physics of the University of Tartu for outstanding presentation of its area and on Maido Merisalu for outstanding presentation of his area.

An important item acted upon at the general meeting of 2016 was streamlining of membership of the Society. A decision was adopted: among active members of the Society only those members would be counted who had paid the membership fee in two last years. In consequence of that decision, the Society had 193 active members as of end 2016.

Estonian Physical Society was active in several manners, operating its Board and Divisions, as specified hereunder.

Division of Teachers of physics of the Society

The Division launched quite a few undertakings in 2016, to yield ample fruit in 2017. Head of Division Siim Oks (HTG) and Kristel Uiboupin participated at training of supervisors of networks organised by Foundation INNOVE. It was also successful at securing funds to organise the Physics Days in 2017. It launched activities to streamline the lists of members of network of teachers of physics and their contacts.

The Division continued organising study trips to the European Nuclear Research Centre (CERN). The week-long training was provided to 15 physics teachers. The project was coordinated by Riina Murulaid of the Society. In CERN Martti Raidal and his team were our partners.

The Society of Physics Students

The year of 2016 was active for the Society of Physics Students (hereinafter FÜS). There were three general meetings, of which two for electing the Board and the third for providing overview of activities of the Society at the beginning of autumn.

In 2016 the Board of the Society comprised Moorits Mihkel Muru, Karl Reinkubjas (spring), Magnus Muru (spring), Adam Erki Enok (spring), Viktoria Sorokina (autumn), Kerttu Maria Peensoo (autumn), Karoliine Kurvits (autumn). The interests of students are represented in the area council by Karl Reinkubjas. In Council of the Institute of Physics the representatives are Karl Reinkubjas and Adam Erki Enok.

The spring semester saw out the project “Development programme”, organised by the Foundation of Student Body of the University of Tartu, with participation of the FÜS Board. Participants were trained for efficiency of work within organisation and for promoting PR and outsourcing funds.

FÜS contributed during the whole year to improvement of teaching physics and popularising the speciality of physics. Several members of FÜS participate in the work of Science Bus, in projects “The student to the physics class!” and “Research laboratory”, help carry out workshops organised by Science School of the University of Tartu.

In 2016 the FÜS was strengthened by the first foreign member, studying at the University of Tartu, majoring in Robotics under curriculum in English of Master programme.

In the autumn semester, there was an article published about FÜS in the journal *Ole Rohkem*. The article recounts about the activities of FÜS, its

aspirations and achievements. It is available at website: <http://olerohkem.ee/fuusikauliopilaste-selts-ehk-loodus-teadus-ja-saunamaailma-pohivormid/>

Since autumn 2016 the physics, chemistry and materials science have been combined under one curriculum. The students having opted for that specialty will start studies together and will major in at least one of the three directions. In autumn, 80 students enrolled in that curriculum, and 59 will continue studies in this semester. 31 have chosen physics; 17 students have chosen chemistry and 11 the materials science direction.

In that year FÜS continued its mentoring programme. Because of the new specialty we involved also chemists and materials scientists. Within framework of the programme, the junior students are assigned senior students as mentors, giving the freshmen a helping hand in the first months of their studies. The programme has got a positive feedback from mentors and freshmen. The programme is aimed to help the freshmen and create a secure and relaxed atmosphere for them, to ease them in the University life. Furthermore, the programme is important for deepening the communication between courses and specialities.

In spring 2016 members of FÜS Mats Mikkor and Raid Vellerind attended the conference ShowScience 2016. We are dealing here with a European conference of science theatres, attracting the representatives of science theatres from various European universities and Science Centres. They share knowledge and experience at plenary sessions for several days, with training events offered in the area of art of speaking and sciences. That conference was held in Iceland, addressing local public within the science festival, with Science Bus representing Estonia and the Physical Society. The ShowScience conferences are organised and coordinated by the association EuroScienceFun, whose member the Physical Society is. Participation at the Conference enhanced the expertise of the Science Bus and enabled it to reach out to various organisations popularising science in Europe.

In 2016 the FÜS organised a host of events, pursuing the idea that they should be available to all interested. Members of FÜS can participate at regular events at a discount. Following is the summary of events held in 2016.

The most popular event in the year was the monthly sauna-night in *Physicum*. The goal of sauna-nights is to attract physics students of various courses and other students studying in *Physicum*. In the spring semester there was an orienteering contest, with participants having to find their way quickly across unknown premises of *Physicum*, using a map. The moderator was Grete-Lillijane Küppas. The quiz was held in both semesters

with unabated enthusiasm. In spring semester it was organised by Hans Daniel Kaimre and Ats Aasmaa, in autumn two quizzes were organised by two teams, the first comprising Ats Aasmaa and Markus Otsus and the second comprised by Mihkel Märten and Kenneth Tuul. The chess tournament too was held in both semesters. Moderator of the spring semester was Adam Erki Enok and of the autumn semester Liisi Metsoja. Juror was Moorits Mihkel Muru. In spring the FÜS held the moot defence. The aim was to give a chance to the authors of simulacrum papers to practice the presentation before the public, providing advice and posing questions.

The whole summer witnessed a series of Lecture Nights in the University Town. During 12 weeks the University lecturers delivered papers once a week. The FÜS helped find lecturers with physics background. Speaking at the series were Martti Pärs, Kalev Tarkpea and Karl Reinkubjas.

At the beginning of autumn, there was the traditional initiation ceremony, organised jointly with chemists and materials scientists, due to the combined specialty. The freshmen donned the mock gowns, followed by a short presentation of the rite. Thereafter the freshmen were dispatched in groups to orienteering track, set up in *Physicum* and *Chemicum*. After orienteering they were herded in inner yard of the Physicum, where they had to give a freshman oath. The day was consummated by the sauna night. The initiation was attended by approximately 120 people.

In autumn 2016, there was the first FÜS tournament of table tennis, moderated by Kerttu Maria Peensoo. This proved to be a popular event: participating were students and two members of faculty. The game was held successively in three categories, completed by finale in every category. We are going to repeat the event. Apart from the table tennis tournament there was the first FÜS LAN (Local Area Network) party, promoted by Rando Avarmaa. The LAN party attracted much attention and at beginning of the spring semester 2017 it will be repeated. We also organised autumn semester film night in *Physicum*, to facilitate integration of freshmen and senior students.

The top event of the autumn semester was the Autumn School in Exact Sciences of the Physical Society. The school was held jointly with the Students Society of BioSciences and took place in Kääriku Sports Centre, with attendance of 120. The event attracted much attention: all seats were booked long before registration ended. Like in the earlier years, the lectures of the autumn school were seconded by development sessions of ESTCube.

The Christmas Party was held in *Physicum*. Attending were students of physics, chemistry and the materials science, and some members of faculty.

The participants indulged in games and watched three short Science Bus performances. The programme lasted until midnight and was followed by karaoke and playful games.

Popularising science

In 2016, the **Science Bus *Ursa Major*** continued efficiently. The beginning of year witnessed the elaboration of the smallest-scale performance in history of the Science Bus: a 45-minute performance accommodated in a shoe box. At the beginning of April, Iceland hosted the EuroScienceFun annual conference, attracting science theatres and science popularisers from the whole of Europe. The participants shared ideas, carried out various workshops to elevate the level of performances. The event culminated with a grand science day in local Science Centre, where the performance of Science Bus won accolades. The conference extended an invitation to the Science Bus to participate at the first official European science theatres championship ScienceMe in summer in Switzerland.

At the end of April the Science Bus (Mats Mikkor and Rait Vellerind) was included in the delegation to the summit of Rectors of Baltic Universities in Vilnius. We gave a performance at reception by the Estonian Ambassador. The performers estimated their act as the best in recent history of the Science Bus. The audience was profuse by its thanks.

We jumped at the opportunity offered in Iceland and *Ursa Minor* made a 3000 km trip to Geneva and back. Kerttu Maria Peensoo and Eliise Tammekivi won the sixth place. The competition was held within the framework the local Researchers' Night. During our stay we did some sightseeing, got excellent international contacts and met interesting people in the profession.

In September, at the beginning of the school year the following Science Bus seminar course started, with 23 motivated students enrolling and also graduating. The seminar had a new supervisor, with Mats Mikkor complementing Mari-Liisi Jaansalu. During the seminar, students acquired the basics of doing science theatre, including scientific explanations. Credit points from seminar course were given to Elina Kuusma, Helen Sepman, Kenneth Tuul, Kertu Metsoja, Artur Kärblane, Miriam Koppel, Airiin Hango, Emilia Laas, Alli Paukson, Elisabeth Parman, Friedrich Krull, Iko-Eerik Uustalu, Ilmar Uduste, Jass Kaarama, Kättriin Julle, Rando Ernits, Siim Karel Koger, Aaro Abolkaln, Ida Maria Orula, Gromet Spaal, Dan Bondarenko, Marta Mikkor and Mikk Mihkel Vaabel.

During the year 14 new performances were developed, 50 trips were made, up to 11 performances per one trip. At the end of the year we also performed at several Christmas parties invited by active freshmen.

The 9th **Science Camp** was held at Kloogaranna, with two shifts – for smaller kids (5-7 grade) and for those in their teens (8-9 grade). There were five workshops – in chemistry, physics, biology and materials science plus psychology, moderated by students from Psycho-bus.

In the chemistry workshop the students recovered fragrant substances exuding from plants and made soap. Materials science students recycled paper, made ferrous liquid and built precision scales. Physics students were concerned with aircraft: they built and launched various elastics-driven and engine-powered planes. Biology students focussed on mystery, by analysis of DNA and other traces. Psychology students elaborated on ethics of tests with humans and engaged in tests of perception and attention. At leisure they played sports on beach and in forest, indulged in quizzes and recitation.

Science camp was run by Joana Jögela, Jaana Lilloja, Maris Palo (materials science) Eliise Tammekivi, Elisabeth Parman, Helen Järvpõld, Jürgen Vahter, Arnold Rein Tatunts (chemistry), Mari Tagel, Hanna Ainelu, Liivi Plumer, Auli Relve (biology), Kadri Raag, Kadi Lang, Kadi Vaher, Madis Vasser, Karl Lomp, Liina Reinart (psychology), Taavi Adamberg, Mats Mikkor, Raid Vellerind, Paap Koemets, Ranel Sarapuu, Gromet Spaal, Simmo Saan (physics). Tutors were Virgi Roop, Kerttu Voor, Kreete Mia Mi Rand, Marie Rahn, Marit Mäealu, Kerstin Kekišev, Hestia Mirka, Anne-Mai Liigand, Egert Merelaid, Piret Valdmaa, Anastasia Bernat, Agnes Vask, Kristina Kraani, Kädi Kolga. Supervisors were Mari-Liis Jaansalu and Karl Reinkubjas.

Instruction materials, physics education

In cooperation with Science School of the University of Tartu we continued the physics, chemistry and biology learning chambers programmes initiated by the Society in 2010 (<http://www.teaduskool.ut.ee/et/oppetoo/opikojad>).

Society continued work with physics textbooks and digital study materials. Physics e-textbook environment made steady progress (<http://õpik.physics.ee>) and it is popular. An important replenishment is the 8th form physics textbook (author Erkki Tempel). We started work to create the 9th form physics course instruction materials.

In cooperation with the school physics centre of the University of Tartu we continued publication of the physics teachers weekly Mesilane. In spring 2016, 17 weeklies had appeared. The archives of the weeklies are available at link http://kfk.fi.ut.ee/?page_id=143.

ESTONIAN ASSOCIATION OF ENGINEERS

Associated with the Estonian Academy of Sciences

23.09.2008

Founded in 1921 as Estonian Union of Engineers

Re-founded 10.12.1988 as Estonian Association of Engineers

Membership: 19 legal entities

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President: Arvi Hamburg, Tel: +372 5162026

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Estonian Association of Engineers is a non-profit organisation, acting in public interests. The Association is an umbrella organisation, bringing together the professional organisations of engineers, trainers of engineers and innovative employers, and all those interested in advancement of the engineering knowledge and technology.

Mission – promotion of Estonian engineering sciences and the development, innovation, and the respective educational policy.

Vision – knowledge- and innovation-based society.

Membership of the Estonian Association of Engineers comprises 11 professional organisations, two universities, one higher school, one professional education institution and four widely recognised companies. They are as follows:

- Estonian Society for Biomedical Engineering and Medical Physics;
- Estonian Association of Civil Engineers;
- Estonian Society for Electrical Power Engineering;
- Estonian Transport and Roads Association;
- Estonian Association of Engineers for Heat Engineering;
- Estonian Mining Society;
- Estonian Association of Systems Engineers;
- Põlva Association of Engineers;
- Estonian Electronics Society;
- Estonian Association of Mechanical Engineers;
- Tallinn University of Technology;
- Estonian University of Life Sciences;
- Tallinn University of Applied Sciences;
- KH Energia-Konsult;
- Viru Keemia Grupp AS;
- ÄF-Consulting AS;

- Grafitek OÜ;
- AS Amhold;
- Tallinn Polytechnic School.

The priority in the activities in 2016 was the valuation of engineering education and engineer's profession. The main goal of the Association is securing the growth of new generation of engineers and creating prerequisites for operation of the integral chain of research, development, innovation and entrepreneurship.

The key areas were related to the "Research and Technology pact" (Pact), focussing on coordinated activity, involving the concerned parties and stakeholders:

- **Reaching out**

Communication to the school students the options for research, engineering and technology, and challenges facing the youth (lectures and role plays at schools, direction of hobby education, creation and supervision of engineering hobby groups).

- **Modern learning environment**

Modernisation of learning opportunities, linking the learning environment to expectations of the labour market (analysis and improvement of curricula in the area of technology, cooperation between practicing engineers and teaching staff, completion of study laboratories and their use cross-wise).

- **Competence – life-long learning**

Developing the engineer proficiency and skills (use of companies for practical training and the apprentice programme, implementation of sustainable life-long learning system for engineers) and bolstering the control system over the level of engineer's professional competence (updating the professional standards, directing work of professional commissions, providing the possibilities for acquiring the basic profession by graduates of a higher school).

The outcome of the whole Pact is securing satisfaction with work of an engineer, transfer to knowledge based economy. In all three above directions the members of Association possess competence and are willing to act as drivers of the activities of the Pact.

In the reporting year, one general meeting and seven meetings of the Board were held.

The Association was engaged in the following activities:

Traditional cooperation with the Estonian Academy of Sciences:

- Roundtable “From Science to Business”, topic “Electronics” (November 28);
- Presentation of an innovative company to Members of the Academy of Sciences – Auvere Power Plant and Enefit280 in Narva (December 14);
- Meeting with science journalists (October 26).

Cooperation with the Division of Informatics and Engineering of the Estonian Academy of Sciences:

- Coordination of joint priorities and planning of the activities – joint meeting of Board of the Division and the Association (June 07);
- Summaries at the year-end meeting of the members of the Association and Division, and setting up goals for the following year.

Cooperation with *Fédération Européenne d’Associations Nationales d’Ingénieurs* (FEANI):

- Accreditation of curricula;
- Processing of documents of the applicants for becoming a euro-engineer (EurIng);
- Participation in FEANI monitoring.

Initiation with Tallinn Directors’ Club of the programme of new generation of engineers basing on common interests;

Compiling of the joint project for popularising of the areas of engineering and technology with local self-governments, professional education schools and non-profit associations;

Harmonising the system of awarding professional qualifications and qualification standards in the engineering areas;

Monitoring of the need for new generation of engineers and their training capacity, OSKA programme;

Composing the survey for recording the engineering culture, drawing on museum collections of engineering and technology;

Mapping the contribution of Association members to activities of the Research and Technology Pact, establishment of priorities and estimate of the necessary resource;

Initiation of the idea of the Estonian Research and Engineering Museum.

The Association held the contest of Engineer of Year 2016 and Student in Engineering of Year 2016. Engineer of Year 2016 – Rein Vainjärv, Development Manager of the *Enefit Energiatootmine AS*. Student in Engineering of Year 2016 – Kristjan Türk, the first year student of Master Programme in production engineering of the Institute of Engineering of the Estonian University of Life Sciences.

The Association participated at FEANI General Assembly in Stockholm on October 7-9, 2016. The focus of the event was on setting the necessary requirements for the qualification of engineers and the related certification issues.

The association summed up the year and laid down directions for the future at the festive end-of-year meeting in the Academy Hall on December 2, 2016. The traditional celebration of the Engineers' Day included a festive speech, awarding the best engineers and interesting papers by students of Tallinn University of Technology.

ESTONIAN BIOCHEMICAL SOCIETY

Associated with the Estonian Academy of Sciences

13.11.2009

Founded in 1959

Membership: 70 active members

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President: Olga Mazina, Tel: +372 56985281, olga.mazina@ut.ee

Academic Secretary: Katrina Laks, Tel: +372 5296923,

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The goal of activities of the Estonian Biochemical Society is providing support to research, promoting teaching effort in biochemistry, contributing to the progress of related theoretical and applied scientific areas, raising public interest in those areas of science, and supporting of scientific interests of members of the Society.

The Estonian biochemists have a long tradition to organize spring schools for members of the Society and guests interested in the topic. In 2016 that event was held in Kuke recreation center, Tuhala on May 13-14. The curator of the spring school was Prof. Peep Palumaa, from Tallinn University of Technology and the executive organizer was Katrina Laks, a PhD student from the same University.

The annual meeting of the Society was held at the end of the first day of the spring school. Among other topics, new board members of the Society were elected.

The annual congress of the Federation of the European Biochemical Societies (FEBS), in Kuşadası from 3rd to 8th September was cancelled due to complicated political situation in Turkey. This year, two members of the Estonian Biochemical Society were planning to attend the conference. The FEBS Council meeting was held in Munich on September 8th; the president of the Society, Olga Mazina participated as a representative from Estonia.

During past years, many members of the Society were actively involved in translation of the textbook "Biochemistry: A Short Course" by John L Tymoczko, Jeremy M Berg and Lubert Stryer. In 2016 the textbook in Estonian language was printed and presented to the public. The book presentation was held in October together with a scientific seminar organized by the Society in Tallinn. Dr. Ann Tiiman from Swedish

Karolinska Institute and Dr. Kadri Ligi from the University of Tartu had the possibility to present their recent research at this event.

With the aim to popularize the research activities among students, the Estonian Biochemical Society has awarded student science prizes since 2007 (guidelines of the contest are available on website of the Society). At the contest of the year 2016 the first prize was granted to Tarvi Teder, a PhD student from Tallinn University of Technology.

ESTONIAN SEMIOTICS ASSOCIATION

Associated with Estonian Academy of Sciences 15.12.2009

Founded in 1998

Members: 70

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President: Katre Pärn, tel +372 566 19 492, katre.parn@ut.ee

Vice-President: Eva Lepik, tel +372 7375413, eva.lepik@ut.ee

In addition to organizing the traditional events like the Autumn School of Semiotics and Semiosalong, in year 2016 Estonian Semiotics Association (ESA) was one of the organizers of Semiofest, an international conference of applied semiotics, as well as ecosemiotics summer seminar and lecture series “Century of Language”. Also *Acta Semiotica Estica XIII* was published.

On May 26, 2016 the general assembly of ESA was held. The financial report and activity report for previous year were presented and future plans discussed. The prize “Semiootiline jälg” (Semiotic trace) was given to Mari-Liis Madisson in recognition of the good quality of her scientific work.

On June 1-3, 2016 Semiofest, an international conference on applied semiotics was held in Kultuurikatel, Tallinn. The conference was co-hosted by ESA, OÜ Mängiv Inimene and Department of Semiotics, University of Tartu. Semiofest with the topic “Semiotics and Culture of Innovation” had over 80 attendees, 30 presentations were given by practitioners of semiotics from all over the world. Keynote lectures were given by Farouk Y. Seif (USA) and Malcolm Evans (UK). On the first day of Semiofest (<http://2016.semiofest.com>), workshop on Tartu semiotics was held, introducing the tools of Tartu cultural semiotics applicable in practical analysis, as well as Tartu experiences in semiotic expert analysis.

On July 9-11 the ecosemiotics summer seminar on “Ecological impoverishment as a collapse of sense” took place on Muhu island. The seminar included 10 presentations given by German philosopher and biologist and biosemiotician Andreas Weber, Kalevi Kull, Timo Maran, Kadri Tüür and Riste Kesksaik among others. The number of participants was over 30.

On November 5-6, 2016 the XVII Autumn School of Semiotics was held in Taevaskoja. The topic of the Autumn School was “Language-likeness”, dedicated to the 100th anniversary of the publication of Ferdinand de Saussure’s *Cours de linguistique générale*. Presentations on the various

forms and roles of language were given by Peeter Torop, Aleksei Turovski, Liina Paales, Leo Võhandu, Roomet Jakapi, Doris Kareva and others. An exhibition of experimental poetry offering a chance to listen to sound poetry of Ilmar Laaban was organized in co-operation with Ragne Soosalu. There were over 60 participants, most of them scholars and students of semiotics, but also of other disciplines. The Autumn School (<http://semiootikasygiskool.blogspot.com.ee>) was organized by ESA and union of students of semiotics “Semioon”.

In autumn 2016, ESA and Department of Semiotics, University of Tartu organized an interdisciplinary series of lectures “Century of Language: Saussure, Linzbach, Jakobson”, celebrating the 100th anniversary of Ferdinand de Saussure’s “Course in General Linguistics” and Jakob Linzbach’s “Principles of Philosophical Language”, as well as the 120th anniversary of Roman Jakobson. The 13 lectures, presented once in a week, were given by Mihhail Lotman, Renate Paljusalu, Leo Võhandu, Ekaterina Velmezova, Jaan Ross, Elin Sütiste, Arne Merilai, Sébastien Moret, Peeter Torop, Silvi Salupere, Aaro Nursi, Ülle Pärli and Birute Klaas-Lang.

A series of seminars Semiosalong (<http://semiosalong.blogspot.com.ee>), dedicated to popularisation of semiotics, was organised in spring and in autumn 2016. The topic of the spring session was “The Semiotics of Crime”, consisting of four salons/presentations; the topic of the autumn session was “Semiotic seismology: anticipation of instability” with three salons and altogether six presentations.

The 8th volume of ESA journal *Acta Semiotica Estica* appeared in November. The topics of the articles covered the representation of Snowden’s scandal in Estonian media, representation of different nationalities in ballet, emulations of ancient art, the idiot’s love, specificities of modelling in human sciences, as well as relations between humans and technology. In addition to original articles the volume also included interviews with Tiit-Rein Viitso and Aleksei Turovski, and translations of papers by Juri Lotman and Olga Freidenberg. Homepage: <http://www.semiootika.ee/acta/>

ESA has begun organizing the spring conference dedicated to relations between semiotics and education, taking place on May 6-7, 2017 in Tartu. Next general assembly will be held during the conference. Also, in co-operation with the Department of Semiotics of University of Tartu, ESA organizes the Tartu Summer School of Semiotics that will take place in august 2017. Next session of Semiosalong will begin in March.

ESTONIAN SOCIETY OF HUMAN GENETICS (ESTSHG)

Associated with the Estonian Academy of Sciences

05.04.2011

Founded in 2000

Membership: 181, including 16 new members in 2016

Address: Riia 23, 51010 Tartu, ESTONIA, estshg@ebc.ee,

<http://www.estshg.ee>

President: Ants Kurg, tel +372 737 5018, akurg@ebc.ee

Secretary: Maarja Kõiv, tel +372 522 9126, maarjakoiv@gmail.com

The board of the Estonian Society of Human Genetics includes the president Ants Kurg and members Andres Metspalu, Riin Tamm, Mari Palgi, Maris Laan, Neeme Tõnisson and Olev Kahre.

For already the 18th time, the EstSHG organized its annual conference that took place on October 13-14, 2016 at Strand SPA and Conference Hotel in Pärnu; 198 persons participated. The composition of the program and the choice of speakers were again based upon the principle that the selected speakers had not presented their results for a minimum of two years. At this year's conference, a guest speaker, Prof. Vincent Pasque (KU Leuven, Belgium) gave a captivating talk. The speakers included some of the best Estonian researchers: Krista Fischer, Reedik Mägi, Rael Laugesaar, Katrin Õunap, Maria Yakoreva, Reet Mändar, Peeter Hõrak, Triin Laisk-Podar, Karin Rosenstein, Agne Velthut-Meikas, Mait Metspalu, Rita Hõrak, Tanel Tenson, Pirjo Spuul and Lili Milani.

Preparations for the annual conference 2017 were started. It will take place on November 16-17 at Rakvere Theatre.

EstSHG participated in organization of joint annual conference of Institute of Molecular and Cell Biology of University of Tartu, Estonian Biocentre and Estonian Genome Center of the University of Tartu on December 19th-20th 2016.

The national round of the 2016 "International DNA Day" students' essay contest was carried out in collaboration with Estonian Genome Centre of the University of Tartu (EGCUT). Within this framework, the Estonian school students submitted their essays in Estonian language and the initial assessment of their work was carried out in collaboration with researchers from EGCUT. The authors of the best works in national round were invited to submit their essays to the international competition organized by the

European Society of Human Genetics. The students were assisted to translate their essays into English, if necessary.

As the Estonian Society of Human Genetics is a member of pan-European Human Genetics Societies association, EstSHG representative also participated in the 12th Meeting of the European Human Genetics Societies that was organized within the framework of the European Society of Human Genetics annual conference held in May 2016, Barcelona, Spain.

ESTONIAN SOCIETY FOR THE STUDY OF RELIGIONS

Associated with the Estonian Academy of Sciences

16.06.2011

Founded in 2006

Membership: 56 members

www.eaus.ee

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Academic Secretary: Piret Koosa, Tel: +372 735 0414,

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The Estonian Society for the Study of Religions is bringing together researchers involved in academic religion studies in various fields. The Society is a member of leading umbrella organisations in the area – International Association for the History of Religions and European Association for the Study of Religions. The main form of work of the Society is holding meetings with papers and conferences. The activity of the Society takes place basically at the University of Tartu. In 2016 the Society carried out five meetings with papers, and in cooperation with Department of Estonian and comparative folklore of the University of Tartu the international conference “Religion and Nation(alism): Entanglements, Tensions, Conflicts”.

April 13 – the meeting with papers, with Raivo Mänd, Professor of Animal Ecology of the University of Tartu speaking on a topic “What is the implication of existence of God? The evolutionary angle of view on religion”.

June 10 – the meeting with papers and the annual meeting of the Society. At the annual meeting, the report of the Board about the events of the last year was delivered; the financial report and report on the activities of the previous year were approved. Kristel Kivari moderated Igor Volke’s paper “We could well be more advanced in both science and religion”.

June 15 – a special seminar dedicated to Mircea Eliade, with Andrei Znamenski, Professor of History of Religion and EurAsia Research of the Memphis University delivering a paper “Quest for the Archaic: Mircea Eliade and Writing the Book of Shamanism” and Paul Firnhaber, an anthropologist having studied under tutorship of Mircea Eliade at Chicago University presenting retrospection “Recollections of Eliade”.

September 15 – researcher of Finnish Literary Society Kati Mikkola delivered a paper “Popular perspectives on secularisation and transformations in religiosity in Finland 1860-1920”.

November 10-11 – a conference “Religion and Nation(alism): Entanglements, Tensions, Conflicts”. The Conference brought together scholarly experts in religion from 17 countries. The plenary presentations were delivered by Frank J. Korom, Professor of the Science of Religion and Anthropology of Boston University, and by Associate Professor Milda Ališauskienė, Head of Department of Sociology of Vytautas Magnus University, Kaunas. The Conference focussed on the aspect of denominations and beliefs furthering national consolidation, the related issues and its manifestations today. The Conference was organised by the Estonian Society for the Study of Religions and the University of Tartu jointly with the Estonian Literary Museum and the Tartu Nefa group.

December 16 – the annual meeting of the Society, with papers delivered by members of Society Atko Rimmel “Problems of researching religion in the predominantly non-religious society” and Jaan Lahe “From Heidelberg to Catania: Mithra cult related and other antiquities at that trip”.

THE ESTONIAN ECONOMIC ASSOCIATION

Associated to the Estonian Academy of Sciences

16.06.2011

Founded: 1930

Re-founded: 2002

Members: 121 private individuals and 4 legal persons

Address: Estonian Business School, Lauteri 3, 10114 Tallinn,
ESTONIA

www.emselts.ee

<https://www.facebook.com/EMS-219560925131732/>

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(from 1.03.2016),

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Tairi Rõõm (until 29.02.2016), Karmo Kroos (from 1.03.2016),

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The Estonian Economic Association was re-founded in 2002. It is a non-profit organisation that brings together Estonian economists in order to promote economic thinking, encourage discussion on current economic topics, help improve the quality of education in economics, and support cooperation and partnership between institutions working in economic research and teaching. The association organises annual conferences, awards the Professor Vello Vensel prize for research, and distributes information about events at institutions that are members of the association. The association supports the work of its member organizations by enhancing quality of doctoral dissertations and their supervising as well as promoting the events and trainings organized by the Doctoral School in Economics and Innovation.

In 2016, the association continued its long tradition of conferences, the first of which had been held in Toila in 2003 under the name of the EMS Winter Conference. The event has become annual since 2006. The eleventh annual conference was held on January 27-28 in Pärnu. The keynote address on the economic challenges facing Estonia was delivered by Ardo Hansson. This was followed by a panel discussion moderated by Prof. Urmas Varblane (University of Tartu) on the contributors to economic growth in Estonia. The panelists were Kalev Kallemets (Ministry of Economic Affairs and Communications), Tiit Tammaru (University of Tartu), Robert Kitt

(Swedbank), entrepreneur Urmas Mägi (Fein-Elast Estonia) and Kaspar Oja (Bank of Estonia).

The first conference day concluded with the Annual Meeting of Estonian Economic Association, where Kaire Pöder (EBS), Karmo Kroos (EBS) and Meelis Kitsing (EBS) were elected to the management board for the next three years. In addition, member organizations gave overview of their activities during the last year.

The conference also hosted sessions on intellectual property rights which was facilitated by Aleksei Kelli (University of Tartu) and Ülle Päril (EBS), and on entrepreneurship studies which was moderated by Tiit Elenurm (EBS). The last sessions of conference allowed participants to present their newest research on various macro- and microeconomic topics.

The EMS research prize named after Professor Vello Vensel was once again awarded. The prize is meant for doctoral students who present their research at the international summer school that is organised as part of the Doctoral School in Economics and Innovation, and whose research work merits this particular reward. In summer 2016, the prize was awarded for the fourth time, the awardee being Maryna Tverdostup, a doctoral student of the University of Tartu, for her work titled “Relative income within households and gender wage gap: evidence from Finland.”

IN MEMORIAM



Foreign Member of the
Academy
Gérard A Maugin

2.12.1944-22.09.2016

Gérard A Maugin was born on 2 December 1944 in the town of Angers in Western France. In 1962 he finished the local lycée, where he acquired the basics of education in engineering. He studied machine-building, aviation mechanics and mathematics in Paris, and was the NASA stipendiary at Princeton University. In 1971 he defended there the PhD in space science and aviation mechanics. In 1975 Gérard A Maugin habilitated in mathematics with Pierre and Marie Curie University – Paris 6. He was honorary doctor of the Darmstadt University of Technology (2001) and the Thessaloniki Aristotle University (2009).

Having passed the national competition in 1972, Gérard A Maugin entered into service of the French National Centre for Scientific Research (CNRS), holding various positions from office clerk to Director for Research. In 1979 he was awarded the highest rank with CNRS – Full Professorship. In 1985-1998 he supervised the continuum mechanics research team of the University of Theoretical Mechanics – Paris 6, later in the laboratory of modelling the problems of mechanics (LMM) and in 1999-2006 as Head of LMM. In 2007 Gérard A Maugin became founder of Jean Le Rond

d'Alembert Institute and its first Director, later Director for Research. Since 2010 he continued as *Professor Emeritus*.

The main scientific interests of Gérard A. Maugin lay with continuum mechanics. The scale of his research covered impact of non-linearity in mechanics, physics and biology, with keywords being solitons, fractals, micro-structured and smart materials. His work displays conspicuously the integration of mechanics with physics, enabling to construct new mathematical models for dynamic processes. Gérard A Maugin released over 480 research papers and authored or edited about 30 monographs and textbooks.

In addition to research and administrative work, Prof. Maugin held the doctoral course at the University of Paris 6 since 1972. He was a visiting professor at many universities in Italy, Japan, Canada, Germany, the USA and elsewhere. He organised over 150 seminars in various countries of the world and participated at international conferences with around 200 invited lectures or papers. Under his supervision 38 doctoral theses were defended.

Gérard A Maugin's cooperation with Estonian scientists started in the 1980s. This long partnership gave impetus to mechanics-related studies in Estonia, affecting the level of several courses delivered in Tallinn University of Technology, primarily that of the basic subject "Continuum mechanics" and the major elective subject "Phase-sensitive materials thermodynamics". The Estonian scientists acquired an opportunity to work in laboratories of the University of Paris 6, to carry out research within joint grants, to hold joint seminars and colloquiums and to release joint articles. Worth of especial note are joint studies in International Centre of Mechanical Sciences at Udine, Italy. Gérard A Maugin was a long-time member of editorial board of *Proceedings of the Estonian Academy of Sciences: Physics and Mathematics*. In 2002 Gérard A Maugin was elected Foreign Member of the Estonian Academy of Sciences in mechanics. He was Member of Messina Humanitarian Academy of Sciences and Foreign Member of the Academy Sciences of Poland, honorary professor of Lomonosov Moscow State University, member of many scientific unions, scientific committees and editorial boards of scientific journals.

Gérard A Maugin belonged among leading scientists in his specialty. His works were recognised with many prizes, incl. the German Max Planck Research Award (2001) and the Eringen Medal of the US Society of Engineering Science (SES) (2003).

Gérard A Maugin passed away on 22 September 2016.



Member of Academy
Lembit Krumm

20.07.1928-13.12.2016

Lembit Krumm was born on 20 July 1928 at Kuressaare to a farmer's family. In 1947 he finished the Saaremaa Secondary School; a deep interest in engineering and mathematics prompted him to enrol at Tallinn University of Technology, which he graduated in 1952. He continued studies and work at Tallinn University of Technology, at Tomsk Polytechnic Institute as a post-graduate student and in laboratory of the Institute of Electrical Engineering with the ESSR National Economy Council. In 1956 he defended there the thesis of candidate of sciences on calculation methods of stationary regimes of electrical systems. Basing on that work he released in 1957 four publications, determining for long the build-up of large electricity networks in the USSR and the Baltic States. In 1979 Lembit Krumm defended his doctoral work on methods of complex optimisation of energy systems, and in 1981 he was awarded Professorship.

In 1959-1962 Lembit Krumm worked as head of laboratory in Novosibirsk, Institute of Transport and Energy; in 1962-1990 as head of Department of Major Power System Performance, Irkutsk Siberian Energy Institute (both in Siberian Branch of the USSR Academy of Sciences). Starting in 1980s until 2004 he simultaneously headed department of the Institute of Thermophysics and Electrophysics (later Institute of Energy) of the Estonian Academy of Sciences, where he was engaged with transfer to the Baltic and Estonia of the potential created in Siberia.

Lembit Krumm was elected Member of the Estonian Academy of Sciences in 1987.

Since 2004 his activity was related to grant projects on control of connection of inter-state electrical systems at the Electrical Power Institute of Tallinn University of Technology.

Lembit Krumm laid the foundation to theory and methods of complex optimal control of major power systems, he created the respective school and research direction. After the Baltic States regained independence, Lembit Krumm developed the said theory in the conditions of market economy. In the recent decade he used his best endeavours to set up the common energy system in the Baltic.

In 1966 Lembit Krumm was awarded the G.M. Kržižanovski Memorial Prize of the USSR Academy of Sciences and in 1986 the USSR State Prize. In 1991-2000 he was President of the Research Association of the Baltic Energy Systems.

Member of Academy Krumm released over 200 scientific publications, incl. some 20 monographs. His legacy from the period in Siberia is 10 Doctors of Sciences and 30 Candidates of Sciences (equivalent to PhD) whom he supervised at different times.

Member of Academy Lembit Krumm passed away on 13 December 2016.

APPENDIX 1: FINANCIAL ACTIVITIES

The budget of the Estonian Academy of Sciences for 2016 and its execution (EUR)

INCOME

Allocations to the Academy of Sciences from the state budget	1,325,992
Other revenue	86,862
Allocations to Under and Tuglas Literature Centre	299,535
TOTAL INCOME	1,712,389

EXPENDITURES

General breakdown

Main activities of the Academy (through Academy Office)	634,589
Estonian Academy Publishers	239,449
Allowance to Members of Academy	293,090
Grants of research professors	100,662
Prizes, scholarships and medals	6,494
Scientific and Learned Societies	61,154
Membership fees to international science organisations	36,613
National Science Prize Committee	26,000
Under and Tuglas Literature Centre	299,122
TOTAL EXPENDITURES	1,697,173

APPENDIX 2: ESTONIAN CONTACT POINTS FOR INTERNATIONAL SCIENTIFIC ORGANISATIONS

as of 1st March 2017 (whose membership fees in 2016 were covered by the Estonian Academy of Sciences from a specific allocation of the Ministry of Education and Research)

Estonian contact organisation	International organisation
Estonian Physical Society (contact: Kaido Reivelt, efs@fyysika.ee)	European Physical Society, EPS
Estonian National Geophysical Committee (contact Rein Rõõm, rein.room@ut.ee)	International Union of Geodesy and Geophysics, IUGG
Estonian National Committee for IGU (contact Mihkel Kangur, geograafiaselts@gmail.com)	International Geographical Union, IGU
Estonian National Committee for Geology (contact Dimitri Kaljo, dimitri.kaljo@ttu.ee)	International Union of Geological Sciences, IUGS
Estonian Association of Engineers/ Estonian Systems Engineering Society (contact Sven Nõmm, sven.nommm@ttu.ee)	International Federation of Automatic Control, IFAC
Estonian National Committee for Mathematics (contact Mati Abel, mati.abel@ut.ee)	International Mathematical Union, IMU
Estonian Polar Research Committee (contact Rein Vaikmäe, rein.vaikmae@ttu.ee)	European Polar Board, EPB
Estonian National Committee on Astronomy (contact Laurits Leedjärv, laurits.leedjarv@to.ee)	International Astronomical Union, IAU
Estonian National Committee for Mechanics (contact Andrus Salupere, salupere@ioc.ee)	International Union of Theoretical and Applied Mechanics, IUTAM
Estonian Academy of Sciences (contact Jüri Engelbrecht, j.engelbrecht@akadeemia.ee)	International Council for Science, ICSU

Estonian Academy of Sciences (contact Jaan Undusk, jaan@utkk.ee)	Union Académique Internationale, UAI
Estonian Academy of Sciences (contact Jüri Engelbrecht, j.engelbrecht@akadeemia.ee)	European Federation of Academies of Sciences and Humanities ALLEA
Estonian Academy of Sciences (contact Margus Lopp, margus.lopp@akadeemia.ee)	European Academies' Science Advisory Council, EASAC
Estonian Academy of Sciences (contact Kristi Viiding, kristi.viiding@ut.ee)	International Commission for <i>Thesaurus Linguae Latinae</i> , TLL
Committee on Phylogenetics and Systematics, Estonian Academy of Sciences (contact Urmas Kõljalg, urmas.koljalg@ut.ee)	Consortium of European Taxonomic Facilities, CETAF
Committee on Marine Sciences, Estonian Academy of Sciences (contact Tarmo Soomere, tarmo.soomere@cs.ioc.ee)	European Marine Board, EMB
ESTQUA (Estonian National Committee for INQUA) (contact Volli Kalm, tiit.hang@ut.ee)	International Union for Quaternary Research, INQUA
Estonian National Committee of Geomorphologists (contact: Tiit Hang, tiit.hang@ut.ee)	International Association of Geomorphologists, IAG
Estonian National Committee for IUPAP (contact Ergo Nõmmiste, ergo.nommiste@ut.ee)	International Union of Pure and Applied Physics, IUPAP
Section of Philosophy and Methodology of Science of the Estonian Association of the History and Philosophy of Science (contact Peeter Mürsepp, peeter.muursepp@ttu.ee)	International Union of History and Philosophy of Science and Technology, Division of Logic, Methodology and Philosophy of Science and Technology, IUHPST/DLMPST

APPENDIX 3: COOPERATION AGREEMENTS WITH PARTNER ORGANISATIONS

(in brackets, the date of signing the currently valid agreement)

1. Academy of Sciences of Bashkortostan (23.06.2012)
2. Academy of Sciences of the Republic Tajikistan (4.06.2012)
3. Austrian Academy of Sciences (12.11.2007)
4. Azerbaijan National Academy of Sciences (27.10.2016)
5. British Academy (4.08.2011)
6. Berlin-Brandenburg Academy of Sciences and Humanities (16.05.2002)
7. Bulgarian Academy of Sciences (2.04.1996)
8. Chinese Academy of Sciences (26.05.2000)
9. Council for the Lindau Nobel Laureate Meetings; Foundation Lindau Nobel Laureate Meetings (02.06.2016)
10. Czech Academy of Sciences (10.04.1996)
11. Finnish Academy of Science and Letters (10.03.1992)
12. French Academy of Sciences (22.03.1994)
13. Georgian National Academy of Sciences (19.10/01.11.2012)
14. Hungarian Academy of Sciences (20.06.1995)
15. Israel Academy of Sciences and Humanities (19.07.1995)
16. Italian National Research Council (23.04.2004)
17. Lithuanian Academy of Sciences (12.11.1991)
18. Latvian Academy of Sciences (12.11.1991)
19. Macedonian Academy of Sciences and Arts (16.12.1996)
20. Montenegrin Academy of Sciences and Arts (17.10.2005)
21. National Academy of Science of Belarus (18.02.2002)
22. National Academy of Sciences of Ukraine (2.10.2000)
23. Polish Academy of Sciences (17.06.1996)
24. Romanian Academy (06.04.2016)
25. Royal Flemish Academy of Belgium for Science and the Arts (26.03.2004)
26. Royal Society of London (30.10.1991)
27. Royal Swedish Academy of Letters, History and Antiquities (18.01.1995)
28. Royal Swedish Academy of Sciences (17.11.2005)
29. Russian Academy of Sciences (17.02.1993); additional memorandum on cooperation in Earth sciences (30.03.2012)
30. Slovak Academy of Sciences (28.11.1993)
31. Slovenian Academy of Sciences and Arts (28.04.1997)
32. Spanish Council for Scientific Research (19.06.2001)
33. Swiss Academy of Sciences (18.09.1989)
34. Tajik National University (4.06.2012)

APPENDIX 4: DIRECTORY

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DIVISION OF BIOLOGY, GEOLOGY AND CHEMISTRY (UT, Ravila 14a, 50441 Tartu, ESTONIA)	Head Toomas Asser · +372 731 8500 Fax +372 731 8106 toomas.asser@kliinikum.ee

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ANNUAL REPORTS
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THE ESTONIAN ACADEMY OF SCIENCES

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|-----------|--|
| 1940 | Year Book I of the Estonian Academy of Sciences
(in Estonian) |
| 1969–1988 | Annual Report of the Academy of Sciences of
the Estonian SSR (in Russian, 20 volumes) |
| 1989 | Annual Report of Estonian Academy of Sciences
(issued separately in Estonian, Russian and English) |
| 1990–1995 | Annual Report of Estonian Academy of Sciences
(issued separately in Estonian and English, 6 volumes) |
| | Scientific Publications of the Estonian Academy of
Sciences (with a Foreword in Estonian and English, 6
volumes) |
| 1996–2016 | Year Book of the Estonian Academy of Sciences II–XXII
(issued separately in Estonian and English) |