CURRICULUM VITAE

1. First name **JÜRI**

2. Surname **ENGELBRECHT**

3. Institution Estonian Academy of Sciences / Institute of Cybernetics at Tallinn University of Technology (TUT)

4. Position Vice-President / Lead Researcher

5. Data of birth August 1, 1939

6. Education TUT, Diploma in Engineering (*cum laude*)
TUT, Post-graduate scholarship

7. Research and professional experience

1968-1969 TUT, Senior Lecturer
1969- Institute of Cybernetics, Senior Research Fellow, Head of Department, Deputy Director, Extraordinary Lead Researcher, Head of the Centre for Nonlinear Studies (Centre of Excellence of Estonian Science), Lead Researcher
1992- TUT, Professor
1994- Estonian Academy of Sciences, President (1994-2004), Vice President (2004 -…)

Visiting Appointments

Czech Technical University (1967-1968), Newcastle-upon-Tyne University (1979-1980, 1986), University of Messina (1981, 1987), Budapest Technical University (1989), University of Cambridge (1989, 1994), University of Paris 6th (1991), RWTH Aachen (1992,1995), University of Torino (1996), University of Duisburg-Essen (2003)

8. Academic degree DSc, Math. Phys.

9. Dates and sites of earning the degrees
1962 - Diploma in Engineering
1968 - Cand Sc (PhD) in Mechanics, TUT
1981 - DSc, Math. Phys. in Continuum Mechanics, Ukrainian Academy of Sciences, Kiev
1999 - Dr. h. c. from Budapest Technical University

10. Honours/awards:
1992 - National Science Prize, yearly award in natural sciences and engineering
1993 - Humboldt Research Award
1995 - Commander of the *Order of the White Rose* of Finland
1999 - Order of the *National Coat of Arms* 4th Class, Estonia
1999 - *Mente et Manu* Small Medal of TUT, Estonia
2000 - Medal of the Baltic Academies of Sciences
2001 - Commander Grand Cross of the *Order of the Lion*, Finland
2002 - *Mente et Manu* Great Medal of TUT, Estonia
2003 - Chevalier des *Palmes Académiques*, France
2004 - Order of Merit (No 1) of the Ministry of Education and Research, Estonia
2004 - Marin Drinov Medal, Bulgarian Academy of Sciences
2005 - Cavalier Cross of the *Order of Merit* of the Republic of Poland
2005 - Nikolai Alumäe Medal, Estonian Academy of Sciences

2007 - Order of the *National Coat of Arms* 3rd Class, Estonia
2008 - Medal, Finnish Academy of Science and Letters
2008 - Commandeur de l'ordere de Leopold II, Belgium
2008 - National Science Prize, yearly award in biosciences and environment (as team member)
1987 - *Accademia Peloritana dei Pericolanti*, foreign member
1990 - Estonian Academy of Sciences, member
1996 - New York Academy of Sciences, fellow
1996 - *Academia Scientiarum et Artium Europaea*, active member
1996 - Latvian Academy of Sciences, foreign member
1998 - Hungarian Academy of Sciences, honourable member
1998 - Gothenburg Royal Society of Sciences and Arts, foreign member
2000 - Estonian Learned Society in Sweden, honorary member
2001 - World Innovation Foundation, fellow
2003 - Estonian Naturalists' Society, honorary member
2004 - *Academia Europaea*, fellow
2007 - Bulgarian Academy of Sciences, foreign member
2010 - Lisbon Academy of Sciences, fellow
2010 - World Academy of Arts and Sciences (WAAS), fellow

11. Research-administrative experience

President's Academic Advisory Board, member (1995-2011)
Estonian Academy of Sciences, President (1994-2004)
Estonian Science and Development Council, member (1994-2004)
National Science Awards Committee, Chairman (1995-2004)
Science Competence Council at Ministry of Education (Funding Agency), Chairman (1997-2002)
Estonian National Committee for Mechanics, Chairman (1991-2008)
ICSU, member of the General Assembly (1995- …)
ALLEA, member of the General Assembly, Head of WG, member of the Steering Committee, President (2006- …)
ESF, member of the Governing Council (1998- …)
IUTAM, member of the General Assembly, Congress Committee and the Bureau (1996-2008), Treasurer (2004- …)
Euromech, member of the Council (1986-1991, 1995-2000), convener of the Advisory Board (2001- …)
ISIMM, member of the Council (1999-2001)
EURAB, member (2004-2007)
EASAC, member of the Council (2006- …)

Ad hoc committees

Search Committees for the ESF, President and CEO (2004, 2007)
Identification Committee for the ERC (2005)
EC Expert group on ERA-NET (2006)
ALLEA WG on National Strategies of Research in Smaller European Countries, Chairman (1999-2002)
ALLEA WG on Research Cooperation, Chairman (2003-2006)
Estonian R&D Strategy 2002-2006, member of WG (2001)
Estonian R&D Strategy 2007-2013, Chairman of WG (2006-2007)
Accreditation of the Estonian Higher Education, Chairman of WG (2006)
OECD Expert Group on Research and Education in Bulgaria, member (2003)
Platform of European S&T Organisations, founding member on behalf of ALLEA (2006)

Foundations and Boards of Trustees

TUT, member of the Board of Trustees (1997-2004)
University of Tartu (UT), member of the Board of Trustees (1997-2002)

Estonian National Piano Museum, member of the Board of Trustees (2006- …)
Estonian National Culture Foundation, member of the Council (2002- …)
Open Estonia Foundation, member of the Council (2003-2006)
Centre for Ethics of the UT, member of the Advisory Board (2004- …)
Baltic Metropoles Inno, member of the Steering Committee (2006- …)

12. Current research

- Complexity of nonlinear wave motion: coherent wave fields, solitonics, phase-transformation fronts, dispersive materials
- Complexity in biophysics – *in silico* modelling of cardiac mechanics.

Publications

11 books, approx. 200 papers in refereed journals, about 150 articles on science management and philosophy in general.

Selected monographs

J. Engelbrecht. Nonlinear Wave Processes of Deformation in Solids. Pitman, London, 1983, 223 p.
J. Engelbrecht. An Introduction to Asymmetric Solitary Waves. Longman, London, 1991, 280 p.
J. Engelbrecht. Nonlinear Wave Dynamics: Complexity and Simplicity. Kluwer Publ., Dordrecht, 1997, 184 p.
A. Berezovski, J. Engelbrecht, G. A. Maugin. Numerical simulation of waves and fronts in inhomogeneous solids. World Scientific, Singapore, 2008, 236 p.
J. Janno, J. Engelbrecht. Microstructured solids. Inverse problems. Springer, Heidelberg, 2011, 160 p.

Textbooks

A. Jeffrey, J. Engelbrecht (eds) Nonlinear Waves in Solids. Springer, Wien et al., 1994 (CISM course).
Ü. Lepik, J. Engelbrecht. The Book of Chaos. Academy Publishers, Tallinn, 1999, 304 p. (In Estonian).

Supervising

9 PhDs promoted, 1 PhD student under supervision.

Selected recent papers

A. Salupere, J. Engelbrecht, and *G. Maugin*. Solitonic structures in KdV-based higher-order systems. Wave Motion, 2001, 34, 51-61.
A. Salupere, J. Engelbrecht, P. Peterson. Long-time behaviour of soliton ensembles. Chaos, Solitons and Fractals, Part I. Emergence of solitons, 2002, 14, 9, 1413-1424, Part II. Periodical patterns of trajectories, 2003, 15, 1, 33-44.
M. Vendelin, P.H. Bovendeerd, J. Engelbrecht, and *T. Arts.* Optimizing ventricular fibres: uniform strain or stress, but not ATP consumption, leads to high efficiency. Am. J. Physiol. Heart Circ. Physiol., 2002, 283, 3, 1072-1081.
M. Vendelin, P.H. Bovendeerd, V. Saks, and *J. Engelbrecht.* Cardiac mechano-energetics *in silico*. Neuroendocrinol. Lett., 2002, 23, 1, 13-20.
A. Berezovski, J. Engelbrecht, and *G.A. Maugin*. Numerical simulation of two-dimensional wave propagation in functionally graded materials. Eur. J. Mech. A/Solids, 2003, 22, 257-265.
J. Engelbrecht, A. Salupere. On the problem of periodicity and hidden solitons for the KdV model. Chaos, 2005, 15, 015114.
T. Soomere, J. Engelbrecht. Extreme elevations and slopes of interacting solitons in shallow water. Wave Motion, 2005, 43, 1-11.
J. Janno, J.Engelbrecht. Solitary waves in nonlinear microstructured materials. J. Phys. A: Math. Gen., 2005, 38, 5159-5172.

A. Berezovski, M. Berezovski, J. Engelbrecht. Numerical simulation of nonlinear elastic wave propagation in piecewise homogenous media. Mat. Sci. Engng., 2006, 418, 364-369.
J. Engelbrecht, A. Berezovski, A. Salupere. Nonlinear deformation waves in solids. Wave Motion, 2007, 44, 493-500.
P. Van, A. Berezovski, J. Engelbrecht. Internal variables and dynamical degrees of freedom. J. Non-Equilib. Thermodyn., 2008, 33, 235-254.
T. Peets, M. Randrüüt, J. Engelbrecht. On modelling dispersion in microstructured solids. Wave Motion, 2008, 45, 471-480.
J. Janno, J. Engelbrecht. Identification of microstructured materials by means of phase and group velocities. Math. Modelling and Anal., 2009, 14, 57-68.
J. Engelbrecht. Complexity of mechanics. Rendicorti Sem. Matem. Univ. e Politec. Torino, 2009, 67, 293-325.
J. Engelbrecht. Deformation waves in solids. In: Quak, E. and Soomere, T. (eds), Applied wave mathematics, Springer, 2009, 13-30.
J. Engelbrecht, A. Ravasoo, J. Janno. Nonlinear acoustic NDE – qualitative and quantitative effects. Mat. Manuf. Proc., 2010, 25, 4, 212-220.
A. Berezovski, J. Engelbrecht, G. A. Maugin. Generalized thermodynamics with dual internal variables. Arch. Appl. Mech., 2011, 81, 229-240.
A. Berezovski, J. Engelbrecht, M. Berezovski. Waves in microstructured solids: a unified viewpoint of modelling. Acta Mechanica, 2011, 220, 349-363.

Selected publications on science policy

The Beauty of Complex World. T. Kändler, J. Engelbrecht, M. Kutser (eds). Institute of Cybernetics, Tallinn, 2007. (In Estonian)
J. Engelbrecht. Attractors of Thoughts. Estonian Acad. Sci., Tallinn, 2004, 174 p.
J. Engelbrecht. From Parts to Whole. Trames, 2003, vol 7, 6-20.
J. Engelbrecht. Quality without Quantity. P. Drenth (ed). Biennial Yearbook 2002. ALLEA, Amsterdam, 2003, 57-69.
J. Engelbrecht (ed). National Strategies of Research in Smaller European Countries, ALLEA and Estonian Academy of Sciences, Amsterdam, 2002.
J. Engelbrecht. Science and Society – Faculties Close or Apart? In: R. Vihalem (ed). Estonian Studies in the History and Philosophy of Science. Kluwer, Dordrecht et al., 2001, 77-88.

Address: Prof. Jüri Engelbrecht
Estonian Academy of Sciences
Kohtu Str. 6
10130 Tallinn, Estonia

phone + 372 644 2013
fax + 372 645 1829
e-mail: je@ioc.ee

also:
Centre for Nonlinear Studies (CENS)
Institute of Cybernetics at Tallinn University of Technology
Akadeemia Rd. 21
12618 Tallinn, ESTONIA

Jüri Engelbrecht – Short CV

Jüri Engelbrecht (1.08.1939) received his Dipl. Eng. degree in Civil Engineering from Tallinn University of Technology (TUT) in 1962. He obtained his PhD in Mechanics after completion of the post-graduate course and joined the Institute of Cybernetics of the Estonian Academy of Sciences (presently at TUT) in 1969. He got his DSc degree in 1981 and later became the Head of the Department of Mechanics at the same institute. In 1998 he founded the Centre for Nonlinear Studies (CENS), which was chosen among the Estonian Centres of Excellence in Science in 2003. CENS combines studies in several fields – mechanics, biophysics, fractal theories and optics and is a member of the Network of Complexity Centres. He also holds a professorship in Applied Mechanics at TUT. In 1994–2004 he was the President of the Estonian Academy of Sciences, since 2004 he is a Vice-President. He has held visiting appointments in many European universities (Cambridge, Paris 6, Turin, Aachen, etc), is a member of the IUTAM Bureau as well as a number of academies and scientific societies, also a member of Editorial Boards of many academic journals. His main scientific interest is in mathematical physics and theoretical mechanics: nonlinear wave motion and general dynamics, complexity and coupled fields, incl. modeling of cardiac dynamics. He has published over 200 scientific papers and several books (by Pitman, Longman, Springer, and Kluwer). He is involved in designing the science policy for Estonia (funding schemes, research strategies, accreditation, etc.) starting from 1994. He has wide experience in implementing and advising on the European science policy – being a member of the EURAB2, serving in various ad hoc committees of the EC, etc. He is the President of ALLEA (All European Academies) for the term 2006–2009, a member of the ESF Governing Council and a member of the EASAC. In ALLEA he has initiated an analysis upon the research strategies of smaller European countries, research co-operation among the Academies and reflection of the Academies in the European Research Area. He has received honours from Estonia, Finland, France and Poland. In all his activities he insists on the excellence and integrity of research as well as the links between science and society.