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 / Head of Department
5. Data of birth August 1, 1939
6. Education TUT, Diploma in Engineering
   TUT, Post-graduate scholarship
7. Research and professional experience
   1968 – 1969 TUT
   1969 – Institute of Cybernetics, Senior Research Fellow, Deputy Director, Head of the Centre for Nonlinear Studies (Centre of Excellence of Estonian Science)
   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. Research-administrative experience

Estonian Academy of Sciences, President (1994 – 2004)
Estonian Science and Development Council, member (1995 – 2004)
State Science Awards Committee, Chairman (1995 – 2004)
Science Competence Council at Ministry of Education (Funding Agency), Chairman (1997 – 2003)
Estonian National Committee for Mechanics, Chairman up to 2008
ICSU, member of the General Assembly
ALLEA, member of the General Assembly, Head of WG, member of the Steering Committee, President (2006 – …)
ESF, member of the Governing Council (1999 – …)

IUTAM, member of the General Assembly, member of the Congress Committee (1996 – 2004), member of the Bureau (1996 – 2008), Treasurer (2004 – 2008)
Euromech, member of the Council (up to 2000), convener of the Advisory Board (2001 – 2006)
ISIMM, member of the Council (2000 – 2003)
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)
NETWATCH advisory board (2009…)
FP Peoples Programme, advisory board (2009…)

Foundations and Boards of Trustees

Academic Council of the State President of Estonia (1995 –…)
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 – 2009)
TEA Estonian Encyclopedia – vice-chair of the Board

11. Honours/awards:

1992 – Estonian Science Prize
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
2001 – Commander Grand Cross of the *Order of the Lion* of 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 – Estonian Science Prize

2008 – Medal, Finnish Academy of Sciences
2008 – *Commandeur de l'ordre de Leopold II*, Belgium
1987 – *Accademia Peloritana dei Pericolanti*, foreign member
1990 – Estonian Academy of Sciences, member
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
2001 – World Innovation Foundation, fellow
2004 – *Academia Europaea*, fellow
2007 – Bulgarian Academy of Sciences, foreign member

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 9 books, about 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, 280p.

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 pp.

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

6 PhDs promoted, 3 PhD students 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 en-sembles. 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.

A. Berezovski, J. Engelbrecht and G.A. Maugin. Internal variables and generalized continuum theories, In: Borodich F.M. (ed.) IUTAM Symp. on Scaling in Solid Mechanics. Springer. Heidelberg, 2009, 69-80.

A. Berezovski, J. Engelbrecht, G.A. Maugin. One-dimensional microstructure dynamics. - In: Mechanics of Microstructured Solids : Cellular Materials, Fibre Reinforced Solids and Soft Tissues. Eds. J.-F.Ganghoffer, F.Pastrone. Berlin : Springer, 2009, 21-28.

J. Engelbrecht. Deformation waves in solids (to appear). - In: Applied Wave Mathematics:Selected Topics in Solids, Fluids, and Mathematical Methods / Eds. E.Quak, T.Soomere. Berlin : Springer, 2009.

J. Engelbrecht, R. Winther, E. Quak. CENS, CMA and the CENS-CMA project. - In:E.Quak and T.Soomere (eds), Applied Wave Mathematics, Springer, 2009, 1–6.

A. Berezovski, M. Berezovski, and J. Engelbrecht. Waves in inhomogeneous solids. - In: E.Quak and T.Soomere (eds), Applied Wave Mathematics, Springer, 2009, 55–81.

J. Engelbrecht, M. Randrüüt, A. Salupere. On modelling wave motion in microstructured solids. Proc. Est. Acad. Sci., 2009, 58, 4, 241–246.

J. Engelbrecht, A. Ravasoo, J. Janno. Nonlinear acoustic nondestructive evaluation (NDE): qualitative and quantitative effects. - Materials and Manufacturing Processes, 2010, 25, 4, 212-220.

M. Berezovski, A. Berezovski, J. Engelbrecht. Numerical simulations of one-dimensional microstructure dynamics. - In: Proc. of the 2nd Int.Symp. on Computational Mechanics and the 12th International Conference on the Enhancement and Promotion of Computational Methods in Engineering and Science, Hong Kong- Macau, China, 30 Nov.- 3 Dec. 2009 / Eds. J. W. Z. Lu [et al.]. Melville, NY : American Institute of Physics, 2010, 1052-1057.

M. Berezovski, A. Berezovski, J. Engelbrecht. Waves in materials with microstructure: numerical simulation. - Proceedings of the Estonian Academy of Sciences, 2010, 59, 2, 99-107.

J. Engelbrecht, A. Ravasoo, J. Janno. Nonlinear acoustic nondestructive evaluation (NDE): qualitative and quantitative effects. - Materials and Manufacturing Processes, 2010, 25, 4, 212-220.

J. Engelbrecht. Nonlinear wave motion and complexity. – Proc. Est. Acad. of Sci., 2010, 59, 2, 66-71.

H. Herrmann, J. Engelbrecht. The balance of spin from the point of view of mesoscopic continuum physics for liquid crystals . J. of Non-Equilibrium Thermodynamics, 2010, 35, 337-346.

J. Engelbrecht, A. Berezovski, T. Soomere. Editorial. Highlights in the research into complexity of nonlinear waves. – Proc. Est. Acad. Sci., 2010, 59, 2, 61-65.

A. Berezovski, J. Engelbrecht, G. Maugin. Thermoelasticity with dual internal variables. – J. of Thermal Stresses, 2011, 34, 5-6, 413-430

A. Berezovski, J. Engelbrecht, G.A. Maugin. Generalized thermomechanics with dual internal variables. - Archive of Applied Mechanics, 2011, 81, 2, 229-240

M. Berezovski, A. Berezovski, J. Engelbrecht. Wave propagation in heterogeneous materials with secondary substructure. - In: Advances in Heterogeneous Material Mechanics (2011): Proc. Third International Conference, May 22-26, 2011, Shanghai, China / Eds. J. Fan [et al.]. Lancaster : DEStech Publications, Inc., 2011, 531-534.

J. Engelbrecht, A. Salupere, K. Tamm. Waves in microstructured solids and the Boussinesq paradigm. - Wave Motion, 2011.

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.

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