

Bo Rikard Gebart

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Objective	Management of high tech activities
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Education	<ul style="list-style-type: none">• PhD Fluid Mechanics, Luleå University of Technology, 1993 Thesis title: "Analysis of heat transfer and fluid flow in the Resin Transfer Moulding process"• Licentiate of Engineering Fluid Mechanics, Royal Institute of Technology, 1987 Thesis title: "Transport mechanisms at a stable density interface – influences of vertical rigid walls"• MSc Engineering Physics, Royal Institute of Technology, 1984 Thesis project in Fluid Mechanics• "STD-programmet", Institutet för Företagsledning (IFL), Sigtuna, 2003 Intensive course in management, leadership, economy, strategic planning etc. for managers in technical consultancy companies
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Research Experience	Supervision of collaborative research projects <ul style="list-style-type: none">• The Swedish Centre for Gasification (SFC) – Principal Investigator of a collaborative research program with three nodes. The main grantee is Luleå University of Technology and the node connected to LTU also involves ETC and Umeå University. The other two nodes are led by KTH and Chalmers. The total budget for the first two years is 58.5 million SEK. The yearly budget for the eight years after that is 58.5 million. Sponsored by the Swedish Energy Agency, LTU, UmU, KTH, Chalmers and 23 companies.• The Bio4Energy Program 2010-2015 – Leader of the Thermochemical Research Platform and principal investigator in collaboration with Luleå University of Technology, Umeå University, the Swedish Agricultural University and Innventia. Total budget of 200 million SEK. Sponsored by the Swedish Government.• The BLG Program 2007-2010 – Program manager and principal investigator in collaboration with Luleå University of Technology, Umeå University, Chalmers Institute of Technology, STFI and Chemrec AB. Total budget of 48 million SEK. Sponsored by the Swedish Energy Agency, MISTRA, Kappa Kraftliner, SCA Packaging, Södra Cell, Sveaskog, Chemrec AB and the County Administrative Board of Norrbotten.• The BLG Program 2004-2006 – Program manager and principal investigator in collaboration with Luleå University of Technology, Umeå University, Chalmers Institute of Technology, STFI, Corrosion Institute and Chemrec AB. Total budget of 45 million SEK. Sponsored by the Swedish Energy Agency, MISTRA, Vattenfall, Kappa Kraftliner, SCA Packaging, Södra Cell, Sveaskog, Chemrec AB and the County Administrative Board of Norrbotten.• Centre for Black Liquor Gasification 2001-2003 – Coordinator and principal investigator in collaboration with Luleå University of Technology, Umeå University, Chalmers Institute of Technology and Chemrec AB. Total budget of 17.5 million SEK. Sponsored by the Swedish Energy Agency and Chemrec AB.• Network Institute of Future Energy Systems (NIFES) 2000-2002 – Coordinator and principal investigator in collaboration with Luleå University of Technology, Umeå University and the Swedish Agricultural University. Total budget of 13 million SEK. Sponsored by EU Goal 1, the Municipality of Piteå and a consortium of regional industry (e.g. Kappa Kraftliner and Skellefteå Kraft).• Hydropower University 1998-2000 – Coordinator and principal investigator in collaboration between several divisions within Luleå University of Technology, Vattenfall Hydropower, Alstom Power and General Electric Turbines. Total budget of 5 million SEK. Sponsored by EU Goal 2, Vattenfall, Alstom, GE and Luleå
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Supervision of PhD students

- Göktepe, B., “Thermo-acoustic feedback in large biomass powder burners”, project started 2008
- Risberg, M., “Simulation of gas cooling in black liquor gasification”, project started 2008
- Carlsson, P., “Large Scale Experiments and Modeling of Black Liquor Gasification”, Luleå University of Technology, Doctoral thesis 2011:??, (2011)
- Marklund, M., “Pressurized entrained-flow high temperature black liquor gasification: CFD based reactor scale-up method and spray burner characterization”, Luleå University of Technology, Doctoral thesis 2006:42, (2006)
- Wiinikka, H., “High temperature aerosol formation and emission minimisation during combustion of wood pellets”, Luleå University of Technology, Doctoral thesis 2005:18, (2005)
- Engström, T.F., “Simulation and experiments of turbulent diffuser flow with hydropower applications”, Luleå University of Technology, Doctoral thesis 2003:10, (2003)
- Burman, J., “Geometry parameterisation and response surface-based shape optimisation of aeroengine compressor blades”, Doctoral thesis 2003:09, Luleå University of Technology, (2003)
- Vahlund, C.F., “Fibre orientation, rheological behaviour and simulation of the compression moulding process for composite materials”, Doctoral thesis 2001:25, Luleå University of Technology, (2001)
- Bergström, J., “Modelling and numerical simulation of hydro power flows”, Doctoral thesis 2000:06, Luleå University of Technology, (2000)
- Lundström, T.S., “Void formation and transport in manufacturing of polymer composites”, Doctoral thesis 1996:184 D, Luleå University of Technology, (1996)

Adjunct professor appointments

- Employed by SICOMP and adjunct professor in fluid mechanics at Luleå University of Technology, 1995-1997
- Employed by ETC and adjunct professor in fluid mechanics at Luleå University of Technology, 2000-2006
- Employed by ETC and adjunct professor in energy technology at Luleå University of Technology, 2007-present
- Employed by ETC and adjunct professor in mechanical engineering at Michigan University of Technology, 2009-present

Combustion and gasification

- Development of a model for black liquor gasification including droplet transport, droplet gasification and gas phase reactions.
- Coordination of a national cross-disciplinary research program on black liquor gasification with an annual budget of about 12 million SEK.
- Investigation of mechanisms for particle formation and growth during pellets combustion. Sensitivity studies aiming at optimisation of combustion processes for minimum particle emissions.
- Supervision of about ten smaller research and development projects on combustion and gasification at ETC each year since 2000.

Computational fluid dynamics

- Development and assessment of methods for estimation of numerical errors (grid and iterative errors).
- Application of CFD in composites manufacturing, hydropower flows, gas turbine compressors, combustion and gasification.
- Development of a pressure-correction based transonic solver based on a modified SIMPLE algorithm.

Experience from experimental methods

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- Hot wire anemometry
 - Laser doppler anemometry including phase doppler techniques for determination of droplet size distribution
 - Particle sizing instruments (hydrodynamic impactor, scanning mobility particle sizer)
 - Data acquisition systems and programming (Labview, HP-BASIC etc)

Shape optimisation

- Development of a blade design system for axial compressors in aero-engines based on NURBS representations. The optimisation methods are based on response surface models. The system is presently in use at Volvo Aero where my former student Jörgen Burman is continuing the development.

Hydropower flows

- Detailed studies of draft tube flows. Assessment of turbulence models by comparison to model experiments.
- Organisation of two international workshops on draft tube flows (Turbine 99 – workshop 1 and 2)

Composites manufacturing

- Modelling of permeability of uni-directional reinforcements. Many other researchers have adopted my model and the original paper has been referenced more than 115 times.
- Studies of void formation during mould filling in the resin transfer moulding process.
- Rheological studies of compression moulding compounds.
- Development of a computer program (TCV) for prediction of temperatures, degree of cure and viscosity in thick laminates during manufacturing. The program is being used for optimisation purposes at the Swedish Institute of Composites.

Turbulent mixing in buoyant flows

- Experimental studies of mixing across a density gradient enclosed by a honeycomb structure. The technical application was a density lock in a new nuclear reactor concept (ABB ATOM PIUS) where mass transfer during normal operation was to be minimised. The results formed the basis for a US and an Italian patent with me as co-inventor.

General fluid flow and heat transfer

- During my time at ABB Corporate Research I gained a large experience from small and large R&D projects on trains, nuclear power, high voltage circuit breakers, metallurgical equipment, transformers, generators etc. The methods used were CFD (PHOENICS and FLOW3D) and model experiments where a range of experimental techniques was used.
- While at Luleå University of Technology I have run about 30 industrially sponsored student projects connected to my course "Applied Fluid Mechanics". The projects span the whole range of fluid mechanics, e.g. gas cleaning equipment and supersonic ejectors. I have also supervised about 20 thesis projects, most of them involving CFD.

Professional Experience

Luleå University of Technology, Luleå, Sweden

Professor

April 2012 - Present

- Program manager for the Swedish Gasification Centre

Energy Technology Centre (ETC), research institute, Piteå, Sweden

Managing director

February 2000 – March 2012

- Overall responsibility for the institute (budget, staff etc.). The number of permanent employees is 18 and the annual turnover is about 20 million SEK.
- Employ and supervise graduate students, senior scientists and technical staff
- Develop long term strategy for research and consulting services
- Initiate and obtain funding for strategic research projects

Luleå University of Technology, Luleå, Sweden

Associate professor

January 1997 – January 2000

- Appointed to Docent in Fluid Mechanics by the Faculty of Technology, 1999
- App. 50 % teaching of undergraduate and graduate courses in fluid mechanics, turbulence, computational fluid mechanics, rheology, design optimisation, combustion, hydraulic turbines etc.
- Supervision of graduate students in composites manufacturing, shape optimisation and hydropower flows
- Obtained funding for a framework program on composites technology from TFR together with professor Håkan Gustavsson and professor Lars Berglund
- Project leader for the development of a new international masters program on hydropower technology ("Hydropower University") sponsored by Vattenfall, ABB Generation and Kvaerner Turbine (renamed to GE Turbines)

European Laboratory for Particle Physics (CERN), Geneva, Switzerland

Research Associate

November 1995 – December 1997

- R&D on cooling and ventilation for the Transition Radiation Tracker detector of the ATLAS experiment connected to the new Large Hadron Collider accelerator
- International collaboration with two official languages, English and French. Improved my French language skills and understanding of cultural differences.

Swedish Institute of Composites (SICOMP), Piteå, Sweden

Scientific leader

August 1989 – November 1995

- Supervision of a multi-disciplinary team of about 20 people
- Own research on impregnation and mould filling in composites manufacturing
- Subtask leader for an EU-sponsored project on resin transfer moulding (BRITE/EURAM II BE5477-92; BRE2/CT92/0227 "Simulation of the resin transfer moulding process for efficient design and manufacture of composites")

ASEA Brown Boveri (ABB) Corporate Research, Västerås, Sweden

Research Engineer

April 1984 – July 1989

- R&D on heat transfer and fluid flow for ABB subsidiaries, including ABB STAL (gas turbines), ABB Switchgear (high voltage circuit breakers), ABB ATOM (new reactor concepts) and ABB Traction (trains).
- Project leader for the development of the density lock for the PIUS nuclear reactor that led to a patent with me as co-inventor.
- Development of a transonic solver for the FLOW3D commercial code to enable analysis of high voltage circuit breakers
- Derivation of a particle tracking algorithm that was used for prediction of erosion problems in gas turbines connected to pressurised fluidised bed coal combustion

Personal references

- Professor Håkan Gustavsson
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- Professor Henrik Alfredsson
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- Professor Peter Gudmundson
Solid Mechanics
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email: peter@half.kth.se
phone: +46 8 790 7548

Publications

Journals with peer review

- Wiinikka, H., Carlsson, P., Marklund, M., Grönberg, C., Pettersson, E., Lidman, M., Gebart, R., "Experimental investigation of an industrial scale black liquor gasifier. Part 2: Influence of quench operation on product gas composition", *Fuel*, 93:117-129, 2012
 - Haggström C., Öhrman O., Rownaghi A.A., Hedlund J., Gebart, R., "Catalytic
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methanol synthesis via black liquor gasification”, *Fuel Processing Technology*, 94: 10–15, 2012

- [Gebart, BR](#), Wiinikka, H, Marklund, M, Carlsson, P, Gronberg, C, Weiland, F, Johansson, AC, Ohrman, O, “Recent advances in the understanding of pressurized black liquor gasification”, *Cellulose Chemistry and Technology*, 45: 521-526, 2011
- Carlsson, P., Iisa, K., Gebart, R., “CFD Simulations of Raw Gas Composition from a Black Liquor Gasifier - Comparison with Experiments”, *Energy and Fuels*, 25: 4122-4128, 2011
- Carlsson, P., Marklund, M., Furusjö, E., Wiinikka, H., Gebart, R., “Experiments and mathematical models of black liquor gasification – influence of minor gas components on temperature, gas composition, and fixed carbon conversion”, *TAPPI J.*, 9 (9): 15-24, 2010
- Carlsson, P., Wiinikka, H., Marklund, M., Grönberg, C., Pettersson, E., Lidman, M., Gebart, R., “Experimental investigation of an industrial scale black liquor gasifier. 1. The effect of reactor operation parameters on product gas composition”, *Fuel*, 89 (12): 4025-4034, 2010
- Wiinikka H, Carlsson P, Granberg F, Lofstrom J, Marklund M, Tegman R, Lindblom M, Gebart R, “Design and methodology of a high temperature gas sampling system for pressurized black liquor gasification”, *Fuel*, 89 (9): 2583-2591, 2010
- Marklund M, Gebart R, Tegman R, “Comparisons of initial experiments and reactor model predictions in high temperature black liquor gasification”, *TAPPI Journal*, 8 (2): 12-18, 2009
- Carlsson, P., Gebart, R., Grönberg, C., Marklund, M., Risberg, M., Wiinikka, H. and Öhrman, O., “Spatially Resolved Measurements of Gas Composition in a Pressurised Black Liquor Gasifier”, *Environmental Progress & Sustainable Energy*, 28 (3): 316-323, 2009
- Marklund M., Tegman R., and Gebart R., “A self-consistent CFD-model for high temperature pressurised black liquor gasification”, *IFRF Combustion Journal*, no. 200801, ISSN 1562-479X, 2008
- Marklund M., Tegman R., and Gebart R. “CFD modelling of black liquor gasification: Identification of important model parameters”, *Fuel*, 86, pp.1918-1926, 2007
- Wiinikka H, Gebart R, Boman C, Boström D, Nordin A, Öhman M “High-temperature aerosol formation in wood pellets flames: Spatially resolved measurements”, *Combustion and Flame*, 147 (4): 278-293 DEC 2006
- Wiinikka H, Gebart R, “The influence of fuel type on particle emissions in combustion of biomass pellets”, *Combustion Science and Technology*, 177 (4): 741-763 APR 2005
- Marklund M, Gebart BR, Fletcher DF, “Determination of the influence of uncertain model parameters in pressurized gasification of black liquor using a factorial design”, *Combustion Science and Technology*, 177 (3): 435-453 MAR 2005
- Wiinikka H, Gebart R, “Experimental investigations of the influence from different operating conditions on the particle emissions from a small-scale pellets combustor”, *Biomass & Bioenergy*, 27 (6): 645-652 2004
- Wiinikka H, Gebart R, “Critical parameters for particle emissions in small-scale fixed-bed combustion of wood pellets”, *Energy & Fuels*, 18 (4): 897-907 JUL-AUG 2004
- C. Fredrik Vahlund and B. Rikard Gebart, "Squeeze flow rheology of glass mat thermoplastic (GMT) at high closing velocities and in large tools", *International Polymer Processing*, 17, pp 158-165, 2002
- Andersson HM, Lundstrom TS, Gebart BR, Synnergren, P., “Application of digital speckle photography to measure thickness variations in the vacuum infusion process”, *Polymer Composites*, 24 (3): 448-455 JUN 2003
- Andersson, H.M., T.S. Lundström, B.R. Gebart and R. Långström, “Flow enhancing layers in the vacuum infusion process”, *Polymer Composites*, 23, pp 895-901, 2002
- Andersson, H.M., T.S. Lundström and B.R. Gebart, “Numerical model for vacuum infusion manufacturing of polymer composites”, *Int. J. of Numerical Methods for Heat & Fluid Flow*, 13, pp 383-394, 2002
- Burman, J. och B.R. Gebart, ”Influence from numerical noise in the objective function for flow design optimization”, *Int. J. of Numerical Methods for Heat & Fluid Flow*, 11, 2001

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- Vahlund C.F. & Gebart B.R., "Analysis of an image processing method for fiber orientation in polymer composites", *Polymer Composites*, 22, 2001
 - Hammami, A. and B.R. Gebart, "Analysis of the vacuum infusion moulding process", *Polymer Composites*, 21, pp28-40, 2000
 - Lundström, T.S., B.R. Gebart and E. Sandlund, "In-plane permeability measurements on fibre reinforcements by the parallel flow technique", *Polymer Composites*, 20, 1999
 - Bergström, J. & B.R. Gebart, "Estimation of numerical accuracy for the 3D flow field in a hydraulic turbine draft tube", *Int. J. of Numerical Methods for Heat & Fluid Flow*, 9, 1999
 - Hammami, A. and B.R. Gebart, "A Model for the vacuum infusion moulding process", *Plastics, Rubber and Composites Processing and Applications*, 27, pp1-5, 1998
 - Gebart, B.R. and P. Lidström, "Measurement of in-plane permeability of anisotropic fiber reinforcements", *Polymer Composites*, 17, pp43-51, 1996
 - Lundström, T.S. and Gebart, B.R., "Effect of perturbation of fibre architecture on permeability inside fibre tows", *J. of Composite Materials*, 29, pp424-443, 1995
 - Lundström, T.S. and Gebart, B.R., "Influence from process parameters on void formation in resin transfer moulding", *Polymer Composites*, 15, pp25-33, 1994
 - Gebart, B.R., "Critical parameters for heat transfer and chemical reactions in thermosetting materials", *J. Applied Polymer Science*, 51, pp153-168, 1993
 - Lundström, T.S., Gebart, B.R., & Lundemo, C.Y., "Void formation in RTM", *J. Reinforced Plastics*, 12, pp1339-1349, 1993
 - Gebart, B.R., "Permeability of unidirectional reinforcements for RTM", *J. Composite Materials*, 26, pp 1100-1133, 1992
 - Strömbeck, L.A. & Gebart, B.R., "Optimization of cure kinetics model parameters from DSC-data", *Thermochimica Acta*, 214, pp 145-148, 1992

Papers in conference proceedings

- Gebart, R, Wiinikka H, Marklund M, Carlsson P, Grönberg C, Weiland F, Johansson A-C, Öhrman O, "Recent advances in the understanding of pressurized black liquor gasification", *Proc. Nordic Wood Biorefinery Conference*, 22-24 March 2011, Stockholm, Sweden
 - Göktepe, B., Gebart, R., Leitao, N. and Fernandes, E., "Visualization of the reactive swirling flows in a 150 kW wood powder burner", *7th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics*, 19-21 July 2010, Antalya, Turkey
 - Göktepe B., Gebart R., Leitão N., Leitão I. V., Merícia J. G., Fernandes E. C. "Simultaneous pressure and heat release measurements in a 150kW wood powder burner", *SPEIC10 - Towards Sustainable Combustion*, 16-18 June 2010, Tenerife, Spain
 - Carlsson, P., Marklund, M., Furusjö, E., Wiinikka, H. And Gebart, R., "Entrained Flow Black Liquor Gasification - Experimental Validation of a CFD Reactor Mode", *Proc. International Chemical Recovery Conference*, March 29-April 1 2010, Williamsburg, Virginia, pp. 160-171
 - Gebart, B.R., "High temperature gasification of black liquor and biomass powders", *Solander Symposium*, Piteå, 11-12 November 2009
 - Gebart, R., "Current research on processes for transportation fuel from forest industry by-products", *Forest Technology Platform Conference*, Stockholm, 8-10 November, 2009
 - Gebart, R., "Current research on processes for transportation fuel from forest industry by-products", *French-Swedish Scientific Workshop on Low-Carbon Energy*, Stockholm, 23 October, 2009
 - Carlsson, P., Gebart, R., Grönberg, C., Marklund, M., Risberg, M., Wiinikka, H. and Öhrman, O., "Spatially Resolved Measurements of Gas Composition in a Pressurised Black Liquor Gasifier", *Proceedings of TC Bioenergy 2009*, Chicago, 16-18 September 2009
 - Carlsson, P., M. Marklund, H. Wiinikka and R. Gebart "Comparison and Validation of Gas Phase Reaction Schemes for Black Liquor Gasification Modeling", *Proc.*
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AICHE Annual Meeting 2008, Philadelphia, 16-21 November 2008

- Gebart, R., Wiinikka, H. and Berglin, N., "The Black Liquor Gasification Programme 2", Solander Symposium, Piteå, 11-12 September 2008
- B. Rikard Gebart, "Turning a pulp mill into a biorefinery – a possible outcome from the second Black liquor gasification program", Proc. 2008 Nordic Wood Biorefinery Conference, Stockholm, March 11-14, 2008
- B. Rikard Gebart, "Black liquor gasification – Swedish research", International seminar on gasification and methanation, Gothenburg, September 20-21, 2007
- Marklund M., Gebart R., and Tegman R. "Experiments and reactor model predictions in high temperature black liquor gasification". Proc. International Chemical Recovery Conference, May 29-June 1 2007, Quebec, Canada, pp. 147-154.
- B. Rikard Gebart, "Improvement potential in chemical pulping: Black liquor gasification", *IEA Workshop on Energy Efficient Technologies and CO₂ Reduction Potentials in the Pulp and Paper Industry*, Paris, 9 October 2006
- B. Rikard Gebart, "Skogens svarta guld – svartlut", Energitinget 2006, Eskilstuna, 7-8 March 2006
- B. Rikard Gebart, "Svartlutsförgasning – idag och imorgon", Energitinget 2006, Eskilstuna, 7-8 March 2006
- B. Rikard Gebart, L. Westerlund, A. Nordin, R. Backman, B. Warnqvist, T. Richards, I. Nohlgren, L. Olm, N. Berglin, L. Troselius and I. Landälv, "Black liquor gasification - the fast lane to the biorefinery", Risoe International Energy Conference, Risö, 23-25 May, 2005
- Marklund, M., Gebart, B.R. and Fletcher, D., "CFD Model for Optimisation of an Entrained Flow Gasifier for Black Liquor", Colloquium on Black Liquor Combustion and Gasification, May 13-16, 2003, Park City, Utah
- Burman, J., N. Papila, W. Shyy and B.R. Gebart, "Assessment of response surface-based optimization techniques for unsteady flow around bluff bodies", 9th AIAA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, Atlanta, Georgia, 4-6 September 2002
- Wiinikka, H. And B.R. Gebart, "Experimental investigations of the influence from different operating conditions on the particle emissions from a small scale pellets combustor", Pellets 2002, Stockholm, 2-7 September 2002
- Wiinikka, H. And B.R. Gebart, "Numerical prediction of particle emissions from small scale combustion of wood pellets", Proc. 2002 Australian Symposium on Combustion, 2002
- Marklund M. And B.R. Gebart, "Prediction of gasification efficiency in a pressurised black liquor gasifier", Proc. 6th European Conference on Industrial Furnaces and Boilers, Lissabon, Portugal 2002
- Marklund, M. And B.R. Gebart, "Approximate Modelling of the Flow of Gas and Droplets in an Entrained Flow Pressurised Black Liquor Gasification Reactor", International Joint Power Generation Conference & Exposition, New Orleans, June 2001
- Marklund, M. And B.R. Gebart, "Approximate modelling of the flow of gas and droplets in a Chemrec Pressurised Black Liquor Gasifier", First Biennial Meeting of the Scandinavian-Nordic Section of the Combustion Institute, Gothenburg, 2001
- B. R. Gebart, L.H. Gustavsson and R.I. Karlsson, "Report from Turbine-99 – Workshop on draft tube flow", Proc. XX IAHR Symposium on Hydraulic Machinery and Systems, Charlotte, 6-9 August 2000
- Vahlund C. F. & Gebart, B. R., "Squeeze flow rheology in large tools", Proc. 5th International Conference on Flow Processes in Composite Materials, 12-14 July, Plymouth, 1999
- Bergström, J. & B.R. Gebart, "An approximate model for the runner in hydraulic turbines", 3rd ASME/JSME Joint Fluids Engineering Conference, San Francisco, July 18-23, 1999
- Engström, F. And B.R. Gebart, "Gyroscopic design of swirling flow diffusers", 3rd ASME/JSME Joint Fluids Engineering Conference, San Francisco, July 18-23, 1999
- Bergström, J. & B.R. Gebart, "An approximate method for the simultaneous flow in rotating and stationary parts of a hydraulic turbine", Proc. XIX IAHR Symposium, Singapore, 9-11 September 1998

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- Hammami, A. And B.R. Gebart, "Experimental investigation of the vacuum infusion moulding process", Proc. Eighth European Conference on Composite Materials, Naples, 3-6 June 1998
 - Hammami, A. And B.R. Gebart, "A model for the vacuum infusion moulding process", Proc. Fibre Reinforced Composites '98, Newcastle, 15-17 April 1998
 - Lundström, T.S., B.R. Gebart and E. Sandlund, "In-plane permeability measurements on fibre reinforcements by the parallel flow technique", Proc. Fibre Reinforced Composites '98, Newcastle, 15-17 April 1998
 - Vahlund, C.F and B.R. Gebart, "Errors in fibre orientation distribution analysis with image processing", Proc. Fifth International Conference on Automated Composites, Glasgow, 4-5 September, 1997
 - Vahlund, C.F. and B.R. Gebart, "Rheological properties of SMC during non-isothermal compression moulding", Poster at the Polymer Processing Society Europe/Africa Region Meeting, Gothenburg, Sweden, August 19-21, 1997
 - Couniot, A., L. Dewez, F. Dupret, R. Keunings, G. Lielens, P. Pirotte, J. Bland, A.G. Gibson, G. Kotsikos, R. Gebart, J. Krispinsson, F. Vahlund, S. Toll, J. Manson and C. Servais, "Prediction of the flow-induced properties of long-fibre compression moulded parts", Proc. COST Conference, Davos, November 1996
 - Krispinsson, J., B.R. Gebart and N. Jekabssons, "Specimen preparation and image analysis of fibre orientation in compression moulded parts", Proc. 7th European Conference on Composite Materials, London, 14-16 May 1996
 - Strömbeck, L.A. & Gebart, B.R., "Influence on the curing process from the thermal properties of RTM moulds", Extended Abstracts Polymer Processing Society European Regional Meeting, Prague, September 1992
 - Gebart, B.R., & Strömbeck, L.A., "Cure simulation as a tool for process optimization", Proc. Verbundwerk '92, Wiesbaden, July 1-3, 1992
 - Strömbeck, L.A. & Gebart, B.R., "Development of experimental moulds for RTM", Composites Tooling II, Amsterdam, Holland, February, 1992
 - Lundström, T.S., Gebart, B.R. & Lundemo, C.Y., "Void formation in RTM", Proc. 47th Annual Conference of SPI Composites Institute, Cincinnati, February, 1992
 - Gebart, B.R., Gudmundson, P. & Lundemo, C.Y., "An evaluation of alternative injection strategies in RTM", Proc. 47th Annual Conference of SPI Composites Institute, Cincinnati, February, 1992
 - Gebart, B.R., "Strömningsproblem vid tillverkning av kompositer", Svenska Mekanikdagarna, Stockholm, January 8-10, 1992
 - Gebart, B.R., Gudmundson, P., Strömbeck, L.A. & Lundemo, C.Y., "Analysis of the permeability in RTM reinforcements", Proc. 8th International Conference on Composite Materials, Honolulu, USA, July 1991
 - Lundström, T.S., & Gebart, B.R., "Influence on the permeability of unidirectional reinforcements from fibre geometry", Extended Abstracts Polymer Processing Society European Regional Meeting, Palermo, September 1991
 - Gebart, B.R., Lindblad, I.A.A., Alfredsson, P.H. & Johansson, A.V., "How to suppress transport across a density interface", Proc. Third International Symposium on Stratified Flows, Pasadena, pp 1037-1046, 1987

Invited lectures, book chapters and editor experience

- Gebart, B.R., "Introduction to biomass combustion and gasification", in Basics of aeroacoustics and thermoacoustics (J. Antoine, ed.), Von Karman Institute for Fluid Dynamics Lecture Series 2007-09, 2007
 - Gebart, B.R. and Strömbeck, L.A., "Principles of Liquid Composite Molding", in Processing of Composites (R.S. Davé and A.C. Loos, eds.), Hanser Publishers, Munchen, 2000
 - Gebart, B.R., "Current issues in Resin Transfer Moulding", Keynote Lecture at the Polymer Processing Society Europe/Africa Region Meeting, Gothenburg, Sweden, August 19-21, 1997
 - Gebart, B.R., "Strömningskontroll och design", Tutorial lecture at Svenska Mekanikdagarna 1999, Stockholm, Sweden, June 7-9, 1999
 - B. R. Gebart, L.H. Gustavsson and R.I. Karlsson (eds.), Proceedings of the Turbine-99 – Workshop on draft tube flow, Porjus, 20-23 June 1999
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Awards	<ul style="list-style-type: none"> • "Outstanding Contribution to the Topic of Gasification" at the International Chemical Recovery Conference, Williamsburg, 29 March – 1 April, 2010 • The Swedish Road Administration's Environmental Award for work on renewable fuels, shared with Chemrec, 2008 • "Highly Commended Award" from the Literati Club Awards for Excellence 2000 (International Journal of Numerical Methods for Heat & Fluid Flow), June, 2000 • "Best Paper Award" at the Fifth International Conference on Automated Composites, Glasgow, 4-5 September, 1997 • Curt Boström Promising Young Researcher Award, the County of Norrbotten Research Foundation, 1993
Miscellaneous	<ul style="list-style-type: none"> • External evaluation of a faculty member for possible tenure, University of Utah, Department of Chemical Engineering, 2010 • Board member of the Swedish Association for Combustion Research, 2007 – • Member of the National Technology Council for Ethanol Production from Lignocellulose formed by the Swedish Energy Agency, 2006 – • Member of the National Technology Council for Gasification formed by the Swedish Energy Agency, 2005 – • Reviewer for Bioresource Technology, Energy and Fuels, Journal of Composite Materials, Polymer Composites, Composites Part A, International Journal of Thermal Sciences and other scientific journals. • US Patent 4939754 and Italian Patent 1230490: "Device for limitation of a flow through a density lock for a nuclear reactor", 1989. The patent protects the design of a crucial component in an inherently safe nuclear reactor design (the PIUS reactor) developed by ABB ATOM. • Faculty opponent of PhD students at KTH, Chalmers, Helsinki University of Technology and Lund University • Member of PhD grading committees at Chalmers Institute of Technology, Lund Institute of Technology, Royal Institute of Technology, Ecole Polytechnique Federal de Lausanne (EPFL) and Luleå University of Technology • Chairman of the independent evaluation committee for the research program "Industrirelevant Strömningsmekanik" (Energy Related Fluid Mechanics) funded by the Swedish Energy Agency (Statens Energimyndighet), December 2002 and 2007 (as member of the committee) • Member of the independent evaluation committee of applicants to senior research positions in engineering sciences for women funded by the Swedish Research Council (Vetenskapsrådet), July 2002. • Member of the Organising Committee of "Turbine 99 – Workshop on Draft Tube Flows", Porjus, 20-23 June, 1999 • Member of the Organizing Committee of the Swedish Mechanics Days (Svenska Mekanikdagarna), Luleå, 16-18 March 1997 • Member of the Scientific Committee of the Sixth International Conference on Flow Processes in Composite Materials, Auckland, New Zealand 15-16 July, 2002 • Member of the Scientific Committee of the Fifth International Conference on Flow Processes in Composite Materials, Plymouth, 12-14 July 1999 • Evaluation of a NATO Collaborative Research Grant application by Dr Papathanasiou, Univ. of South Carolina and Dr Gladden, Univ. of Cambridge, 1997 • Member of the Scientific Committee of the 7th European Conference on Composite Materials, London, 14-16 May 1996
Languages	Fluent in English. Good working knowledge of French.
Personal details	<ul style="list-style-type: none"> • Born: 3 November 1955 • Married to Inger and have two children, Joakim (1986) and Katarina (1988) • Our clan also includes two cats and two horses.
Hobbies	Horses and horseback riding, long distance skating, cross country and downhill skiing, cycling

Experience from building and construction projects

Below is a short graphical summary of major construction projects that I have been personally involved in during the last ten years.



This is what the lab (the one-story building in the foreground) looked when I started as manager at ETC in 2000. In the background is the Smurfit Kappa pulp mill. At that time we were 6 employees of ETC working in the building. The experiments were done in small scale in the experimental hall on the right side of the building. The long low part of the building to the left contained the offices, a conference room and a lunch room.



In 2001 we decided to make an extension of the lab building with 700 m² to house a large black liquor gasifier. The extension is to the right of the old lab hall. One can also see two tanks for liquid oxygen and liquid nitrogen that are used in the experiments to the right of the new lab hall. I was in charge of the construction project (as a buyer) from day one, including initial discussions with the architect and up to the final inspection of the new lab hall. I was also heavily involved, together with the chairman of our board of directors, in securing funding for the project. Our initial cost estimate (without contingency) was 6 million SEK and the final cost came up less than 10% above this estimate which I think is quite acceptable since everything in this building was “special”.



In 2008 we were in strong need of new offices since our activities had expanded a lot since 2000. In the building at that time were, apart from our own employees, a large number of employees of our partner companies. We had during several years “cannibalised” the lab space and converted some of it to offices but we had run out of options. Therefore we decided to build a second floor with 25 new offices on top of the office part of the building. This started as a joke (“why don’t we build a second story... ha ha”) but I asked a local architect company to make some calculations and to do a ground survey to see if it was possible. To my surprise they said that this would work without any problems. Me and a few other key people then decided to push for a “science park” (Solander Science Park) around our research and were lucky enough to get support from the local city and the county administration of Norrbotten (a government branch). Through these contacts we managed to obtain funding for carrying out the building project. When the project started I was again heavily involved from the start, including the initial discussions with the architect and the users of the building. The project finished within the budget (12 million SEK) but with a slight overdraw on the time plan that led to several tough discussions with the building contractor. Today there are close to 60 people that are regularly working in the building.



In 2009 we had run out of lab space again and decided to build a new 400 m² gasification hall (the structure behind the blue container). This time we started an internal project that defined all the functions that we wanted the new building to have before we contacted the architect. After several iterations with the architect we came up with a solution that everyone agreed was what they wanted. I was in charge of obtaining funding for the building and managed to get support from two external sources that took about 60% of the cost. The remaining 40% came from our own funds. The total cost was about 5 million SEK which was almost exactly on our cost estimate (including contingency). Regarding the idea with a user definition project before contacts with the architect, this worked out over expectations and everyone agrees that the end result is what they wanted.



This photograph was taken in May 2010 and shows an on-going experimental project with very complex chemical process equipment that will produce DME (a new diesel fuel). The experimental equipment is this time installed outside the lab since it is so large and there is also a safety issue with explosive gases. In the open tower any gas leaks will be dispersed before a dangerous concentration can build up. This construction project has a budget of almost 150 million SEK (about 15 million Euro). This time I am participating in the project but the actual construction project is led by another research partner. Still, I am learning a lot about large scale projects that I think will add to my competence. To the left in the photo you can see the new entrance that was built in 2008. On the second floor you can see the new lunch room which can seat about 50 people at the same time.