

# Curriculum Vitae

Dr. Bengt Eliasson

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<b>Date of birth:</b>	27 April 1965		Strathclyde University
<b>Place of birth:</b>	Sundsvall, Sweden		Glasgow G4 0NG, Scotland, UK
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## Higher Education

- PhD in Numerical Analysis, Department of Information Technology, Uppsala University (Advisor: Prof. Bertil Gustafsson, Department of Information Technology. Co-Advisor: Prof. Bo Thidé, Swedish Institute of Space Physics), 1999–2002. Date of dissertation: Nov. 29, 2002.
- Master of technology, speciality in numerical analysis, Uppsala University, 1994 – 1998.
- Engineer of computers and electronics, university of technology level, at The Mid Sweden University (Sundsvall/Härnösands högskola), 1986 – 1988.

## School Background

- Electrical engineer, upper secondary school level, at Västermalms skola, Sundsvall, 1981 – 1985.

## Compulsory National Military Service

- Radio telegraph operator at Norrland Signal Regiment S3, Boden, Sweden, 1985–1986.

## Employments

- 29.07.2013—present: Reader at Physics Department, Strathclyde University, Glasgow, Scotland, UK.
- 04.05.2009—31.07.2013: Senior Scientist at the Faculty of Space and Astronomy, Department of Theoretical Physics IV, Ruhr-University Bochum, Germany, in the DFG Research Unit 1048 “Instabilities, Turbulence and Transport in Cosmic Magnetic Fields”, project “Instabilities and Nonlinear Dynamics Beyond the Magnetic Threshold”.
- 01.12.2006—03.05.2009: Senior Scientist at the Department of Physics, Umeå University, Umeå, Sweden, and Project Leader of the project “Computer Modeling of the Earth’s Ionosphere”, funded by the Swedish Research Council.
- 01.07.2003—30.11.2006: Senior Scientist at Theoretische Physik IV, Ruhr-Universität Bochum, Germany, in the DFG SFB 591 “Universelles Verhalten gleichgewichtferner Plasmen: Heizung, Transport und Strukturbildung”.
- 01.01.2003—31.06.2003: Postdoctoral position at Theoretische Physik IV, Ruhr-Universität Bochum, Germany, in the framework of the EU Research Training Network (RTN) HPRN-2001-0314, “Turbulent Boundary Layers in Geospace Plasmas.”
- 1988—1994: Electrical and computer engineer at Industrial Delivery AB (ILD AB), Sundsvall. The work included the development of the company’s CAD and database system which was a tool to document the engineering of instrumentation and power supply in projects for the pulp and paper industry.

## Theses

- B. Eliasson, Numerical Vlasov-Maxwell modelling of space plasma, PhD Thesis, Acta Universitatis Upsaliensis. Comprehensive Summaries of Uppsala Dissertations from the Faculty of Science and Technology 158. Uppsala. ISBN 91-554-5427-5, November 2002.
- B. Eliasson, Numerical Simulation of Kinetic Effects in Ionospheric Plasma, Licentiate Thesis 2001-004, ISSN 1404-5117. Department of Information Technology and Department of Astronomy and Space Physics, Uppsala University, Uppsala, Sweden, April 2001.
- B. Eliasson, Theoretical and Numerical Study of Nonlinear Interaction Between Electromagnetic Waves and Space Plasma, Masters Thesis, Department of Astronomy and Space Physics, Uppsala University, Uppsala, Sweden, UPTec F98 098, November 1998; IRF Scientific Report 250, February 1999.

## Prizes and Awards

- **Fellow of the American Physical Society**, September 2012.
- **The 2007 Abdus Salam ICTP Plasma Physics Prize for Best Teacher** at the *Abdus Salam ICTP Summer college on Plasma Physics 2007*.

## Project Grants

- Principal Investigator of *Computer Modeling of the Earth's Ionosphere* (Swedish: *Datormodellering av Jordens Jonosfär*), 4-year project funded by the Swedish Research Council (Vetenskapsrådet, VR) by 330 kEuro, 2006–2010.
- Co-Investigator together with Project Leader Padma Shukla in the second phase continuation of project *Instabilities and Nonlinear Dynamics Beyond the Magnetic Threshold*, in Research Unit 1048 *Instabilities, Turbulence and Transport in Cosmic Magnetic Fields*, 3 years funded by the German Research Council (Deutsche Forschungsgemeinschaft, DFG) by 200 000 Euro, 2012–2014.
- Co-Investigator of the *International Advanced Workshop on the Frontiers of Plasma Physics*, Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy, 5–16 July 2010, funded by UNESCO by 75 kEuro.

## Editorships

- Associate Editor of *Journal of Plasma Physics* 4.11.2013—31.12.2015.
- Acting Editor of *Journal of Plasma Physics* 1.2.2013—4.11.2013.
- Co-Editor of Proceeding books/Special issues:
  1. B. Eliasson, L. Stenflo, R. Bingham and J. T. Mendonça (Guest Editors), Special Issue in memory of Professor Padma Kant Shukla (1950-2013). *Journal of Plasma Physics* **79**(06) (December 2013).
  2. J. T. Mendonça, P. K. Shukla, B. Eliasson, and J. A. Rodrigues (Guest Editors), Proceedings of the 2012 International Topical Conference on Plasma Science: Advanced Plasma Concepts. Faro, Portugal, 24-28 September 2012. *Journal of Plasma Physics* **79** (04) (August 2013).
  3. P. K. Shukla and B. Eliasson (Editors), Joint ITER-IAEA-ICTP Advanced Workshop on Fusion and Plasma Physics Trieste, Italy 3-14 October 2011. ISBN ISBN 978-0-7354-1041-1, ISSN 0094-243X. *AIP Conference Proceedings* **1445** (2012).

4. P. K. Shukla, B. Eliasson, J. T. Mendonca and D. Resendes (Editors), International Topical Conference on Plasma Science: Strongly Coupled Ultra-Cold and Quantum Plasmas Lisbon, Portugal 12-14 September 2011. ISBN 978-0-7354-0999-6, ISSN 0094-243X (print), 1551-7616 (online). *AIP Conference Proceedings* **1421** (2012).
5. B. Eliasson and P. K. Shukla (Editors), New Frontiers in Advanced Plasma Physics. Proceedings of the 2010 ICTP Advanced Workshop on the Frontiers of Plasma Physics, Trieste, Italy, 5 - 16 July, 2010. ISBN 978-0-7354-0862-3, ISSN 0094-243X. *AIP Conference Proceedings* **1306** (2010).
6. B. Eliasson, L. Stenflo, R. Bingham, J. T. Mendonca, A. A. Mamun and D. Shaikh (Guest Editors) Special Issue of *Journal of Plasma Physics*, Vol. **76** (3-4) (June 2010), in honor of Professor Padma Shukla's 60th birthday.
7. B. Eliasson and P. K. Shukla (Editors), New Developments in Nonlinear Plasma Physics: Proceedings of the 2009 ICTP Summer College on Plasma Physics and International Summer College on Cutting Edge Plasma Physics, Trieste, Italy, 10 - 28 August, 2009. ISBN: 978-0-7354-0754-1. ISSN: 0094-243X. *AIP Conference Proceedings* **1188** (2009).
8. P. K. Shukla, B. Eliasson and L. Stenflo (Editors), Frontiers in Modern Plasma Physics: Proceedings of the 2008 ICTP International Workshop on the Frontiers of Modern Plasma Physics, Trieste, Italy, 14 - 25 July, 2008. ISBN: 978-0-7354-0591-2. *AIP Conference Proceedings* **1061** (2008)
9. P. K. Shukla, L. Stenflo and B. Eliasson (Editors), New Aspects of Plasma Physics: Proceedings of the 2007 ICTP Summer College on Plasma Physics, Trieste, Italy, 30 July to 24 August 2007. World Scientific Publishing Co Pte Ltd (Singapore). ISBN: 978-981-279-977-7, 981-279-977-X

## Memberships

- American Physical Society
- American Geophysical Union

## Organization of Conferences/Workshops

- Member of International Scientific Committee of *7th International Conference on the Physics of Dusty Plasmas (ICPDP 2014)* to be held in New Delhi, India, 3-7 March 2014.
- Member of Scientific Committee of *International Workshop on the Theory and Application of the Vlasov Equation (VLASOVIA 2013)* to be held in Nancy, France, 25-29 November 2013.
- Co-Director of the *International Advanced Workshop on the Frontiers of Plasma Physics*, Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy, 5-16 July 2010.
- Organization of Computer Simulation courses for international students at Plasma Physics Workshops and Summer Schools at ICTP, Trieste, 2005-2011 (see details in Teaching below)

## International Collaborations/Invitations

- Laboratory for Laser Plasmas and the Institute of Natural Sciences, Shanghai Jiao Tong University, Shanghai, P. R. China, 7 October – 7 November 2012. Collaborations with Prof. Zheng-Ming Sheng on laser-plasma interactions.
- Department of Astronomy, University of Maryland at College Park, MD, 9 March – 9 April 2008, 1 November 2008 – 30 April 2009, 16 Jan. – 31 May 2010, 1 – 31 July 2011, 1-31 March 2012, and 1-31 March 2013 (total 14.5 months): Collaborations with group of Prof. K. D.

Papadopoulos on simulation studies of ELF wave generation as well as and electron acceleration and artificial ionization by ionospheric heating of ground-based transmitters, mode conversion processes of VLF (lower hybrid and whistler waves) in the Earth's ionosphere. Collaborations with group of Prof. C. S. Liu on relativistic laser-plasma interactions and proton and ion laser acceleration.

- National Central University, Jhung-Li, Taiwan, 20 November – 10 December 2005. Collaboration with Prof. C. S. Liu on relativistic laser-plasma interactions.

### Invited Talks at Major Conferences and Workshops

- Joint 39th European Physical Society Conference on Plasma Physics and 16th International Congress on Plasma Physics, Stockholm, Sweden (July 2012).
- VLASOVIA 2009 Workshop, Marseilles, France (September 2009).
- 14th International Congress of Plasma Physics, Fukuoka, Japan (September 2008)
- 48th Annual Meeting of the Division of Plasma Physics of American Physical Society, Philadelphia (October 2006)
- 33rd European Physical Society Conference on Plasma Physics, Rome, Italy (June 2006).
- European Geophysical Union, Nice, France (April 2004)

### Referee for Journals

- Physical Review Letters
- Physical Review E
- Physics of Plasmas
- New Journal of Physics
- Physica Scripta
- IEEE Transactions on Plasma Science
- Journal of Plasma Physics
- Physics Letters A

### Teaching

- Teaching at Ruhr-University Bochum: The course Computational Physics II was given during the winter semester 2010/2011 (Lectures+Computer labs, 5 university points). It included Simulations of partial differential equations, spectral and pseudospectral methods, de-aliasing schemes for turbulence fluid simulations, Vlasov simulations, shock capturing schemes, solutions of large linear and nonlinear systems of equations. (number of hours in classroom: 40, number of students: 5)
- Teaching at the Abdus Salam International Center for Theoretical Physics (ICTP), Trieste, Italy, 2005-2011 (total number of hours in classroom: about 40. Average number of students: about 35):
  - Teaching of international students at the *Joint ITER-IAEA-ICTP Advanced Workshop on Fusion and Plasma Physics*, Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy, 3–14 October 2011. Class-room teaching of the *Computer Simulation Course* including supervision of computer labs. The course contained four sections: 1. *Basic commands in Matlab*, 2. *Simulations of ordinary differential equations*, 3. *Simulations of partial differential equations*, and 4. *Solutions of nonlinear systems of equations and nonlinear boundary value problems*.

- Course Director on Plasma Simulations at the *2009 Summer College on Plasma Physics*, Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy, 10–28 August 2009. Class-room teaching of the course *Numerical Methods and Simulations* including supervision of computer labs. The course contained four sections: 1. *Basic commands in Matlab*, 2. *Simulations of ordinary differential equations*, 3. *Simulations of partial differential equations*, and 4. *Solutions of nonlinear systems of equations and nonlinear boundary value problems*.
- Teaching of international students at the *2008 International Workshop on the Frontiers of Modern Plasma Physics*, Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy, 14–25 July 2008. Class-room teaching of the course *Numerical Methods and Simulations* including supervision of computer labs. The course contained four sections: 1. *Basic commands in Matlab*, 2. *Simulations of ordinary differential equations*.
- Coordinator Targeted Activity on Plasma Simulations at the *2007 Summer College on Plasma Physics*, Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy, 30 July–24 August 2007. Class-room teaching of the course *Numerical Methods and Simulations* including supervision of computer labs. The course contained four sections: 1. *Basic commands in Matlab*, 2. *Simulations of ordinary differential equations*, 3. *Simulations of partial differential equations*, and 4. *Solutions of nonlinear systems of equations and nonlinear boundary value problems*. Students who completed the course were awarded a certificate.
- Lecturer (class-room teaching) in numerical methods and plasma physics at the *Workshop on Frontiers of Plasma Science*, Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy, 21 August–1 September 2006.
- Lecturer (class-room teaching) in numerical methods at the *Autumn College in Plasma Physics*, Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy, 5–30 September 2005.
- Teaching at Uppsala University 1998–2002 (total 51 weeks, estimated number of hours in classroom: 250).
  - Computer laboratory work in the usage of Maple, used for analytic manipulations, in the first course in Algebra and Geometry in the Civil Engineering programme. The teaching included supervision in classroom as well as correction of laboratory reports: 3 weeks during 1998. Number of students: about 30.
  - Computer-based laboratory work in Fluid Mechanics with the software CFX. The teaching included the design of laboratory assignments, supervision in classroom and correction of laboratory reports: 4 weeks during 1998. Number of students: 15
  - Tutorials and laboratory work in numerical analysis and programming (Numerical Analysis I). The teaching included tutorials in classroom in the theory of numerical analysis, design of supervision of laboratory assignment (using c++ and Matlab) in classroom and correction of laboratory reports and of written exams: 5 weeks each year 1999-2002. Number of students: about 30
  - Computer-based laboratory work in Fluid Mechanics with the software Femlab. The teaching included the scheduling of classroom teaching, the design of laboratory assignments, class-room supervision, the correction of laboratory reports, and the reporting of university points of approved laboratory work to the university administration: 5 weeks each year 1999-2002. Number of students: about 20
  - Project supervision in parallel computing and GRID technology. The teaching included the meetings and supervision of a group of students in their last-year studies of numerical analysis (Scientific Computing, Advanced Course). The project involved the implementation of my parallelized Vlasov code as a GRID application with the help of

the Globus Toolkit and to run the program in parallel between two separate computer clusters, one located at the Department of Scientific Computing, Uppsala University and the other one located at the Swedish Institute of Space Physics in Uppsala. The results are summarized in the Internal Technical Report 3/2002, entitled *Parallel computing on the GRID* by Jonas Agmund, Robert Granat, and Magnus Ingelson at the Department of Scientific Computing: 4 weeks in 2002.

## PhD Student and Postdoc Supervision

- Co-Supervisor of Lars Daldorff: Numerical Simulation as a Tool for Studying Waves and Radiation in Space. Doctoral thesis, Department of Physics and Astronomy, Uppsala University, Uppsala, Sweden. Dissertation: 30 January 2009. ISSN 1651-6214;488.
- Interaction and supervision of international PhD students at ICTP, Trieste, on numerical simulations and plasma physics, each year 2004-2011.
- Supervision of PhD student Aram Vartanyan at University of Maryland on simulations of hydromagnetic waves in the ionosphere, year 2010-present.
- Supervision of postdoctoral research fellow Yunliang Wang visiting Ruhr-University Bochum August 2012-July 2013 on numerical methods and plasma physics.

## Opponent and Referee on Theses

- External Reviewer on PhD Thesis *Modulational Interactions in Quantum Plasmas*, by Ms. Fatema Sayed, The University of Sydney, Australia. 14 November 2013.
- External Reviewer on PhD Thesis *Low Frequency Perturbations in Inhomogeneous Plasma*, by Mr. Ali Ahmad, COMSATS Institute of Information Technology, Islamabad, Pakistan. 14 May 2013.
- External Reviewer on PhD Thesis *An Effective Field Theory Approach to Compton Scattering in a Plasma: Application to Laser-Plasma Acceleration*, by Mr. Ravindra Kumar, Indian Institute of Technology Kanpur, India. 14 May 2013.
- Opponent on PhD Thesis *Modelling of spin and other quantum effects in plasmas*, by Mr. Jens Zamanian, Umeå University, Umeå, Sweden. 13 April 2012.
- Faculty Examiner on Licentiate Thesis *Modeling the Lunar Plasma Wake*, by Mr. Shahab Fatemi, Luleå Technical University, Luleå, Sweden. Swedish Institute of Space Physics, Kiruna, 19 December 2011.
- External Reviewer on PhD Thesis *Collective Modes in Weakly Magnetized Relativistic and Ultra-relativistic Electron Plasmas*, by Mr. Gohar Abbas, GC University Lahore, Lahore, Pakistan. 16 December 2011.
- External Reviewer on PhD Thesis *Quantum Effects on Low Frequency Waves in Dense Plasmas*, by Mr. Shabbir Ahmad Khan, COMSATS Institute of Information Technology (CIIT), Islamabad, Pakistan. 2 September 2010.
- Faculty Examiner on Licentiate Thesis *Structure formation and transient dynamics of secondary electromagnetic radiation related to HF pumping of the ionosphere*, by Mr. Lars Norin, Uppsala University, Department of Astronomy and Space Physics, Uppsala, Sweden, 5 June 2007.