

CURRICULUM VITAE (as of April, 2014)

Professor Mats Persson

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Citizenship: Swedish
Birthdate: October 18, 1954
Civil status: Married and three sons born 1980, 1982 and 1985.

EDUCATION

Spring 1988 Docent, Institute of Theoretical Physics, Chalmers
Spring 1983 Ph. D. in Mathematical Physics, Chalmers
Fall 1977 M. Sc. in Engineering Physics (Civ. Ing. F), Chalmers

EMPLOYMENT RECORD

1/06- Department of Chemistry,
The University of Liverpool, UK
7/92- 12/12 Department of Applied Physics, Chalmers
7/85-7/92 Institute of Theoretical Physics, Chalmers
7/83-7/85 LASSP, Cornell University, Ithaca, USA
77-7/83 Institute of Theoretical Physics, Chalmers

ACADEMIC POSITIONS

7/2001 - Full Professor
1997 - 2002 Senior Researcher
1996 - 7/2001 Professor
1988 - 1996 Associate Professor
1985 - 1988 Research Associate
1983 - 1985 Postdoctoral Associate
1982 - 1983 Research Assistant
1977 - 1982 Teaching assistant

VISITING POSITIONS

6/2006 - 7/2006
4/2005 - 7/2005
5/2004 - 7/2004
4/2003 - 7/2003 Visiting researcher, Fritz Haber Institut der MPG, Berlin, Germany
11/2004 - 1/2005
12/2003 - 1/2004
9/2001 - 6/2002 Visiting researcher, Department of Physics and Astronomy,
University of California, Irvine, USA

PERSONAL SCHOLARSHIPS AND AWARDS

2012	RSC Surfaces and Interfaces Award
4/2004	Humboldt Senior Researcher Award
1997 - 2002	NFR Senior Researcher Fellowship in “Condensed Matter theory” (NFR Former Swedish Natural Science Research Council)
1983 - 1985	NFR Postdoctoral fellowship
1983	Svensk Kullagerfabriken (SKF) Scholarship
1978 - 1982	Chalmers Graduate Fellowship
1977	John Eriksson Medal

AWARDED RESEARCH FUNDING AS PRINCIPAL INVESTIGATOR

1991 – 2002	“Dynamical Processes at Surfaces” (NFR) (renewed three times) (265,000 ECU since 95/96)
1997 – 2002	“Senior Researcher in Condensed Matter Theory” (NFR) (480,000 ECU)
12/1997 – 12/2001	“Atomic/Molecular Manipulation” (EU-TMR network) (191,000 ECU)
2002	“Computers for research” (VR) (the Swedish Research Council) (50,000 ECU)
1/2003 – 12/2006	“Theory of Nanostructured Materials on Surfaces and Their function ” (VR) (247,000 ECU)
8/2002 – 8/2006	“Atomic and Molecular Manipulation as a new Tool for Science and Technology (AMMIST)” (EU-RTN network) (196,000 ECU)
3/2004 – 3/2007	“Control, manipulation and manufacture on the 1-10 nm scale using localized forces and excitations” (NANOMAN) (EU-STRP network) (162,500 ECU granted)
11/2006 – 5/2009	”Surface Reactivity: beyond Born-Oppenheimer”, (EPSRC, UK) (349,000 ECU)
10/2006 – 10/2010	”Supramolecular hierarchical self-assembly of organic molecules onto surfaces towards bottom-up nanodevices” (PRAIRIES) (EU-RTN) (312,000 ECU)
1/2009 - 12/2011	”Theory of elementary excitations in intentionally structured nanostructures on surfaces”, (VR, Sweden) (180,000 ECU)
2/2010 - 1/2013	”Alternative Routes for Information Storage and Transport at the Atomic Scale” (ARTIST) (EU-STRP network) (200,000 ECU)
1/2011 - 3/2014	Probing Inside Molecules: Theory and Simulations (Leverhulme Trust Award) (ECU)

SUPERVISION OF GRADUATE STUDENTS AND POSTDOCS

Principal supervisor of 7 PhD students (S. Papadia, L. Bengtsson, M. Hassel, F. Olsson, J. Björk, A. Fuentes, J. Sharp) and 9 postdocs (N. Lorente, S. Paavilainen, M. Forsblom, M. S. Dyer, I. Makkonen, M. Honkela, , F. Hanke, K. Kotsis, and I. Scivetti). Co-supervision of four PhD students (C. Hedenäs, L.-A. Salmi, T. Fondén and J. Strömqvist) as demonstrated by joint publications.

PROFESSIONAL ACTIVITIES

Chairman of (1) the European Research Conference on Fundamental Aspects of Surface Science: “Elementary Processes in Surface Reactions” in 1998, Acquafredda di Maratea, Italy; (2) the

Symposium on “the Quantum Mechanical Basis for Materials Properties” in 1998, Hjortviken, Hindås, Sweden; (3) the 7th workshop on “Interactions of Molecular Beams and Surfaces” in 1990, Hindås, Sweden

External PhD examiner of eight graduate students (five in UK)

On the expert committee for promotion of professorships (E. McFarland, UC, Santa Barbara, USA; Y. Zeire, Ben-Gurion Univ of the Negev, Israel) and lectureship in “Computational Physics”, KTH, Stockholm

Reviewer for National Science Foundation, USA, Science Research Council of Norway, and journals (Science, Phys. Rev. Lett., Phys. Rev. B, J. Chem. Phys., ...)

Member of steering group for the ESF network on “Electron-Induced Processing at the Molecular Level“ (EIPAM)

SCIENTIFIC PRESENTATIONS

In total about 60 invited talks at conferences, universities and research institutes.

Invited, at conferences since 1996

2013

”Charging and Bond formation of Adsorbates on Ultrathin, Insulating Films supported by a Metal Substrate”, The DIPC workshop on ”Controlled Atomic Dynamics on Solid Surfaces: Atom and Molecular Manipulation”, 13-16 May 2013, San Sebastian, Spain

”Tunnelling-Electron-Induced Single Molecule Dynamics at Surfaces”, The Winter school on Chemical Reaction Dynamics at Surfaces, 10-15 March, Schloss Ringberg, Germany

2012

”Theory of Tunnelling-Electron-Induced Dynamics at Surfaces”, UCL Faraday symposium, University College London, RSC award talk, 7 November

”Reversible Bond Formation in a Metal-Organic Molecular Complex as a Molecular Switch”, The 13th International Conference on Desorption and Dynamics Induced by Electronic Transitions (DIET 13), Stratford-upon-Avon, UK, 2-6 July

Computational Molecular Science 2012, Royal Agricultural College, Cirencester, UK, June 24 - 27

2011

2010 International Workshop on “Energy Dissipation at Surfaces”, Schöntal, Germany, Sep. 5-8 (invited by Prof. E Hasselbrink)

International Workshop on “Inelastic Transport”, DIPC, Donastia, Spain (invited by P. M. Echenique)

Shanghai Expo Materials Symposium on “New Frontiers in Materials Chemistry”, Shanghai, China

2009 Conference on ”Nanostructures at Surfaces”, Monte Verita, Switzerland (invited by Prof. W.-D. Schneider)

Workshop on ”Electron-induced Processes at Surfaces”, Avila, Spain (invited by Prof. G. Thornton)

2008 Discussion meeting on ”Frontiers in Nanoscience: Spectroscopy at the nanometre scale”, Schloss Ringberg, Tegernsee, Germany (invited by Prof. K. Kern)

- The inaugural workshop of the Materials Simulation Laboratory (MSL), University College London (UCL) (invited by Dr. A. Michaelides)
- 2007 Gordon Conference on “Dynamics at Surfaces”, Proctor Academy, Andover, USA
Interdisciplinary Surface Science Conference 16 (ISSC16), St Andrews, Scotland
- 2006 Symposium on “Dynamics and Reactivity of Individual Molecules/Clusters” for National Meeting of the American Chemical Society, in San Francisco, USA
Workshop on ”Dynamics of Electron Transfer Processes at Interfaces”, in Berlin, Germany
Round table on ”Scanning probe spectroscopy : Elementary excitations on the atomic scale”, in Bad Honnef, Germany
- 2005 Symposium on “Interfaces in Organic & Molecular Electronics II” at the MRS Fall meeting in Boston
23rd European Conference on Surface Science (ECOSS-23), Berlin, Germany
“Nanoscale Physics and Technology Annual Spring Meeting” arranged by Institute of Physics at University of Birmingham UK, June 10
EIPAM conference, Milton Keynes, UK
- 2004 DIPC Workshop on “Molecule-Surface Interactions: Elementary Reactive Processes”, San Sebastian, Spain
Workshop on “Dissipation at Surfaces”, Köln, Germany
- 2003 Discussion meeting on “Organising Atoms: Manipulation of Matter on the sub-10 nm scale” by the Royal Society, London, UK
- 2002 Japan-Germany Workshop on ”Dynamics of elementary excitations in condensed molecular systems and at interfaces”, Hayama, Kanagawa, Japan
International Workshop ”Towards atomic scale- and time-resolution at interfaces”, San Sebastian, Spain
- 2001 American Vacuum Society meeting, San Francisco, USA
Gordon Conference on “Dynamics at Surfaces”, Andover, USA
Workshop on “Atomic, Molecular, and Optical Physics at Surfaces”, Harvard Univ., Cambridge, USA
Keynote Speaker at the Second Stig Lundqvist Conference on the Advancing Frontiers of Condensed Matter Physics: “Non-conventional Systems and New Directions” ICTP, Trieste, Italy
- 2000 7th International Summer School Nicolas Cabrera on “Imaging and Manipulation of Matter at a Nanometer Scale, Miraflores de la Sierra, Spain
Faraday Discussion 117 on “Excited States at Surfaces”, Univ. of Nottigham, UK
Keynote lecture in the workshop “Can Theoretical Catalysis Describe Reality?”, Liverpool, UK
Twelfth Annual Workshop on “Recent Developments in Electronic Structure Methods”, Georgia Institute of Technology, Atlanta, Georgia, USA
- 1999 Institute of Physics CMMP’99, Univ. of Leicester, UK

Third European Workshop on “Time-dependent Methods in Gas-surface Dynamics”, Leiden, Netherlands

Swedish-Israeli Symposium on “Dynamics at Interfaces”, Hindås, Sweden

1998 TMR-Euroconference on “Dynamics and Kinetics of Bond Making and Breaking at Surfaces”, Aguadulce, Spain

Faraday Discussion 110 on “Chemical Reaction Theory”, Univ. of St. Andrews, Scotland

1997 Second European Workshop on “Time-Dependent Methods in Gas-Surface Dynamics”, Villeneuve d’Ascq, France

1996 18th Taniguchi symposium on “Elementary Processes in Excitations and Reactions on Solid Surfaces”, Kashikojima, Japan

Invited, at universities and research institutes

2014 Specialised iNANO lecture: “Tunneling Electron-Induced Reactions: Tautomerisation and Reversible Bond Formation in single molecules”, Aarhus University, Denmark, 7 February (invited by B. Hammer)

Chemistry at the Space-Time Limit (CASTL) seminar: “Tunneling electron-induced reactions: tautomerisation and reversible bond formation in single molecules”, University of California, Irvine, USA, 27 January (Invited by W. Ho)

Seminar: “Charging and Bond formation of Adsorbates on Ultrathin, Insulating Films supported by a Metal Substrate”, SLAC/Stanford University, Palo Alto, USA, 22 January (invited by Prof. J. K. Norskov)

2012 ”Tunnelling-Electron-Induced Single Molecule Dynamics at Surfaces”, RSC Lecture at Department of Chemistry, 6 December 2012, University of Warwick, UK

Seminar at University College London, UK (invited by Dr. C. Hirjibehedin)

Chemistry at the Space-Time Limit (CASTL) seminar by Persson, University of California, Irvine, USA, 13 January 19 April (Invited by W. Ho)

2011 Seminar, SLAC/Stanford University, Palo Alto, USA (invited by Prof. J. K. Norskov)

Chemistry at the Space-Time Limit (CASTL) seminar by Persson, University of California, Irvine, USA, 13 January (Invited by W. Ho)

2009 Seminar at Kalmar University, Sweden (invited by Prof. C. Canali)

CaSTL Seminar, UC Irvine (invited by Prof. W. Ho)

Physical Chemistry Seminar at Nottingham University (invited by Dr. N. Besley)

2008 Condensed Matter Physics Seminar, University of Leicester, UK (invited by Dr. K. von Haeften)

Chemistry Research Seminar, Heriot-Watt University, UK (invited by Dr. M. J. Paterson)

The Chemical Bonding Center on Chemistry at the Space-Time Limit (CaSTL) Lecture, University of California, Irvine, USA (invited by Prof. Wilson Ho)

Zhong-Guan-Cun Forum on Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing, China (invited by Prof. S. W. Gao)

Condensed Matter Physics Seminar, University of Basel, Switzerland (invited by Dr. T. Jung)

Surfaces, Microstructure and Fracture Group Seminar, Cavendish Laboratory, Cambridge (invited by Dr. W. Allison)

2007 Condensed Matter & Nanoscience seminar, University of Nottingham (invited by Prof. P. Beton)

Dept of Physics and Chemistry, Univ. of Calif., Irvine, USA (invited by Prof. W. Ho)

Dept of Chemistry, Univ. of Potsdam, Potsdam, Germany (invited by Prof. P. Saalfrank)

Dept of Physics, Univ. of Bath, UK (invited by Prof. D. Kovalev)

2006 ISIS, Univ. of Calif., Irvine, USA (invited by Prof. D. L. Mills)

Dept of Theoretical Chemistry, Royal Institute of Technology, Stockholm, Sweden (invited by Prof. Yi Luo)

2005 Theoretical Chemistry Kolloquium, Lehrstuhl für Theoretische Chemie, Ruhr-Universität Bochum, Germany (invited by Dominik Marx)

2004 Dept of Physics, Univ. of Calif., Irvine, USA (invited by Prof. D. L. Mills)

2003 Fritz-Haber Institut der Max-Planck Gesellschaft, Berlin, Germany (invited by Prof. M. Scheffler)

Max-Planck Institut für Festkörperforschung, Stuttgart, Germany (invited by Prof. K. Kern)

2002 Dept of Chemistry, Univ. of California, Santa Barbare, USA (invited by Prof. H. Metiu)

Lawrence National Lab, Berkeley, USA (invited by Dr. M. Salmeron)

Dep. of Chemistry, Univ. of Calif., San Diego (invited by Prof. A. Kummel)

2001 Dept of Physics, Univ. of Calif., Irvine, USA (invited by Prof. D. L. Mills)

IBM Almaden Res. Center, San Jose, USA (invited by Dr. D. M. Eigler)

1998 Dep. of Chemistry, Univ. of Mass. Amherst, USA (invited by Prof. B. Jackson)

1997 LASSP, Cornell University, Ithaca, USA (invited by Prof. W. Ho)

SCIENTIFIC PUBLICATIONS

About 140 published articles in refereed journals (excluding five published as monographs, book chapters or reviews). About 5,900 citations in total and an H-index of 43, two published articles in Science, one in Nature Nanotechnology, one in Nature Chemistry and 25 published articles in Physical Review Letters.

EDUCATIONAL ACTIVITIES

Full teaching responsibility, including course development, in seven undergraduate and two graduate courses as detailed below. Completed one-week pedagogical course at Chalmers in 1978 and one half-week course in supervision of graduate students in 1995. Guest lecturer in several courses on graduate and undergraduate level such as Surface physics, Heterogenous catalysis and other surface reactions, Computational physics, and Materials theory. Lecturer in: second European Summer school in Surface Science at Hindås in 1993; graduate course at the Nanoscale Physics Research Laboratory, University of Birmingham, UK, 1996; the Second Laboratory Meeting on “STM imaging and manipulating: Theory and calculations”, 1999 in Toulouse, France; graduate course on “Nanoscale Phenomena”, 2002 at UC, Irvine; graduate school on “Atomic Manipulation”, 2005 at University of Birmingham, UK.

Theoretical Surface Physics (two times). Graduate course at Chalmers/Göteborg University (GU). Essentially, it was based on course material being developed and compiled by myself.

Quantum Mechanics (four times). Optional course in F4 (4th year of engineering physics, Chalmers) and a compulsory graduate course at Chalmers/GU. It was based on the textbook entitled “Quantum Mechanics” by S. Sakurai. An important part of the course involved oral and written presentations of mini-projects and computer projects.

Vector Calculus and Classical Physics (two times) Second year undergraduate course in the engineering physics program at Chalmers. It is based partly on the text book “Vector Calculus” by P. C. Matthews. One part part of the course involved computer projects.

Materials Theory Fourth year undergraduate course in the engineering physics program at Chalmers and graduate course. Part of the course material was developed and compiled by myself. Computer project and oral presentations constitutes an important part of the course.

Mechanics FY360 (one time). First year undergraduate course in the physics program at GU. It was based on the textbook entitled “Fundamental University Physics”, part I, Mechanics” by Alonso and Finn.

Quantum Physics II (one time). Third year undergraduate course in the physics program at GU. It was based on a compendium written by Alf Sjölander. Solving home problem was a key ingredient.

Mechanics FY0110 and Experimental problem solving (two times). Basic undergraduate course in Physics at GU. It was based on the textbook entitled “Fundamentals of Physics”, by Halliday, Resnik and Walker.

Applied Quantum Physics (one time). Optional course in F3. It was based on course material being developed and compiled by myself.

Quantum Physics FY0110 (four times). Basic undergraduate course in Physics at GU. It was based on the textbook entitled “Fundamentals of Physics” by Halliday, Resnik and Walker. Oral and written presentations of project constituted an important part of the course.

MANAGEMENT RESPONSIBILITIES AND EXPERIENCIES

- 2003 - Member of the Swedish National Allocation Committee (SNAC) for national parallel computing resources
- 1997 Course in leadership arranged by Chalmers
- 1993-1997 Director of the Physics Computer (Fysikdatorn) at School of Physics and Engineering Physics, Chalmers
- 198X - Board member of the consortium of heavy computing (UNICC) at Chalmers
- 1988-1992 Supervisor of graduate studies at the Institute of Theoretical Physics, Chalmers