

	Full name:	Lars Österlund
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Place of birth	Nordmaling, Västerbotten	

Lars Österlund is Professor and co-chair of Div. Solid State Physics at Uppsala University, and responsible for third cycle education of the Engineering Physics Program. He is the co-founder of the Swedish Society of Vibrational Spectroscopy and was its president from 2010-2017. He is board member of the Uppsala Center for Photon Sciences, vice-chairman of the International Science Program, ISP, working committee, and board member of the international Transparent Conducting Materials network, TCMnet. Prof. Österlund has a PhD from 1997 from Chalmers, where his thesis work involved fundamental surface science studies of photo-induced surface reactions on single crystal surfaces employing a broad range of surface spectroscopic methods and reaction kinetic modelling. A general theme of his current research is development of catalytic materials, including solar light responsive materials, such as photocatalytic, electrochromic, photochromic and thermochromic materials, self-cleaning surface coatings, and solid state gas sensors. Recent internationally recognized research include the invention of spectral selective multilayer photocatalytic and infrared and solar absorbing coatings with enhanced reactivity, and a new method to modify acid-base properties of oxide surfaces based on photo-adsorption of electrophilic molecules from gas-phase. Employing advanced gas deposition methods Österlund's group has developed methods to fabricate nanoporous thin films of pure and mixed metals and oxide nanoparticles, as well as metal – organic ligand assemblies for electronic sensors for exhaled breath analysis. He is co-founder of the companies Nanoform AB and Molecular Fingerprint AB. Prof. Österlund has published 160+ peer-reviewed scientific articles and holds 6 international patents.

Doctoral degree: 1997 in Physics, Chalmers University of Technology and Göteborg University, “Elementary surface processes on graphite and aluminium”, supervisor: Bengt Kasemo.

Post-doctoral visits: 1997-1999: University of Aarhus, Denmark (Prof. Flemming Besenbacher's group); 1999-2000: Competence Centre for Catalysis, Chalmers University of Technology, Göteborg.

Senior lecturer expertise: Docent in physics 2002, Chalmers University of Technology.

Present employments: Co-chair of Division of Solid State Physics, Dep. Engineering Sciences, The Ångström Laboratory, Uppsala University 2010-ff.

Former employments Research director, Swedish Defence Research Agency - FOI 2006-2009; Adj. Professor, Uppsala University 2006-2009; Dep. Research director FOI – The Swedish Defence Research Agency 2003-2006; Assistant Professor in Nanotechnology at Dep. Applied Physics, Chalmers University of Technology, Göteborg, 2000-2002; Project leader at the Competence Centre for Catalysis, Chalmers University of Technology, 1999-2002; Assistant Research professor, Institut for Fysik og Astronomi and Center of Atomic-Scale Material Physics, University of Aarhus, Århus, Denmark, 1999; Ph.D. student at the Dep. of Physics and Engineering Physics, Chalmers University of Technology, Göteborg, 1992-1997.

Graduate studies: M.Sc. in physics at Umeå University, Master Thesis at Max-Planck Institute, Dortmund, Germany 1991; B. Sc. in physics at University of Sussex, U.K and Umeå University 1990.

Parent leave: 2000, 2006 and 2017.

Supervision

Main supervisor: 10 PhD students and 5 post-docs:

David Langhammer, Licentiate thesis, Uppsala University, April 2019; Andreas Mattsson, PhD thesis, Uppsala University (2018); Stella Kioko, PhD thesis, University of Eldoret, Kenya/Uppsala University (2018); Delphine Lebrun, Uppsala University, PhD thesis, Uppsala University 2016; Bozhidar Stefanov, PhD thesis, Uppsala University (2015); Linnea Ahlinder, PhD thesis, Uppsala University (2015); Malin Johansson, PhD thesis, Uppsala University (2014); Peter Mäkie, PhD thesis, Umeå University (2012); Zareh Topalian, PhD thesis, Uppsala University (2011); Christian Werdinius, Licentiate thesis, Chalmers University of Technology (2002).

Post-docs: Tesfalem Welearegay (2019-2021); José Montero, (2018-2020); Zareh Topalian (2011-2012); Torbjörn Lindgren (now changed to: van der Meulen) (2004-2005); Andrey Kiselev (2004-2005).

Co-supervisor: Umut Cindemir, Uppsala University (2016); Ruitai Wen, Uppsala University (2015); Per-Anders Carlsson, Licentiate thesis, Chalmers University of Technology (2002); S. Johansson, PhD Thesis Chalmers University of Technology (2001).

Commissions of trusts and awards (selected)

- 2020–ff Vice-chair Swedish Research Council NT-18 panel (Materials Science)
- 2020–ff Board member Dept. Materials Science and Engineering
- 2020–2021 Board member Uppsala University International Science Program.
- 2018–ff TCMnet board member (International Network for Transparent Conducting Materials)
- 2017 Vinnova (Swedish Commercialization Agency) commercialization award.
- 2016–2017 Member of organizing committee for Euroanalysis 2017 28 Aug – 1 Sep 2017, Stockholm.
- 2016–ff Vice-chairman Uppsala University International Science Program working committee.
- 2016–2018 Member of the Swedish Research Council expert evaluation board NT-18.
- 2015–2017 Scientific coordinator of the Baltic University Program Teacher’s conferences and student SAIL courses on sustainable development.
- 2014–ff Board member Uppsala Photon Science Centre.
- 2010 VinnNu award from Vinnova (Swedish Commercialization Agency).
- 2010–ff Member of The Analytical Section of the Swedish Chemical Society.
- 2010 Chairman and organizer of 1st Conference of The Swedish Soc Vibrational Spectroscopy at The Analytical Days, Uppsala.
- 2010–ff Past president and co-founder of The Swedish Society of Vibrational Spectroscopy (a division of the Swedish Chem. Soc.)
- 2009–ff CEO and co-founder of the spin-off company Molecular Fingerprints AB.
- 2008 Handelsbanken Innovation Award.
- 2008 Innovationsbron Innovation Award
- 2008 Co-founder and board member of The NIR Research Foundation, Umeå University.
- 2006–2009 Board member of FOI (Swedish Research Agency) research directorate.
- 2002–ff PhD faculty opponent 9 times, and member of examination board 13 times outside home institution.
- 1997 Awarded STINT (Swedish Foundation for Internationalisation and Higher Education) postdoctoral grant (Rank 1 among applicants).
- 1991 Awarded first class honours for B.Sc. studies at University of Sussex, U.K.

Scientific publications

160 peer-reviewed scientific publications, incl. 6 invited book chapters, and 6 patents.

Current research funding

- Swedish Research Council (VR) grant no 2019-05614, 3,800,000 SEK. PI
- European Commission H2020 RISE grant (“bTB-TEST”) 2017—2020. PI and Coordinator.
- Swedish Research Council (VR) U-Forsk grant no 2016-05904 (“Small-scale cleaning of water: Solar assisted bi-functional photocatalyst for field-use”): 3,600,000 SEK, PI and main applicant

- Formas, project grant no 2016-00908 (“Solar Driven Water Purification Using Low Dimensional Photocatalysts”) 2,990,000 SEK, co-applicant
- VR grant no. 2015-04757, 3,500,000 SEK, PI and main applicant
- European Research Council under the European Community’s Seventh Framework Program (FP7/2007–2013) Grant Agreement No. NMP4-SL-2013-608950 (“SESBE”), 3,482,745 Euro, co-applicant.
- EC’s H2020 Program H2020-MSCA-RISE-2014, Grant Agreement No. 645758 (“TROPSENSE”), 1,386,000 Euro, coordinator.
- NATO SfP project no. 984599 (“Nanocomposites for Enhanced Decomposition of Toxic Chemicals”), 393,000 Euro, co-applicant.

Collaborations (on-going)

- Dr. Jiri Henych and Dr. Vaclav Stengl, Inst Inorganic Chemistry, Czech Academy of Sciences, The Czech Republic (catalytic nanomaterials).
- Prof. Dr. Juris Purans, Inst. Solid State Physics, Riga, Latvia (PVD thin film technology, electrochromism and thermochromism).
- Ilona Oja Asic, School of Engineering: Department of Material and Environmental Technology: Laboratory of Thin Film Chemical Technologies, TalTech, Estonia.
- Prof. Dr. Boris Mizaikoff, Institute Director and Chair, Institute of Analytical and Bioanalytical Chemistry, University Ulm, Germany (IR waveguide spectroscopy and surface functionalization).
- Dr. Radu Ionescu, Dept. Electronics, Electrical and Automatic Engineering, Rovira i Virgili University, Spain. (PVD fabrication of ligand coupled noble metal arrays for gas sensors).
- Prof. Kersti Hermansson, Dept. Chemistry – Ångström, Uppsala University, Sweden (surface vibrational spectroscopy and DFT calculations on metal oxides).
- Dr. Jolla Kullgren, Dept. Chemistry – Ångström, Uppsala University, Sweden (surface vibrational spectroscopy and DFT calculations on metal oxides)
- Assoc. Prof. Mikael Karlsson, Dept. Appl. Materials Science, The Ångström Laboratory, Uppsala University, Sweden (microfabrication of IR diamond waveguides).

Areas of expertise

- Surface science: Heterogeneous catalysis, photo-induced surface reactions
- Surface spectroscopy (FTIR, Raman, spectrophotometry, EELS, ESCA/XPS, UPS, TPD, LEED).
- Surface chemistry: Advanced wetting, surface functionalization
- Solid state physics: Optical properties of semiconductors; Chromogenic materials; Materials characterization of low-dimensional semiconductors; thin film PVD methods, in particular magnetron sputtering and advanced gas deposition.
- Physical chemistry: Photocatalysis, Photoelectrochemistry for synthetic fuel synthesis and CO₂ fixation.
- Biosensors: ATR-FTIR for proteins; Mid-infrared diamond waveguide guide methods.
- Nanotechnology: Colloidal lithography for fabrication of ordered nano-patterned surfaces in nanocatalysis; fabrication of facet textured photocatalysts; fabrication of photonic bandgap materials by colloidal template methods.
- Nanotoxicology: Vibrational spectroscopy imaging methods, in particular Raman, to measure biodistribution of nanoparticles in cells and tissues; studies of inhalation of nanoparticles and inflammatory responses of them.

Miscellaneous

- 2014—2019 Scientific coordinator of the SAIL student summer schools and teacher conferences organized by the Baltic University programme on-board STS Fryderyk Chopin.