



Prof. Lars Österlund

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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, comprising about 40 active researchers and students. 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, the International Science Program (ISP), board member of the Intl. Transparent Conducting Materials network (TCMnet), and regularly counselling for the Swedish Research Council (VR); currently chair of VR's panel for Materials Science and Technology. He is elected foreign member of the Latvian Academy of Sciences. Prof. Österlund has a PhD from 1997 from Chalmers under supervision of Bengt Kasemo, involving 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. He was postdoc at Aarhus University in Denmark 1997- 1999 in Flemming Besenbacher's group conducting fundamental studies of adsorbate interactions with metal and oxide surfaces using STM, and developed a high-pressure STM capable of atomic-scale imaging from UHV to 1 bar. He is co-founder of the companies Nanoform Science AB (www.nanoformscience.se) and Molecular Fingerprint AB (www.molfing.com). Prof. Österlund (h-index 43; ~ 500 citations/yr) has published 207 peer-reviewed scientific articles, book chapters and books, and holds several international patents. He has been main supervisor of 11 PhD students.

Current research in Österlund's focuses on fundamental surface science studies on photon and electron stimulated reactions in heterogeneous catalysis, chromogenic materials, transparent conducting oxides, nanopatterning and functional multilayer structures, and applied research in photocatalysis, solid state gas sensors, self-cleaning and antimicrobial surfaces and with applications in building and display technology, air and water treatment, and medical technology. Recent research includes the invention of spectral selective multilayer thermo-photocatalytic 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, yielding superior oleophobic, self-cleaning properties and long-lasting catalytic properties. 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. Recently, the group focusses on hot electron-stimulated surface reactions on oxides, bifunctional and heterojunction catalysts, and inorganic photochromism in lanthanide oxyhydrides. The group has dedicated instruments for making nanoporous coatings by PVD techniques (sputtering, inert gas-phase deposition), angle-resolved UHV-IRRAS, in situ and operando FTIR setups, and micro-Raman, photoluminescence, an almost complete spectrophotometric lab, optical modelling software, and several dedicated gas and liquid reactors for catalysis and adsorption studies.