



Dr. Jan P. F. Lagerwall

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UNIVERSITY OF LUXEMBOURG
PHYSICS & MATERIALS SCIENCE RESEARCH UNIT

www.lcsoftmatter.com

Profile

Internationally active soft matter physicist with strong interest also in materials science, physical chemistry and—very much so—cross-disciplinary activities. The driving force is a deep fascination and enthusiasm for the scientific beauty of the field as well as the diverse application possibilities. Experience from multiple world-class academic research & teaching environments in five countries on three continents. Long-term core expertise in liquid crystals—thermotropic and lyotropic—expanded with activities in electrospinning, microfluidics and colloids, leading modern liquid crystal science to new directions, with wearable technology, soft robotics and bioinspired performance materials being our main applied foci. Active in relationship building and networking, with a record of organizing and leading international multi-expertise scientific teams. Efficient in delivering complex information to diverse audiences thanks to enthusiasm and good skills in written and verbal communication, with support of multiple digital media as well as hands-on experiments and demonstrations.

Qualifications

M.Sc. (Engineering physics)	04/11/1 997	Chalmers University of Technology, Department of Microwave Technology, Göteborg, Sweden Thesis: <i>Optical Implementation of Neural Networks for Pattern Recognition.</i>
Techn. Lic. (Materials science)	02/18/2 000	Chalmers University of Technology, Department of Microelectronics and Nanosciences / Department of Physics, Göteborg, Sweden Thesis: <i>Phase Characterization of Polar Liquid Crystals Using Dielectric Spectroscopy</i>
Ph.D. (Materials science)	05/08/2 002	Chalmers University of Technology, Department of Microelectronics and Nanosciences / Department of Physics, Göteborg, Sweden Thesis: <i>Structures and Properties of the Chiral Smectic C Liquid Crystal Phases —Ferro- and Antiferroelectricity in Soft Matter.</i>
Docent (Physics)	04/05/2 007	Chalmers University of Technology, Department of Physics, Göteborg, Sweden Docent lecture title: <i>Liquid crystals in modern soft matter physics research</i>
Dr. Habil. (Physical Chemistry)	12/14/2 010	Martin-Luther-Universität Halle-Wittenberg, Faculty of Natural Sciences II, Institute of Chemistry, Halle, Germany Habilitation thesis title: <i>Three Facets of Modern Liquid Crystal Science</i>

Academic Experience

since 03/2014	Professor, University of Luxembourg, Physics & Materials Science Research Unit	Luxembourg
04/2013 - 02/2014	Associate professor, Seoul National University, Graduate School of Convergence Science & Technology	Suwon, Korea
09/2010 - 03/2013	Assistant professor, Seoul National University, Graduate School of Convergence Science & Technology	Suwon, Korea
09/2007 - 08/2010	Research group leader, Institute of Chemistry - Physical Chemistry, Martin Luther University Halle-Wittenberg	Halle, Germany
07/2003 - 08/2007	Post-doc, University of Stuttgart, Institute of Physical Chemistry (group of Prof. F. Giesselmann), and Max Planck Institute for Solid State Research, von Klitzing department (group of Prof. S. Roth)	Stuttgart, Germany
05/2007	Visiting researcher, University of Washington, Department of Chemistry (group of Prof. Y. Xia)	Seattle (WA), USA
01-05/2003	Post-doc, Technical University Berlin, Institute of Physical and Theoretical Chemistry (group of Prof. G. Heppke)	Berlin, Germany
10-12/2002	Post-doc, University of Colorado, Physics Department (group of Prof. N. A. Clark)	Boulder (CO), USA
10/1997 - 09/2002	Doctoral student, Chalmers University of Technology, Physics Department (advisor: Prof. B. Stebler)	Göteborg, Sweden
08-11/2001	Visiting researcher, Technical University Clausthal, Institute of Physical Chemistry (group of Prof. P. Zugenmaier)	Clausthal- Zellerfeld, Germany

Education

08/1986 - 06/1989	Scientific high school education, Göteborgs Högre Samskola	Göteborg, Sweden
09/1991 - 04/1997	Master studies, Chalmers University of Technology	Göteborg, Sweden
09/1994 - 06/1995	Courses at humanistic faculties, Göteborgs universitet (philosophy, religion and history of economics)	Göteborg, Sweden
10/1997 - 05/2002	Doctoral studies, Chalmers University of Technology	Göteborg, Sweden

Skills, Knowledge and Qualities

- Thorough expertise in modern experimental research in liquid crystals, polymers and colloids;
- Deep understanding in the physics/physical chemistry of thermotropic & lyotropic liquid crystals;
- Broad knowledge base thanks to an M.Sc. in physics, Ph.D. in materials science and long-term post-doctoral research in chemistry, always with an interest in cross-disciplinary topics;
- Up-to-date overview of current developments in materials/soft matter research and technology;
- Rich in initiative and innovative power, confirmed through multiple research grants and fellowships;
- Inspiring teacher and advisor, recognized for outstanding presentation, speaking and writing skills;
- Fluent in English, German and Swedish, near fluent in French, and communicating in Italian;
- Actively uses modern computing tools and the web for reaching the highest efficiency in conducting and presenting research.

Main Academic Accomplishments

- Explanation of phase sequence and helix pitch behavior of cellulose nanocrystal suspensions, as a result of competition between kinetic arrest and liquid crystal formation;
- Elucidation of the photonic cross communication between short-pitch cholesteric shells or drops and recognition of the potential of the generated patterns in authentication;
- First realizations of polymerized or polymer-stabilized liquid crystal shells, for curved elastomeric actuators (functioning as micropumps) or for rendering liquid crystal shells and their internal structures permanent;
- First production of liquid crystal-functionalized electrospun non-woven fiber mats and demonstration of their application potential in VOC sensing and photonic crystal fibers;
- First production of smectic liquid crystalline shells via microfluidics and analysis of the internal structures, defect arrangements and the effects of phase transitions;
- Delivered teaching in physics and chemistry with top evaluations and pedagogical awards;
- Main organizer (together with Mathew Schwartz) of the event [TEDxSNUSuwon](#) on interdisciplinary activities
- Revamped the web site of the International Liquid Crystal Society giving the society a modern, informative and attractive presence on the web.

Publications & presentations

- 75 refereed journal articles, 9 book chapters, 1 edited book, 1 patent, 2 book reviews, 2 popular science articles, 4 theses
 - h-index: 25 (ISI); total number of citations: 1883 (ISI)
 - 43 invited oral conference presentations (presenting author), seven invited tutorial/public lectures
- Five representative journal articles:
- ▶ Taming Liquid Crystal Self-Assembly: The Multifaceted Response of Nematic and Smectic Shells to Polymerization
J. Noh, B. Henx, **J. L.**, *Adv. Mater.*, DOI 10.1002/adma.201603158 (2016)
 - ▶ High-fidelity spherical cholesteric liquid crystal Bragg reflectors generating unclonable patterns for secure authentication
Y. Geng, J. Noh, I. Drevensek-Olenik, R. Rupp, G. Lenzini and **J. L.**
Sci. Rep., 6, Art.nr.: 26840, DOI: 10.1038/srep26840 (2016)
 - ▶ Cellulose nanocrystal-based materials: from liquid crystal self-assembly and glass formation to multifunctional thin films
J. L.*, Christina Schütz, Michaela Salajkova, JungHyun Noh, Ji Hyun Park, Giusy Scalia and Lennart Bergström*
NPG Asia Materials, 6, e80, doi:10.1038/am.2013.69 (2014), open access
 - ▶ Nematic-smectic transition under confinement in liquid crystalline colloidal shells
H.-L. Liang, S. Schymura, P. Rudquist and **J. L.**, *Phys. Rev. Lett.*, **106**, 24, 247801 (2011)
 - ▶ Liquid Crystal Functionalization of Electrospun Polymer Fibers (Perspective article)
Dae Kyom Kim, Minsik Hwang and **J. L.**, *J. Polym. Sci. B: Polym. Phys.*, **51**, 11, pp. 855-867 (2013)