Light & Materials Synergy Day 2023

Light Meets Materials

10 October 2023

Palaestra & AF-Borgen, Lund

8:30 Coffee and registration
Palaestra

8:55 Opening session
Palaestra auditorium
Chair: Stacey Ristinmaa Sörensen

9:00 Welcome and opening by Lena Eliasson, Chair of the board of Light & Materials

9:05 Presentation and update of:

- Light & Materials, Tönu Pullerits, Coordinator LU Profile area Light & Materials
- Lund Laser Centre, Per Eng-Johnsson, Director Lund Laser Centre
- NanoLund, Anders Mikkelsen, Director NanoLund
- MAX IV, Olof "Charlie" Karis, Director MAX IV Laboratory

10:10 Poster pitches
Palaestra auditorium
Chair: Ivan Scheblykin

- Patrik Olausson, *Vertical MOSFETs using a "semiconductor-last" approach based on Template-Assisted Selective Epitaxy (poster # 83)*
- Ivan Unksov, *Semiconductor nanowires for biosensing (poster # 64)*
- Elham Akbari, *Tissue-in-a-pit: an infection-on-a-chip, microfluidic system to mimic host-pathogen Interactions (poster # 59)*
- Mehran Sedrpooshan, *Novel Thin Film Coating Approach via Spark-Ablation. (poster # 82)*
- Hampus Månefjord & Meng Li, *Exploring Insect Stratification & Diversity Across Taï Forest Canopy, Côte d'Ivoire (poster # 51)*
- Akvile Zabiliute-Karaliune & Maria Ruchkina, *Tm3+ doped LiNbO3 and LaF3 crystals for deep tissue optical imaging (poster # 74)*
- Enrico Turato, *Mixing with Viscoelastic Waves (poster # 68)*
- Isac Lazar, *Diffusion-Bonding Printed Circuit Heat Exchangers for future energy applications; challenges due to process-induced microstructural changes (poster # 90)*
- Jesper Schwarz, *New Photoredox Catalysis driven by Iron carbene complexes – utilizing the power of two photons in one catalytic cycle (poster # 101)*
- Lisa Rämisch, *Combined optical-and laser-based operando diagnostics of heterogeneous model catalysts (poster # 87)*
- Björn Annby-Andersson, *Maxwell's demon across the quantum-to-classical transition (poster # 43)*
- Fan Wu, *Modification of the excitation energy transfer by optical microcavity (poster # 33)*
- Viktor Svensson, *Protection of poor man's Majoranas in interacting quantum dots (poster # 37)*
- Vénus Poulain, *Toward XUV-XUV pump-probe spectroscopy (poster # 5)*

10:45 **Coffee**

Palaestra

11:20 **Plenary talks**

Palaestra auditorium

11:20 Plenary talk. Chair: Anders Mikkelsen
Managing photons with nanostructures: from single-molecule detection to solar energy. Heiner Linke, Professor Solid State Physics

11:50 Plenary talk. Chair: Per Eng-Johnsson
Ultrashort light pulses meet materials. Anne L'Huillier, Professor Atomic Physics

12:30 **Lunch and posters**

AF-borgen Festvåningen and Sångsalen

13:45 **Parallel sessions**

Medicine & Light

Palaestra övre

Chair: Christelle Prinz

Clinical Spectroscopy – Light for non-invasive diagnostics, Aboma Merdasa (Ophthalmology)

Novel approaches to resolve molecular structures in living systems at nanoscale, Oxana Klementieva (Medical Microspectroscopy)

When light meets sound - microscale manipulation of fluids, Per Augustsson (Biomedical Engineering)

Ultrasound optical tomography and plans for first test in humans, Sophia Zackrisson (Radiology Diagnostics)

Beyond nanoscale localisation: Using polarised light to measure molecular organisation in cells, Vinay Swaminathan (Cell mechanobiology)

Energy

Palaestra nedre

Chair: Francesca Curbis

Next-generation wide- and ultra-wide bandgap semiconductors for energy-efficient high-frequency and power electronics, Vanya Darakchieva (Solid State Physics)

Metal combustion as Renewable Energy carrier, Zhongshan Li (Combustion Physics)

Towards solar energy conversion with Fe-based molecules bound to semiconductor nanoparticles, Linnea Lindh (Chemical Physics)

Tandem Junction GaInP/InP Nanowire Photovoltaic Devices – Processing and Characterization, David Alcer (Solid State Physics)

Integrating Robotic Synthesis with in-situ Multimodal Hard X-ray Characterization to Unravel Complex Synthesis Processes for Metal-Halide Perovskites, Justus Just, (MAX IV)

15.00 **Coffee and posters**

AF-borgen Festvåningen

15:45 Parallel sessions

Climate & Environment

Palaestra nedre

Chair: Joakim Bood

Catalysis in the light of lasers, Johan Zetterberg (Combustion Physics)

Closing the Loop: Advanced X-ray spectroscopy a key for Safe Secondary Use of Materials, Jenny Rissler (Ergonomics and Aerosol Technology)

UV breakdown of plastics and its effects on toxicity of nanoplastics, Tommy Cedervall (Biochemistry and Structural Biology)

Aerosol-cloud-climate interactions Moa Sporre (Combustion Physics)

Light meets insects, Mikkel Brydegaard (Combustion Physics)

Quantum Physics & Technology

Palaestra övre

Chair: Tönu Pullerits

Emission enhancement of rare-earth-doped nano-materials, Andreas Walther (Atomic Physics)

Quantum networks: from physics to technology, Armin Tavakoli (Mathematical Physics)

Convergence of Light and Matter in the Phenomenon of Perovskite Superradiance, Dmitry Baranov (Chemical Physics)

Thermoelectric cooling of a finite-size reservoir, Stephanie Matern (Solid State Physics)

One photon at a time: Detection of individual microwave photons using cavity-coupled quantum dots, Subhomoy Haldar (Solid State Physics)

17:00 Posters and pre-dinner drinks

AF-borgen, Festvåningen and Sångsalen

17:00 – 17:45: Even-numbered posters
17:45 – 18:30: Odd-numbered posters

19:00 Dinner at Grand Hotel

Pre-registered only