

Lasers and Photonic Technologies for Environmental Challenges (SYEC)

jointly organized by
the Short Time-scale Physics and Applied Laser Physics Division (K) and
the Environmental Physics Division (UP)

Simon Spelthann
Leibniz Universität Hannover
Institute of Quantum Optics
Welfengarten 1
30167 Hannover
spelthann@iqo.uni-hannover.de

Michael Steinke
Leibniz Universität Hannover
HITec – Hannover Institute of Technology
Welfengarten 1
30167 Hannover
michael.steinke@hitec.uni-hannover.de

Stefanie Falk
Institut für Meteorologie und Klimaforschung
Atmosphärische Spurenstoffe und Fernerkundung
Hermann-von-Helmholtz-Platz 1
76344 Eggenstein-Leopoldshafen
stefanie.falk@kit.edu

As one of the major issues facing the world, the ongoing climate crisis substantially threatens today's society. To mitigate this threat we need to increase the overall energy usage efficiency (greener industrial designs) and reduce CO₂, methane, black carbon and CFC emissions (avoid environmental pollution, safeguard human health and weaken greenhouse warming) by establishing low-carbon "clean" energy sources (renewables, nuclear fusion and others). At the same time, the current century is known as the age of the photon spawned through the invention of the laser and its continuous development. At this special symposium, current solutions to environmental challenges based on lasers and photonic technologies will be presented and discussed. These solutions will be as diverse as the environmental challenge they aim to solve and cover, e.g., optical fibre and waveguide technology, photonic sensing, photocatalysis, nanophotonics, (ultrashort pulsed) lasers, or photonic quantum technologies.

Overview of Invited Talks and Sessions

(Lecture hall ELP 6: HS 1 and ELP 6: HS 4)

Invited Talks

SYEC 1.1	Tue	11:10–11:40	ELP 6: HS 1	Nanostructured optical waveguides inside YAG crystals as a crucial step towards the development of microlasers for advanced sensing applications — ●OMAR DE VARONA, FRANZETTE PAZ-BUCLATIN, PAUL SANTOS, PABLO MOLINA, LEOPOLDO MARTÍN, AIRÁN RÓDENAS
SYEC 1.2	Tue	11:40–12:10	ELP 6: HS 1	Laser surface modification of graphite anodes for lithium-ion batteries with improved fast-charging capability — ●MAX-JONATHAN KLEEFoot, JENS SANDHERR, JIRI MARTAN, VOLKER KNOBLAUCH, HARALD RIEGEL
SYEC 2.1	Tue	14:00–14:30	ELP 6: HS 4	Development of soft glass optical fibers based on 3D printed preforms — ●RYSZARD BUCZYNSKI, PAWEŁ WIENCLAW, PRZEMYSŁAW GOLEBIEWSKI, DARIUSZ PYSZ, ADAM FILIPKOWSKI, GRZEGORZ STEPNIEWSKI, OLGA CZERWINSKA, ANDRZEJ BURGS
SYEC 2.2	Tue	14:30–15:00	ELP 6: HS 4	Three-dimensional Ultrashort-Pulse Laser Nanolithography of Optical Materials — ●AIRÁN RÓDENAS, OMAR DE VARONA, FRANZETTE PAZ-BUCLATIN
SYEC 2.3	Tue	15:00–15:30	ELP 6: HS 4	Fibre-based plasmonic micro reactor CO₂ reduction — ●DEVIN O'NEILL, PATRICK SPATH, WIEBKE ALBRECHT
SYEC 5.1	Tue	17:15–17:45	ELP 6: HS 4	Studying atmospheric dynamics with lasers in remote places — ●BERND KAIFLER

Sessions

SYEC 1.1–1.3	Tue	11:00–12:25	ELP 6: HS 1	Laser-Based Micro-/Nanostructuring for Environmental Challenges
SYEC 2.1–2.3	Tue	14:00–15:30	ELP 6: HS 4	Fiber-Based Plasmonic Microreactor for Flow Chemistry
SYEC 3.1–3.2	Tue	15:30–16:00	ELP 6: HS 4	Photonics-Assisted Green Energy Production I
SYEC 4.1–4.3	Tue	16:30–17:15	ELP 6: HS 4	Photonics-Assisted Green Energy Production II
SYEC 5.1–5.4	Tue	17:15–18:30	ELP 6: HS 4	Photonic Measurement Technology for the Environment