

Optics & Photonics in Sweden 2022 (OPS) 4 - 7 October 2022

Umeå, Umeå University



GENERAL INFORMATION

The Optics & Photonics in Sweden conference (OPS 2022) will be held on 4-7 October 2022 in Umeå at Umeå University. The conference is organised by PhotonicSweden (PS). On 7 October the Laser Lab Sweden will have a workshop.

More information: photonicsweden.org

GENERAL CHAIR

- Ove Axner (Umeå University)

PROGRAMME COMMITTEE

- Maria Abrahamsson, Chalmers
- Magnus Andersson, Umeå University
- Ove Axner, Umeå University
- Petra Bindig, PhotonicSweden
- Joakim Bood, LTH
- Ludvig Edman, Umeå University
- Kristinn Gylafson, KTH
- Kenneth Järrendahl, LiU
- Magnus Karlsson, Chalmers
- Valdas Pasiskevicius, KTH
- Mikael Sjö Dahl, LTU Luleå
- Thomas Wågberg, Umeå University
- Petra Hardke, Thorlabs
- Urban Konradsson-Botes, Optonyx, Kista
- Håkan Olsson, SLU, Umeå
- Ewa Orłowska, Hamatsu Norden AB
- Christofer Silfvenius, Energimyndigheten
- Maria Strand, Adopticum, Skellefteå
- Lisa Rähmisch, LU, Lund
- Lennart BM Svensson, PhotonicSweden

KEYNOTE SPEAKERS

will highlight European research and developments.

INVITED TALKS

will cover a variety of topics in Optics and Photonics, reflecting current Swedish research and development at universities, institutes and industry.

A POSTER SESSION

will provide an additional opportunity to display the most recent developments and achievements. It will also give an overview of Optics and Photonics in Sweden and offer a good platform for creating new collaborations.

BEST POSTER AWARDS

The best poster will be awarded with 3,000 SEK
The second and third prize will be awarded with 1,000 SEK. The poster awards are sponsored by:



AN EXHIBITION AND A SESSION WITH COMPANY PRESENTATIONS

will be held in parallel to the technical sessions to provide industry, institutes, and associations an opportunity to display their products and services and bridge the gap between science and industry.

ABSTRACT SUBMISSION FOR POSTER PRESENTATIONS

Authors are requested to submit an abstract of a half to one page (font 11, including figures and references). Contributions will be accepted for poster presentation. All authors are requested to register for the meeting separately from abstract submission.

Required poster size: The posters should have a maximum size of DIN A0 (841 x 1189 mm) preferably in a portrait format (not landscape format). Pins and similar pads will be provided by the organizer.

Abstracts can be sent to petra@photonicsweden.org
Deadline for abstracts: 15 September 2022

EXHIBITION & SPONSORING OPPORTUNITIES

Please contact Lennart BM Svensson if you are interested in our exhibition and sponsor opportunities:

lennart@photonicsweden.org

FURTHER INFORMATION

For further information please go to photonicsweden.org

CONFERENCE VENUE

Umeå University
901 87 Umeå, Sweden

JOB FAIR AT EXHIBITION

We will arrange a matchmaking between companies and job seekers at the conference Optics and Photonics in Sweden 2022 at Umeå University. It will take place on 5 and 6 October in the exhibition area. All exhibiting companies welcome students (graduates, undergraduates and Phd students) to discuss jobs, internships, etc. More information on the conference can be found at <https://photonicsweden.org/optics-photonics-in-sweden-2022/>

APPLICATION FOR STUDENT FREE ADMISSION

Up to 10 students in a Bachelor's degree or Master's degree program can apply for free admission for OPS-2022, which is sponsored by ThorLabs Sweden AB. <https://photonicsweden.org/wp-content/uploads/Apply-for-student-free-admission-to-Optics-Photonics-2022.pdf>



REGISTRATION FOR PARTICIPANTS

The registration deadline for online-registration is 20th of September.

Register here: <http://dinkurs.se/OPS2022Participants>

REGISTRATION FEES

3.300 kr +25% VAT	Non Members
2.600 kr + 25% VAT	Personal Members of PhotonicSweden and/or European Optical Society (EOS)
1.500 kr + 25% VAT	Student Members & Pensioner Members of PhotonicSweden and/or European Optical Society (EOS)
1.500 kr +25% VAT	Invited Speakers

Observe that all Swedish and European participants must pay 25% VAT (Moms) *. The option without VAT is only for VAT-registered companies outside Europe.

All fees includes one person conference fee and all lunches & coffee breaks and conference dinner.

Personal annual member fee is 350 SEK/Year and student & pensioner annual member fee is 110 SEK/Year. Personal membership includes membership in PhotonicSweden, Svenska OptikSällskapet and European Optical Society.

*** New EU VAT rules for courses and conferences**

In March 2019, the European Court of Justice rejected Sweden's interpretation of the part of the VAT directive relating to access to events. The ruling means that payments to gain physical access to courses and conferences are to be seen as access to events and must therefore always be made in the country where the event is held. The change also means that foreign companies attending courses in Sweden will receive invoices issued with Swedish VAT. Participants from companies and organizations within the EU with a VAT number have the opportunity to claim back the VAT on the participation fee via their local tax authority. The UK left the EU (Brexit) in 2020 and is thus no longer an EU country. Now the same rules regarding VAT apply to the UK as to other countries outside the EU.

REGISTRATION FOR EXHIBITORS

The registration deadline for online-registration is 20th of September.

Register here: <http://dinkurs.se/OPS2022Exhibitors>

EXHIBITION FEES

15.900 kr + 25% VAT	Non Members (incl. one person participation fee)
13.600 kr + 25% VAT	Company Members of PhotonicSweden (incl. one person participation fee)
2.600 kr + 25% VAT	additional exhibitors colleagues (incl. one person participation fee)

Observe that all Swedish exhibitors must pay 25% VAT (Moms). The option without VAT is only for VAT-registered companies outside Sweden.

All fees includes one person conference fee and all lunches & coffee breaks and conference dinner.

Exhibition stand will be selected based on registration order. Map of exhibition floor will later be sent out to exhibitors.

Please contact Lennart BM Svensson
lennart@photonicsweden.org if you are interested in exhibiting at OPS-2022.

Goods for the OPS-2022 conference delivers to:

Goods Label and Shipping Address:

OPS-2022/Ove Axner
Servicegränd 12
Umeå universitet
907 36 Umeå

Map: <https://goo.gl/maps/aEnwaBE3rY2wte6o8>

Delivery contact at Husservice/Universum:
Mr. Jan-Erik Lingebrandt
+46 (0)90 786 88 90
+46 (0)70-350 51 72

Hotel reservation

PhotonicSweden has **reserved 20 double rooms and 40 single rooms** at Hotel Björken, which is close to the venue.

- Special price for single room SEK 750 per room and night
- Special price for double room SEK 1150 per room and night
- The accommodation price includes breakfast.
- The parking cost is SEK 80 per day.
- Enter the code "PhotonicSweden 2022" when booking to get the special price.
- Rooms not booked 3 weeks before arrival are automatically canceled.

Hotell Björken

Visiting address: Lasarettbacken 10

Postal address: Box 7986

907 19 Umeå, Sweden

Phone: +46 90 10 87 00

E-mail:

hotell.bjorken.se@sodexo.com

Web:

www.hotellbjorken.se

Map:

<https://goo.gl/maps/xLQdz8m8Z3yxUj3W9>

**VICTOR MALKA**

Weizmann Institute of
Science, Rehovot, Israel

victor.malka@weizmann.ac.il

Victor Malka obtained his PhD thesis at Ecole Polytechnique in 1990. He worked on atomic physics, inertial fusion, laser plasma interaction, relativistic laser plasma interaction and on laser plasma accelerators, in which he makes several breakthrough contributions. He has published about 380 articles and has been invited in more than 200 international conferences. He got several prizes and grants including ERC and EIC ones. Since 2019 he is full time Professor at the Weizmann Institute of Science in Israel.

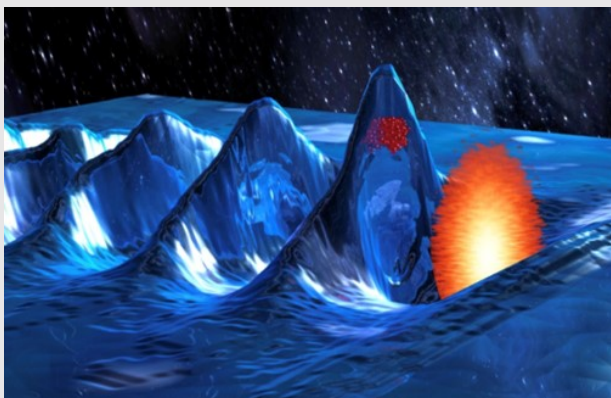
Laser Plasma Accelerators (LPA) rely on our ability to control finely the electrons motion with intense laser pulses [1]. Such manipulation allows to produce giant electric fields with values that can exceed by more than 3 orders of magnitude those used in current accelerator technology. Controlling the collective electrons motion permit to shape the longitudinal and radial components of these fields that can be optimised for delivering high quality electrons beam or energetic photons.

To illustrate the beauty of laser plasma accelerators I will explain some of these concepts that improve beam quality and show how one can use them to image relativistic plasma wave [3] or electron bunch.

Finally, I'll show the pertinence of the approach for many applications by considering the two most mature cases of relevance in security domain with non-destructive inspection compact gamma sources, and for radiotherapy with very high energy electrons delivered by compact LPAs [4].

Keywords: high power lasers, accelerators, X-ray beams, electron beams

- [1] V. Malka, *Europhysics Letters*, **115**, 54001 (2016)
 [2] V. Malka *et al.*, *Science* **22**, **298** (2002)
 [3] Y. Wan *et al.*, Accepted in *Nature Physics*.
 [4] V. Malka *et al.*, *Nature Physics* **4**, 447 (2008)

**HOLGER Schlüter**

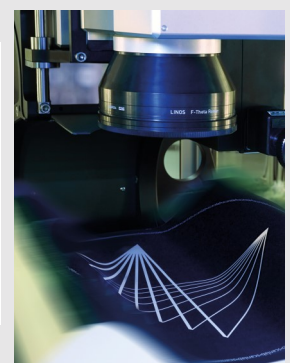
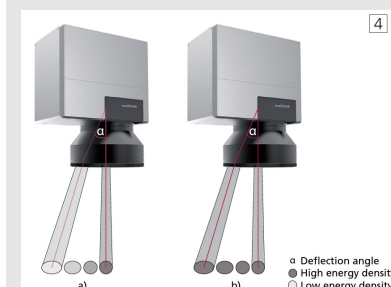
Business Development
SCANLAB GmbH, Germany

h.schluter@scanlab.de

Holger Schlüter studied Physics in Aachen and made his Ph.D. at ILT Aachen in 1996. He joined TRUMPF and worked there in various leading positions in the United States. In 2008 he returned to Germany and worked as COO and CTO for Technolas Perfect Vision, a maker of surgical ophthalmic laser equipment. He joined SCANLAB in 2015 as the head of Business Development.

Many industrial laser applications are in production today. We present some of the most important applications as videos and investigate further which applications require galvanometer scanners. In the second part of the presentation some of the most important technologies involved in industrial galvanometer scanning are discussed. These include

- Setup of a galvanometer scan system
- Digital position detectors enable accuracy of $\pm 4 \mu\text{m}$
- Innovative control algorithms increase throughput
- Spot distance control assures product quality and reduces scrap
- Image field corrections facilitate additional precision
- Trajectory planning and XL SCAN allow for processing with an accuracy of $\pm 1.5 \mu\text{m}$
- High power ultra-short pulse (USP) lasers require new ideas
- Use case: Probe card manufacturing



TUESDAY 4 OCTOBER 2022

14:00-21:00 **Exhibition set up** Room: **Caféhörnan**

14:00-18:00 Room: **Triple Helix, Universitetsledningshuset**
Nordic Photonics Forum meeting

14:00 - 14:10
Introduction

14:10 - 14:40
Make equality measurable, *Maria Strand and Kenth Johansson, Adopticum, Skellefteå*
 At Adopticum we love to measure things, it's what we do, it's a part of our DNA. But today we won't be talking about measuring from an optical point of view, but rather how we work with and measure equality in highly technical project.

14:40 - 15:20
European Chips Act (ECA): Why do we need an Initiative? *Thorbjörn "Toby" Ebefors, Smarter Electronic Systems.*
 The European Commission has released its primary response to this crisis through the European Chips Act, aiming to double the European share of global microchip production by 2030 and reduce supply dependencies. The presentation highlights why Europe needs an Initiative for a Chips Act. There are three pillars of the Chips Act: Chips for Europe Initiative, Security of Supply, and Monitoring and Crisis Response. The situation today, and what is missing in the EU is addressed, as well as the most important activities.

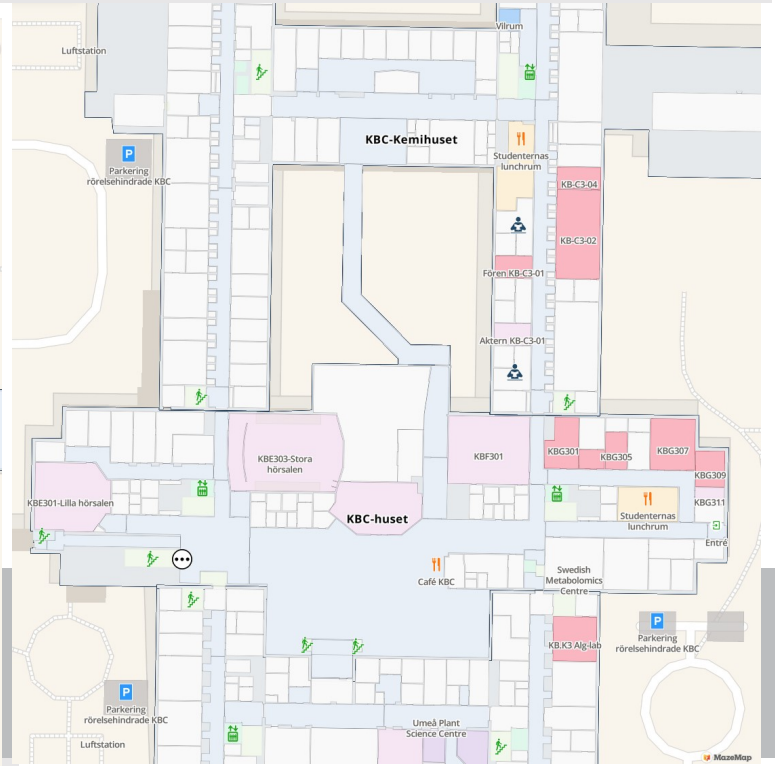
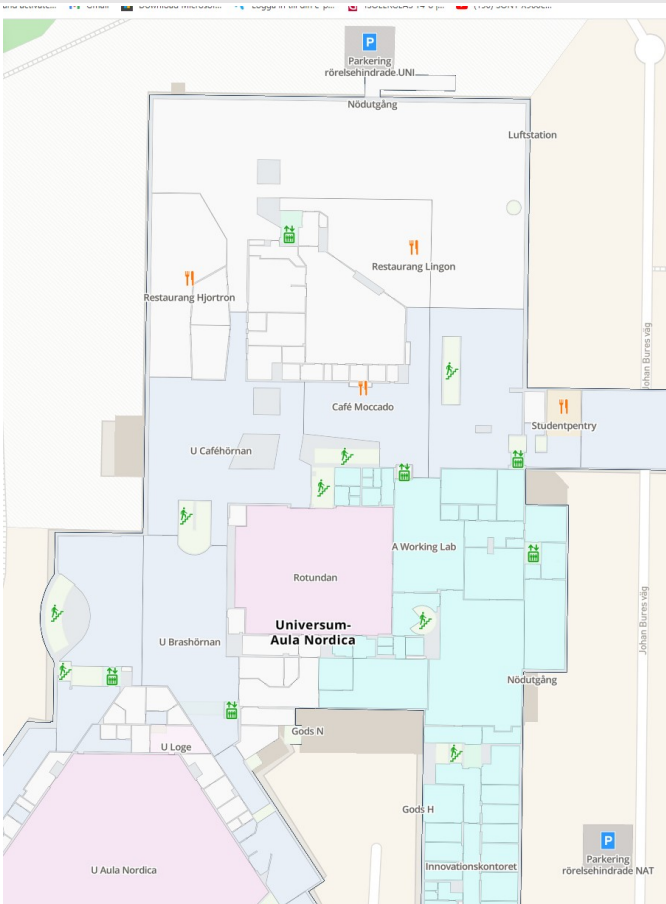
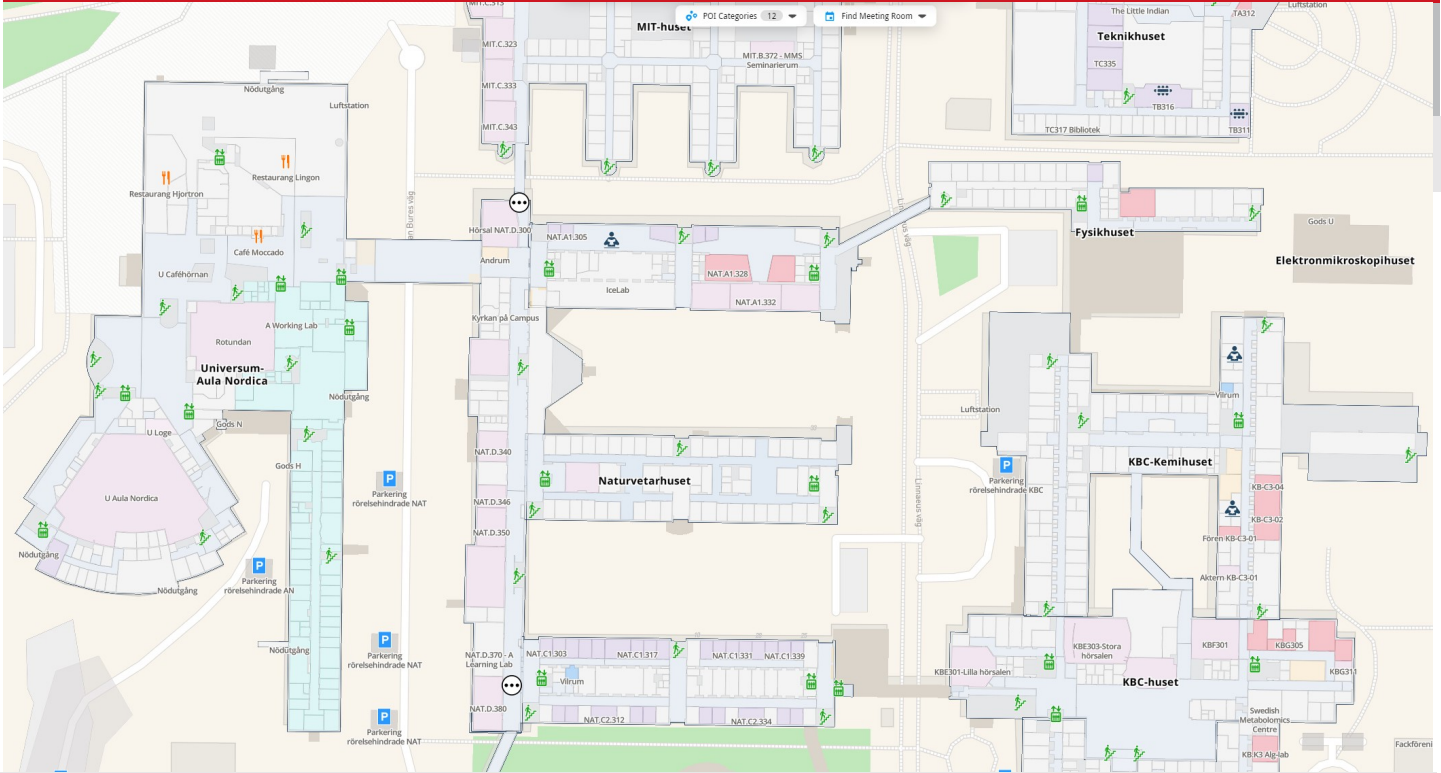
15:20 - 15:35
Coffee Break

15:35 - 16:25
European Chips Act Continuation: *Thorbjörn "Toby" Ebefors, Smarter Electronic Systems*
Support for Swedish Small and Medium sized Enterprises (SME's), *Business Sweden / TBD*
 Does your company have fewer than 250 employees and a turnover below 50 million euro? If so, we can help you expand your business overseas. Our government funding allows us to offer a wide range of tailored services to support your international growth.

16:25 - 17:00
Innovation Support offered by EU-project PhotonHub
 A fund of 7.4 million Euro is earmarked for eligible companies, to perform technical innovation projects within the PhotonHub framework. Experts, laboratory resources, prototyping and test facilities across Europe are available to the projects.
Lennart BM Svensson, PhotonicSweden
Åsa Claesson, RISE

17:00 - 18:00
Photonics Clusters
 Photonics Finland, *Juha Purmonen*
 Danish Photonics Club, *Henrik Mertz, FORCE Technology, Denmark*
 Baltics Photonics
 Photonics in Latvia and NOP-2023 Norther Optics and Photonics in Riga, *Valters Jakobsons, LIAA, Latvia Embassy in Stockholm*

18:00-19:00 Room: **Triple Helix, Universitetsledningshuset**
Networking with drinks and fingerfood



<https://link.mazemap.com/VEajgXaf>

CONFERENCE SCHEDULE

WEDNESDAY, 5 OCTOBER 2022

09:00-10:00 Room: **KB.E3.03 Kempe Salen in the KBC huset**
On-site registration and welcome coffee

10:00-10:15 Room: **KB.E3.03 Kempe Salen in the KBC huset**
Opening Remarks
Åsa Claesson, PhotonicSweden; Ove Axner, Umeå University

10:15-11:00 Session Chair: *Ove Axner*
Keynote Talk
Manipulating Relativistic Electrons with Intense Laser Pulses
Victor Malka, Weizmann Institute of Science, Rehovot, Israel

11:00-12:20 Room: **KB.E3.03 Kempe Salen in the KBC huset**
Exhibitor Presentations Session Chair
Exhibitor Pitch Talks *Lennart BM Svensson*

12:20-14:00 Room: **Restaurant Lingon, Brashörnan, Caféhörnan**
Lunch & Poster Session & Exhibition

Room: **KB.E3.03 Kempe Salen**

Room: **KB.E3.01 Lilla hörsalen in KBC huset**

14:00-15:00
Session A1 | Photonics for Life Sciences

Session Chair:

14:00-14:20
Functional fibers for opto-fluidic applications
Fredrik Laurell, Royal Institute of Technology (KTH)

14:20-14:40
Characterization of individual pathogens using optical tweezers based methods
Magnus Andersson, Umeå University

14:40-15:00
Plasmonically-powered trapping and rotation of gold nanorods
Hana Jungová, Chalmers University of Technology

14:00-15:00
Session B1 | Photonics application-funding

Session Chair:

14:00-14:20
TBD

14:20-14:40
Examples of photonics development projects funded by SES and upcoming opportunities
Thorbjörn Ebefors, Ph.D, Acting Program Manager, Smarter Electronic Systems (SES) (only 5/10)

14:40-15:00
Examples of regional innovation funded projects through optical measurement technology and how to assist in new projects
Åsa Almström, Project Manager, The Adopticum Foundation, Skellefteå

WEDNESDAY, 5 OCTOBER 2022

15:00 - 15:20
Break

Room: **KB.E3.03 Kempe Salen**

15:20-16:20
Session A2 | Laser Driven Light and Particle Sources

Session Chair: Fredrik Laurell

15:20-15:40
Generation of attosecond light and relativistic electron pulses with ultra-intense lasers
Laszlo Veisz, Umeå University

15:40-16:00
Applications of Laser Plasma Accelerators
Olle Lundh, Lund University

16:00-16:20
Physics at ultra-high intensities
Mattias Marklund, University of Gothenburg

Room: **KB.E3.01 Lilla hörsalen in KBC huset**

15:20-16:20
Session B2 | 3D-analysis / Spectroscopy
Session Chair: tba

15:20-15:40
3D camera tracker for fast and easy physical performance analysis,
Jonas Sjöberg, Ph.D., Founder of Photon Sports AB, Umeå

15:40-16:00
Laser Based Spectroscopy – Novel Solutions for Faster, Smarter Workflows ,
Robert Wills, Molecular Spectroscopy Product Specialist, Agilent Technologies LDA UK Ltd (only 5/10)

16:00-16:20
Lasers for Raman Spectroscopy Applications
Mickael Winters, Ph.D., Area Sales Manager för Scientific Research & Instrumentation, Coherent, Gothenburg

16:20-17:30
Break

17:30-19:00
Poster Session & Exhibition & Beverage

Room: **Brashörnan, Caféhörnan**

19:00-22:00
Conference dinner

Location: **Restaurant Lingon**

THURSDAY, 6 OCTOBER 2022

08:45-09:30
Welcome coffee

Room: **KB.E3.03 Kempe Salen**

09:30-10:30
Session A3 | Spectroscopy / Spectrometry / Imaging
Session Chair: tba

09:30-09:50
Precision spectroscopy using optical frequency combs – toward better understanding of exoplanetary spectra
Aleksandra Foltynowicz, Umeå University

09:50-10:10
Kilometer-range panoramic photon-counting 3D lidar
Markus Henriksson, FOI

10:10-10:30
FRAME: Snapshot imaging using coded light
Karolina Dorozynska, Lund University

10:30-10:40
Break

10:40-12:00
Session A4 | Advanced Photonic Materials
Session Chair:

10:40-11:00
High-speed mid-infrared photothermal heterodyne imaging in a wide field of view
Florian Schmidt, Umeå University

11:00-11:20
Towards sustainable and efficient light-emitting electrochemical cells
Ludvig Edman, Umeå University

11:20-11:40
3D printed glass
Michael Fokine, Royal Institute of Technology

11:40-12:00
Redox-tunable optical nanoantennas based on conductive polymer nanostructures.
Shangzhi Chen, Linköping University

Room: **KB.E3.01 Lilla hörsalen in KBC huset**

09:30-10:30
Session B3 | Lasers / Hyperspectral Imaging
Session Chair: tba

09:30-09:50
Industrial lasers simplify elemental mapping based on LIBS (Laser Induced Breakdown Spectroscopy)
Elena Vasileva, Ph.D. Cobolt/HÜBNER Photonics, Stockholm

09:50-10:10
Lasers for Raman Spectroscopy Applications
Mickael Winters, Area Sales Manager Scientific Research & Instrumentation, Coherent, Gothenburg (only 6/10)

10:10-10:30
Automatic parasite detection in fish using Hyperspectral Imaging
Andreas Vidman, Prediktera AB (only 6/10)

10:40-12:00
Session B4 | LIDAR applications / Forestry
Session Chair:

10:40-11:00
Flasheye-Lidar used same as cameras: real-time 3d lidar monitoring for security and industrial applications,
Ida Rhenström, COO and Johan Söderberg, Lead Developer, Flasheye AB, Luleå

11:00-11:20
National Mapping of Swedish Forests using Airborne Lidar,
Mats Nilsson, Associate Professor, Department of Forest Resource Management, SLU, Umeå

11:20-11:40
Stem quality estimated from ground based laser scanning,
Kenneth Olofsson, Associate Professor, Department of Forest Resource Management, SLU, Umeå

11:40-12:00
Processing of remote sensing data, including ground scanning and drone images at the Ljungberg lab,
Jonas Bohlin, Section Manager, Department of Forest Resource Management, SLU, Umeå

THURSDAY, 6 OCTOBER 2022

12:00-13:45 Room: **Restaurant Lingon and Glasövergången to Naturvetarhuset, Caféhörnan**
Lunch break & Poster session & Exhibition

13:45-14:30 Room: **KB.E3.03 Kempe Salen**
Keynote Talk
Laser Applications and Scanner Technologies for Industrial Solutions
 Holger Schlueter, SCANLAB GmbH, Germany

14:30-15:00
PhotonicSweden Awards and Poster Prize
 Mikael Sjö Dahl, Luleå University, Peter Strömberg, Acoem AB, Laszlo Veisz, Umeå University

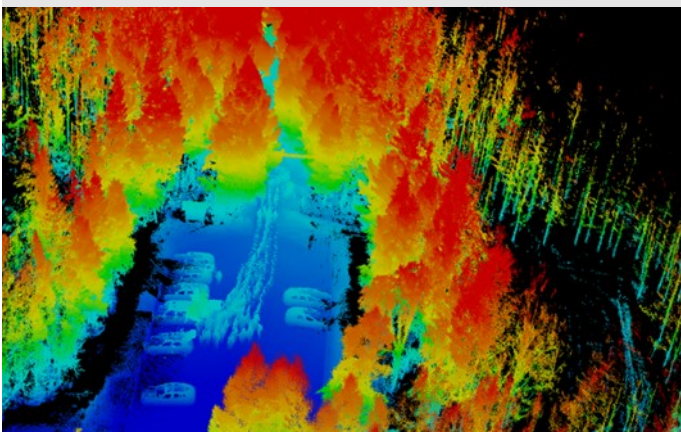
15:00-15:30
Coffee Break

15:30-17:30
Lab visits

The Ljungberg laboratory at SLU (The Swedish University of Agricultural Sciences)

The Ljungberg laboratory is a training laboratory for 3D remote analysis of forests where the latest technology is available in terms of platforms and sensors.

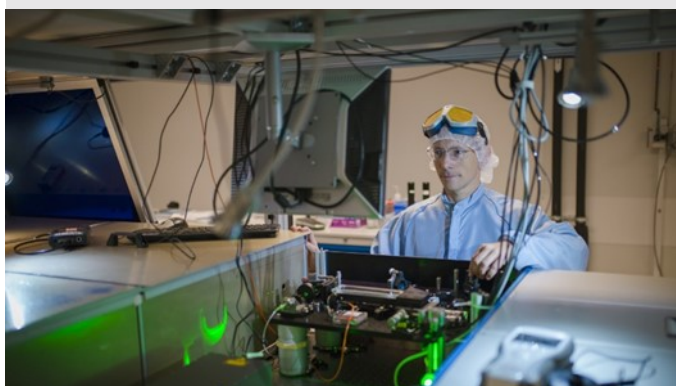
In the Remote sensing and forest inventory course at SLU we always has a demo of different sensors and platforms available for the students in the Ljungberg laboratory like for example processing remote sensing data, including ground scanning, drone images, etc



The Department of Physics belongs to the Faculty of Science and Technology at Umeå University.

At present about 100 people work at the new Department of Physics, professors, lecturers, researchers, guest professors, postdocs, doctoral students, and technical and administrative staff.

We carry out research and research education in various fields, for example in optical physics, nonlinear physics, plasma physics, general relativity, condensed matter physics and nanotechnology, photonics, biological physics, complex networks, space physics and physics education.



FRIDAY, 7 OCTOBER 2022

**Laserlab
Sweden**



8.30 – 14.45

Room: Triple Helix, Universitetsledningshuset.

Laserlab Sweden Day- A presentation of the ongoing activities within Laserlab Sweden - A hot field with lots of job opportunities - CARLA Camp

Laserlab Sweden is a Swedish network of Laser Research Infrastructures. It is organized in five nodes, comprising Lund Laser Centre, Laserlab Umeå, Laserlab Göteborg, Laserlab Uppsala, and Laserlab Stockholm. Further information can be found at <https://laserlab-sweden.se/> .

8.30 – 8.40 Introduction to Laserlab Sweden

Dag Hanstorp

8.40 – 9.40 Presentation of the Gothenburg node

Node presenter (15 min): Dag Hanstorp

Invited speaker (25+5 min): Hélène Coudert-Alteirac, "Attohallen: commissioning of a new attosecond facility"

PhD student speaker (12+3 min): Javier Marmolejo, "A water droplet as a toy atom"

9:40 -10:00 Coffee break

10:00 - 11:00 Presentation of the Lund node

Node presenter (15 min): Claes-Göran Wahlström

Invited speaker (25+5 min): Anne-Lise Viotti, "Ultrafast sources at high repetition rates"

PhD student speaker (12+3 min): Weihua Lin, "Light-induced electronic dynamics in 2D perovskites"

11:00 - 12:00 Presentation of the Umeå node

Node presenter (15 min): Laszlo Veisz

Invited speaker (25+5 min): Vinicius Silva de Oliveira, "Double resonance spectroscopy of methane using an optical frequency comb"

PhD student speaker (12+3 min): Aitor De Andres, "Spatio-spectral characterization of few-cycle laser pulses"

12:00 - 13:00 Lunch

13:00 - 14:30 Presentation of the Stockholm/Uppsala nodes

Stockholm node presenter (10 min): Valdas Pasiskevicius

Invited speaker (25+5 min): Clarissa Harvey, "Advanced fiber fabrication"

PhD student speaker (12+3 min): Christoffer Krook, "Self-compression of pulses by impulse polariton scattering"

Uppsala node presenter (5 min): Ronny Knut

Invited speaker (25+5 min): Ronny Knut, "Ultrafast dynamics in magnetic materials"

14.30 – 14.45 Wrapping up



Photonic Quantum Random Number Generation with Guaranteed Privacy

Joakim Argillander, Linköping University

Cascaded Mode-locking of Nd:YVO₄ Laser through Intra-Cavity Sum-Frequency Generation

Martin Brunzell, The Royal Institute of Technology (KTH)

Development of a new laser facility for material science research

Ruslan Chulkov, Uppsala University

Raman frequency conversion of spectrally tunable laser radiation on coherently driven molecular vibrations in high-pressure hydrogen

Ruslan Chulkov, Uppsala University

Attohallen: Commissioning of a new attosecond science facility

Helene Coudert-Alteirac, University of Gothenburg

Double-resonance spectroscopy of methane in the $3\nu_3 \leftarrow \nu_3$ region using a frequency comb probe

Vinicius de Oliveira, Umeå University

GAS MODULATION REFRACTOMETRY – A TECHNIQUE FOR PRECISE AND ACCURATE PRESSURE ASSESSMENTS

Clayton Forssen, Umeå University

Optical frequency comb Fourier transform spectrometer for high-accuracy line position retrieval in the 8 μm range

Adrian Hjältén, Umeå University

Implementing the Multi-plane Gerchberg-Saxton Algorithm in Digital Signal Processors

Varis Karitans, University of Latvia

Slow light laser stabilization

Marcus Lindén, Lund University

Towards 3D printed lasers

Pawel Maniewski, The Royal Institute of Technology (KTH)

Optical spectrophotometry for material appearance modelling in 2.5D and 3D printing

Alina Pranovich, Linköping University

Coherent Control of Molecular Rotation with Single-shot fs/ns Coherent anti-Stokes Raman Spectroscopy

Meena Raveesh, Lunds University

Protocells and Surface-adhered Biomembrane Networks

Ruslan Ryskulov, Chalmers University of Technology

Quantitative in situ detection and imaging of gas-phase K, KOH and KCl in biomass combustion

Emil Thorin, Linköping University

Non-polarizing spatial light modulation on liquid crystals for Li-Fi under normal lighting conditions

Sergiy Valyukh, Linköping University

Simultaneous quantitative measurement of KOH, KCl and K atom with spatial resolution

Weng Wubin, Lunds University

Neutron Optics: Using Magnetic Reference Layers in Neutron Reflectometry Studies to Effectively Explore Organic Matter

Ivan Yakymenko, Linköping University

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1ST PRIZE



2ND PRIZE



POSTER AWARD



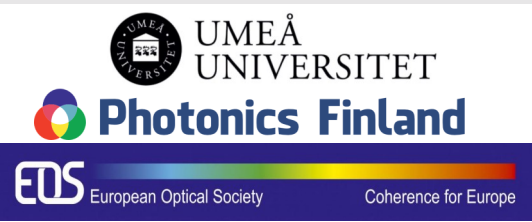
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