

LALS-2010

XII International Conference
on Laser Applications in Life Sciences

Organized by

University of Oulu, Oulu, Finland
M.V. Lomonosov Moscow State University, Russia
VTT – Technical Research Centre of Finland

Sponsored by

Biocenter Oulu, Finland
University of Joensuu, Finland
European Physical Society (EPS)

In cooperation with

SPIE—International society advancing light-based research

Conference web-site

www.ee.oulu.fi/LALS-2010

Conference Chair

Prof. Risto Myllylä
University of Oulu
90570 Oulu, Finland

Program Committee Contacts

Prof. Victor Zadkov
International Laser Center
M.V. Lomonosov Moscow State University
Moscow 119991, Russia
Phone: +7 495 939 2371; Fax: +7 495 932 9802
E-mail: zadkov@phys.msu.ru

Organizing Committee Contacts

Dr. Matti Kinnunen
Optoelectronics and Measurement Techniques Laboratory
Department of Electrical and Information Engineering
Faculty of Technology
University of Oulu
90570 Oulu, Finland
Phone: +358 8 553 7686; Fax: +358 8 553 2774
E-Mail: matti.kinnunen@ee.oulu.fi

Author timeline

February 15, 2010	Paper submission deadline
March 31, 2010	Notification of paper acceptance
May 1, 2010	Final program
May 7, 2010	Deadline for reduced registration fee
May 7, 2010	Due date for hotel reservation (conference rate)
June 9, 2010	Conference proceedings due date
June 9-11, 2010	LALS-2010 in Oulu, Finland

Objectives and Scope

The XII Int'l Conference on Laser Applications in Life Sciences 2010 organized jointly by Optoelectronics and Measurement Techniques Laboratory of Univ. of Oulu (Finland), Int'l Laser Ctr. of M.V. Lomonosov Moscow State Univ. (Russia), and VTT – Technical Research Ctr. (Finland) will be held in Oulu, Finland, on June 9-11, 2010.

It will provide a frame for presentation the latest research in the areas where lasers are used to investigate biologically relevant molecular and macroscopic systems and processes. Traditionally, the main purpose of the LALS conferences is to bring together scientists from East and West working in the frontiers of laser applications in life sciences.

History of the LALS series goes back to 1986, when the first conference was organized in Prague, Czechoslovakia. The following conferences were held in Pecs, Hungary (1988); Moscow, Russia (1990); Jyväskylä, Finland (1992); Minsk, Belarus (1994); Jena, Germany (1996); Bratislava, Slovakia (1998); Tokyo, Japan (2000); Vilnius, Lithuania (2002); Moscow, Russia (2007); Taipei, Taiwan (2008).

Technical sessions

The LALS-2010 technical program will include plenary and keynote papers, invited and selected contributed papers in the fields of nanobiophotonics; laser-tissue interactions; laser biomedical diagnostics, sensing and therapy; single cell manipulation; THz waves in biophotonics; vibrational spectroscopy; imaging and microscopy; novel devices in biophotonics; printing techniques in biotechnology. In addition, the conference program will include a symposium on water in bioenvironment. The updated list of plenary, keynote and invited speakers can be found at the conference website www.ee.oulu.fi/LALS-2010. It is expected that all LALS-2010 sessions will feature also poster papers, which will better serve for informal discussions.

Language

English is the official conference language that will be used for all printed materials, presentations, and discussions.

Plenary Speakers



Diffuse optical imaging using spatially and temporally modulated light

Bruce J. Tromberg, *Beckman Laser Inst. and Medical Clinic Univ. of California, Irvine, USA*

This lecture reviews principles of “diffuse optical spectroscopic imaging (DOSI)” for non-invasively characterizing cellular metabolism, extracellular matrix composition, and vascular dynamics in thick tissues. Emphasis is placed on the development of broadband spatially- and temporally-resolved measurements of NIR absorption and scattering spectra. These data are used to form images of deoxygenated hemoglobin, oxygenated hemoglobin, methemoglobin, lipid, and water, as well as the tissue “scatter power”. Clinical study results will be shown highlighting DOSI sensitivity to breast tumor metabolism with sufficient sensitivity for cancer detection and therapeutic drug monitoring. Broadband spatial frequency-domain imaging is used in pre-clinical animal models to dynamically map intrinsic brain signals and monitor the efficacy of chemotherapeutic agents. These findings will be placed in the context of conventional imaging methods, such as MRI, in order to assess the current and future role of diffuse optics in medical imaging.



Photoacoustic tomography: High-resolution in vivo imaging of optical contrast at new depths

Lihong V. Wang, *Washington Univ. in St. Louis, USA*

Photoacoustic tomography, as a single hybrid modality, combines the advantages of optical contrast and ultrasonic resolution. High-resolution functional and molecular imaging has been demonstrated in vivo in small animals, while functional imaging has been tested in humans.



Raman microspectroscopy—a powerful tool for biomedical diagnosis

Jürgen Popp, *Inst. für Physikalische Chemie Friedrich-Schiller-Univ. Jena, Jena, Germany*

Here we will present challenges to be met in connection with the application of molecular spectroscopic imaging and in particular Raman microspectroscopy for life sciences and biomedicine. Overall within this contribution it will be shown that Raman microspectroscopy and its various techniques (micro-Raman, SERS, CARS, TERS etc.) are powerful biophotonic tools for bioanalytical and biomedical applications like e.g. rapid pathogen identification, sensitive drug monitoring or clinical tissue diagnostics.

Keynote and Invited Speakers

1. Nano-Biophotonics

Keynote speaker

Xiaohu Gao, *Univ. of Washington, USA*, “Smart nanoparticles for imaging and drug delivery”

Invited speakers

Saulius Bagdonas, *Vilnius Univ., Lithuania*, “Phototransformations of quantum dots: intersection of coating, environment and light”

Kristian Berg, *The Norwegian Radium Hospital, Norway*, “Photochemical internalization: A technology for site-specific drug delivery”

Sergey Deyev, *Shemyakin and Ovchinnikov Inst. of Bioorganic Chemistry, Russia*, “To be announced”

Alexander Priezzhev, *M.V. Lomonosov Moscow State Univ., Russia*, “Laser assessment of the effect of diamond nanoparticles on deformability and aggregation of red blood cells *in vitro*”

Ricardas Rotomskis, *Vilnius Univ., Lithuania*, “To be announced”

2. Laser-Tissue Interactions

Keynote speaker

Francesco Pavone, *Univ. degli Studi di Firenze, Italy*, “Morpho-functional nonlinear laser imaging of tissues”

Invited speakers

Steven Jacques, *Oregon Health and Science Univ., USA*, “How tissue optical properties affect dosimetry for laser procedures and phototherapy”

Kirill Larin, *Univ. of Houston, USA*, “Noninvasive functional imaging of early embryonic development in mammalian systems with Optical Coherence Tomography”

Elena Zagaynova, *Inst. of Fundamental and Applied Medicine, Russia*, “Optical diagnostics and laser hyperthermia of tumors with plasmon-resonance gold nanoparticles”

3. Laser Biomedical Diagnostics, Sensing and Therapy

Keynote speaker

Irving Bigio, *Boston Univ., USA*, “Using elastic scattering spectroscopy to reveal early stages of apoptosis in viable cells”

Invited speakers

Stefan Andersson-Engels, *Lund Univ., Sweden*, “Diffuse fluorescence spectroscopy for tissue diagnostics and treatment control”

Rafat Ansari, *NASA Glenn Research Center, USA*, “Non-invasive and early detection of oxidative stress leading to normal aging on Earth and accelerated aging during spaceflight”

Martin Leahy, *Univ. of Limerick, Ireland*, “Challenges in deep tissue imaging”

Galina Petrova, *M.V. Lomonosov Moscow State Univ., Russia*, “The processes of sorption of ions with different ionic radii on protein surface”

Valery Tuchin, Ekaterina Galanzha, Vladimir Zharov, *Saratov State Univ., Russia and Univ. of Arkansas for Medical Sciences, USA*, “Laser cytometry *in vivo*”

4. Single Cells and Molecules; Optical Trapping and Manipulation

Keynote speaker

Josef Käs, *Univ. of Leipzig, Germany*, “Feeling for cells with light: Illuminating the role of biomechanics for tumor progression”

Invited speakers

Jesper Glückstad, *Denmarks Tekniske Univ., Denmark*, “Next generation of biophotonics workstation”

Mathias Goksör, *Göteborg Univ., Sweden*, “To be announced”

Karl Otto Greulich, *Leibnitz Inst. for Age Research, Germany*, “Insights on ageing and ageing related diseases using laser microtools”

5. THz Waves in Biophotonics

Keynote speaker

Kodo Kawase, *Nagoya Univ., Japan*, “THz technique for skin measurement”

Invited speakers

Alexander Shkurinov, *M.V. Lomonosov Moscow State Univ., Russia*, “THz time-domain spectroscopy and spectrochromography from basis to spectral line assignment”

Joo-Hiuk Son, *Univers. of Seoul, Korea*, “Terahertz molecular imaging for medical applications”

Ingrid Wilke, *Rensselaer Polytechnic Inst., USA*, “THz emitter development for THz wave application in biophotonics”

Gerald Wilmink, *Air Force Research Laboratory: Brooks City-Base, USA*, “Assessing interactions between Terahertz radiation and biological tissue, cellular, and molecular level”

6. Vibrational Spectroscopy of Biological Systems

Invited speakers

Sanford Asher, *Univ. of Pittsburg, USA*, “UV resonance Raman determination of the energy landscape for protein and peptide folding”

Andrey Chikishev, *M.V. Lomonosov Moscow State Univ., Russia*, “Laser spectroscopy and computer simulation of the effect of solvent molecules on protein dynamics and function”

Alfred Laubereau, *Technische Univ. München, Germany*, “Electron detachment and recombination in aqueous halides studied with 2- and 3-pulse femtosecond spectroscopy”

Cees Otto, *Univ. of Twente, the Netherlands*, “Spontaneous Raman microscopy and CARS microscopy of developing bone”

Edyta Podstawka, Leonard M. Proniewicz, *Jagiellonian Univ., Poland*, “Surface enhanced Raman spectroscopy (SERS) of selected neurotransmitters/bombesin family compounds, analogs and fragments”

Hiroaki Takahashi, *Waseda Univ., Japan*, “To be announced”

Hideaki Kano, Masanori Okuno and Hiro-o Hamaguchi, *Univ. of Tokyo, Japan*, “Label-free, multi-color, high-speed imaging of a living cell by CARS spectral imaging”

7. Molecular and Bio-Imaging

Keynote speaker

Vasilis Ntziachristos, *Technische Univ. München, Germany*, “Illuminating biomedical discovery with multi-spectral opto-acoustic tomography (MSOT)”

Invited speakers

Regine Choe, *Univ. of Pennsylvania, USA*, “*In vivo* cancer therapy monitoring with diffuse optics”

Frank Chuang, *Univ. of California, Davis, USA*, “Role for [functional] biophotonic imaging in molecular medicine”

Qingming Luo, *Huazhong Univ. of Science and Technology, China*, “Optical molecular imaging for drug validation”

8. Laser Microscopies

Keynote paper

Herbert Schneckenburger, *Hochschule Aalen, Germany*, “Multi-dimensional fluorescence microscopy of living cells”

Invited speakers

Alzbeta Chorvatova, *Intl. Laser Centre, Slovakia*, “Time-resolved micro-spectroscopy of endogenous metabolites in living cells”

Chia-Liang Cheng, *Natl. Dong Hwa Univ., Taiwan*, “Nanodiamond interaction with human red blood cells: the microspectroscopic point of view”

9. Novel Optical Devices for Biomedicine

Keynote speaker

Yoshiaki Yasuno, *Univ. of Tsukuba, Japan*, “Optical imaging in ophthalmology”

Invited speakers

Barry Cense, *Utsunomiya Univ., Japan*, “Measuring polarization properties of the human retina with polarization-sensitive OCT and adaptive optics”

Arthur Chiou, *Natl Yang-Ming Univ., Taiwan*, “Probing the viscoelastic properties of individual human RBCs by optical trap-and-stretch; a brief overview and recent progresses”

Karl-Heinz Feller, *Fachhochschule Jena, Germany*, “Microfluidic microanalytic cell-on-a-chip platform for the investigation of cosmetics”

Victor Loshchenov, *General Physics Inst. RAS, Russia*, “To be announced”

10. Printing Techniques and their Applications in Biotechnology

Keynote speaker

Ghassan Jabbour, *Arizona State Univ., USA and Univ. of Oulu, Finland*, “To be announced”

Invited speakers

To be announced

Symposium on Water in Bioenvironment: Spectroscopy and Simulation

Keynote speakers

Gerald Pollack, *Univ. of Washington, USA*, “Water, energy and life: Does $E=H_2O?$ ”

Martina Havenith, *Ruhr-Univ. Bochum, Germany*, “The THz dance of the protein with the water”

Invited speakers

Maxim Pshenichnikov, *Univ. of Groningen, the Netherlands*, “To be announced”

LALS-2010 Committees

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Program Committee

Victor Zadkov, **Chair**, *M.V. Lomonosov Moscow State Univ., Russia*

1. Nano-Biophotonics

Andrey Zvyagin, **Co-Chair**, *Macquarie Univ., Australia*

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Takashi Yatsui, *Univ. of Tokyo, Japan*

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2. Laser-Tissue Interactions

Valery Tuchin, **Co-Chair**, *Saratov State Univ., Russia*

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Lothar Lilje, *Ontario Cancer Inst., Canada*

Roberto Pini, *Ist. di Fisica Applicata, Italy*

Ronald Sroka, *Klinikum der Univ. München, Germany*

3. Laser Biomedical Diagnostics, Sensing and Therapy

Alexander Priezzhev, **Co-Chair**, *M.V. Lomonosov Moscow State Univ., Russia*

Janis Spigulis, **Co-Chair**, *Univ. of Latvia, Latvia*

Irving Bigio, *Boston Univ., USA*

Juergen Lademann, *Charité-Universitätsmedizin Berlin, Germany*

Kai-Erik Peiponen, *Univ. of Joensuu, Finland*

Ivan Pelivanov, *M.V. Lomonosov Moscow State Univ., Russia*

4. Single Cells and Molecules; Optical Trapping and Manipulation

Arthur Chiou, **Co-Chair**, *National Yang-Ming Univ., Taiwan*

Karl Otto Greulich, **Co-Chair**, *Leibnitz Inst. for Age Research, Germany*

Paulius Grigaravicius, *Flitz Lipmann Inst., Germany*

P.K. Gupta, *Raja Rmanna Centre for Advanced Technology, India*

Samarendra Mohanty, *Univ. of Texas, USA*

5. THz Waves in Biophotonics

Alexander Shkurinov, **Co-Chair**, *Moscow State Univ., Russia*

Xi-Cheng Zhang, **Co-Chair**, *Rensselaer Polytechnic Inst., USA*

6. Vibration Spectroscopy of Biological Systems

Maxim Pshenichnikov, **Co-Chair**, *Univ. of Groningen, the Netherlands*

Hiro-o Hamaguchi, **Co-Chair**, *Univ. of Tokyo, Japan*

Thomas la Cour Jansen, *Univ. of Groningen, the Netherlands*

Vlad Yakovlev, *Univ. of Wisconsin-Milwaukee, USA*

7. Molecular and Bio-Imaging

Alexander Savitsky, **Co-Chair**, *A.N. Bach Inst. of Biochemistry of Russian Academy of Sciences, Russia*

Nikolaos Deliolanis, **Co-Chair**, *Inst. for Biological and Medical Imaging, Germany*

Ata Akin, *Bogazici Univ., Turkey*

Turgut Durduran, *Inst. of Photonic Sciences-ICFO, Spain*
Qingming Luo, *Britton Chance Center for Biomedical Photonics, China*
Giannis Zacharakis, *Inst. of Electronic Structure and Laser - FORTH-IESL, Greece*
Elena Zagaynova, *Inst. of Fundamental and Applied Medicine, Russia*

8. Laser Microscopy

Jiri Homola, **Co-Chair**, *Inst. of Photonics and Electronics, Czech Republic*
Pekka Hänninen, **Co-Chair**, *Univ. of Turku, Finland*

9. Novel Optical Devices for Biomedicine

Victor Loshchenov, **Co-Chair**, *General Physics Inst. RAS, Russia*
Timo Jääskeläinen, **Co-Chair**, *Univ. of Joensuu, Finland*
Tapani Lahtinen, *Kuopio Univ., Finland*
Toyohiko Yatagai, *Univ. of Utsunomiya, Japan*

10. Printing Techniques and their Applications in Biotechnology

Ghassan Jabbour, **Co-Chair**, *Arizona State Univ., USA and Univ. of Oulu, Finland*

Symposium on Water in Bioenvironment: Spectroscopy and simulation

Gerald Pollack, **Chair**, *Univ. of Washington, USA*

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Program Topics

1. Nano-Biophotonics

- Lab-on-a-chip technology
- Biological assays
- Plasmonics
- Manipulation with biological matter on a nanoscale

2. Laser-Tissue Interactions

- Photon migration in tissues
- Static and dynamic light scattering in tissues
- Diffusion wave and correlation spectroscopy of tissues
- Spectrophotometry, fluorescence, Raman spectroscopy, and nonlinear spectroscopy of tissues and tissue components
- Optical polarimetric and coherent-domain methods for study of tissues and cell structures
- Optothermal and optoacoustic methods for tissue diagnostics
- Optical microelastography of tissues
- Optical monitoring of matter diffusion in tissues and tissue optical clearing
- Tissue phantoms designing
- Photochemical, photodynamic, photothermal and photobiological effects, mechanisms of phototherapy
- High energy laser interactions with cells and tissues, laser surgery techniques
- Lasers and optical technologies in dermatology, ophthalmology, gynecology, cardiology, dentistry

3. Laser Biomedical Diagnostics, Sensing and Therapy

- Laser diagnostics of pathologic states of cells, tissues and organisms
- Laser sensing of analytes, static and dynamic inhomogeneities in vitro and in vivo
- Laser therapeutic techniques and clinical applications
- Diagnostic optical spectroscopy for point-of-care applications

4. Single Cells and Molecules; Optical Trapping and Manipulation

- Laser microbeam and optical tweezers as tools for manipulating single cells
- The effect of laser microtools on single cells — microirradiation
- Forces, single cells and optical tweezers
- Handling single molecules with laser microtools
- From single cells to whole tissues — laser microtools to study the cell in its environment

5. THz Waves in Biophotonics

6. Vibrational Spectroscopy of Biological Systems

7. Molecular and Bio-Imaging

- Novel imaging techniques
- Fluorescence, bioluminescence, and photoacoustic imaging and tomography
- New probes and contrast mechanisms
- Novel developments towards clinics
- Techniques for live cell imaging

8. Laser Microscopies

- Fluorescence microscopy
- Confocal laser scanning microscopy
- Near-field scanning optical microscopy
- Raman microscopy
- Nonlinear optical microscopy
- Computer-assisted image analysis
- Microscopy for chemical and biological imaging

9. Novel Optical Devices for Biomedicine

- Optical coherence tomography
- Spectral imaging technologies
- Optical manipulation
- Optical tweezers
- Applications of surface plasmonics

10. Printing Techniques as a Novel Fabrication Method in Biotechnology

- Printable light emitting devices
- Printable sensors
- Printing techniques used in biotechnology
- Optical methods for characterization of printed structures

11. Symposium on Water in Bioenvironment: Spectroscopy and Simulation

Submission of Papers

Abstracts should be submitted by e-mail according to the template, which can be downloaded from the conference website

www.ee.oulu.fi/LALS-2010/Paper_submission/Paper_submission.htm

to Dr. Matti Kinnunen: matti.kinnunen@ee.oulu.fi. The receipt will be acknowledged. **The submission deadline is February 15, 2010.**

Authors will be notified of paper acceptance by **March 31, 2010**. Notifications will be sent to the corresponding authors.

Accepted papers will be scheduled either for 15-min oral (including 3 min questions time) or poster presentations. Computer, overhead projector, screen and poster boards will be provided by the organizers. At the submission time, the authors must indicate a preferable session and mode of presentation (oral, poster).

The Best Young Scientist's Paper Award

A competition will be organized among young conference participants (as primary authors) for the best oral and the best poster presented at the LALS-2010. Winners will be awarded with money prizes and certificates.

School for Young Scientists

X Summer School in the series on Optoelectronic Devices and Instrumentation will be organized prior to the LALS-2010 conference, on **June 6-8, 2010**. The School Program is aimed at advanced undergraduate and post-graduate students with some background in optics, and optoelectronics devices.

The School is closely associated with and funded by the Infotech Oulu Graduate School (Oulu) and Graduate School of Modern Optics and Photonics (Joensuu). Graduate students will receive tentatively 3-4 credit points by successfully passing the School Program.

School Program

The School Program includes the following courses (4 to 5 hours long):

- Prof. Chia-Liang Cheng, Natl Dong Hwa Univ., Taiwan, "Nanodiamond: spectroscopy, surface functionalization and bio applications"
- Prof. Steven Jacques, Oregon Health and Science Univ., Portland, USA, "Laser-tissue interactions"
- Prof. Janis Spigulis, Univ. of Latvia, Latvia, "Laser technologies for skin assessment (laser-Doppler, fluorescence, multi-spectral)"
- Prof. Lihong Wang, Washington Univ. in St. Louis, USA, "Photoacoustic tomography: Breaking through the optical diffusion limit"

Registration

Students who are not members of the above mentioned graduate schools have to pay the registration fee of **100 EUR**. For other attendees, the registration fee is **400 EUR/all courses, 150 EUR/one course**. The registration fee covers lunches, coffees, the social program and the course material. This fee should be transferred with the reference "Summer school 2010" before registration to Oulu University bank account: NORDEA 166030-101520.

The registration applications should mention the following: Name, tel./fax, e-mail, institution, address, graduate school (if any), food allergies (if any).

Registration Deadline

The registration is due no later than **May 7, 2010** by contacting Ms. Päivi Ronkainen (paivi.ronkainen@ee.oulu.fi).

School Web-page

http://www.ee.oulu.fi/LALS-2010/Summer_school/Summer_school.htm

Conference Publications

Advance Conference Program

The advance Conference Program will be posted on the conference website: <http://www.ee.oulu.fi/LALS-2010/Program/Program.htm> on May 1, 2010.

Book of abstracts

The Book of abstracts will consist of camera-ready abstracts of all submitted papers. It will be included into the registration package.

Conference Proceedings

Chairs/Editors: Risto Myllylä and Matti Kinnunen

In order to highlight the scientific excellence and technical innovations of the presentations of LALS-2010 conference, SPIE will publish the conference proceedings. Everybody is kindly asked to submit a manuscript of his/her conference presentation. Manuscripts must be prepared according to the guidelines of SPIE. To ensure high-quality Proceedings, all manuscripts will be reviewed by the Conference Program Committee and Proceedings editors for technical merit and content and only after their approval the manuscripts will go for printing. Camera-ready manuscripts are required and must be submitted in English by

due date. Late manuscripts run the risk of not being published. Copyright to the manuscript is necessary for publication in the Proceedings of SPIE. Papers published are indexed in leading scientific databases including INSPEC, Compendex Plus, Physics Abstracts, Chemical Abstracts, International Aerospace Abstracts, and Index to Scientific and Technical Proceedings. If an author does not make a presentation at the meeting, the editor may choose not to publish the author's manuscript in the conference proceedings. For the instructions on the manuscript preparation for the SPIE Proceedings see the SPIE Author Guidelines at: <http://spie.org/x14101.xml>

The deadline for the manuscript submission: **June 9, 2010**.

Special Issue of the Russian journal “Kvantovaya Elektronika” (Moscow) and its English translation “Quantum Electronics” (published by Turpion Ltd, UK)

Guest Editors: Alexander Priezhev and Alexander Bykov

Some 10 papers will be selected for publication in a special issue of the journals “Kvantovaya Elektronika” (Quantum Electronics). Submission is by the invitation of Guest Editors only.

The guidelines for paper preparation can be found at:

- http://www.quantum-electron.ru/pravila_eng.html (in English)
- <http://www.quantum-electron.ru/pravila.html> (in Russian)

The Special Issue is scheduled for **November 2010**. The deadline for the manuscript submission is **July 1, 2010**.

Special Issue of the “Journal of Biophotonics”

Guest Editors: Alexey Popov, Tapio Fabritius and Victor Zadkov

Some 7-8 selected papers based on presented research results will be published in a special issue of Journal of Biophotonics. Submission is only by the invitation of Guest Editors.

The Special Issue is scheduled for **January-February 2011**. The Deadline for manuscript submission: **September 1, 2010**.

Registration

The registration fee includes admission to all technical sessions, one copy of the Book of Abstracts, refreshment breaks, lunches, a get-together party, and a banquet.

Advance registration is strongly recommended to speed up your pickup of registration materials at the conference and to save money. The deadline for early registration is **May 7, 2010**.

	Before 7 May	After 7 May
Regular	350 EUR	400 EUR
Student (*)	100 EUR	150 EUR

NOTE: Student registration fee does not include banquet.

(*) Applicants for the student rate must be a full-time undergraduate or graduate student with one of the Universities, Institutes of the Academy of Sciences or other kinds of the high-educational bodies. They should send a copy of an official student identity card, which must also be presented on-site when collecting registration materials.

Ways of payment will be announced later on the conference web site.

Cancellation

In case of early cancellation (before May 7, 2010), a charge of 80 EUR will be made. A request for cancellation must be made in writing. No refunds for cancellations after May 7, 2010.

Conference Venue

Oulu is the largest city in Northern Finland. Founded in 1605 by King Karl IX of Sweden opposite the castle built on the island of Linnan-saari. Oulu is situated by the Gulf of Bothnia, at the mouth of Oulu River, which is an ancient trading site. The name “Oulu” comes from a word in the Sami language meaning “floodwater”. Oulu has been the capital of Oulu province since 1776. From being a town known for tar and salmon, Oulu has evolved into a growing modern centre of competence.

General information

Oulu has the sixth largest population amongst Finnish towns.

In January 2007, the city had about 130000 inhabitants.

The area of Oulu is 411 km².

- Coordinates: 65.01° N, 25.28° E
- Elevation: 0 meters (0 feet)
- Region: Oulu, Finland
- Time Zone: East European Daylight Time (GMT + 2:00)

Internet Links About the City of Oulu

www.ouka.fi

www.visitoulu.fi

Internet Links About Finland

www.finland.fi

www.finland.com

www.visitfinland.fi

Voltage: 220 V, 50 Hz, European plug

Metric system

Currency: euro

Credit cards are widely accepted

University of Oulu

Oulu has also almost 100 different teaching establishments. The most significant of these is University of Oulu where the LALS-2010 will be held. Oulu region is also well known for its rapidly growing high technology industry, which sells its products throughout the world.

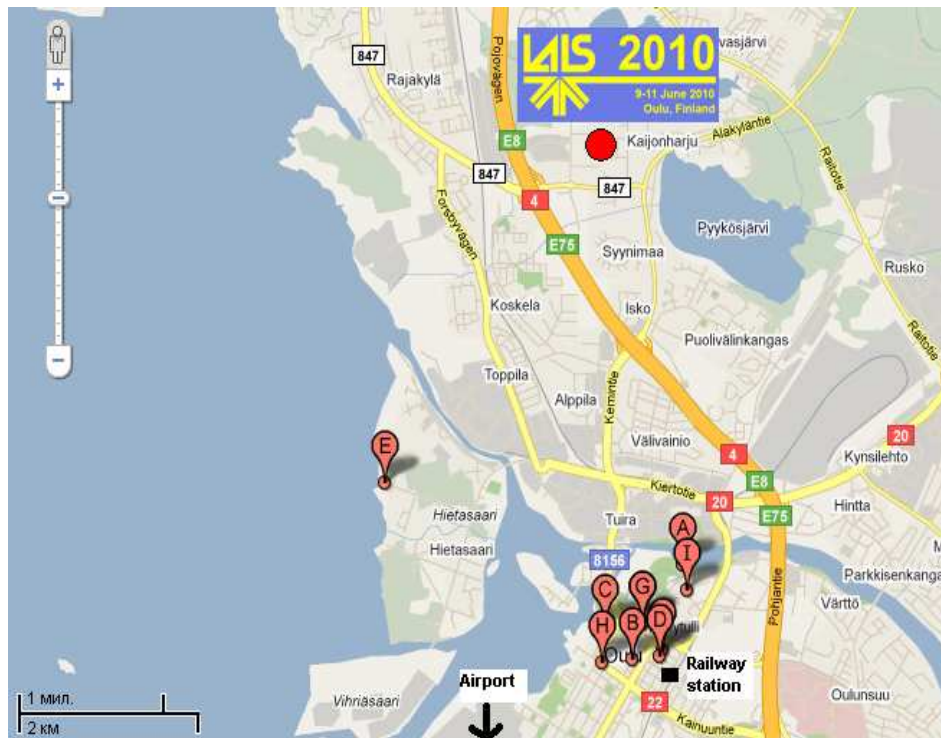
University of Oulu (founded in 1958) is an international science community, whose core strength lies in multidisciplinary basic research and high-quality education based on it. Although its academic offerings



span over 70 disciplines, the university's concentrated research policy channels the efforts of researchers into three focus areas: Information Technology and Wireless Communications, Biotechnology and Molecular Medicine as well as Northern and Environmental Issues.

Its tasks include promoting free research, education and culture and strengthening the national competence base to improve competitiveness and well-being. In addition, the university strives to ensure the availability of a well-qualified academic labour force and researcher base.

Map of Oulu



Hotels in Oulu reserved for the LALS-2010 participants are indicated on this map by capital letters B and H. The LALS-2010 logo indicates the conference venue.

Housing and Travel

A number of hotels are available in Oulu. All of them are located in downtown, about 5 km away from the university, meeting venue of the **LALS-2010**. Information on transportation between Oulu and the University will be available at the conference website shortly prior the conference.

Hotels in Oulu

You may find an exhaustive information about the hotels in Oulu at the following internet link: www.oulutourism.fi/en/oleminen/majoitus.aspx

In the following hotels rooms are reserved for participants of LALS-2010 at the special reduced conference rates:

Sokos Hotel Arina

Pakkahuoneenkatu 16

90100 Oulu, Finland

Tel. +358 (0) 8 3123 111

Fax +358 (0) 8 3123 123

www.sokoshotels.fi/en/hotels/oulu/

93 EUR / single room / night

113 EUR / twin room / night

Scandic Oulu

Saaristonkatu 4

90100 Oulu

Tel. +358 (0) 8 543 1000

www.scandichotels.com/en/Hotels/Countries/Finland/Oulu/Hotels/Scandic-Oulu/

97 EUR / single room / night

117 EUR / twin room / night

Prices include breakfast and evening sauna. When making reservation please mention LALS-2010 to get the special prices.

Getting here

Oulu is easily accessible by railway and airplane. Railway station is located in the downtown and Oulu airport is about 14 km away, which is linked to the city by a bus route No. 19 and taxi. The university which hosts LALS-2010, is located about 6 km far from downtown Oulu. It can be reached by public transportation (bus).

Airlines Internet Links

www.finnair.com

www.flysas.com

www.airbaltic.com

www.blue1.com

Railways Internet Links

Finnish railways: www.vr.fi/eng

Russian railways: www.rzd.ru

Visa

Invitation letters for those participants (and their accompanying persons) who need visa to enter Finland will be sent upon requests by e-mail, in which we kindly request you to indicate your full name(s), date of birth and passport number.

Exhibition

During all three days of the conference a table-top exhibition offering companies products will be arranged at the conference site. The price for a stand is **1000 EUR**. This fee includes besides an exhibit space full conference registration for one person.

Companies interested in presenting their products and services at the exhibition, please contact:

Dr. Matti Kinnunen

Optoelectronics and Measurement Techniques Laboratory

Department of Electrical and Information Engineering

Faculty of Technology

University of Oulu

90570 Oulu, Finland

Phone: +358 8 553 7686; Fax: +358 8 553 2774

E-Mail: matti.kinnunen@ee.oulu.fi

Companies and institutes are encouraged to send black and white advertisements to be included in the conference program/book of abstracts. One page (A4) costs **300 EUR** and half a page (1/2 A4) costs **180 EUR**.

All relevant materials should be sent **before May 7, 2010** to Dr. Matti Kinnunen (see the address above).