DECEMBER 2005

EOS NEWSLETTER

THE OFFICIAL PUBLICATION OF THE EUROPEAN OPTICAL SOCIETY

First microsystems meeting comes to Italy

The recent Optical Microsystems event in Italy was a big success and a repeat event will take place in 2007.

The first EOS topical meeting on the subject of Optical Microsystems took place during 15–18 September on Capri island, in the Gulf of Naples, Italy, and was a great success. More than 100 delegates from all over the world attended the four-day meeting, aptly named OμS'05.

The event was organized by the Italian Branch of the European Optical Society – Società Italiana di Ottica e Fotonica (SIOF) – and three Italian research institutes: the Institute of Microelectronics and Microsystems (IMM-sezione di Napoli), the National Institute of Applied Optics (INOA-sezione di Napoli) and the University of Roma La Sapienza (Ultrafast Photonics Laboratory).

The meeting covered both the fundamental nature and more applied aspects of optical microsystems. Topics presented included:

- photonic crystals;
- nonlinear and quantum optics;
- nanophotonic-based devices;
- silicon-based optoelectronics and MOEMS;
- new characterization methods;
- microsensors and biochips.

Two parallel sections saw a total of 97 oral presentations including 19 keynote and invited talks, and about 30 posters. The use of two committees, one scientific and one industrial, created an interdisciplinary forum and promoted cross-fertilization between the two sectors.

In addition, the "New frontiers in integrated optics" session closed the meeting with a lively discussion about the fundamental question: "Where are optics and photonics going?" Hopefully, this debate will stimulate much new research that will be discussed at the next Optical Microsystems conference in 2007.

An Italian round-table event ran on Saturday 17 September and brought together politicians, researchers, economists and experts on intellectual property to discuss the role of Italian research within the European Union's 7th framework programme which starts in 2007.

Lastly, we would like to thank the many private companies (Hamamatsu Photonics, Monte dei Paschi di Siena, Gruppo Dema, Micos Italia and others) for sponsoring the event. The Institute of Physics will also dedicate a special issue of its *Journal of Optics A: Pure and Applied Optics* to publishing a selection of papers.

The chairmen of the meeting were Ivo Rendina (ivo.rendina@na.imm.cnr.it), Eugenio Fazio (eugenio.fazio@uniroma1.it) and Pietro Ferraro (ferraro@ino.it).

Highlights of OμS'05

A sample of some of the keynote and invited presentations at OμS'05:

Electromagnetic study of photonic crystal microcavities
P Lalanne *et al.*, CNRS, France

Advanced interference lithography for writing nano-photonic patterns
M L Schattenburg *et al.*, MIT, US

Observation of modulation instability in photonic band-gaps
G Salamo *et al.*, Arkansas University, Princeton University (both US) and Technion, Israel

Periodically poled crystals with submicrometre grating – fabrication, evaluation and applications
F Laurell *et al.*, KTH, Sweden

Photoinduced dynamic light guides and related structures
G Montemezzani *et al.*, University of Paul Verlaine and Supelec CNRS (both France) and ETH, Switzerland

Applications of microresonators: from photodetectors to biological sensing and imaging
M Selim Unlu, Boston University, US

Optical microsystems development based on micro/nano biosensor devices
L M Lechuga *et al.*, CNM-CSIC and IKERLAN (both Spain)

All optical effects in nonlinear photonic crystals
A Arie *et al.*, Tel Aviv University, Israel

Fibre-optic long period grating sensors with nanostructured coatings
R P Tatam *et al.*, Cranfield University, UK

Silicon waveguided components for the long-wave infrared region
R Soref *et al.*, Air Force Research Laboratory, US

Digital holography – a tool with exciting perspectives
W Juptner *et al.*, BIAS Bremer Institute, Germany

Raman-based silicon photonics: technology and applications
B Jalali *et al.*, UCLA, US

Integration of micro/nano-photonic devices for optical printed circuit board (O-PCB) applications
E H Lee et al, OPERA, Korea

OPERA 2015 outlines its vision

NEWS FROM BRUSSELS

The OPERA project presents its objectives at meetings in Warsaw and Brussels.

Following the announcement in the last newsletter (*OLE* September 2005) that the OPERA 2015 project was to receive its own website and advisory board, I am pleased to report that both these tasks have now been completed.

The recently launched OPERA website can be found at www.opera2015.org and provides a wealth of information of photonics and optics in Europe including:

- ongoing European projects including both national and FP6 projects;
- a forum for researchers to exchange information;
- information on the status of projects including reports and deliverables;
- events calendar.

The OPERA advisory board has also been established and the names, profiles and contact details of the board are published on the website. The members of the board are representatives from both industry and academia, and their primary mission is to define the future evolution of photonics over the next decade.

Eastern support

At the recent SPIE International Congress on Optics and Optoelectronics (ICOO) in Warsaw, Poland (28 August – 2 September), OPERA 2015 presented its ongoing activities and major aims. The presentation took place during a session entitled "European workshop on photonics projects" which was chaired by Hugo Thienpont, Vrije University Brussels, and Ronan Burgess, European Commission.

Participants from eastern European countries were particularly encouraged to hear about the initiative and said that they will provide information on photonics initiatives and activities from their respective countries. The next workshop for OPERA 2015 will take place at the Photonics Europe conference in Strasbourg next April.

"The OPERA team have also started their 'technology watch'"

The OPERA team have also started their "technology watch" tasks, which involve compiling and updating information on current state-of-the-art capabilities in Research (WP2) and Industry (WP3) sectors. Compiling this information is a long-term strategic vision of OPERA 2015 with a special focus on industry trends, products and market developments.

OPERA 2015 is also supporting the creation of a European Technology Platform in Photonics called Photonics 21. The idea was discussed in Brussels on 1–2 December with OPERA agreeing to play an active role in establishing this joint European initiative in photonics. The December workshop on Photonics 21 acted as a starting point for drafting and implementation of a common vision on Optics and Photonics in Europe.

When complete, the initiative will provide the basis for a common strategy to achieve a strong European leadership in photonics. Most importantly, it will help coordinate investment into photonics R&D at the European (FP7), national and regional level.

OPERA partners

Organization	Abbreviation	Country
VDI Technologiezentrum	VDI	Germany
Institute for the promotion of innovation by science and technology in Flanders	IWT-Intec	Belgium
Enterprise Ireland	IE	Ireland
SenterNovem	Senter	The Netherlands
Ministry of Education, Science and Sport	MESS	Slovakia
Innovacion, Desarrollo y Transferencia de Tecnologia	iDeTra	Spain
Optics Valley		France
UK Consortium for Photonics and Optics	UKCPO	UK
European Photonics Industry Association	EPIC	EU
European Optical Society	EOS	EU

Danish society joins EOS

Danish photonics is blooming with high-quality research in quantum optics, spectroscopy and communications.

Although it is one of the smaller countries in Europe, Denmark boasts a thriving optics scene with many universities, start-ups and established firms active in the sector. At the heart of this activity is the Danish Optical Society (DOPS) which supports a strong interaction between industry and academia. Earlier this year (2 February), DOPS became an affiliated member of the EOS.

During the last decade, numerous optical start-ups have appeared in Denmark, especially around Copenhagen. A driving force behind the creation of many of these is NKT Innovation and Research which is devoted to the commercialization of optical technologies that are part of the NKT Photonics Group.

One of the better known start-ups is Crystal Fibre, which has become one of the leading commercial producers of photonic crystal fibre. Other examples are Koheras which develops fibre lasers, the phase mask specialist Ibsen Photonics and Kaleido Technology which produces moulds and precision optical components.

There are also several young firms that serve the optical communications market such as Hymite, which makes customized housings for optoelectronic systems, and Alight Technologies which is developing high-power singlemode VCSELs. Outside this field, Laser Interface specializes in scanners for laser beams, and the company Unit One develops sensor systems.

Aside from these emerging enterprises, several larger optical companies also have their base in Denmark – OFS Fitel which supplies equipment for production of optical fibre and FOSS Analytical, a developer of grating- and FTIR-spectrometers for use in the food industry. In addition, Radiometer makes blood-gas testing equipment based on spectroscopy.

One area where Denmark is particularly strong is in laser-based metrology equipment. Two well-known firms with an international reputation in this field are Brüel & Kjær which provides laser vibrometers and Dantec Dynamics which develops laser-based velocimeters and particle imaging velocimeters for analysing fluid dynamics.

Another area of expertise is thin-film coatings and filters thanks to DELTA Light & Optics and Ferroperm Optics.

As well as boasting a strong industry base, many Danish universities are engaged in photonics research and education.

For example, the University of Aarhus is active in the fields of quantum optics, laser spectroscopy, applied optics and astronomy. The quantum optics group is the largest and covers activities such as laser cooling and trapping of atoms and ions as well as research into quantum gases and quantum informatics.

Jesper Glückstad Risø National Laboratory

Optical tweezers developed at Risø National Laboratory for 3D real-time manipulation of small particles are an example of Denmark's strength in photonics.

In contrast, the applied optics group is involved in topics such as laser micromachining, fibre lasers, optically active nanoclusters and planar photonic bandgap components.

Aarhus's laser spectroscopy group uses lasers, lamps and other optical sources to study ultrafast processes in physics and chemistry as well as biological systems. Staying on the theme of spectroscopy, the University of Southern Denmark is heavily involved in the study of absorption and desorption on surfaces via time-of-flight evanescent wave spectroscopy.

Another university that is active in the fields of both spectroscopy and quantum optics is the Technical University of Denmark. Its physics department is developing laser systems for UV-generation and two-photon spectroscopy as well as investigating entangled states, squeezed light and quantum information.

A unique feature of TU Denmark is its highly acclaimed research centre called COM which is dedicated to research into optical communications and nanophotonics.

In contrast, the main thrust of research at Aalborg University is fundamental science, reaching all the way from surface plasmon polaritons to second harmonic generation at a metallic surface. In addition very interesting work with electro-optical polymers is conducted at this university.

Finally, Risø National Laboratory in Roskilde has a large portfolio of optical activities including development of new laser systems, optical tweezers, bio-optics and optical sensors. As a national laboratory, the work is equally divided into basic and applied research.

Steen G Hanson is chairman of the Danish Optical Society and a research specialist at Risø National Laboratory in Roskilde, Denmark.

Calendar

DATE	EVENT	LOCATION
April 3–7	Photonics Europe	Strasbourg, France
May 16–19	LAMP 2006 International Congress on Laser Advanced Materials Processing	Kyoto, Japan
June 5–7	WIO 06 Fifth International Workshop on Information Optics	Toledo, Spain
June 19–22	CGIV 2006 Third European Conference on Colour in Graphics, Imaging and Vision	Leeds, UK
July 10–14	7th National Symposium on Display Holography	St Asaph, UK
August 28–31	ROMOPTO 2006 Micro- to Nano-Photonics	Sibiu, Romania
September 13–15	Speckle 2006	Nimes, France
October 16–19	EOS Annual Meeting and Topical Meetings	Paris, France
December 6–8	ODF 06 Fifth International Conference on Optics-Photonics Design and Fabrication	Nara, Japan

For more information on any of these events, please visit **www.myeos.org**.

Are you a member of EOS?

Look at the benefits

Individual members are eligible for:

- a regular *EOS Newsletter* e-mail
- reduced conference fees
- reduced prices for EOS journals
- free subscription to *Opto & Laser Europe*
- 20% discount on Institute of Physics Publishing books
- members living outside Germany are entitled to a 50% discount on subscription to the German-language journal *Photonik*, published by AT-Fachverlag

Additional benefits for corporate members:

- a company profile in the EOS directory
- a presence on the EOS website
- free advertisements for jobs in the EOS market
- reduced conference fees for all employees

EOS 2006 membership fees

Individual members (who do not belong to a branch or affiliated society of the EOS): **€40**
Students (who do not belong to a branch or affiliated society of the EOS): **€10**
Corporate members (regardless of the number of employees of the company or members of the institute): **€200**

Individual members of the branches DgaO (Germany), SFO (France), SSOM (Switzerland), SOS (Sweden) and SIOF (Italy) are automatically full individual members of the EOS. Individual members of the affiliated societies Promoptica and CBO-BCO (Belgium), CSSF (Czech and Slovak Republic), DOPS (Denmark), FOS (Finland), the Optics Division of the Norwegian Physical Society (Norway), the Optics Division of the Polish Physical Society (Poland), ROS (Romania), SEDO (Spain), LAS (Russia) and the Optical Group of the IOP (UK) are automatically associate members of the EOS.

Membership information

To find out more about joining EOS, contact: Klaus Nowitzki, executive director, Hollerithallee 8, D-30419 Hannover, Germany. Tel: +49 (0)511 2788 115; e-mail: info@myeos.org; web: **www.myeos.org**

Contact

To contact the EOS board:
Executive director Klaus Nowitzki
info@myeos.org
President Joseph Braat
j.j.m.braat@tnw.tudelft.nl
Secretary Peter Török
peter.torok@imperial.ac.uk
Treasurer Daniel Dolfi
daniel.dolfi@thalesgroup.com

To learn more about your national EOS branch, please contact:
Belgium Yvon Renotte
y.renotte@ulg.ac.be
Czech and Slovak republics
Pavel Tomanek
tomanek@dphys.fee.vutbr.cz
Denmark Steen Grüner Hanson
steen.hanson@risoe.dk
Finland Harri Kopola
harri.kopola@vtt.fi
France Francoise Chavel
francoise.chavel@iota.u-psud.fr
Germany Cornelia Denz
denz@uni-muenster.de
Hungary Aladar Czitrovsky
czitrov@sunserv.kfki.hu
Italy Anna Consortini
anna.consortini@unifi.it
The Netherlands
Bernhard Hoenders
b.j.hoenders@phys.rug.nl
Norway Aasmund Sudbo
aas@unik.no
Poland Katarzyna Macukow
kmacukow@duch.mimuw.edu.pl
Romania Laurentiu Fara
laurf@nare.renerg.pub.ro
Russia Ivan Kovsh
las@tsr.ru
Spain Concepcion Domingo Maroto
cdomingo@iem.cfmac.csic.es
Sweden Fredrik Laurell
fl@laserphysics.kth.se
Switzerland Peter Seitz
peter.seitz@swissnex.org
UK Peter Melville
peter.melville@iop.org

***EOS Newsletter* is produced for the European Optical Society by Institute of Physics Publishing Ltd**

Editor Oliver Graydon
oliver.graydon@iop.org
Tel: +44 (0)117 930 1015

EOS IoP