



PHASE 2005

International Workshop

on

PHysics & Applications of SEMiconductor LASERS

Supélec, Campus de Metz, March 29-March 30 (2005)

The **scope** of the workshop is to acknowledge recent advances in the physics and applications of semiconductor lasers and to emphasize modern trends in this field. Four key-note speakers will report on the latest progress in their respective research area and will highlight novel applications and future developments. We also expect a large number of contributed talks in order to give a broad and interesting overview of the modern progress in semiconductor laser studies. This workshop therefore aims at bringing together the photonic community in Europe and the program shall be designed to give ample time for discussions and networking.

The workshop is organized in the framework of **COST 288** "Nanoscale and Ultrafast Photonics". COST is the acronym (in French) for "European Cooperation in the Field of Scientific and Technical Research". It is a framework for international research and development cooperation, allowing to coordinate national research at European level. The main objective of the COST 288 Action is to advance the application of ultrafast nanophotonics to provide high capacity photonic communication infrastructures, as well as to provide a forum to bring forward advanced research on novel topics such as advanced optical signal processing and optical logic, microwave photonics and exploratory technologies (based on nanophotonics) such as quantum communication. A **meeting** of COST 288 Action will be held on **March 31 - April 01, 2005**. The workshop benefits from the technical support of the **IEEE/LEOS French Chapter** and of the **CNRS UMR laboratory LMOPS** (Laboratoire Matériaux Optiques, Photonique et Système), which is a common laboratory between Supélec and the University of Metz.

The workshop will cover the different aspects of semiconductor laser research, including theory, modeling, simulation, experiments and applications. We are seeking for contributions in the following, non-exhaustive list of **topics**:

- Physics of quantum well, quantum wire and quantum dot lasers: strain effects, carrier dynamics, gain suppression, polarization phenomena etc.
- Vertical-cavity surface-emitting lasers (VCSELs): new VCSEL structures, transverse modes, polarization control, noise properties, optical feedback and optical injection effects etc.
- Dynamics and noise in diode laser systems: gain switching, mode locking, self-pulsation, chaos and instabilities, bistability, nonlinear dynamics in lasers with optical injection and time-delayed feedback, unidirectionally or mutually coupled lasers and applications for chaos communications, etc.
- Numerical simulation: optical, electrical and thermal phenomena in diode lasers, new simulation or modeling techniques, continuation techniques for bifurcation analysis of laser systems, etc.

- High-performance semiconductor laser devices and their applications: low threshold current, high output power, high-speed modulation, broadband laser sources, tunability, polarization controlled VCSELs, high resistance to optical feedback instabilities, advances in fabrication technologies, etc.
- Photonic crystals in semiconductor lasers: performances and applications.

The workshop will be located in **Supélec, Metz (France)** on **March 29-30, 2005**. Supélec is among the top engineering institutes and grandes écoles in France, and is a reference in its field “electrical energy and information sciences”. Supélec was established over a century ago in Paris. A first extension was created in Rennes, Brittany, in 1972. In 1975 its headquarters were relocated on the Gif-sur-Yvette campus, fifteen miles south of Paris, and a further extension was built in Metz, Lorraine, in 1985. Ever since, Supélec has functioned as a three-campus, single Engineering Institution.



The three-campus organization is used as a model and a learning tool for team work via the new information technologies. Supélec, Metz is located in an environment of high-level technology (Metz Technopôle 2000), which has attracted a large number of companies, universities and engineering schools dealing with information technologies and telecommunications. Supélec also has an active international policy which has led to cooperative agreements with universities located mostly in Europe, Northern America and Japan.



The city of **Metz**, though becoming a European center for high technology, has not forgotten its rich history and culture, which reaches back to the Roman Empire and beyond. If you wander through the streets of Metz, you will be charmed by the coherence of its architecture. You will enjoy beautiful places such as the hill of Sainte-Croix with its pre-Christian ruins, the medieval arches of the Place Saint-Louis, the St. Etienne cathedral, one of the finest gothic cathedrals in all of France and beautiful parks and planted squares in the heart of the city.

Enjoy also the cultural benefits the city has to offer, including regular concerts by the Symphony Orchestra of Lorraine, the Chamber Music Orchestra Ad Artem, jazz ensembles, etc.

We do hope you will contribute to the PHASE workshop and we are looking forward to meeting you soon in Supélec, Metz...

Marc Sciamanna (Supélec & LMOPS)
Krassimir Panajotov (Vrije Universiteit Brussel)
Co-chairs of PHASE 2005

Invited Speakers

- C. Chang-Hasnain (University of California, U.S.A.)
High-speed performance of directly modulated, injection locked VCSELs
- S. L. Chuang (University of Illinois at Urbana-Champaign, U.S.A.)
IEEE/LEOS Distinguished Lecturer 2004
Tunneling injection semiconductor quantum-dot lasers
- D. Biemberg (Technical University of Berlin, Germany)
Nanophotonic Devices and Systems
- W. Elsässer (Technical University of Darmstadt, Germany)
Quantum noise performance of semiconductor optoelectronic emitters: from non-classical squeezed states of light towards applications in quantum imaging

Program Committee

Marc Sciamanna (Supélec & LMOPS, France) (co-chair)
Krassimir Panajotov (Vrije Universiteit Brussel, Belgium) (co-chair)
Judy Rorison (University of Bristol, U.K.)
Philippe Gallion (Ecole Nationale Supérieure des Télécommunications, France)
Erwin Bente (Technische Universiteit Eindhoven, The Netherlands)
Uwe Bandelow (Weierstrass Institute for Applied Analysis and Stochastics, Germany)
Pierluigi Debernardi (Politecnico di Torino, Italy)
Angel Valle (Instituto de Física de Cantabria, Spain)
Claudio Mirasso (Universitat de les Illes Balears, Spain)

Local Organizing Committee (Supélec and LMOPS)

Marc Sciamanna
Delphine Wolfersberger
Jean Maufoy
Abdallah Ougazzaden
Gaëlle Orsal
Nicolas Fressengeas
Patrice Bourson
Michel Aillerie
Armel Bahouka

Abstracts You are kindly invited to contribute to the PHASE 2005 workshop. Submissions should consist of a one-page summary and should be sent as an e-mail attachment to phaseworkshop@supelec.fr. Please use PDF format. The summary should include the title, authors, affiliation, and should include figures, equations, references and acknowledgments if needed. All abstracts will be published in the workshop proceedings. The deadline for abstract submission is **December 15, 2004**.

Special issue of Optical and Quantum Electronics journal Original, extended full-length papers based on workshop abstract contributions can be submitted for publication in one or two special issues of *Optical and Quantum Electronics* journal (Springer-Verlag, previously Kluwer Academic Publishers), guest editors: Marc Sciamanna and Krassimir Panajotov. *Optical and Quantum Electronics* journal provides an international forum for the publication of original research papers, tutorial reviews and letters in such fields as optical physics, optical engineering and optoelectronics.

Manuscripts must be prepared according to the guidelines for authors (see <http://www.kluweronline.com/issn/0306-8919/contents>) and will be peer-reviewed and selected according to the journal policy. Deadline for manuscript submission is **June 1, 2005**.

Registration Information on how to register and on registration fees will be available later.

Workshop location The workshop will be held in the Amphitheater of Supélec, Metz. Practical informations on Supélec can be found on the website www.supelec.fr. Tourist information on the city of Metz is also available on the website <http://tourisme.mairie-metz.fr/>. Details on accomodation will be available later.

For more information, contact the organizing committee at phaseworkshop@supelec.fr