Introduction to the Issue on Nanophotonics and Optical MEMS

IN 2006, driven by the growing interest in tuning the optical properties of nanostructures using microactuators, the steering committee of the former IEEE Photonics Society (LEOS; formerly known as IEEE Lasers and Electro-Optics Society) International Conference on Optical Microelectromechanical Systems (MEMS) and Their Applications decided to bring together experts in the fields of nanophotonics and optical MEMS. From 2007, the conference was newly entitled Optical MEMS and Nanophotonics. The present special issue is a snapshot of the state of the art in this fascinating field with new applications in highly sensitive sensors and telecommunications among many others.

In this special issue, 36 papers are spanning over a wide range of topics. *Optical scanners and mirrors* keep on interest with four papers introducing original approaches using, for example, photonic crystals. *Adaptive and tunable optics* draws attention for both varifocal lenses and mirrors. *Nanoscale sources and emission* are reported using dye emitters as well as InGaN multiple quantum well. Others will be interested to read about *optical sensors* and *biochemical sensors* based on cantilevers and nanofilms. Two articles are also related to *nanowires* and *nanoparticles* on chip. Finally, two papers investigate *plasmonics* with applications to nanowires and scaling effects. We hope that the readers will find sources of inspiration for future developments in the field of nanophotonics and optical MEMS.

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Dr. Peter has been a member of various program committees and reviews, including the Program Chair of the 2008 IEEE Photonics Society (Photonics Society; formerly known as IEEE Lasers and Electro-Optics Society) Optical Microelectromechanical Systems and Nanophotonics Conference. He is a member of the IEEE LEOS, the Optical Society of America, and the Swiss Physical Society.

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He is currently with the Royal Institute of Technology, where he was an Assistant Professor, an Associate Professor, and a Full Professor. Since 1999, he has also been with Zhejiang University, Hangzhou, China, where he is appointed as a “Chang-Jiang Project” Professor by the Ministry of Education of China. His current research interests include metamaterials, photonic integration technologies, biophotonics, fiber-optical communication technologies, and optical sensing technologies. He has authored or coauthored more than 300 papers published in refereed international journals and one monograph (Oxford University Press). He is a Topical Editor for *Optics Letters*.

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Olivier J. F. Martin received the B.Sc. and Ph.D. degrees in physics in 1989 and 1994, respectively, from the Swiss Federal Institute of Technology, Lausanne (EPFL), Switzerland.

In 1989, he joined IBM Zurich Research Laboratory, where he investigated thermal and optical properties of semiconductor laser diodes. Between 1994 and 1997, he was a research staff member at the Swiss Federal Institute of Technology, Zurich (ETHZ), Switzerland. In 1997, he received a Lecturer fellowship from the Swiss National Science Foundation (SNSF). During 1996–1999, he spent a year and a half in the U.S.A., as Invited Scientist at the University of California, San Diego (UCSD). In 2001, he received a Professorship grant from the SNSF and became a Professor of Nano-Optics at the ETHZ. In 2003, he was an appointed Professor of Nanophotonics and Optical Signal Processing, Swiss Federal Institute of Technology, Lausanne (EPFL), where he is currently the Head of the Nanophotonics and Metrology Laboratory. He has authored or coauthored more than 270 scientific publications including 110 journal articles. He also holds a handful of patents and invention disclosures. His research interests focus on the interactions

of electromagnetic fields with low dimension systems, especially in the optical regime. Plasmonics is at the heart of his current research interest, with applications in optical signal processing, plasmonic antennas, and biophotonics.

Dr. Martin has organized several important conferences, including the 9th International Conference on Near-field Optics, Nanophotonics, and Related Techniques in September 2006. In 1999, he received the Latsis University prize for contributions to the study of near-field optics and photonic bandgap structures.

Minoru Sasaki (M'07) received the M.S. and Dr. Eng. degrees from Nagoya University, Nagoya, Japan, in 1993 and 1995, respectively.

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Olav Solgaard earned his Ph.D. degree from Stanford University in 1992. His doctoral dissertation: “Integrated Semiconductor Light Modulators for Fiber-optic and Display Applications” described, for the first time, deformable grating light valves. These microphotonic devices were the basis for the establishment of a Silicon Valley firm that became Silicon Light Machines (SLM), co-founded by Dr. Solgaard in 1994. He served as a consultant and Technology Advisory Board member to SLM, which was bought by Cypress Semiconductor Corporation in 2000. From 1992 to 1995 he carried out research on optical MEMS as a Postdoctoral Fellow at the University of California, Berkeley, and in 1995, he joined the Electrical Engineering faculty of the University of California, Davis. His work at UC Davis led to the invention of the multi-wavelength, fiber-optical switch, which has been developed into commercial products by several companies. In 1999 he joined Stanford University where he is now an Associate Professor of Electrical Engineering. Professor Solgaard’s research interests include Optical MEMS, Photonic Crystals, and Atomic Force Microscopy for applications in telecommunication and bio-medicine. He has

authored more than 250 technical publications and holds 40 patents. Professor Solgaard came to Stanford with the support of a Royal Norwegian Council for Scientific and Industrial Research Fellowship in 1986 and was named a Terman Fellow at Stanford for the period 1999-2002. He is a Fellow of the Optical Society of America and member of the Royal Norwegian Society of Sciences and Letters.