Introduction to the Issue on Optical Microsystems

The field of optical microelectromechanical systems (MEMS) and optical microsystems is at a very exciting and dynamic state of development. A foundation of fabrication processes has been established over the last several years, fueled by the investments in MEMS for telecommunication applications. Much on the research in the field is still focused on creation of advanced fabrication, integration, and packaging technologies, but optical MEMS has also become an enabling technology for a variety of applications. This has led to an increasing system emphasis in optical MEMS research, to the point where we have chosen to use the name Optical Microsystems for this issue of the IEEE JOURNAL OF SELECTED TOPICS IN QUANTUM ELECTRONICS to highlight the increased concentration on integrated devices and systems. In parallel with the technological maturation and increased systems emphasis that we are now experiencing, there are also exciting new concepts, techniques, and applications being introduced. Particularly noteworthy are the use of MEMS actuators to create tunable photonic crystals and the application of optical MEMS to microscopy and imaging.

The state of development of optical MEMS is reflected in the distribution of papers in this issue. Broadly speaking, the papers can be placed in the following three categories:

1) technology development with emphasis on actuator design, integration, and low-cost fabrication;
2) novel optical systems enabled by optical MEMS technology;
3) devices that incorporate optical MEMS in novel architectures with novel functionality.

This diversity demonstrates that although optical MEMS is maturing, it is still a very dynamic and exciting field, which we think is well represented by the excellent collection of papers in this issue of the IEEE JOURNAL OF SELECTED TOPICS IN QUANTUM ELECTRONICS.

We wish to extend our thanks to the authors who contributed to this issue, to the IEEE Lasers and Electro-Optics Society staff who have devoted so much of their time to the publication of this issue, and to you, the reader, for your interest in this topic. We think you will find the papers interesting, stimulating, and entertaining, and we hope to see you at the next IEEE International Conference on Optical MEMS in Takamatsu, Kagawa, Japan, from August 22–26, 2004.

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From 1992 to 1995, he carried out research in 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. Since 1999, he has been with Stanford University, where he is now an Associate Professor of electrical engineering. His research interests include fabrication technology for microoptical devices and systems, optical communication and sensing, and nanophotonics. He has authored more than 100 technical publications, holds 15 patents, and is an active consultant in the MEMS industry.

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