

GUEST EDITORIAL

SILICON-BASED MOEMS AND THEIR APPLICATIONS

Micro-optoelectromechanical systems (MOEMS) have developed into a unique class of micromachines that specialize in sensing and spatial-temporal modulation of electromagnetic radiation. Silicon-based substrates are the standard developmental platform for MOEMS devices as they are widely available, versatile, and offer the advantage of large-volume manufacturing at low cost. New materials, sophisticated fabrication processes, and designs have been proposed. They have led to a series of MOEMS devices with the potential to create novel functionality or simply replace existing methods. Two large-volume markets are within reach: picoprojection displays and optical telecommunications.

With the availability of even more miniaturized MOEMS devices and light sources, picoprojectors integrated into mobile devices such as PDAs and mobile phones are receiving increased focus. During the past two years an increasing number of papers have dealt with the development of scanning mirrors. In addition to that, several spin-offs were created focusing on the development of picoprojectors, indicating the market relevance of these developments.

The second large-volume market within reach for silicon-based MOEMS devices is the well-known market of optical telecommunication. The rebound after the telecom bubble is now clearly visible. Market analyses are predicting significant growth rates and market volumes, especially for MOEMS-based optical switches and variable optical attenuators.

Results of further research and development activities addressing smaller or not yet developed markets prove the high versatility of silicon-based MOEMS technology. Optical spectroscopy for food analysis and process control is making increased use of high-performance MOEMS

devices, while medical imaging systems, especially in optical microscopy/endoscopy, are starting to benefit from the advantages of adaptive optical elements and very compact/high-speed scanning mirrors.

This special section was intended to highlight current research and development activities of the community. Contributed papers were solicited from researchers in the field of silicon-based MOEMS and their applications.

We wish to thank the entire staff of the editorial office of the *Journal of Micro/Nanolithography, MEMS, and MOEMS*. In particular, we express our appreciation to the Managing Editor, Karolyn Labes, for her excellent support in organizing and setting up this special section. Special thanks goes to the Editor-in-Chief, Burn J. Lin, for giving us the opportunity to publish this special section. Last but not least we would like to thank all the authors who submitted their manuscripts to this special section and all the reviewers who dedicated their valuable time to ensure the high quality of this journal. To all our readers, we hope this special section provides inspiration for your own work to further develop silicon-based MOEMS technology and its applications.

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