MONASH University

Department of Electrical and Computer Systems Engineering (ECSE)
Faculty of Engineering

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Title: Microplasma Devices in Semiconductors, Ceramic and Polymer/Metal Multilayer Structures: Photodetectors, Optical Amplifiers, and Arrays

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Abstract: Microplasma devices are a new generation of micro-optical sources and detectors that have been fabricated in semiconductors, ceramics, and metal/dielectric/metal structures. Capable of producing photons from the infrared spectral region to the vacuum ultraviolet, these devices are well suited for integration with micro-optoelectronic, fluidic, and mechanical systems. Photodetection in the ultraviolet, visible and near infrared has also been observed with microdischarge devices having pyramidal Si photocathodes. Recently, gain on the 460.3 nm transition of the singly-charged Xe ion has been observed in a segmented, linear array of microdischarges, fabricated in a ceramic multilayer structure and having a gain length of ~1 cm. The optical and electrical characteristics of devices as small as ~10 μm in diameter and arrays with ~10^3 pixels at packing densities >10^4 cm^{-2} will be discussed.

J. GARY EDEN, Ph.D. University of Illinois (1976), was appointed a National Research Council Post-Doctoral Research Associate at the U.S. Naval Research Laboratory (Washington, DC) and, as a research physicist in the Laser Physics Branch (Optical Sciences Division) of NRL from 1976 to 1979, he made several contributions to ultraviolet and visible lasers and laser spectroscopy, including the co-discovery of the KrCl rare gas-halide excimer laser and the first proton beam-pumped lasers. Since joining the University of Illinois faculty in 1979, he has been engaged in research in molecular and ultrafast laser spectroscopy, the discovery and development of visible and ultraviolet lasers (including the first ultraviolet and violet fiber lasers), and microplasma devices. He is a Fellow of the IEEE, the Optical Society of America and the American Physical Society, Past Editor-in-Chief of the IEEE *Journal of Quantum Electronics* and, in 1998, served as President of the IEEE Lasers and Electro-Optics Society (LEOS). Dr. Eden has received the LEOS Distinguished Service Award and, in 2000, was awarded an IEEE Third Millennium medal. At the University of Illinois, he has served as Associate Vice-Chancellor for Research, Assistant Dean of the College of Engineering, and Associate Dean of the Graduate College. Dr. Eden was the James F. Towey Scholar at the University of Illinois from 1996 through 1999.