

The Department of Mechanical Engineering presents:

Costas P. Grigoropoulos

*Laser Thermal Laboratory
Department of Mechanical Engineering
University of California, Berkeley*

Friday, February 25, 2011

11:10AM-12:00PM

Bourns Hall A265

Laser Based Nanomanufacturing of Electronics and Energy Systems

Abstract:

This talk presents an overview of recent work on the nanomanufacturing of flexible electronics and energy systems. By tightly focusing pulsed laser radiation to nanometric dimensions we have been able to induce materials modification processes at extremely small scales. Applications in nanoprocessing, nanomachining, nanolithography and nanodeposition have been demonstrated. Interactions of pulsed laser radiation with nanostructures are investigated and shown to substantially improve device performance. New concepts have been introduced for the high throughput, directed growth and assembly of nanostructures.

Maskless fabrication of functional devices on flexible substrates has been conducted by utilizing nanoparticles in conjunction with laser processing and high-resolution nanoimprinting. High-performance electronics and solar cells have been realized on flexible substrates. Laser processing combined with high throughput printing and imprinting has the potential to enable an integrated approach for the scalable manufacturing of optimized energy systems.

Bio: Costas P. Grigoropoulos received his Diploma Degrees in Naval Architecture and Marine Engineering (1978), and in Mechanical Engineering (1980) from the National Technical University of Athens, Greece. He holds a M.Sc. degree (1983), and a Ph.D. (1986), both in Mechanical Engineering from Columbia University. He joined the faculty of the Department of Mechanical Engineering at the University of California at Berkeley in 1990. His current research interests are in micro/nano engineering, laser materials processing, laser-biomaterial interactions, manufacture of flexible electronics, microscale energy sources, microscale and nanoscale transport. His laboratory is engaged in the development of new methods for the manufacture of functional nanoscale devices.

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