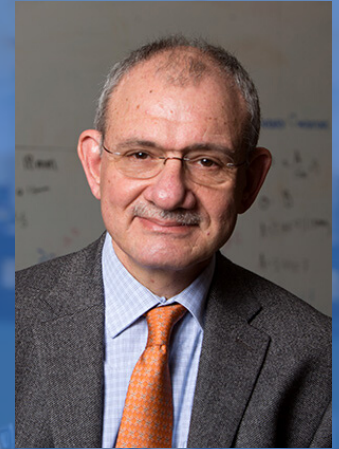


The Department of Mechanical Engineering Presents

Costas Grigoropoulos, Ph.D.

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Title: Laser Materials Processing and Nanomanufacturing

Abstract: The Laser Thermal Laboratory has conducted work on the fundamental study of laser material interactions across length and time scales in the context of laser microprocessing and maskless nanomanufacturing. Understanding of the associated energy transport phenomena has opened the way to applications on micro/nanofabrication, the synthesis of nanomaterials and their integration into electronic and energy devices. New methods have been introduced for the localized structural modification, growth and assembly of nanostructures. Laser-effected thinning and stable doping of two-dimensional layered semiconductors has been demonstrated. Reversible laser crystallization of nanostructures has been studied.

Ultrafast laser radiation drives nonlinear interactions that can be utilized for nanoprocessing. Quantitative studies have been carried out addressing biological cell response to nanodomains patterned via multiphoton ablation lithography. Fabrication of filamentous model structures for the growth and differentiation of biological cells has also been studied. New concepts on the ultrafast laser fabrication of three-dimensional mechanical metamaterials and the directed self-assembly of nanostructures are discussed.

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About the Speaker: Costas P. Grigoropoulos is a Professor and the A. Martin Berlin Chair in the Department of Mechanical Engineering at the University of California, Berkeley. He received his Diploma Degrees in Naval Architecture and Marine Engineering, and in Mechanical Engineering from the National Technical University of Athens, Greece. He holds a M.Sc. degree, and a Ph.D., both in Mechanical Engineering from Columbia University. He is a Fellow of ASME and SPIE and an Editor for the International Journal of Heat and Mass Transfer. His current research interests are in laser materials micro/nanoprocessing in the context of electronics manufacturing, laser-aided fabrication of flexible devices, energy systems and biomaterials, the study of ultrafast laser interactions with materials, the probing of fundamental microscale and nanoscale transport, the design and fabrication of architected materials with enhanced mechanical performance.

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