PURDUE UNIVERSITY

Birck Nanotechnology Center

Photonic Processing of Materials for Manufacturing Processes – From Flexible Hybrid Electronics to Semiconductor Processing

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Zoom Link: https://purdue-edu.zoom.us/j/94432743947

Abstract: Photonic processing, recognized as a non-equilibrium heating method, is established for drying and sintering metal-based conductive inks, annealing CIGS photovoltaic materials, and treating coatings on substrates sensitive to high thermal loads. This technology continues to drive innovation in the processing of coated thin films for applications such as displays, sensors, energy storage, and other flexible-hybrid electronics (FHE) devices. Notably, advancements in tool engineering are expanding the range of applications for photonic processing, especially in the field of semiconductor manufacturing and processing.

This seminar will describe the differences between laser-aided thermal processing and broadband photonic processing, highlighting how these technologies and products are utilized by academic and corporate researchers globally. We will specifically explore newer areas such as:

(a) Photonic Soldering: Employing photonic energy for soldering electronic components, enhancing compatibility with temperature-sensitive and flexible substrates.
(b) Photonic Lift-Off: A novel method providing an alternative to Laser Liftoff (LLO), offering cost efficiency and faster processing in manufacturing.

The talk will conclude with a focus on the application of photonic processes in the synthesis and transfer of 2D materials, showcasing their potential in advancing technology in this field.

Bio: Rudy Ghosh is the Global Director of Technology Sales and Commercialization at PulseForge Corporation. In his role, Rudy spearheads the strategic development of PulseForge's innovative technologies for commercial success. Rudy's broad technical expertise enables him to provide a strategic vantage for the technical leadership of the corporation. In his previous role as the Technical Program Lead, Rudy was responsible for the development of the groundbreaking and award-winning PulseForge Inline. Before joining NovaCentrix, Rudy was lead scientist at Applied Novel Devices Inc. where he worked on realizing ultra-thin solar cells for use by the Department of Defense. As a post-doc at the University of Texas at Austin, he led the Micro-electronics Research Center's efforts in the growth of 2D materials. Rudy holds a PhD in Physics from the University of North Carolina at Chapel Hill. He also has a MS in Physics from the Indian Institute of Technology, Bombay. With over 15 years of research experience in light-matter interaction and over 30 publications in a variety of technical journals Rudy brings technical guidance to the leadership and customers of PulseForge.