**ABSTRACT**: The Internet of Things consists of interconnected computing devices embedded in everyday objects that sense, process and transmit data among themselves. These devices are very distinct (both in terms of architecture and functionality) from conventional devices. Ideally, these devices need to combine flexibility, low cost and high performance. One route to achieving these properties is to use mature printing technologies on low cost flexible substrates. However, flexible substrates usually tend to be thermally fragile. This has led to the implementation of novel post processing techniques. In this talk, we introduce one such process: Photonic Curing.

Photonic Curing is an industrial thermal process in which a thin film is heated with pulsed light from a flash lamp. When the film is heated on a substrate, the bulk of the substrate stays relatively cool since the exposure time is so brief (~1ms). When this transient processing is performed on substrates that have relatively low thermal damage threshold, such as plastic or paper, it is possible to attain significantly higher temperatures in the thin film without damaging the substrate compared to a conventional oven. Since photonic curing tools quickly cure thin films at high temperature on low temperature substrates, it is ideal for roll-to-roll processes on polymer or paper.

Photonic curing was first developed by NovaCentrix and is enabled in the PulseForge® set of tools. It has become a transformative process used in the manufacture of printed electronics as it allows inexpensive and flexible substrates to be substituted for more traditional, costly, temperature-stable substrates. Additionally, high energy/ low processing time of photonic curing increases throughput all while maintaining a very tiny machine footprint.

For this talk we focus on how researchers around the world are using PulseForge tools for exploring new materials, substrates and processes for printed electronics and photovoltaic applications.

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**SPEAKER**: Dr. Rudresh (Rudy) Ghosh is an Applications Engineer at NovaCentrix where he works on investigating photonic curing as a processing tool for printed electronics and how printed electronics can be used for various novel applications.

Before joining NovaCentrix he was a Post-Doctoral Fellow at the Microelectronics Research Center at the University of Texas at Austin where he led the Center's efforts in the synthesis and characterization of 2D materials. Rudy earned his Ph.D. in Physics from the University of North Carolina at Chapel Hill. As a Graduate Research Assistant he worked with Prof. Rene Lopez, and was a member of the UNC – Energy Frontier Research Center. His work involved exploring thin film growth using pulsed laser deposition and tailoring the morphology of these films for photovoltaic and gas sensing applications.

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**COMPANY**: NovaCentrix offers industry leading photonic curing tools, conductive inks, material and expertise enabling development and production of next generation printed electronic devices. PulseForge® tools utilize photonic curing which dries, sinters, and anneals functional inks in milliseconds on low-temperature, flexible substrates such as paper and plastic. PulseForge tools can save time and money, and enable new types of products in applications like solar, RFID, display, packaging, and circuit. Our Metalon® conductive inks capitalize on advanced materials and formulation to provide conductivity options for additive manufacturing of printed electronics with stretchable, solderable, resistive, and magnetic qualities.