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Hosted by Michael Bedzyk

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**2:00PM Cook Hall 2058**

# Series Production and Process Development of Solar Modules based on Amorphous and Nanocrystalline Si Tandem Solar Cells

Thin film silicon is a very promising technology for solar module manufacturing. Its deposition processes are compatible with mass production on large-area substrates, and the availability and environmental sustainability of the raw materials for silicon-based modules is a long term advantage. By using two silicon layers with spectral responses spanning both the visible and infrared spectra, it is possible to extend the absorption capabilities of the solar cell and thus the efficiency of the device. The fabrication of tandem solar cell structures presents many challenges. The development of nanocrystalline Si layers lags that of amorphous Si and thus presents a bottleneck both in production capacity and efficiency improvements.

Inventux was founded in 2007 with the goal of producing and commercializing silicon tandem cell solar modules. Top efficiency on the cell level for tandem cells is achieved by using a sophisticated light-trapping scheme involving textured glass covered by nanotextured ZnO, intermediate reflectors, and dielectric back reflector. Implementation of advanced light trapping approaches offers much potential for increase in current generation and therefore power conversion.

In this talk, the roadmap for the near and mid-term technology development at Inventux Technologies will be illustrated. Challenges for the scaling and development of new processes will be addressed. Many obstacles that exist for the rapid deployment of thin film silicon modules will be discussed in light of current market conditions.

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