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UCSD NANOENGINEERING SEMINAR

Monday, August 29, 2016
Seminar Presentation: 11:00am – Noon
Cymer Conference Center

Functional imaging of materials for renewable energy

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Abstract:

My research group at UMD utilizes light to probe and understand mesoscale physical phenomena in materials for renewable energy. I will present an overview of the primary research topics in the READ-Lab, including our most recent scientific findings. In the first part of the talk, I will show how we image the functionality of photovoltaic devices using nanospectroscopy by scanning probe microscopy methods. We apply NSOM and illuminated Kelvin probe force microscopy to quantify and spatially resolve the quantum efficiency and open-circuit voltage of solar cells. These measurements reveal the carriers' collection and recombination within inhomogeneous materials with nanoscale spatial resolution, not possible by macroscopic electrical measurements. Our non-destructive imaging platform can be expanded to any optoelectronic device, including LEDs. In the second part of my talk, I will discuss how we image the dynamics of the electrode changes in all-solid-state batteries. Finally, I will present a new platform for plasmonics materials, formed by metal alloys with on demand optical response that can be applied into devices ranging from perfect absorbers to solar cells.

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Biosketch:

Leite is an Assistant Professor in Materials Science and Engineering, and the Institute for Research in Electronics and Applied Physics. Her group is engaged in fundamental and applied research related to inorganic materials for energy applications, exploring these materials from their nano-scale structural, electrical, and optical properties to their implementation in devices. Before joining UMD, Leite worked for two years at NIST and was a post-doctoral scholar at Caltech. She received her PhD in physics from Campinas State University in Brazil and the Synchrotron Light Source Laboratory.