

# Carnegie Mellon University

## Materials Science & Engineering

*presents*

### **Electrochemical Materials Processing for Fabricating Nano-Materials and Electro-Extraction of Bulk Metals**

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#### **ABSTRACT:**

Electrochemical processing of materials is central to a wide variety of devices and applications such as semiconductor technology, batteries, photovoltaics and electrometallurgy. In this talk, the speaker will discuss challenges and breakthroughs pertaining to two ongoing electrochemical process development efforts in his laboratory:

- (i) development of a novel electrochemical atomic layer deposition and etching process for the scalable nano-manufacturing of low resistivity copper and cobalt films as interconnect materials in advanced semiconductor devices;
- (ii) development of a novel segmented diaphragm electrolytic cell for the extraction or recovery of multivalent metals (such as titanium, neodymium) using electrodeposition from molten salt electrolytes.

In outlining these efforts, aspects of fundamental electrochemistry design, electrochemical reactor design and materials properties will be highlighted. Broader technological impacts of aforementioned disruptive solutions will also be discussed.

#### **BIOGRAPHY:**

Rohan Akolkar is presently the F. Alex Nason Associate Professor (Chemical and Biomolecular Engineering) and Ohio Eminent Scholar at Case Western Reserve University in Cleveland OH USA. His expertise and research interests include electrochemistry and electrochemical engineering, electrodeposition, electrometallurgy, electro-nucleation and dendrite growth, and electrochemical materials fabrication. His research has been recognized by the Case School of Engineering Research Award, the prestigious Norman Hackerman Young Author Award of the Electrochemical Society, and numerous industry awards during his 8-year tenure (2005-2012) in R&D at Intel Corporation. He is a member of the Electrochemical Society, the International Society of Electrochemistry, and the Minerals, Metals and Materials Society. He holds Ph.D. in Chemical Engineering also from Case Western Reserve University (2004).

**Doherty Hall 2315, 11:30AM  
Friday, March 31, 2017**