

# Carnegie Mellon University

## Materials Science & Engineering

*presents*

### **The good, the bad and the ugly of lithium-air batteries**

Venkat Viswanathan

Carnegie Mellon University – Mechanical Engineering

Li-air batteries have a much higher theoretical gravimetric energy storage density than all other candidate battery chemistries and this has led to a strong interest in developing such batteries for powering EVs, enabling driving ranges comparable to gasoline powered automobiles. However, many fundamental challenges need to be solved before these batteries can become practical. I will address three issues, based on density functional theory calculations and electrochemical modeling coupled with experiments, relating to the practicality of non-aqueous Li-air batteries - (1) Thermodynamic efficiency, (2) Deep discharge and (3) Rechargability of non-aqueous Li-air batteries.

Venkat Viswanathan is an Assistant Professor of Mechanical Engineering at Carnegie Mellon University. He graduated from Stanford University working under the guidance of Jens Nørskov and his graduate work involved understanding and identifying the fundamental limitations of lithium-air batteries and trends in electrocatalysis of oxygen reduction. His awards include ACS Petroleum Research Fund 2014 New Investigator Award, MIT Technology Review Innovators Under 35 Finalist, Electrochemical Society Daniel Cubicciotti Award in 2010; Electrochemical Society Herbert H. Uhlig Summer Fellow in 2009.

**Doherty Hall 2210, 11:30AM**  
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