



## Dr. Branden Kappes

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### *Graphene at the Interface*

Although its existence was theorized in 1947, not until 2004 was graphene first isolated. Since then, batteries, composites, electronics, spintronics, molecular sieves, membranes, and innumerable others populate the list of applications and consumer products that stand to benefit from this remarkable material. Cooperative experimental and theoretical investigation have fueled the exponential growth and interest in graphene; and nowhere is this more noticeable than in the field of electronics, where graphene is poised to replace silicon as the material-of-choice for electronic devices. However, several technological hurdles still stand in the way, and key among these, the interaction between graphene and its host substrate. Our work focuses on three facets of the graphene interface: the chemical stability of graphene on prospective substrates, the affect of substrate chemistry and crystallography on the fundamental electronic properties of graphene, and understanding the impact of chemical modification on these properties. This presentation will provide both an overview of these efforts and an exciting peek into the current state-of-the-art in graphene research.

Branden Kappes is an NSF CI-TraCS Postdoctoral Fellow at the Colorado School of Mines, where he develops methods for computational identification of application-specific materials; most notably, epitaxial graphene and electrode materials for lithium-ion batteries. He received his Ph.D. from the Colorado School of Mines in 2008 for his work in atomic-scale simulations of grain boundary pinning in aluminum alloys, and an M.S. from the University of Utah in 2002 for his work on devitrification processing of exchange-spring permanent magnets.

**Wednesday, March 7—4:00 pm**  
**Room 136 Jorgensen Hall**  
*Refreshments served at 3:45 pm*

Host:  
Dr. Jeff Shield  
Department of  
Mechanical and  
Materials Engineering

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