



The Department of
Mechanical Engineering
PRESENTS



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Winston Chung Hall 205/206
11:10-12:00PM

Graphene Synthesis in Atmospheric Pressure Plasmas

Abstract:

Atmospheric pressure plasmas can be used to continuously produce graphene powders that have numerous applications, including composites, electronics, and energy storage. The substrate-free gas-phase synthesis of graphene involves sending precursors, such as ethanol, directly into microwave-generated argon plasmas. The graphene sheets that are produced by this single-step process are pure and highly ordered. This talk will provide a review of the synthesis of graphene in atmospheric pressure plasmas. Factors affecting the formation of graphene and challenges of the bottom-up process will also be discussed. Additionally, the characteristics and applications of gas-phase-synthesized graphene will be presented.

About the Speaker:

Albert Dato is the Iris and Howard Critchell Assistant Professor at Harvey Mudd College. He received his B.S. degrees in Mechanical Engineering and Aeronautical Engineering from UC Davis in 2001, M.S. degree in Mechanical Engineering from UC Berkeley in 2004, and Ph.D. in Applied Science & Technology from UC Berkeley in 2009. He discovered the substrate-free gas-phase synthesis of graphene at UC Berkeley. After receiving his Ph.D., he worked as a process development engineer at Novellus Systems Inc., where he developed high density plasma chemical vapor deposition processes for semiconductor devices. He also worked as a scientist at Air Liquide Electronics US LP, where he led the research and development of new products, processes, and services for detecting and analyzing nanoscale contamination on high-performance materials used throughout the semiconductor industry. Driven by his passions for teaching, research, and educational outreach, he joined the faculty of Harvey Mudd College in 2014. His research focuses on developing solutions to energy and environmental challenges through the applications of gas-phase-synthesized graphene.

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