

CHEMICAL ENGINEERING

SEMINAR SERIES



STACEY BENT

Monday, January 29, 2018

Jagdeep And Roshni Singh Professor
Senior Associate Dean for Faculty & Academic Affairs,
Senior Fellow At Precourt Institute for Energy

Stanford University

ENERGY CONVERSION MATERIALS BY ATOMIC AND MOLECULAR LAYER DEPOSITION

ABSTRACT: With the growing interest in functional nanoscale materials for applications such as electronics, catalysis, and energy conversion, methods for fabricating materials with atomic-level control are becoming increasingly important. Atomic layer deposition (ALD) is a method that provides excellent capabilities for depositing thin films, nanoparticles, and other nanoscale inorganic materials. The method relies on self-saturating, layer-by-layer, gas-surface reactions to deposit conformal materials. This talk will describe research into the fundamental processes that drive ALD and the related process of molecular layer deposition (MLD), which incorporates organic monomers into films, as well as applications of these highly controlled materials. We explore fundamental nucleation processes in ALD and MLD to better understand the chemical reactions and the evolution of the structure and morphology of deposited nanoscale materials. Applications of the nanoscale materials toward energy conversion systems will also be discussed. We will describe the use of ALD films in photovoltaics such as perovskite solar cells, and we will illustrate how the films can be used in heterogeneous catalysis and electrocatalysis applications.

RECEPTION 3:30 • LECTURE 4:00 – 5:00
PHYSICS ASTRONOMY BLDG. PAA A 114



CHEMICAL ENGINEERING
UNIVERSITY of WASHINGTON

Knowledge and solutions for a changing world

BIOGRAPHY: Stacey F. Bent is the Jagdeep and Roshni Singh Professor and Senior Associate Dean for Faculty and Academic Affairs in the School of Engineering at Stanford University, where she is appointed Professor of Chemical Engineering and Professor, by courtesy, of Chemistry, of Materials Science and Engineering, and of Electrical Engineering. Professor Bent serves as the Director of the TomKat Center for Sustainable Energy and is a senior fellow in the Precourt Institute of Energy. Professor Bent obtained her B.S. degree in chemical engineering from UC Berkeley and her Ph.D. degree in chemistry from Stanford. After carrying out postdoctoral work at AT&T Bell Laboratories, she joined the faculty of the Chemistry Department at New York University. She moved to Stanford University in 1998. Professor Bent's research focuses on understanding surface and interfacial chemistry and materials synthesis, and applying this knowledge to a range of problems in sustainable energy, semiconductor processing, and nanotechnology. Her research group currently studies new materials and processes for electronics, solar cells and solar fuels, and catalysts.