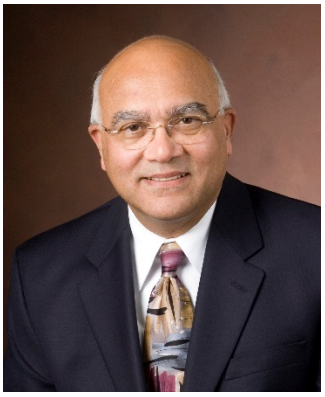
UCLA ENGINEERING
Chemical and Biomolecular Engineering

SEMINARS IN CHEMICAL AND BIOMOLECULAR ENGINEERING



Monday, April 16th, 2018 | 1:00PM **Boelter Hall 8500**

Presented by:

Arvind Varma

Professor
Department of Chemical Engineering
Purdue University

"Solution Combustion Synthesis of Nanoscale Materials: Fundamentals and Applications"

We have developed solution combustion synthesis (SCS), a novel one-step technique for the preparation of nanoscale complex metal oxide powders. It involves mixing of metal nitrates (in stoichiometric proportions) and fuel, their dissolution in water, followed by heating and self-combustion to yield the product. In SCS, homogenous mixing ensures controlled composition and oxidation state of the product, which is typically of nanoscale dimension, with high surface area and controlled pore structure. We have utilized the SCS technique to synthesize novel materials for a variety of contemporary applications, including catalysts for various uses, oxygen carriers for chemical looping combustion and anode materials for Lithium-ion batteries.

In this talk, I will first present the basic ideas of the SCS technique. This will be followed by some of our key results for different applications.

Dr. Arvind Varma has served as the R. Games Slayter Distinguished Professor of Chemical Engineering at Purdue University since January 2004. From then until July, 2016 he was also the Jay and Cynthia Ihlenfeld Head of Chemical Engineering. Prior to joining Purdue, he was at the University of Notre Dame. His research interests are in chemical and catalytic reaction engineering, and new sources for energy and chemicals. He has published over 310 archival journal research articles in these areas, co-authored three books and co-edited two books. He is the founding Editor (1996-present) of the Cambridge Series in Chemical Engineering, a series of textbooks and monographs published by the Cambridge University Press.

Professor Varma received his PhD degree from the University of Minnesota (1972). He has received several recognitions for his research and teaching, including AIChE's R. H. Wilhelm (1993) and Warren K. Lewis (2013) awards, and ASEE's Chemical Engineering Lectureship (2000) and Benjamin Garver Lamme awards (2018). From Purdue, he has received the Leadership Award of the College of Engineering, Sigma Xi Faculty Research Award, and the Arden L. Bement Jr. Award for Pure or Applied Science or Engineering. He is a Fellow of AIChE and of the American Association for the Advancement of Science.