School of Natural Sciences
Physics Colloquium Series

UCMERCED

Seeking Simplicity in Complexity: A Physicist's View of Vulcanized Media

By Paul M. Goldbart
Dean and Betsy Middleton and John Clark Sutherland Chair
School of Physics
Georgia Institute of Technology

Date: 09/23/16 **Time: 10:30 AM** **Location: COB 267**

For More Information Contact: Ajay Gopinathan, agopinathan@ucmerced.edu

Abstract:

Vulcanized media – materials that acquire their valuable and unusual properties through the random chemical linking of their molecular constituents – surround us, from the tires of our cars to the tubing of wine-making and medicine, to rubber bands, flooring and waterproof clothing. The aim of this talk is to look at vulcanized media through the lens of condensed matter physics, and to ask how their properties – most notably their universal random structure and rigidity – emerge via the collective behavior of their constituents. Along the way, we shall see that, provided some twists are added, a familiar field theory allows us to identify at least some simplicity in these archetypes of complexity.

Bio

Professor Paul M. Goldbart is currently the Betsy Middleton and John Clark Sutherland Chair of Physics and the Dean of the College of Sciences at the Georgia Institute of Technology. He received his Ph.D. in physics from the University of London's Imperial College in 1985. He then joined the Department of Physics at the University of Illinois at Urbana-Champaign as an assistant professor in 1987, and advanced to associate professor and full professor there. While at UIUC, he served as the first director of the Institute for Condensed Matter Theory. A theoretical condensed matter physicist, Professor Goldbart has made remarkably diverse contributions to his field. He has made deep and pioneering contributions to the theory of random solids, quantal geometric phases in a range of condensed matter settings, superconductivity and superfluidity as well as phase transitions in liquid crystals. He is a winner of the NSF Presidential Young Investigator Award, a Fellow of the Institute of Physics and of the American Physical Society. He is also a enthusiastic and gifted lecturer, known for giving popular lectures to audiences of all ages and backgrounds.