

Spring 2016 COLLOQUIUM SERIES
Engineering Science & Mechanics

Sponsored by
The Granular Science Laboratory & Mechanics Research Communications

Prof. David Steigmann

Department of Mechanical Engineering
University of California at Berkeley

March 23, 2016

2:30 – 4:00 p.m.

Mechanical Engineering Center – Room 221

**Coupled Field Problems in the Mechanics and Physics of
Lipid Bilayers**

Lipid bilayer membranes afford a particularly rich opportunity to study the interplay among mechanics, geometry and a host of physical phenomena ranging from viscous intra- and extra- viscous flow to surface diffusion of trans-membrane proteins, phase transitions and electro-mechanics. Starting with the elements of the standard theory, we discuss the foundations of the subject, and discuss extensions of the basic model to accommodate viscous flow, diffusion, gradient capillarity conferred by variable thickness distension and electro-mechanical interactions. The emphasis is on the development of theory and illustrative examples.

Dr. David Steigmann is a Professor of Mechanical Engineering at the University of California – Berkeley. He received his PhD at Brown University, and he began his academic career at the University of Alberta. He has been at UC-Berkeley since 1997, where his research spans a broad range of topics in the field of continuum mechanics, including plasticity, thin shells, finite elasticity, stability, electromagnetic phenomena, thin films and biological membranes. He serves on the editorial boards of 14 international journals, including the *Journal of Elasticity*, *ZAMP*, the *IMA J. of Applied Mathematics*, the *International Journal of Solids & Structures*, the *Proceedings of the Royal Society of London*, and the *Journal of the Mechanics of Materials & Structures*. He is Editor-in-Chief of *Mathematics & Mechanics of Solids* and an Associate Editor of *Mechanics Research Communications*. In recognition of seminal contributions to the field of mechanics, he was awarded the 2013 Levi-Civita Medal, the Engineering Science Medal, was elected as a Fellow of the Society of Engineering Science in 2010, and has a recent special issue of *Continuum Mechanics & Thermodynamics* in his honor.

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