UNIVERSITY OF CALIFORNIA, IRVINE

Department of Materials Science and Engineering

Control of Magnetoelastic Matter

Professor Monica De La Cruz

Department of Materials Science and Engineering,

Chemistry, Physics and Astronomy, and Chemical & Biological Engineering

Northwestern University

Thursday, February 24, 2022, 2:00-3:20 p.m.

Zoom: **https://uci.zoom.us/j/98283794389?pwd=RlpiSXg4RHBQNzNRN0pLSzIrc2tkUT09**

Meeting ID 982 8379 4389 — Passcode 380564

Abstract: Magnetic fields exert controllable forces that generate microscopic actuation and locomotion in soft materials with superparamagnetic or ferromagnetic components. I will describe the shape changes and materials parameters required to drive and direct matter including filaments, membranes and hydrogels with magnetic components using magnetic fields.

Bio: Monica Olvera de la Cruz obtained her Ph.D. in Physics from Cambridge University, UK, in 1985. She joined Northwestern University in 1986, where she is the Lawyer Taylor Professor of Materials Science & Engineering, Professor of Chemistry, and by courtesy, Professor of Physics and Astronomy and of Chemical & Biological Engineering. She is the Director of the Center for Computation and Theory of Soft Materials. From 1995-97 she was a Staff Scientist in the Commissariat a l'Energie Atomique, Saclay, France, where she also held visiting scientist positions in 1993 and in 2003. She has developed theoretical models to determine the thermodynamics, statistics and dynamics of soft materials including multicomponent solutions of heterogeneous synthetic and biological molecules, and molecular electrolytes. She is a member of the American Philosophical Society, the National Academy of Sciences (NAS), the American Academy of Arts and Sciences and a Fellow of the American Physical Society (APS). She was awarded the 2017 APS Polymer Physics Prize and the 2007 Cozzarelli Prize in Applied Sciences (PNAS), and various awards and fellowships including a National Security Science and Engineering Faculty Fellowship (DoD), a Presidential Young Investigator Award (NSF), an Alfred P. Sloan Fellowship, and a David and Lucile Packard Fellowship in Science and Engineering. She has served in the advisory committee of the Basic Energy Science Department of Energy, the NSF Mathematical and Physical Science Directory, the Max Planck Institute for Polymer Research, and ESPCI (École supérieure de physique et de chimie industrielles de la Ville de Paris). She has participated in various National Research Council (NRC) committees and chaired the NRC Condensed Matter and Materials Research Committee. She is a Senior Editor for the ACS Central Science, a member of the PNAS editorial board and a member of the Board of Trustee of the Gordon Reserch Conferences.