

*The George and Dot Bishop Advanced Materials*

# Colloquium Series

Presents:

Dr. Monica Olvera de la Cruz

January 30, 2020 - 200 Olin Hall - 4:00 - 5:00 PM

Light refreshments will be served at 3:45 PM in the Olin Hall First Floor Lobby

## Control of Magnetoelastic Matter

Magnetic fields exert controllable forces that generate microscopic actuation and locomotion in soft materials with superparamagnetic or ferromagnetic components. Magnetoelasticity is used here to describe elastic filaments, membranes and hydrogels with magnetic components under the influence of external magnetic fields, and the shapes changes in terms of their material parameters and actuation mechanisms.

**Dr. Monica Olvera de la Cruz**  
**Lawyer Taylor Professor, Materials Science and Engineering,**  
**Chemistry & Chemical & Biological Engineering, Physics & Astronomy**  
**Northwestern University**

Monica Olvera de la Cruz obtained her B.A. in Physics from the UNAM, Mexico, in 1981, and 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, 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 macromolecules in complex environments including multicomponent solutions of heterogeneous synthetic and biological molecules, and molecular electrolytes.

She is a member of 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, a National Security Science and Engineering Faculty Fellowship (DoD), the 2007 Cozzarelli Prize (NAS), the Presidential Young Investigator Award (NSF), the Alfred P. Sloan Fellowship, and the David and Lucile Packard Fellowship in Science and Engineering. She is a member of the US Department of Energy's Basic Energy Sciences Advisory Committee and a Senior Editor for the ACS Central Science.

