

Boulder School for Condensed Matter and Materials Physics

Soft Matter In and Out of Equilibrium

July 6-31, 2015

The goal of the Boulder-2015 school is to discuss basic concepts and theoretical methods useful to understand the physics of soft materials. Special emphasis will be attached to geometrical and topological properties, nonlinear effects, disorder, and dynamics out of equilibrium. These broad themes will be explored using examples drawn from modern research in liquid crystals, membranes and filaments, glasses and randomly pinned systems, turbulent biological flows, topological soft matter, and active materials to name but a few.

Through pedagogical lectures students will be exposed to key ideas of elasticity, differential geometry, topological defects, hydrodynamics, quenched disorder, and non-equilibrium methods. They will learn about the rich phenomenology of soft matter systems that vividly exhibit these themes. More rigorous mathematical methods will be supplemented by powerful scaling arguments and qualitative reasoning, indispensable for the understanding of experiments and numerical simulations. Basic theoretical lectures will be complemented with lectures on modern experiments to convey the details of physical realizations and experimental methods of the field.

Noel Clark (CU Boulder)
Zvonimir Dogic (Brandeis)
Eric Dufresne (Yale)
Efi Efrati (Weizmann)
Nigel Goldenfeld (UIUC)
Jean-François Joanny (Inst. Curie)
Mehran Kardar (MIT)
Oleg Lavrentovich (Kent State)
Pierre LeDoussal (ENS)
Alex Levine (UCLA)
Tom Lubensky (UPenn)
Lisa Manning (Syracuse)
M. Cristina Marchetti (Syracuse)
Narayanan Menon (UMass)
David Nelson (Harvard)
Jennifer Ross (UMass)
Ivan Smalyukh (CU Boulder)
John Toner (Oregon)

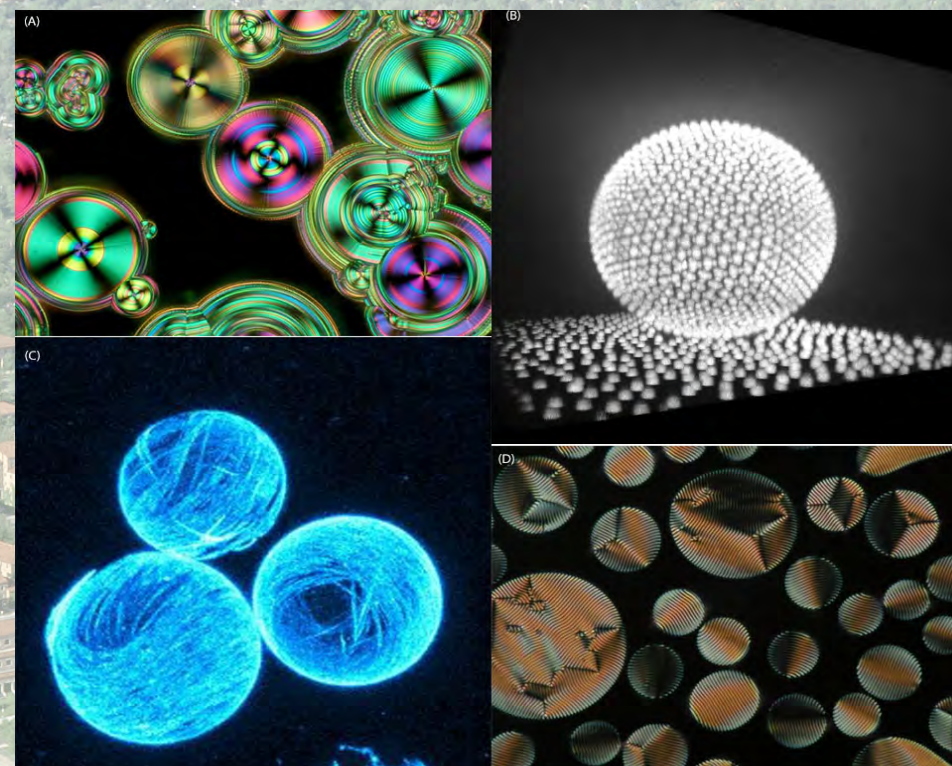


Photo Credits: (A) Circular smectic liquid crystal domains (N. Clark lab), (B) A colloidal crystal on a curved surface (W. Irvine lab), (C) Active nematic film on the surface of a spherical vesicle (A. Bausch lab), and (D) Focal conic defects in chiral nematic liquid crystal droplets (N. Clark lab)

Scientific Organizers:

Mark Bowick (Syracuse University)
William Irvine (University of Chicago)
M. Cristina Marchetti (Syracuse University)
Vincenzo Vitelli (Leiden University)
Leo Radzihovsky (University of Colorado, Boulder)

The school will pay for most local expenses, and there are travel grants available for participants from U.S. universities. Students and postdocs interested in participating should submit an electronic application by the February 1 deadline. The application form, and detailed information regarding housing, travel and financial support are available at

<http://boulderschool.yale.edu/>

The Boulder School in Condensed Matter and Materials Physics provides expert training, not usually available within the traditional system of graduate and post-graduate education, for advanced graduate students and postdoctoral researchers working in condensed matter physics, materials science and related fields. The School is supported by the National Science Foundation, with additional funding provided by the University of Colorado, and meets annually during July in Boulder, Colorado.