

# SEMINAR IN PHYSICS

Friday, January 24 – 3:30-4:45 – Ross 0220  
Refreshments

## Self-Assembly of Topological Defects and Colloids

**Professor Ivan I. Smalyukh**

Department of Physics, University of Colorado at Boulder

Topologically nontrivial fields frequently arise in physics ranging from superstring and quantum field theories to plasmas, optics, elementary particles, cosmology, condensed matter and atomic systems, etc. Their complex structures are expected to follow predictions of topological theorems and mathematical theories, such as the knot theory, but are rarely accessible to direct experimental visualization.

On the other hand, soft condensed matter systems, such as colloids and liquid crystals, offer complexity in degrees of freedom and symmetries that allow for probing analogous phenomena on completely different scales, ranging from kinetics of atoms in glasses to cosmic strings in the early Universe.

In this lecture I will discuss soft matter model systems to probe the interplay of topologies of surfaces, fields, and defects. This combination of topology and self-assembly paradigms emerges as an interdisciplinary scientific frontier of topological soft matter, potentially enabling scalable fabrication of composite materials with new properties.