abstract

Workshop on Topology: Identifying Order in Complex Systems
Topic:

Speaker:

Affiliation:

Date:

Time/Room:

"I seemed to see the membraneous and cylindrical tubes tremble beneath the undulation of the waters."
- Jules Verne (describing Captain Nemo's underwater garden in 20,000 Leagues Under the Sea)

For over half a century, microscopists have seemed to see amazing things in the ultrastructure of the endoplasmic reticulum (ER), one of the most dynamic and complex membraneous organelles of eukaryotic cells. Its morphological complexity has inspired many and varied descriptions: tubules, sheets, lamellae, flattened vesicles. Despite the elegant membrane mechanics offered by the work of Helfrich, Canham and others, physical theory has mostly sat, trembling on the sidelines. Are new ideas from mathematics and theoretical physics able to illuminate the old observations and generate new predictions of ER phenomena?