

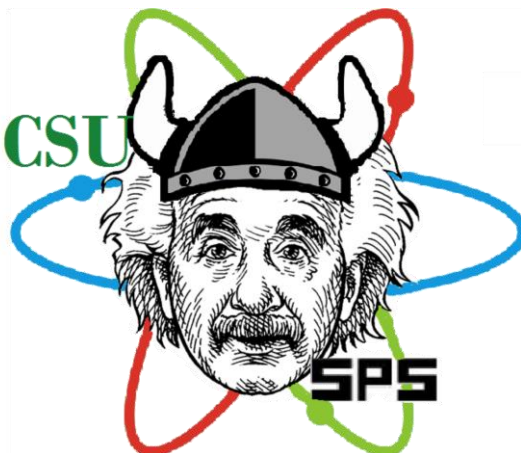
SOCIETY OF PHYSICS STUDENTS (SPS) PRESENTS:

Langevin analysis of an optically trapped primary cilium.

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Primary cilia are slender cellular organelles, present on most vertebrate cells, hypothesized to function as a fluid flow sensor. The mechanical properties of cilium remains incompletely measured. Optical trapping is an ideal probe of the mechanical response of a cilium due to the trap's spatial localization and non-contact nature. However, analysis of an optically trapped cilium is complicated both by the geometry of a cilium (a slender deformable cylinder oriented along the optical axis) and boundary conditions (the cilium is anchored, not free to diffuse). Here, we present initial modeling results deriving the mean-squared displacement of a trapped cilium using the Langevin approach and apply our analytical results to measured data of a trapped cilium, where the trapping force is applied oppositely directed to the elastic restoring force of the ciliary axoneme. We demonstrate that the mechanical properties of the cilium can be accurately determined and efficiently extracted from our data using our model. Improved measurements will result in improved understanding of the biological function of flow sensing by this organelle.



WHERE: SR - 151

WHEN: 11:30am-12:15pm

THURSDAY, Apr. 28, 2016

Pizza and Soda are provided!