Department of Mathematics and Statistics Colloquium

Velocity Bounds for Soft Filaments in Fluids

Abstract: The past forty years have witnessed an ever-increasing interest in applications of slender-body dynamics (such as Kirchhoff rod theory), in particular with regard to the shape, movement, or material parameters of biomolecules or materials. In most applications, hydrodynamic interactions (i.e. surface traction often approximated by resistive force theory) have been of utmost importance since the biologically relevant scales usually result in very small Reynolds number. However, the formulation of classical Kirchhoff slender-body assumes no surface traction in the development of the constitutive relation. We will discuss an asymptotic approach to reconciling this apparent inconsistency and provide velocity bounds for which the compatibility of Kirchhoff rod and resistive force theory hold.

The speaker is a candidate for an open position in the Department of Mathematics and Statistics. For reasons of confidentiality, the speaker's name and institutional affiliation have been suppressed.

Monday, February 6 at 3:45 in Roop 103

refreshments at 3:30