**BIOMATH SEMINAR**

Friday, February 26

1-2 pm

Harris 4119

Surface Traction and the Dynamics of Elastic Rods at Low Reynolds Number

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**Abstract:**  Biological processes often involve structures that are significantly longer in one dimension than they are in the other two (e.g. bacterial flagella). The dynamics of these structures are the consequence of the balance between the forces from the structure itself and forces from the surrounding fluid. Typically, the motion of these filamentary objects is described using variations of the Kirchhoff rod equations with resistive forces from the fluid treated as body forces acting on the centerline.  In reality, though, these forces are applied to the surface of the filament; however, the standard derivation of the Kirchhoff equations ignores surface traction stresses. Here, I will re-derive the Kirchhoff rod equations in the presence of resistive traction stresses and determine the conditions under which treating the drag forces as body forces is reasonable.  This is work performed in collaboration with Charles Wolgemuth of the University of Arizona.