abstract

Symplectic Dynamics Seminar
Topic:

Speaker:

Affiliation:

Date:

Time/Room:

We present a Hamiltonian framework for higher-dimensional vortex filaments (or membranes) and vortex sheets as singular 2-forms with support of codimensions 2 and 1, respectively, i.e. singular elements of the dual to the Lie algebra of divergence-free vector fields. It turns out that the localized induction approximation (LIA) of the hydrodynamical Euler equation describes the skew-mean-curvature flow on higher vortex filaments of codimension 2 in any any dimension, which generalizes the classical binormal, or vortex filament, equation in 3D. This framework also allows one to define the symplectic structures on the spaces of vortex sheets, which interpolate between the corresponding structures on vortex filaments and smooth vorticities.