1052-35-314 **Annalisa M Calini*** (calinia@cofc.edu), Department of Mathematics, Robert Scott Small Bldg, Room 339, 66 George St, Charleston, SC 29424, and **Thomas Ivey**. *From circles to cables: closed finite-gap solutions of the Vortex Filament Flow.*

I will discuss joint work with Thomas Ivey on algebro-geometric solutions of the Vortex Filament Flow (VFF). This integrable model of self-induced dynamics of a vortex filament in an ideal fluid is closely related to the cubic focussing nonlinear Schrödinger (NLS) equation. We adapt algebro-geometric techniques for constructing finite-gap NLS solutions, and use the theory of isoperiodic deformations to generate a family of closed VFF solutions of increasingly higher genus, and increasing topological complexity, via successive deformations of the associated Riemann surface. We prove that each step of a deformation process that begins with a circular filament generates a cable on the previous filament, and that the knot type of the resulting cable is determined from the deformation scheme, and is invariant under the time evolution. If time allows, I will comment on our current work on stability of such solutions. (Received August 31, 2009)