



February 19
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***Moving Interfaces in Spectral Problems:
Laplace Eigenvalues on Polygons and Soap Film Dynamics***

I will talk about the change in the Laplace eigenvalues for a smooth domain induced by the change of shape. In particular, I will concentrate on the perturbation of the circle to a regular polygon with N sides and the decomposition of eigenvalues in powers of $1/N$. The series involves the Riemann zeta function. I will also talk about out-of-plane deformation of the domain and the connection to the dynamics of soap films. I will present the fully nonlinear governing equations of soap films. No such equations have heretofore existed. The new equations present a great opportunity to advance our understanding of the dynamics of two-dimensional systems which, in addition to soap bubbles, include biological membranes and other systems.