1116-86-2670 **N Benjamin Murphy*** (nbmurphy@math.uci.edu), 340 Rowland Hall, University of California, Irvine, Irvine, CA 92697-3875. *Spectral analysis of transport in sea ice.*

Sea ice is a multiscale composite which mediates a broad range of geophysical processes in the polar marine environment and plays a key role in climate. The composite structure of sea ice ranges from sub-millimeter brine inclusions to kilometer sized melt ponds atop vast ice floes. Fluid flow through porous sea ice helps control the drainage of melt ponds which, in turn, determine the albedo of the ice pack, a key parameter in climate modeling. The analytic continuation method provides a rigorous approach to treating the transport properties of such composites, as well as the advection enhanced diffusive transport of tracers and sea ice floes. The method provides Stieltjes integral representations for the associated bulk transport coefficients, involving the spectral measure of a random matrix which depends only on composite geometry. In this talk we will look at transport in sea ice through the lens of random matrix theory. We will discuss connectedness-driven transitions in its microstructural transport properties, in terms of transitions in the statistical properties of the eigenvalues of the matrix as well as the delocalization of its eigenvectors – analogous to Anderson localization in quantum systems. The spectral description of advective-diffusion will also be discussed. (Received September 22, 2015)