1145-82-666 **Ira B. Schwartz*** (ira.schwartz@nrl.navy.mil), US Naval Research Laboratory, Code6792, Washington, DC 20375, and **Klimka Szwaykowska** (klimka@gmail.com), **Thomas W. Carr** (tcarr@smu.edu), **Jason Hindes** (jason.hindes.ctr@nrl.navy.mil) and **Leah B. Shaw** (lbshaw@wm.edu). *Large fluctuations, rare event prediction and control in complex networks.*

Noise-induced large fluctuations occur in systems across many fields and over many length scales. They range from desynchronization in power-grid networks and switching patterns in autonomous drone swarms at the macro-scale to alternating coupled neurons used to model perception at the micro-scale. An important class of dynamical systems that model such noise-induced behavior are networks with heterogeneous topological properties and local parameters. Importantly, noise-induced large fluctuations can give rise to dramatic events such as extinction of networked epidemics and species, switching between different collective network states, and/or complete collapse of network functionality and structure.

In this talk, I will review some of our recent general results in noise-induced fluctuations in complex networks. In particular, I will discuss how these results lead to new scalings of the probability occurrence of rare, large fluctuations in: mixed-reality coupled systems with asymmetric noise, switching and control of large fluctuations in complex networks, and large fluctuations to extinction in adaptive networks. My main collaborators for this work are: Jason Hindes, Klimka Szwaykowska, Thomas Carr and Leah Shaw. (Received September 12, 2018)