**Date:** **February 2nd**

**Time:** **11:00 AM**

**Location:** **Maryland Hall 110**

**Speaker:** **Dr. Darryn Waugh**
**Johns Hopkins University**

**Title:** **"Stirring in the surface ocean"**

**Abstract**

**Understanding horizontal dispersal in the oceans is important for a wide range of problems, including plankton dynamics, larval transport, the fate of pollutants, and spatial distribution of passive tracers. However, the spatial and temporal variations in the stirring and mixing in the surface ocean are not well quantified. Here I examine lateral stirring and its relationship to the flow dynamics using surface geostrophic currents derived from satellite altimeter measurements. The distributions of finite-time Lyapunov exponents (FTLEs) are calculated using trajectories driven by these surface currents, and it is shown that the stirring is not uniform and stretching rates over 15 days vary from less than 0.02 1/day to over 0.3 1/day. These variations occur at both large (~1000 km) and small (~10 km) scales. The regional variations in the stirring are closely related to variations in mesoscale activity, and there are compact relationships between the mean FTLEs, mean strain rates, and the eddy kinetic energy. The small scale variations are related to the characteristics of coherent vortex structures, with low FTLES inside vortices and filaments of high FTLEs in strain-dominated regions surrounding these vortices.**