Date: **November 10th**

Time: **11:00 AM**

Location: **Maryland Hall 110**

Speaker: **Dr. Edwin Gerber**
Columbia University

Title: **"The Dynamics of the North Atlantic Oscillation and Annular Modes"**

Abstract

The North Atlantic Oscillation (NAO) and Annular Modes are the dominant patterns of intraseasonal variability in the extratropical atmosphere. The NAO in particular characterizes a significant fraction of the wintertime variability in Eastern North America and Europe, and has been recognized in some form since the eighteenth century. I'll begin with a simple model based on random walks to explain why these patterns of variability always dominate statistical analyses of the extratropical circulation. I'll then move to a more realistic model, a dry general circulation model of the atmosphere, to probe the dynamics of the variability. Annular Mode and NAO-like patterns are created with the addition of idealized topography and heating anomalies approximating land-sea contrast. We find that the NAO arises from the confluence of topographic and thermal forcing, and is best understood in terms of the eddy life cycle. We also find a parameter sensitive coupling between eddies (day-to-day weather) and the large-scale flow that extends the persistence of the variability on timescales of 10-100 days. The feedback loop, however, is very sensitive to zonal asymmetries, consistent with the limited persistence of the observed NAO and annular modes.