Applied and Computational Mathematics Seminar

Title: Instabilities of Rossby Waves and the Generation of Zonal Flows

Speaker: Colm Connaughton (Warwick Mathematics Institute and Centre for Complexity Science)

Date: Fri 6th February 2009 at 2:15PM

Location: Mathematical Sciences Teaching Room

Abstract: The Charney-Hasegawa-Mima equation is the most basic model of the large scale dynamics of the atmosphere or ocean. It admits wave solutions which we know as Rossby waves. In this talk I will discuss two basic instabilities of a Rossby wave, the decay instability and the modulational instability, and the relationship between them. The nonlinear saturation of the modulational instability provides a mechanism for the generation of zonal jets which are ubiquitous features of thin fluid layers subject to strong rotation.