# 2007 - 2008

# MATHEMATICS COLLOQUIUM SERIES
# UNIVERSITY OF CENTRAL FLORIDA

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**Dr. Eleftherios Gkioulekas**
**Department of Mathematics**
**University of Central Florida**

will speak on

## Locality and stability of the cascades of two-dimensional turbulence

**ABSTRACT**: In my talk, I will discuss the notion of locality as it pertains to the cascades of two-dimensional turbulence. The mathematical framework underlying our analysis is the infinite system of balance equations that govern the generalized unfused structure functions, first introduced by L'vov and Procaccia. As a point of departure we use a revised version of the system of hypotheses that was proposed by Frisch for three-dimensional turbulence. We show that both the enstrophy cascade and the inverse energy cascade are local in the sense of non-perturbative statistical locality. We also investigate the stability conditions for both cascades. We have shown that statistical stability with respect to forcing applies unconditionally for the inverse energy cascade. For the enstrophy cascade, statistical stability requires large-scale dissipation and a vanishing downscale energy dissipation. I will conclude with a careful discussion of the subtle notion of locality.

**DATE:** **Wednesday, February 20, 2008**

**TIME:** **11:00am – 12:00pm**

**PLACE:** **MAP 318**

Refreshments will be served