

**Geophysical Fluid Dynamics Fellowships**  
at the  
**Woods Hole Oceanographic Institution**

2002 Program of Study in  
Geophysical Fluid Dynamics

**Bounds on Turbulent Transport**

**June 17 to August 23, 2002**



Since 1959 the Geophysical Fluid Dynamics (GFD) Program has brought together graduate students and researchers from a variety of fields who share a common interest in the nonlinear dynamics of rotating, stratified fluids. These fields include classical fluid dynamics, physical oceanography, meteorology, astrophysics, planetary atmospheres, geological fluid dynamics, hydromagnetics, physics and applied mathematics. For the graduate student fellows, the centerpiece of the program is a research project that each fellow pursues under the supervision of the staff. At the end of the program, each fellow presents a lecture and a written report for a proceedings volume.

The central topic of the 2002 program will be "Bounds on Turbulent Transport". The introductory lectures by F. H. Busse (University of Bayreuth) will discuss studies of rigorous upper bounds to transports of heat by convection and to momentum by shear flow. The solutions of the associated variational problems share many properties such as temperature profiles or shear flow profiles with actually realized turbulent velocity fields. Topics of rotating convection and turbulence in stratified fluid will be covered in additional lectures during a mini-symposium. The theoretical descriptions of the nonlinear dynamics of these systems share common features with the variational problems such as sequences of successive bifurcations and modification of the mean field. Numerous additional staff lectures will be given in these and other topics during the program. More details of the topics are found at the announcement for 2002 on the web site.

Up to ten competitive fellowships are available for graduate students. Successful applicants will receive stipends of \$4,275 and an allowance for travel expenses within the United States. Fellows are expected to be in residence for the full ten weeks of the program. The application deadline is February 15, 2002. Awards will be announced by April 1, 2002. We particularly encourage applications from women and members of underrepresented groups. Further information and application forms may be obtained through the Education section of the Woods Hole Oceanographic Institution World Wide Web homepage at <http://www.whoi.edu/education/gfd.html>, or by writing directly to:

**The GFD Fellowship Committee**  
Education Office, Clark Laboratory, MS #31  
Woods Hole Oceanographic Institution  
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Woods Hole, MA 02543-1541

**Telephone: (508) 289-2950**  
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*Prospective senior visitors, please e-mail Jack Whitehead at: [jwhitehead@whoi.edu](mailto:jwhitehead@whoi.edu)*

**The Woods Hole Oceanographic Institution is an Equal Employment Opportunity/Affirmative Action Organization**

The GFD Program is funded by the National Science Foundation and the Office of Naval Research