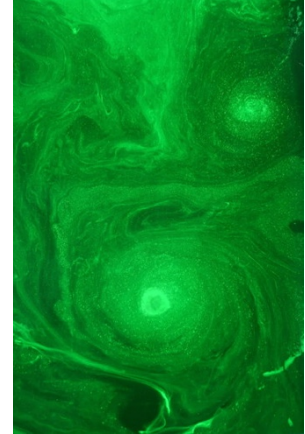


Post-doctoral position in fluids mechanics
wave turbulence in geophysical flows
LEGI, Grenoble

A postdoctoral position is available in LEGI (Laboratoire des Ecoulements Géophysiques et Industriels, Grenoble, France). The research program concerns the topic of wave turbulence in stratified flows in the framework of the ongoing ERC-funded project WATU (*Wave turbulence: beyond the Zakharov spectrum*) under the supervision of Nicolas Mordant. Wave Turbulence Theory was developed initially to describe the statistical properties of waves at the surface of the ocean but many other wave systems can sustain such turbulence. In addition to surface waves, WATU project investigates also geophysical flows with a special focus on stratified flows. Fluids with a stable vertical variation of density can sustain internal gravity waves. In oceans, this stratification results from variations of temperature and salinity. When the waves are nonlinear, they may evolve into a state of wave turbulence characterized by an energy flux in scale. In addition to waves, such fluids can also develop high Reynolds number turbulence made of vortices and which structure is affected by the anisotropy induced by the gravity. The presence of either sort of turbulence improves the mixing efficiency of the flow that in turn affects the stratification. These issues are of primary importance in the dynamics of the large scale oceanic circulation and the issue of energy and scalar dissipation in oceanography. Part of the WATU project also concerns surface waves in gravity or capillary regimes (including solitonic turbulence) as well as elastic waves in thin plates.



The post-doctoral associate will have to develop experiments and advanced statistical analyses of turbulence forced by waves in stratified water (with or without rotation). Experiments are developed in the CORIOLIS facility (see picture) which is a unique device dedicated to the modeling of geophysical flows. It consists in a 13m diameter, 1m-deep rotating tank equipped with a specific hydraulic scheme to generate arbitrary salt stratification profiles. The scientific issue is to reveal the wave contribution into stratified turbulence by developing a space and time resolved analysis of the turbulent field.



The project being experimental, the applicant must have developed an expertise in experimental fluid dynamics. Experience of the use of PIV will be appreciated. He/She must be familiar with standard statistical data processing (Fourier spectra, correlations, PDF...).

The project is hosted on the Grenoble campus of Saint Martin d'Hères, on the premises of LEGI which is a fluid mechanics laboratory with very diverse research interests and with a strong experimental component. Applicants must contact Nicolas Mordant (nicolas.mordant@univ-grenoble-alpes.fr), phone: +33 (0)4 76 82 50 47 for further information and application.

<http://nicolas.mordant.free.fr>