

# Post-doctoral position in experimental fluids mechanics in LEGI (Grenoble)

## ERC project on Wave Turbulence (PI N. Mordant)



European Research Council  
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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*). Stratified fluids can sustain internal gravity waves. When these waves are nonlinear, they may evolve into a state of wave turbulence characterized by an energy flux in scale that preserves the wave structure. In addition to waves, such fluids can also sustain high Reynolds number turbulence made of vortices. The structure of such turbulence is affected by the anisotropy induced by the gravity. The presence of either sort of turbulence improves the mixing efficiency that in turn affects the stratification. These issues are of practical importance in the dynamics of the oceanic circulation and the issue of energy and scalar dissipation in oceanography. The ERC project WATU is aimed at obtaining a **significant experimental advance in wave turbulence** either at the surface of water or in stratified water. A large part of the project concerns stratified wave turbulence either in a bilayer configuration or the case of continuous stratification. **Experiments are developed in the CORIOLIS facility** (see picture) which is a unique device (fully renewed in 2014) dedicated to stratified and rotating flows to model geophysical flows. It consists in a 13m diameter, 1m-deep pool equipped with a specific hydraulic scheme to generate arbitrary salt stratification profiles. It can rotate at rotation rates up to 6 rpm. The experimental goal is to generate wave turbulence of internal waves and obtain space and time resolved measurements of the turbulent field in 3D to reveal the wave contribution to the turbulent motions. This can be achieved in a similar way as reported by Yarom & Sharon (*Nature Physics* 2014) by using laser scanned PIV. This research is developed in collaboration with P. Augier, A. Campagne and J. Sommeria. The postdoctoral associate will be associated to this experimental effort concerning bilayer stratified flows or turbulence in the continuously stratified fluid.



The project being experimental, the candidate must have developed an expertise in experimental fluid dynamics in particular using the PIV technique. He should be familiar with standard statistical data processing (Fourier spectra, correlations).

The project is hosted on the Grenoble campus of Saint Martin d'Hères, on the premises of LEGI. The position is for one year and can be subsequently renewed. Applicants must contact Nicolas Mordant ([Nicolas.mordant@univ-grenoble-alpes.fr](mailto:Nicolas.mordant@univ-grenoble-alpes.fr), phone: +33 (0)4 76 82 50 47) for further information and application. <http://nicolas.mordant.free.fr>