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Stratified turbulence

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A turbulent flow in which density gradients exist is bound to be subject to a vertical buoyancy force. This buoyancy force interacts with the turbulent flow field and alters the physics of mass, momentum and energy transport. In many situations of practical importance, the density stratification is stable, i.e. light fluid lying on top of heavy fluid, and can be also influenced by additional features, like the presence of a boundary, rotation or even the presence of more than one phase. Examples of such flows can be found in both industrial and geophysical/environmental applications and include heat exchangers, chemical/nuclear reactors and atmospheric/oceanic boundary layers.
Experimental, computational, and theoretical methodologies have provided plenty of data and insights into the complex intertwined phenomena typical of stably stratified turbulence, yet the field remains rich in future challenges. One of the main challenges in this field is the need for accurate numerical and experimental results at large Reynolds and Rayleigh number. In fact, it is far from clear that results obtained by low-Reynolds/Rayleigh-number simulations/experiments can be confidently extrapolated to the scales relevant of real-world phenomena, especially in the oceanic and atmospheric instance. In this context, the capability of carrying out innovative and accurate simulations/experiments will allow for systematic investigation of a broader range of the governing parameters and will certainly help researchers to develop reliably buoyancy-sensitive turbulence closure laws and models.
The aim of the proposed mini symposium is to gather together a group of young researchers in the study of turbulent stratified flows, to discuss the main physical, experimental and computational challenges standing before us, and devise avenues to provide adequate solutions.

Topics of interest include, but are not limited to:

- *Unbounded stably-stratified turbulence*
- *Wall-bounded stably stratified turbulence*
- *Internal gravity waves*
- *Rotating stratified flows*
- *Stratified multiphase flows*
- *Non Oberbeck-Boussinesq effects in stratified turbulence*

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