GEOPHYSICAL TURBULENCE

- Much too short for a comprehensive coverage (a full conference in 1961)

- There is a need for focusing the research to relevant benchmark configurations: geometry, initial conditions, forcing…

•Convection:

Prof. Narashimha focused on moist convective plumes, showed how to reconcile laboratory studies with atmospheric convection (unsteadiness, internal heating)

Prof. Bodenschatz stressed the importance of turbulence for cloud micro-physics.

Prof. Sreenivasan analysed recent data on solar convection (small Pr)

Prof. Spiegel proposed an unexpected but illuminating analogy between hot stars and fluidized beds.

Prof. Doering provided rigorous upper bounds on convective fluxes

Profs. Tatsumi and Cambon advocated the use of two-point closures for turbulence statistics.

Claude Cambon discussed homogeneous turbulence subjected to separate and combined effects of shear, stratification and system rotation.

Nicholas Kevlahan proposed to explain the k-5/3 spectra in the interstellar medium in term of statistics on shocks.

Wouter Bos and Antoine Venaille showed results on local structures (strain, vortices) for 2D and stratified turbulence.

3 questions:

1) Existence of an anisotropic (3D) direct Kolmogoroff cascade (spectrum in $k^{-5/3}$) for stratified turbulence.
Lindborg (2008)

2) Estimate the energy decay in the limit of small Rossby and small Froude (quasi-geostrophic regimes).
Problem of 'missing mixing' in the ocean (Wunsh and Ferrari, 2004)

3) Coherent structures in geophysical context:
extremisation principles for stably stratified fluids,
multiscale organisation of convective plumes.