

# Seminar

Miklós Vincze

Eötvös Loránd University Budapest

## Modeling planetary-scale fluid flows in the laboratory

Wednesday, May 31, 2023

at 15:15 h

ESI, Boltzmann Lecture Hall and online via Zoom meeting

**Abstract:** Certain fundamental processes of the atmosphere and the oceans can be modeled with a surprising accuracy using laboratory-scale rotating experimental setups subject to differential heating or differential rotation, based on the principle of hydrodynamic similarity. Under laboratory conditions it is possible to control the governing physical parameters and disentangle different phenomena that cannot be studied independently in nature. In this talk I intend to summarize our recent and ongoing experimental research in the von Kármán Laboratory of Budapest (Hungary), at the Brandenburg University of Technology (Germany) and in the Geophysical Fluid Dynamics Institute of the Florida State University (USA) tackling a wide range of problems related to Rossby waves (baroclinic instability) and barotropic instabilities in planetary atmospheres and ocean circulation. The projects to be addressed cover the minimalistic modeling of the effects of decreasing meridional temperature contrast on the extreme statistics of temperature fluctuations at the mid-latitudes, the experimental demonstration of the eocene-oligocene transition (yielding the glaciation of Antarctica), the emergence of polygonal vortices due to (barotropic) shear instability in gas giant planets and the conceptual modeling of the atmospheric circulation of a tidally locked exoplanet.

A. Constantin, D. Dritschel, N. Paldor  
Zoom coordinates: <https://univiennea.zoom.us/>

Meeting ID: 663 0694 7737  
Passcode: hkmQPT

May 26, 2023