

## **Early Career Talk**

### **Semi-Discrete Optimal Transport Techniques for the Compressible Semi-Geostrophic Equations**

**Theo Lavier**

The semi-geostrophic equations for a compressible fluid, first analyzed by Cullen and Maroofi [2003], provide a simplified model of the formation and evolution of atmospheric fronts. I will discuss the use of semi-discrete optimal transport theory to rigorously prove the existence of global-in-time weak solutions as the limit of spatially discrete approximations. This constructive proof of the existence of weak solutions directly extends the work of Bourne et al. [2022] from the incompressible to the compressible setting.

This is joint work with David Bourne, Charlie Egan and Beatrice Pelloni.