

Weekly CEAFM Seminar: Spring 2017



JOHNS HOPKINS
Center for Environmental
& Applied Fluid Mechanics

Date: **Friday, February 10, 2017**
Time: 11:00 AM
Location: Gilman Hall # 132
Speaker: **Dr. Daniel Lecoanet** (Princeton University)
Title: ***"The Turbulent Diffusivity of Convective Overshoot"***

Abstract

There are many natural systems with convectively unstable fluid adjacent to stably stratified fluid; including the Earth's atmosphere, most stars, and perhaps even the Earth's liquid core. The convective motions penetrating into the stable region can enhance mixing, leading to changes in transport within the stable region. In this talk, I will present convective overshoot simulations, in which I quantitatively measure the extra mixing due to overshoot. This extra mixing can be accurately modeled as a turbulent diffusivity. I will then apply the turbulent diffusivity measurements to the astrophysical problem of mixing in convectively bounded carbon flames.

Bio

Daniel Lecoanet is a postdoc at the Princeton Center for Theoretical Science and the Princeton Department of Astrophysical Sciences. He received his PhD in physics from UC-Berkeley after completing Part III of the Maths Tripos at University of Cambridge. Daniel is broadly interested in geophysical and astrophysical fluid dynamics. His research focuses on developing reduced models for complicated (often turbulent) systems, with the goal of developing physical intuition. Daniel is a core developer for the Dedalus code (dedalus-project.org), which is an open-source, highly flexible, spectral PDE-solver, written in Python.