

Olivier Pauluis (NYU) will be the speaker of next week's GEO/AOS/PEI Climate Seminar this coming Monday ...

**Monday, February 25, 2019, 4pm-5pm; Guyot 220.**

**"Hurricanes as Heat Engines"**

**Olivier Pauluis, Courant Institute of Mathematical Sciences, NYU**

**Abstract:** Hurricanes act as heat engines that produce kinetic energy by transporting energy from the warm surface to the colder troposphere. The efficiency of this engine is reduced by the hydrological cycle, however, due to both the mechanical work required to lift water as well as to moist entropy considerations.

Here we develop a new approach to extract thermodynamic cycles from numerical simulations. Applied to hurricanes, this approach shows that convection in the outer rainbands is inefficient at producing kinetic energy, whereas the deep circulation associated with the eyewall is quite efficient, producing about 70% as much kinetic energy as a comparable Carnot cycle. Thus hurricanes are characterized by a high generation of kinetic energy that differs significantly from that found in atmospheric convection.

Light refreshments will be served.