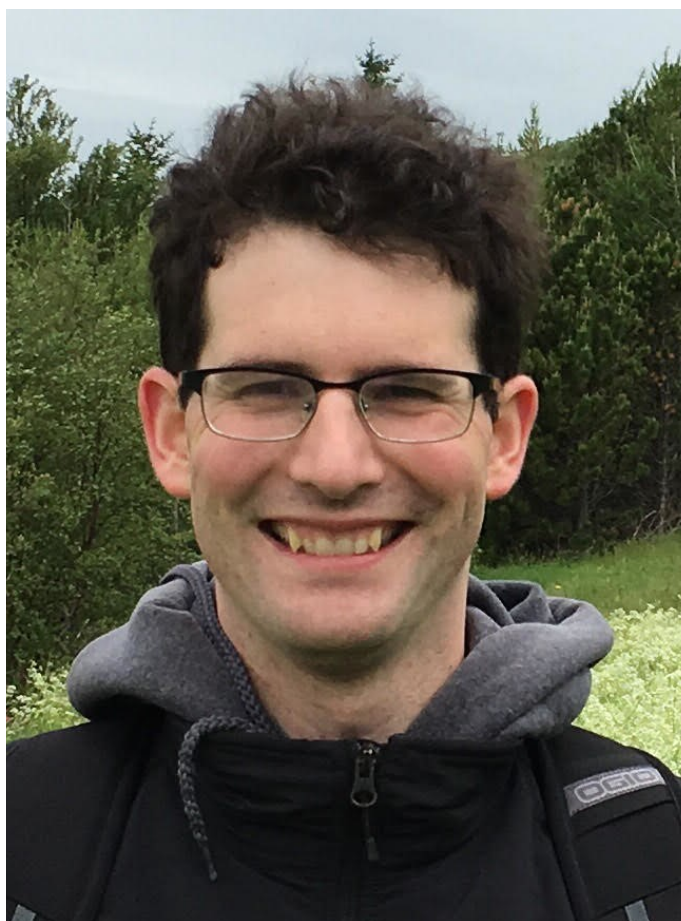


PHYSICS & ENVIRONMENTAL STUDIES COLLOQUIUM

# The frontiers of air pollution research using observations from space

Atmospheric trace gases, such as ozone, CO<sub>2</sub>, and methane, have significant impacts on human health and the climate; these are the three most important greenhouse gases from human activities, and ground level ozone is the most prevalent air pollutant in the United States. Despite their importance societally and scientifically, the precise abundances, sources, and effects of these trace gases on the Earth system remain uncertain.

Observation from space is an increasingly powerful tool for measuring the concentrations of these gases. I will explain the physics that enables satellite measurements of trace gases and describe current efforts to improve the observations. Satellite observations are used to investigate the Earth system, human activities, and their interactions; I will show examples ranging from exploring the physics and air quality impacts of forest fires to studying the current economic turmoil in Venezuela. The launching of future geostationary satellite instruments represents a transformative development for observing air pollution from space. I will present an overview of these missions as well as policy-relevant and science applications of future measurements.



**Wednesday, March 15**  
**3:10-4:10 p.m.**  
**RNS 210**

**Cookies and Apple Cider Served!**

## **Peter Zoogman**

---

Peter Zoogman is a postdoctoral fellow at the Harvard-Smithsonian Center for Astrophysics with a research focus on air pollution and climate change. He received his Doctorate in Earth and Planetary Sciences and his Masters in Physics from Harvard University. Peter has been deeply involved in the design and development of an upcoming NASA satellite mission and his research both guides and is guided by environmental policy and planning for governmental agencies worldwide.