

# Environmental Engineering Seminar

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*The Astani Department of Civil & Environmental Engineering presents*



**Prof. Jesse Kroll**  
**School of Civil & Environmental Engineering**  
**School of Chemical Engineering**  
**Massachusetts Institute of Technology**

Date: Wed, November 7, 2018

Time: 11:30 – 12:30 pm

Place: RRI 101

## **Low-cost air quality sensors for measuring atmospheric composition and chemistry**

The recent development of air quality sensors that are small, inexpensive, and sensitive has opened up new possibilities in air quality monitoring, measurements of health effects of air pollution, and atmospheric chemistry. However the performance (accuracy, precision, selectivity, and drift) of most such sensors remains poorly characterized, greatly limiting their utility. This talk will cover our recent work on deploying, characterizing, and interpreting data from such sensors, across a range of environments: Boston MA (a relatively clean urban environment), Delhi India (a highly polluted urban environment), and the Island of Hawai'i (a remote environment characterized by emissions from the Kilauea volcano). Key topics will include sensor calibration, challenges and tradeoffs in sensor design and deployment, and the use of sensor data to infer major pollution sources.

### **About the Speaker**

Jesse Kroll is an Associate Professor at MIT's Departments of Civil and Environmental Engineering and Chemical Engineering, and is the Director of MIT's Ralph M. Parsons Laboratory for Environmental Science and Engineering. Before coming to MIT he received his PhD in Chemistry from Harvard University in 2003, and was a postdoc at Caltech and then a Research Scientist at Aerodyne Research, Inc. Jesse's research centers on atmospheric organic chemistry, with a particular focus on secondary organic aerosol, aerosol aging, and the use of new mass spectrometric techniques for measuring atmospheric organics; a more recent focus of his group's research is the use of low-cost sensors to measure gas-phase and particulate pollutants.



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