

## **Air-Microfluidics: Creating Small, Low-cost, Portable Air Quality Sensors**

Igor Paprotny, Ben Gould, Omid Mahdavi pour, Dorsa Fahimi, Paul A. Solomon, Richard White,  
and Lara Gundel

Air-microfluidics shows great promise in dramatically reducing the size, cost, and power requirements of future air quality sensors without compromising their accuracy. Microfabrication provides a suite of relatively new tools for the development of micro electro mechanical systems (MEMS) that can be used to reduce the size of conventional instruments by orders of magnitude, enabling a new suite of highly portable (potentially wearable) air quality instruments. In this presentation we provide a comprehensive overview of this technology, describing the benefits, challenges, and limitations related to building air-microfluidic circuits with particle-laden air as the working fluid. These results build on the continuing research of the Air-Microfluidic Group, a research consortium between University of Illinois at Chicago, Lawrence Berkeley National Laboratory, University of California Berkeley, and the U.S. Environmental Protection Agency. Challenges such as data validity and scalability will be addressed in the context of emerging citizen science initiatives.