

# SEMINAR

## **A Tale of Two (plus) Cities: Production, Sources, and Associated Deaths from Urban Secondary Organic Aerosol**

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Organic aerosol (OA) is an important constituent of urban submicron aerosol around the world and one of the causes of poor air quality and premature mortality. However, OA sources and production, especially for urban secondary OA (urban SOA), remains poorly understood. In this talk, I will first present results from a recent campaign, the NASA/NIER Korean-United States Air Quality (KORUS-AQ) study, to probe the sources and production of urban SOA. The results indicate that the urban SOA production is higher and more rapid over Seoul than compared to other megacities. I find that the observed urban SOA was photochemically produced, and mainly due to local emissions of volatile organic compounds (VOCs) and subsequent rapid production, rather than being transported from distant sources. I then will place the recent Seoul results into the context of prior observations in numerous other megacities around the world. I find that the variability in urban SOA production across megacities is highly correlated with the emission ratio reactivity of VOCs. This observation provides important constraints on the urban SOA production and sources. With this constraint, I used the GEOS-Chem model and the methods of the Global Burden of Disease studies to estimate the premature deaths per year associated with urban SOA specifically. I find that urban SOA leads to approximately ~400,000 deaths per year, or ~12% of total deaths from all aerosols per year.

**Monday, September 17, 2018, 3:30 p.m**

Refreshments 3:15 p.m

NCAR Foothills Laboratory

3450 Mitchell Lane, Boulder, CO 80301

FL2-1001, small seminar room

Live webcast: <http://ucarconnect.ucar.edu/live>

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