

# Seminar Series 2013-2014

Southern Ontario Centre for Atmospheric Aerosol Research  
University of Toronto

## Aerosol Acidity: Observations and Impacts



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Aerosol acidity is important because it influences gas-particle partitioning and particle chemistry, as well as the impact of particles in terms of human and ecosystem health. Two different metrics may be applicable in different situations: 1) strong acidity, which represents the sum of  $\text{H}^+$  and  $\text{HSO}_4^-$  concentrations in particles per unit volume of air, and 2) aerosol pH, which represents the activity of the  $\text{H}^+$  ion in aerosol liquid water. While strong acidity can be calculated directly based on the difference between measured anions and cations, estimates of aerosol pH require thermodynamic modelling calculations. Furthermore, as aerosol strong acidity approaches zero, estimates of pH become highly uncertain. In this seminar, I will present estimates of aerosol acidity made using online Ambient Ion Monitor Ion Chromatograph and Aerosol Mass Spectrometer instruments, and demonstrate why simultaneous measurements of gas phase ammonia and/or nitric acid are crucial for constraining pH estimates. I will also present an analysis of spatial and temporal trends in aerosol acidity using 20 years of particulate data from eight geographically diverse sites in the Canadian Air and Precipitation Monitoring Network (CAPMoN). Finally, I will show some examples of how aerosol acidity can affect gas-particle partitioning of ionisable compounds such as amines and perfluorinated acids.

**December 4, 2013, 3 - 4 pm**

**Wallberg Building, 200 College Street, Room 407**

