The Ninth Annual Harold I. Schiff Lecture
Faculty of Pure and Applied Science

Presented by:

Dr. Leonard A. Barrie

Senior Research Scientist in Atmospheric Chemistry and Meteorology, Atmospheric Environment Service
Adjunct Professor, Chemistry Department and Centre for Atmospheric Chemistry, York University

on:

Aerosols and Atmospheric Chemistry

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Abstract: Aerosols play a key role in the biogeochemical cycles and impacts of many atmospheric pollutants. Climate change, atmospheric toxics, stratospheric and tropospheric ozone depletion, acid rain, urban/regional oxidants, visibility and health effects are some of the issues in which they are involved. Aerosols originate from both natural and anthropogenic sources. They have residence times in the troposphere of days to several weeks and in the stratosphere of years. Natural aerosol types include sea salt, soil dust, biomass burning, terrestrial and marine biogenic and volcanoes. Anthropogenic aerosol types include sulphates, black carbon (soot), organics, human-induced biomass burning and human-induced wind blown dust. In this presentation, chemical and physical characteristics of aerosols peculiar to these aerosol types and relevant to their role in these issues will be discussed. Multiple benefits of modelling, monitoring and processes research on aerosols will be explored. For instance, has knowledge gained about aerosols in acid rain research helped us to better understand impacts of aerosols on visibility, climate or ozone depletion? These linkages are extremely important to recognize formulating scientific research strategy. Various initiatives and expertise in Canada that are available to address these problems will be highlighted. For example, these include, (i) an effort to include aerosols as active constituents in a Northern Aerosols Regional Climate Model (NARCM) and ultimately in the Canadian General Circulation Model; (ii) studies of the role of aerosols in health effects; (iii) aircraft studies of the impact of aerosols on cloud microphysical properties; (iv) the role of aerosols in the movement of toxic substances; and (v) investigations of the importance of aerosols as products and hosts of chemical reactions that deplete polar ozone. A few examples of the implication to multiple issues of a single-issue aerosol pollution control action are given.

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For further information please contact Carol Weldon, 736-5410 or cac@yorku.ca