

# Air Quality over East Asia: Trends and Broader Impacts



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**4:30 p.m.**



**Conference Room, 3/F,  
Mong Man Wai Building**



**Zoom Link (Mixed-mode)**

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EARTH AND ENVIRONMENTAL  
SCIENCES PROGRAMME

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East Asia is suffering from severe particulate matter (PM) and ozone air pollution problems that threaten public health, affect climate forcing, and deteriorate ecosystems. In the past decade, fine particulate matter ( $PM_{2.5}$ ) in East Asia decreased sharply due to stringent emission control measures; however still far exceeds the World Health Organization (WHO) air quality guideline. Meanwhile, ozone increased significantly, and China has become a global hotspot for surface ozone air pollution. Of the multiple components of  $PM_{2.5}$ , nitrate is the most difficult to cut down and now becomes a principal driver of wintertime haze pollution over North China. There is an urgent need to seek solutions to effective nitrate reduction. Anthropogenic fugitive dust, present as coarse particulate matter ( $PM_C$ ) in the air, constitutes a particle mass comparable to  $PM_{2.5}$ . Its presence and trends can affect  $PM_{2.5}$  nitrate by taking up  $HNO_3$  but the effects need a thorough evaluation. Geostationary satellite remote sensing of aerosols can augment surface monitoring of  $PM_{2.5}$  and provide constraints to aerosol climate forcing but these require a better understanding of aerosol optical properties. Peroxyacetyl nitrate (PAN) is an important reservoir species of nitrogen oxides ( $NO_x$ ) and volatile organic compounds (VOCs), two precursors of ozone. The long-range transport of PAN relates  $NO_x$  and VOCs from Asia to the northern hemisphere's atmospheric oxidative capacity and surface ozone air quality. A recent satellite dataset of daily global PAN provides the first direct monitoring of this process. This talk will start with  $PM_{2.5}$  air quality over East Asia and then extend to the implications of emission changes in Asia to ozone air quality over North America and the well-being of ecosystems as well as carbon cycles.

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