

# RESEARCH SEMINAR

DEPARTMENT OF GEOGRAPHY AND RESOURCE MANAGEMENT  
THE CHINESE UNIVERSITY OF HONG KONG

## Ten-year air quality changes in China and how we study it

5<sup>th</sup> Oct 2023 (Thur)  
4:30 – 6:00 pm (UTC+8)  
Rm 221, Chen Kou Bun  
Building, CUHK

Fine particulate matter (PM<sub>2.5</sub>) and ozone have been causing severe air pollution problems in China. In year 2013, the Chinese government introduced the most stringent ever Clean Air Action to aggressively control anthropogenic emissions. Since then, national observation network shows a dramatic decrease in PM<sub>2.5</sub> but a significant increase in ozone. PM<sub>2.5</sub> is a complex mixture of multiple components, among which nitrate is the most difficult to cut down, due both to moderate decrease of nitrogen oxides (NO<sub>x</sub>) emissions and chemical and physical feedbacks. Ozone over industrialized regions is mainly produced by reactions of nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds (VOCs) in the presence of sunlight. The formation of ozone is highly nonlinear that a moderate decrease of NO<sub>x</sub> emissions and a flattened VOCs emissions can cause an increase in ozone. Meanwhile, changes in PM<sub>2.5</sub> can affect ozone through heterogeneous reactions. This talk will show the air quality changes in China since around 2013 and how we understand it by integrating observations from satellites, aircraft, and surface networks with an atmospheric chemical transport model.

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Shixian is an assistant professor from the Earth and Environmental Sciences Programme at CUHK. Before joining CUHK, she works as a Postdoc at Harvard University. She received her Ph.D. degree in Atmospheric Physics and Atmospheric Environment in 2019, joint educated by NUIST and Harvard University. Shixian has first authored and co-authored 30 peer-reviewed publications in top journals like Nature Geoscience, PNAS, Atmospheric Chemistry and Physics, Geoscientific Model Development, etc. Several of Shixian's first-authored publications have presented innovative achievements, ranking as hot (top 0.1%) or highly cited (top 1%) publications in geoscience.



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