

Wintertime and cold region atmospheric chemistry have important impacts on health, geochemical cycles, and climate. Central to discussions of these topics are aspects that make gas- and multiphase atmospheric science in cold environments unique and complex, including key components such as sea ice, snow, and ice clouds. Processes that occur at low temperatures in the atmosphere and at the ocean–atmosphere interface, including multiphase processes, the formation and processing of aerosol, particle nucleation and growth, trace gas emissions and fluxes, aerosol and pollution transport, and changes of sea ice and snow with time and space are key areas of research in this discussion. Recent results from field campaigns, laboratory experiments, atmospheric modelling, and computational work, have all contributed to this investigation.

This volume brings together world-leading established and early-career scientists working in the disciplines of atmospheric science, physics, chemistry, sea-ice science, meteorology, and oceanography, to discuss the latest research in this area.

In this volume, the topics covered include:

- Multiphase chemistry in aerosol, ice/mixed-phase clouds, and snow
- Role of trace gases in particle and ice nucleation and growth
- Exchange processes through/in snow and sea-ice
- Emissions of trace gases and aerosol and atmospheric mixing/transport

Front cover image:  
Unveiling the influence of molecular arrangement on early-stage heterogeneous ice nucleation in organic aerosols.  
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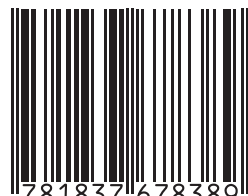
# Faraday Discussions

## Volume: 258

**Faraday Discussions** documents a long-established series of Faraday Discussion meetings which provide a unique international forum for the exchange of views and newly acquired results in developing areas of physical chemistry, biophysical chemistry and chemical physics.

The papers presented are published in the Faraday Discussion volume together with a record of the discussion contributions made at the meeting. Faraday Discussions therefore provide an important record of current international knowledge and views in the field concerned.

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