

## **Aerosols in the atmosphere of the Earth System: air pollution, public health and climate change**

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Aerosols, tiny solid particles or liquid droplets suspended in air, are key elements in the atmosphere of the Earth system, influencing air quality, climate and human health in the Anthropocene. They scatter or absorb sunlight, serve as nuclei for clouds and precipitation, and adversely affect human health. Aerosol formation and evolution involve detailed gas-phase atmospheric chemistry and gas-particle interactions. The interaction of aerosols with atmospheric water, as well as their size and physical properties, are key to much of their behavior. Our research mainly focused on (1) haze chemistry that drives the formation of extreme air pollution, (2) aerosol nano-size effects and phase transition, (3) aerosols' health and climate impact. The overall goal is to obtain a predictive understanding of the origin, fate, and impact of atmospheric aerosols to address the grand challenge of an actionable projection of future climate and environment in the Anthropocene.