

The influence of aerosols on clouds and climate

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Clouds are not only fascinating to watch for their myriad of shapes, but are also scientifically challenging because their formation requires both knowledge about the large-scale meteorological environment as well as knowledge about the details of cloud droplet and ice crystal formation on the micro-scale. The ice phase in cloud remains enigmatic because ice crystal number concentrations can exceed the number concentrations of those aerosol particles acting as centers for ice crystals (so-called ice nucleating particles) by orders of magnitude. To date, measurement devices for ice nucleating particles are rare and custom-made. In this work, I present the significant progress that has been made in the ice nucleation community in identifying which aerosol particles may act as ice nucleating particles as well as on observations of mixed-phase clouds. An additional uncertainty related to clouds is that it is not yet clear how clouds change in a warmer climate. In this lecture, I'll also discuss how different assumptions of mixed-phase clouds in the present-day climate influence future climate change.