

Clouds, Climate and Weather

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Clouds are fundamental to climate and climate change, and a large body of research has studied the cloud impact on top-of-atmosphere radiative fluxes and hence climate sensitivity. But there is more to clouds than climate sensitivity. In this talk I will focus on how cloud-radiative heating of the atmosphere shapes the midlatitude jet streams and storm tracks and their response to surface warming. I will in particular highlight the role of high-level ice clouds in shifting the jet streams poleward and in supporting regional circulation changes such as the downstream extension of the wintertime North Atlantic jet. I will further argue that the impact of atmospheric cloud-radiative heating is not limited to climate time scales. To this end I will present ongoing work that indicates competing effects of low-level and high-level cloud-radiative heating on the dynamics of idealized midlatitude cyclones.

References:

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