TEXAS TECH UNIVERSITY
National Wind Institute™

Wednesday, October 25th
3:30 p.m.
Experimental Sciences Building, Rm. 120

WiSE Wednesday Lecture Series Presents:

Mixed-phase Convective Clouds in the Arctic Marine Boundary Layer

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ABSTRACT:
Boundary-layer convection (BLC) commonly develops where cold air is advected over relatively warm water. Such convection falls within the 1-10 km resolution "grey zone", and assumes a spectrum of scales, from fine linear features just off the land/ice edge to wider/deeper cloud streets and eventually open cells. BLC occurs rather frequently in autumn along the North Slope of Alaska (NSA), as cold air from ice-covered Arctic is advected over open coastal waters north of Alaska. For more than a decade the U.S. Atmospheric Radiation Measurement (ARM) program has been operating a rich array of profiling and scanning radars, lidars and other sensors at the NSA, to document the vertical structure of the lower troposphere, as well as clouds and precipitation.

This presentation first summarizes observations of a BLC episode at the ARM NSA site, including the mesoscale organization of precipitation, BL structure, and mean profiles and distributions of vertical air velocity, cloud liquid water and ice. Next, these data are used to validate a high resolution (<1 km) Weather Research and Forecasting (WRF) simulation with parameterized BL processes but resolved convection. This WRF simulation is used in turn to evaluate how well shallow convection parameterizations represent BL structure, clouds and precipitation in coarser resolution simulations, and to assess to what extent these schemes are scale-aware.

BIOGRAPHY:
Dr. Yonggang Wang is a Research Assistant Professor of Atmospheric Science in the Department of Geosciences at Texas Tech University. Dr. Wang received his Ph.D. in Atmospheric Sciences from the University of Wyoming in 2012. His research interests focus broadly on the area of boundary layer clouds, cumulus convection, and regional climate modeling. Specifically, he has used the tools of remote sensing and numerical weather prediction models to examine boundary-layer convection and precipitation in the Arctic region, entrainment processes in cumulus clouds, and regional impacts of climate change on precipitation and snowpack patterns.