ATS/CIRA Colloquium

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The University of Kansas

Radar Instrumentation for Remote Sensing of Ice, Snow, and Soil Moisture

Hosted by David Randall

Friday, April 1, 2016

ATS room 101; Discussion will begin at 11:15am
Refreshments will be served at 10:45am in the weather lab

We developed radar instrumentation operating over a frequency range extending from approximately 14 MHz to 36 GHz for operation on long- and short-range aircraft and Uninhabited Aircraft Systems (UASs). We developed our existing radar instrumentation primarily to sound ice and image the ice-bed interface, map near-surface internal layers in polar firn and ice, measure the thickness of snow cover over sea ice, map near-surface internal layers in polar firn with fine resolution of about 3 cm), and measure surface elevation with high precision. We have used these radars to collect data with NASA Operation IceBridge (OIB) and through CReSIS field activities over the Antarctic and Greenland ice sheets, as well as over Arctic and Antarctic sea ice.

I will discuss the scientific and technical requirements for developing radars for remote sensing of ice, snow, and soil moisture. I will show results from low- and high-altitude flights over the Antarctic and Greenland ice sheets, as well as results from flights over snow-covered sea ice and land and polar firn. Finally, I will discuss technical advances in Radio Frequency (RF) and microwave, antenna, and signal-processing technologies, including our recent work on the development of ultra-wideband radars for measurements of ice, snow, and soil moisture. I will also discuss a few concepts for radars able to measure rain rate from geostationary satellites and fine resolution radars capable of characterizing clouds and aerosols from small satellites.

Link to colloquium videos and announcement page: http://www.atmos.colostate.edu/dept/colloquia.php