

ATS/CIRA Colloquium

Dr. Michael M. Bell

Assistant Professor, University of Hawai'i at Mānoa

**New Insights into Tropical Clouds and Hurricanes using
Polarimetric Radar**

Hosted by Jeff Collett

Monday, March 7, 2016

**ATS room 101; Discussion will begin at 3:30 pm
Refreshments will be served at 3:00 pm in the weather lab**

Recent upgrades to the U.S. operational radar network now allow for polarimetric measurements of tropical convection and cyclones near Hawaii and the U.S. coast, providing new opportunities for studying these weather phenomena. In addition to the operational radar observations, a Doppler on Wheels mobile polarimetric radar was deployed to Oahu from 22 October to 13 November 2013 as part of the Hawaiian Educational Radar Opportunity (HERO). The project was the first dual-polarization field experiment performed on the island of Oahu, and one of the few research radar deployments in Hawaii. Though the primary purpose of HERO was educational, it provided a unique opportunity to observe clouds and convection on Oahu at very high spatial and temporal resolution.

This talk will present recent research using these observations to improve our understanding of microphysical and mesoscale processes and improve forecasts of tropical weather systems. Highlights from the 2013 HERO project will be presented, along with radar observations from 2014 in Hurricanes Arthur and Ana. Simulations of these hurricanes with the Weather Research and Forecasting model were tested using six different microphysics schemes to compare with the observations. All the simulations were able to capture the major features of both hurricanes, including accurate tracks, asymmetric distributions of precipitation, and the approximate intensity of the storms. However, most of the schemes produced a higher frequency of larger raindrops than observed and a high bias in the simulated intensity. The results show a strong relationship between the simulated rainfall and wind intensity, suggesting that improvements in cloud physical parameterizations will lead to better hurricane forecasts.

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