

***\*\*Please note special time and date\*\****

**ATS/CIRA Colloquium**

**Robert M. Rauber**

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**Generating cells and elevated convection in winter storms –  
results from the Profiling of Winter Storms Experiment**

**Hosted by Jeff Collett**

**Thursday, April 23, 2015**

**ATS room 101; Discussion will begin at 2:30 pm  
Refreshments will be served at 2:00 pm in the weather lab**

In the 1950s, pioneering scientists used the new technology of vertically pointing radar to discover that the warm frontal and occluded sectors of winter cyclones were commonly topped by convective “generating cells” that produced snow streamers that merged and were organized by shear to produce linear bands. Although studies further explored these ideas in the subsequent decades, the concept of generating cells as the mechanism creating organized winter storm mesostructures was largely abandoned as the new concept of moist symmetric instability gained favor and scanning radar systems replaced vertically pointing radars in cyclone research. In this talk, we revisit the concepts first espoused in the 1950s using new, ultra-high resolution (15 m) W-Band radar measurements obtained during flights of the NSF/NCAR C-130 across the occluded region of continental winter cyclones during the 2009-10 Profiling of Winter Storms (PLOWs) field campaign. I will show that cloud top instability is ubiquitous in winter cyclones, even at altitudes near the tropopause, and that this instability generates the snow that is organized in the lower altitudes into linear features. I will further show that elevated deep convection, driven by the release of potential instability, is common on the warm side of the comma head within the northwest cyclone quadrant and is responsible for occasional observations of “thundersnow”. Finally, I will demonstrate that these circulations are largely invisible to the current WSR-88D network using its standard scanning procedures.

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