*****Please note this colloquium starts at 3:00pm*****

ATS/CIRA Colloquium

Christopher Davis

Visiting ATS from NCAR

Hurricanes from Scratch

Hosted by Wayne Schubert and Russ Schumacher

Friday, February 20, 2015

ATS room 101; Discussion will begin at 3:00pm
Refreshments will be served at 2:30pm in the weather lab

The upscale aggregation of convection is used to understand the emergence of rotating, coherent mid-tropospheric structures and the subsequent process of tropical cyclone formation. The CM1 model is integrated on an f-plane with uniform SST and prescribed uniform background flow. Moist cyclonic vortices form, merge, and eventually result in a single dominant vortex that subsequently forms a tropical cyclone. Consistent with previous studies, the approach to saturation within the mid-tropospheric vortex accelerates the genesis process. A novel result is that, while updrafts do not intensify prior to genesis, downdrafts do. Stronger downdrafts produce cold pools that maximize their negative buoyancy about one day prior to genesis. Shear-cold-pool dynamics promote organization of lower-tropospheric updrafts that spin up the surface vortex. It is inferred that the observed inconsistency between convective intensity and thermodynamic stabilization prior to genesis results from sampling limitations of the observations wherein the important cold pool gradients are unresolved.

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