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**Visiting ATS from NCAR, Boulder, Colorado**

**Intensification of Hurricane Sandy (2012) through  
Extratropical Warm Core Seclusion**

**Hosted by Russ Schumacher**

**Friday, December 6, 2013**

**ATS room 101; Discussion will begin at 11:15am**

**Refreshments will be served at 10:45am in the weather lab**

Hurricane Sandy's landfall along the New Jersey shoreline at 2330 UTC 29 October 2012 produced a catastrophic storm surge stretching from New Jersey to Rhode Island that contributed to damage in excess of \$50 billion – the sixth costliest U.S. tropical cyclone on record since 1900 – and directly caused 72 fatalities. Hurricane Sandy's life cycle was marked by two upper-level trough interactions while it moved northward over the western North Atlantic on 26–29 October. During the second trough interaction on 29 October, Sandy turned northwestward and intensified as cold continental air encircled the warm core vortex and Sandy acquired characteristics of a warm seclusion. The aim of this presentation is to determine the dynamical processes that contributed to Sandy's secondary peak in intensity during its warm seclusion phase using high-resolution numerical simulations.

The modeling results show that intensification occurred in response to shallow low-level convergence below 850 hPa that was consistent with the Sawyer-Eliassen solution for the secondary circulation that accompanied the increased baroclinicity in the radial direction. Additionally, cyclonic vertical vorticity generated by tilting of horizontal vorticity along an axis of frontogenesis northwest of Sandy was axisymmetrized. The axis of frontogenesis was anchored to the Gulf Stream in a region of near-surface differential diabatic heating. The unusual northwestward track of Sandy allowed the cyclonic vorticity over the Gulf Stream to form ahead of the main vortex and be readily axisymmetrized. The underlying dynamics driving intensification were non-tropical in origin, and supported the reclassification of Sandy as extratropical prior to landfall.

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