

# *The RAP Seminar Series*



## NCAR

## **Boundary-layer Turbulence in Atmospheric Models - Exposing Models to Observations**

by

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Foothills Lab, Building 2, Auditorium Room 1022,  
3:00 p.m.*

In this presentation, results from three model intercomparison projects will be discussed with a focus on boundary layer performance. The results are from ARCMIP - Arctic Regional Climate Model Intercomparison Project - and from the first and second studies within GABLS - GEWEX Atmospheric Boundary Layer Study. In each of these projects a number of models participated and the results are compared either with observational data or LES results. The ARCMIP study is three-dimensional with as realistic as possible forcing and the intercomparison is performed for an entire year, using data from the SHEBA - Surface Heat Budget of the Arctic Ocean - experiment. The GABLS experiments are performed with single-column models using more idealized forcing. The first experiment focussed on the stably stratified regime and the second on the diurnal cycle - this case was set up with data from the CASES99 - Cooperative Atmosphere-Surface Exchange Study-1999. The major conclusions for the ARCMIP study are that the mean variables as temperature and wind-speed are relatively well simulated by the models but that the heat fluxes are very poorly simulated. The first GABLS study revealed that there are large differences in how the boundary-layer parameterisations handle the stably stratified regime with a large difference between operational weather-forecast models and research models especially in terms of boundary-layer height, wind speed and direction. The second GABLS study show that the diurnal cycle in most parameters are underestimated compared with the observations and there are large variations among the single-column models.