



Physikalisches Kolloquium

David Parsons, National Center for Atmospheric Research, USA

**»The Scientific Challenges Associated with
Improving Predictions of High Impact Weather –
The Motivation for a Global Atmospheric Research Program«**

Einführung: S. Jones

Informal discussions with scientists outside of the field of atmospheric research have led me to believe that they hold a very diverse opinion of weather prediction and research. One extreme viewpoint is that weather prediction is an ill-posed and unsolvable problem, since the atmosphere is a chaotic, complex and therefore a largely unpredictable fluid. The other extreme viewpoint is that few challenges remain in weather research, since predictions today are good enough. This presentation will begin by examining the trends in the accuracy of the numerical simulations that are utilized as the foundation for weather prediction. These trends show that while weather prediction has improved substantially over the past several decades, forecast skill is still lacking for many of the events that have the highest impacts of society (e.g., hurricanes and tropical cyclones, floods, severe winter storms, etc.) The need to advance the simulation and prediction of these high impact events leads to several fundamental and unsolved research challenges. The bulk of the seminar will address these research challenges that include issues such as i) The extent to which organized deep convection in the atmosphere is predictable and how well do we treat deep convection in numerical models? ii) Can the global observing system be adaptive so that we can predict exactly where, when and what types of measurements are needed to improve the forecast of a specific event?; iii) Why hasn't the satellite remote sensing revolution benefited prediction as much as was hypothesized?; iv) What are the global-to-regional dynamics that control the frequency, location and intensity of these high impact events? These and other research questions together with society's need for improved prediction, have led to an international ten-year research program within the World Meteorological Program called THORPEX (THE Observing System Research and Predictability Experiment) designed to improve forecast skill. THORPEX is considered by many to be the 2nd Global Atmospheric Research Experiment. The seminar will conclude with the priorities and plans of the THORPEX effort.

Freitag, 03.11.2006, 17 Uhr c.t.,

**Universität Karlsruhe (TH), Otto-Lehmann-Hörsaal, Physik-Flachbau (Geb. 30.22).
Anschließend Nachsitzung im Gastdozentenhaus „Heinrich Hertz“**