



Institute for Pure and Applied Mathematics
University of California, Los Angeles
presents a program in

Mathematical Issues and Challenges in Data Assimilation for Geophysical Systems: Interdisciplinary Perspectives

February 22 - 26, 2005

Members of the organizing committee are **Christopher K.R.T. Jones**, Chair (University of North Carolina at Chapel Hill), **Kayo Ide** (UCLA), **Robert N. Miller** (Oregon State University) and **Douglas Nychka** (National Center for Atmospheric Research)



Scientific Overview:

The problem of *assimilating data* into a geophysical system related to the atmosphere and oceans is both fundamental in that it aims at the estimation and prediction of an unknown, true state and challenging as it does not naturally afford a clean solution. It has two equally important elements: observations and computational models. Observations measured by instruments provide direct information of the true state, whether they are taken in situ or by remote sensing. Such observations are heterogeneous, inhomogeneous in space, irregular in time, and subject to differing accuracies. In contrast, computational models use knowledge of underlying physics and dynamics to provide a complete description of state evolution in time. Models are also far from perfect: due to model error, uncertainty in the initial conditions and computational limitations, model evolution cannot accurately generate the true state.

The issue of assimilating data into models arises in all scientific areas that enjoy a profusion of data. In its broadest sense, it is the subject that arises at the meeting point of data and models. Technology has driven the advances on both sides of the equation: new techniques of measurement have led to an enormous surge in the amount of available data and ever faster computers have given us the capability of new levels of computational modeling. The development of effective data assimilation methods must now be viewed as one of the fundamental challenges in scientific prediction. The two explicit goals of this workshop will be: 1) introduce data assimilation to mathematicians and scientists who work in related areas but are not currently involved in data assimilation; 2) outline future directions for mathematical and statistical developments of data assimilation techniques. These goals will be achieved by complementing technical and overview presentations by "brainstorming sessions" in which mathematicians and geophysicists will be brought together in groups to define the big issues and the possible directions that might resolve them. Sessions will be organized by themes and a panel discussion will be held.

Participation:

The program is open to the entire mathematical and scientific communities. Please visit our website for more information, including an online registration form and an application for support at: <http://www.ipam.ucla.edu/programs/da2005>. Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM's mission and we welcome their applications.

Please visit our website at

<http://www.ipam.ucla.edu/programs/da2005>

or email questions to da2005@ipam.ucla.edu