



Collaborative Graduate Specialization in Computational Science and Engineering

WEEKLY COLLOQUIUM

Tuesday, 14 November 2006

2:30-3:30 in Goodes 303

Speaker: GILBERT BRUNET
Research Director, Meteorological Research Division
Science and Technology Branch, Environment Canada

Title: Numerical Weather Prediction R&D in Canada: past, present and future

Abstract: We will present an historical overview of Canadian Numerical Weather Prediction through the 20th century, including its today status and future. Numerical Weather Prediction (NWP) systems are optimally developed to exploit high performance computers to solve the atmospheric initial condition and boundary problem that was formulated first by Bjerknes (1904) and solved numerically for the first time by Charney, Fjörtoft et von Neumann (1950). The accuracy of initial conditions is crucial for the first two weeks of a weather forecast, but also the physics parameterization of sub-grid scale processes. The numerical weather forecast modeler needs to make physics and numerical approximations (cloud, precipitations, mountains, etc.) due to the limited computer resources. We will discuss the different numerical and physics parameterization strategies used with the Environment of Canada model GEM with emphasis on urban weather forecast applications and high impact weather, like hurricanes.

About the speaker:

Dr. G. Brunet is head of the Meteorological Research Division (MRD), Environment Canada. MRD is responsible for the R&D of the modelling component of the Numerical Weather Prediction (NWP) System for the Canadian Meteorology Center and the Regional Meteorological Centers of Environment Canada (EC). MRD's science activities cover a wide range of numerical applications from high impact weather forecasting, from minutes to seasons, using high performance computers and land-based, marine-based data, aerological data and remotely sensed data from satellites. An increasing array of environmental prediction products, whether it is in forecasting real time flooding events, wind energy, drought periods, dryness index, or air/water quality impacts for municipalities and ecosystems in general are based on MRD R&D.

Dr. Brunet is Adjunct Professor at the Department of Atmospheric and Oceanic Sciences, McGill U., and at the "Département des Sciences de la Terre et de l'Atmosphère", UQÀM. He is established as an expert in dynamical meteorology since his work at the Department of Applied Mathematics and Theoretical Physics (Cambridge U., UK) and Laboratoire de Météorologie Dynamique (École Normale Supérieure, Paris). On top of his duty as head of MRD, he supervises doctoral students and post-doctoral fellows. His work covers analytical and empirical studies of wave processes in hurricanes to planetary scales, and numerical weather prediction from minutes to seasons.