Workshop II: Numerical Hierarchies for Climate Modeling

Monday April 12, 2010

8:00–9:00 *Check-In/Light Breakfast (Hosted by IPAM)*

9:00–9:50 **Akio Arakawa** (University of California, Los Angeles (UCLA))
TOWARD UNIFICATION OF GENERAL CIRCULATION AND CLOUD-RESOLVING MODELS

10:00–10:15 *Break*

10:15–11:05 **Dale Durran** (University of Washington)
Physically Motivated Soundproof Equations for Compressible Stratified Flow

11:15–11:30 *Break*

11:30–12:20 **Almut Gassmann** (Max-Planck-Institut für Meteorologie)
Hamiltonian tools applied to nonhydrostatic modeling

12:30–2:30 *Lunch (on your own)*

2:30–3:20 **Nigel Wood** (Meteorological Office)
A hierarchy of models, from planetary to mesoscale, within a single switchable numerical framework

3:30–4:00 *Break*

4:00–4:50 **David Williamson** (National Center for Atmospheric Research)
EVALUATION OF DYNAMICAL CORES INTENDED FOR GLOBAL ATMOSPHERIC CLIMATE MODELS

5:00–6:30 *Poster Session & Reception (Hosted by IPAM)*

Tuesday April 13, 2010

8:00–9:00 *Continental Breakfast*

9:00–9:50 **Jason Frank** (CWI (Center for Mathematics and Computer Science))
Thermostat closures for inviscid fluid models

10:00–10:15 *Break*

10:15–11:05 **Boualem Khouider** (University of Victoria)
Bad numerics or bad models?

11:15–11:30 *Break*

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11:30–12:20 **Peter Spichtinger** (ETH Zürich)
Modelling of cirrus clouds - status, problems and new concepts

12:30–2:30 *Lunch (on your own)*

2:30–3:20 **John Thuburn** (University of Exeter)
Enstrophy and energy cascades in numerical models

3:30–4:00 *Break*

4:00–4:50 **Sebastian Reich** (Universität Potsdam)
A (fairy?) tale of three strands in numerical analysis and their relevance to GFD

Wednesday April 14, 2010

8:00–9:00 *Continental Breakfast*

9:00–9:50 **Luca Bonaventura** (Politecnico di Milano)
PERSPECTIVES FOR EXPONENTIAL INTEGRATORS IN APPLICATIONS TO GEOPHYSICAL SCALE DYNAMICS

10:00–10:15 *Break*

10:15–11:05 **Rupert Klein** (Freie Universität Berlin)
Sound-proof for small scales, compressible for large scales via scale-dependent time integration

11:15–11:30 *Break*

11:30–12:20 **Matthew Piggott** (Imperial College)
Modelling ocean dynamics with anisotropic adaptive mesh methods

12:30–2:30 *Lunch (on your own)*

2:30–3:20 **Todd Ringler** (Los Alamos National Laboratory)
Exploring a Multi-Resolution Approach within the Shallow-Water System

3:30–4:00 *Break*

4:00–4:50 **William Skamarock** (National Center for Atmospheric Research)
Variable-Resolution Solvers for Multi-Scale Atmospheric Simulation

Thursday April 15, 2010

8:00–9:00 *Continental Breakfast*

9:00–9:50 **Francis Giraldo** (Naval Postgraduate School)

10:00–10:15 *Break*

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10:15–11:05 **Mark Taylor** (Sandia National Laboratories)
CAM-HOMME: A locally conservative, mimetic finite element methods for the moist atmospheric primitive equations in NCAR's Community Atmospheric Model

11:15–11:30 *Break*

11:30–12:20 **Alistair Adcroft** (Princeton University)
The piecewise quartic method (PQM), steps towards accurate general coordinate ocean models, and the spurious diffusion problem.

12:30–2:00 *Lunch (on your own)*

2:00–2:50 **Vincent Legat** (Université Catholique de Louvain)
Multiscale marine numerical and mathematical modeling with high- order discontinuous finite elements : how to gain several orders of magnitude in speedup

3:00–3:15 *Break*

3:15–4:05 **Peter Lauritzen** (National Center for Atmospheric Research (NCAR))
A geometrically flexible conservative semi-Lagrangian scheme for multi-tracer transport

4:15–4:30 *Break*

4:30–5:20 **Patrick Haertel** (Yale University)
Lagrangian Modeling of Oceans and Atmospheres

Friday April 16, 2010

8:00–9:00 *Continental Breakfast*

9:00–9:50 **Piotr Smolarkiewicz** (National Center for Atmospheric Research (NCAR))
MODELING ATMOSPHERIC CIRCULATIONS WITH HIGH-RESOLUTION METHODS

10:00–10:15 *Break*

10:15–11:05 **Jörn Behrens** (University of Hamburg)
Efficient adaptive methods for multi-scale geophysical applications

11:15–11:30 *Break*

11:30–12:20 **Christiane Jablonowski** (University of Michigan)
An analysis of Finite-Volume schemes: High-order Methods and Grid Reflections on Adaptive Grids

12:30–2:30 *Lunch (on your own)*

2:30–3:20 **Robert Walko** (University of Miami)
Representing Diverse Scales in OLAM - Advantages and Challenges of Locally-Refined Unstructured Grids

3:30–4:00 *Break*

4:00–4:50 **Amik St-Cyr** (National Center for Atmospheric Research (NCAR))
(MUSE) A Multiscale Unified Simulation Environment