

Model Hierarchies Workshop

2-4 November 2016

Princeton University, New Jersey, USA

CALL
FOR
PAPERS

Venue

The Modeling Hierarchies Workshop will be held on the campus of Princeton University, New Jersey, USA. The meeting will run from 13:00, 2 November 2016 to 12:00, 4 November 2016. This meeting is held in conjunction with WGCM-20, which runs from 31 October to 2 November 2016.

Committee

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Sponsors

The Modeling Hierarchies Workshop is sponsored by the World Climate Research Programme under the auspices of the WCRP Grand Challenge on Clouds, Circulation and Climate Sensitivity and the Working Group on Coupled Models. Princeton University is kindly providing facilities.



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Background

In "On Exactitude in Science", the Argentinian writer Borges tells the parable of a nation bankrupted by its cartographers, who endeavoured to create a map of the country on the scale of the country itself. It is sometimes argued that builders of Earth System models, which continue to grow in resolution and complexity, somewhat resemble Borges' mapmakers. Models so intricate that their behaviour is as rich and mysterious as the planet's itself, may not advance the science of climate as much as we would like.

Workshop goals

In an influential essay, Isaac Held indicated how we may bridge this "gap between simulation and understanding". We construct hierarchies of models, with a range of complexity: simpler ones that embody a particular mechanism that underlies some aspect of the full Earth system, to comprehensive general circulation models with an interactive carbon cycle. An impressive range of models form the toolkit of Earth System Science: simplified forms of the primitive equations to study rotating fluids, LES models to study turbulence, cloud-resolving models, and so on, up to AOGCMs and ESMs. Similarly there are modeling experiments also forming a hierarchy from highly idealized settings to the attempts to recreate the observed climate history in all its glory.

A key challenge is how to make the hierarchy more effective, so that we may readily isolate observed behaviour of a complex model in a simpler one, and represent findings from idealized models in GCMs. This workshop solicits talks that address this challenge. A desired outcome of the workshop is a paper intended for a broad audience around the theme of model hierarchies, to which all workshop participants will be encouraged to contribute.

Workshop themes and structure

The workshop will be organized into several sessions, based on aspects of the Earth system to which different model "species" can be applied. In each session we will encourage talks showing how robust and uncertain features from comprehensive (e.g. CMIP) model simulations can be interpreted through simpler or more idealized models and experiments. We also encourage the proposal of experimental designs where different models of the same species may be compared ("idealized MIPs"), as well as talks on modeling infrastructure frameworks that allow the construction of various model species from a single codebase.

The session themes include:

- Tropical convection and radiative-convective equilibrium
- Mid-latitude dynamics and storm tracks
- Stratosphere-troposphere coupling
- Ocean dynamics
- ENSO and other coupled modes of variability
- Climate sensitivity and feedbacks
- Biospheres and the carbon cycle: from Gaia to full ecosystems

You are encouraged to align with one of these themes, but topics relevant to the overarching theme of model hierarchies may be submitted.

Submission instructions

Abstracts should be submitted electronically (<http://wcrp-climate.org/gc-model-hierarchies-abstract-submission>). All papers will be considered for oral presentation, but in case of a large number of qualified presentations, a poster presentation may be offered instead.

Important Dates

Call for submissions: **15 March 2016**

Abstract submissions: **15 May 2016**

Support application: **15 May 2016**

Notification of Acceptance: **15 June 2016**

Website

<http://wcrp-climate.org/gc-model-hierarchies-home>

