



MICMoR Summer School 2015

Modeling of Land Surface – Atmosphere Interactions

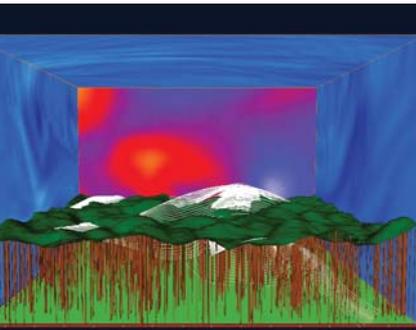
Institute of Meteorology and Climate Research – Atmospheric Environmental Research (KIT/IMK-IFU), Garmisch-Partenkirchen, Germany

August 16-26, 2015

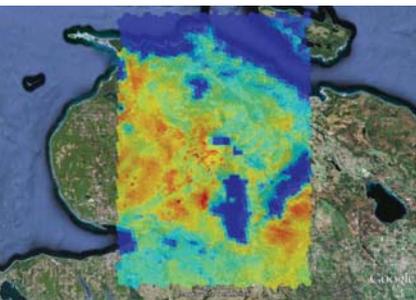


The terrestrial biosphere, soils, hydrosphere and the atmosphere are highly dynamic compartments of the Earth system. All these compartments are tightly coupled and strongly interact in a complex way by the exchange of vast quantities of energy, water, greenhouse gases, nutrients and other trace substances. Feedback interactions between land surface processes and the atmosphere are particularly important over heterogeneous landscapes and in structurally complex areas such as mountain regions.

This course will provide PhD students and Postdocs the opportunity to deepen their understanding of land surface – atmosphere interactions and how to describe and simulate them in models. Course participants will engage in classroom lectures, computer lab simulation exercises, and field tours to understand and directly apply knowledge about land surface – atmosphere interactions. One of the field trips will be in collaboration with the InnSAR Summer School of the University of Innsbruck, Austria. Lectures will focus on the fundamental mechanisms that couple the atmosphere and biosphere, the common approaches to modeling these mechanisms, and to challenges for these models due to land-surface heterogeneity and ecosystem complexity. We will also provide hands-on instruction for the use of a suite of model types, covering a range of scales and complexity levels, from single plant to ecosystem and global simulations. Students will work in groups to design, implement, and present model-based mini-research projects.



By the end of the course, participants will be able to model the basics of the land-surface energy budget, biosphere – atmosphere flux exchanges, understand the modeling implications of different spatial and temporal scales, understand the sensitivity of land-surface processes to variable climate forcings, land-use and ecosystem structure changes. Participants will have gained hands-on experience with model-based experimentation, model evaluation, statistical analysis and scientific presentation of model results, and be familiar with the operations of at least two comprehensive land surface – atmosphere interaction modeling systems at different scales and complexity levels.



Instructors and Presenters (to be confirmed)

Gil Bohrer (Ohio State University, USA) – lead lecture
Simone Fatichi (ETH Zürich, Switzerland)
Paul Stoy (Montana State University, USA)
David Medvigy (Princeton University, USA)
Steven Garrity (Decagon Devices, USA)
Matthias Mauder (KIT/IMK-IFU, Germany)
Harald Kunstmann (KIT/IMK-IFU, Germany)
Edwin Haas (KIT/IMK-IFU, Germany)

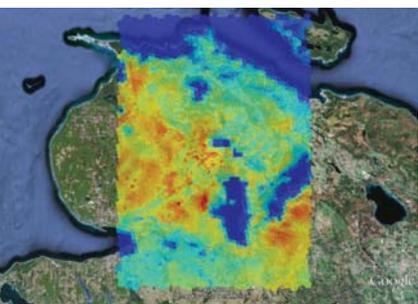
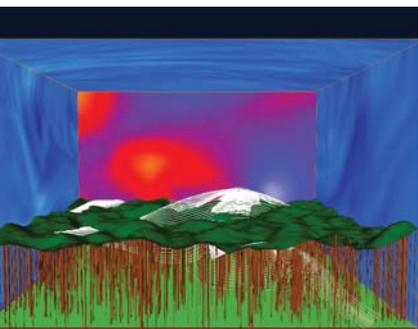
Eligibility

The course is open to a maximum of 25 participants (Graduate Students, Postdocs) with a background and research topic in land surface – atmosphere interactions.

Contact:

MICMoR Coordination Office
KIT / IMK-IFU
Kreuzeckbahnstraße 19
82467 Garmisch-Partenk.

www.micmor.kit.edu
info@micmor.kit.edu



Application

To apply, please submit a statement of motivation, a short CV highlighting your educational background and research positions or experience, and arrange to have a letter of recommendation sent by your advisor, or an academic familiar with your work. Please send your application documents to the MICMoR Coordination Office at info@micmor.kit.edu. Application deadline is May 15, 2015. There is no tuition fee; however, participants must cover travel and accommodation costs.

Draft Schedule (as of January 2015)

Sunday, 16 August 2015

Evening: Arrival, ice-breaker

Monday, 17 August 2015

Introduction and welcome

The atmospheric planetary boundary layer and its coupling to the Earth surface (Bohrer, Mauder)

Evening: Student poster session

Tuesday, 18 August 2015

The surface energy budget and surface fluxes (Bohrer, Stoy)

Wednesday, 19 August 2015

Morning: Approaches for modeling ecosystem function and fluxes. Model demonstration – CANVEG, CACHE, Thetys Cloris (Fatichi)

Afternoon/Evening: Dynamic ecosystem models – lecture and model demos – LandscapeDNDC, ED2 (Medvigy, Haas).

Thursday, 20 August 2015

Morning: Coupled Atmosphere – Biosphere, and Earth-System Modeling (Bohrer)

Afternoon: Intro and demos - atmospheric and Earth system models: Global reanalyses (ECMWF/NCEP), WRF (Regional Model+ Hydro/Chem), ED2 (coupled-OLAM), RAFLES (forest large eddy simulation) (Bohrer, Medvigy, Kunstmann)

Evening: start work on personal hands-on model-based project (Bohrer, Medvigy, Fatichi, Garrity)

Friday, 21 August 2015

Hands-on modeling – the basics: Compiling the models, testing input/output (Bohrer, Medvigy, Fatichi, Garrity).

Saturday, 22 August 2015

Field Trip 1 - The TERENO Experiment

Sunday, 23 August 2015

free time

Monday, 24 August 2015

Model Evaluation and Data analysis

Morning: Lecture / Hands-on tutorial: Model evaluation approaches (Bohrer, Garrity).

Afternoon/Evening: Hands-on data analysis, preparations for final presentations.

Evening: Social Dinner

Tuesday, 25 August 2015

Field Trip 2 - To a glacier in Austria (field trip with the Innsbruck InnSAR Summer School)

Wednesday, 26 August 2015

Wrap-up and final presentations

Morning: complete preparations for presentations

Noon-Afternoon: presentations

Evening: Wrap up

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