

# HPSC TerrSys Fall School 2016

Bonn / Germany

## Terrestrial Modeling and High-Performance Scientific Computing

### 2<sup>nd</sup> Announcement

<http://www.geoverbund-abcj.de/HPSCTerrSys-FallSchool-2016>

#### Date

Monday, 10 October, 2016, 13:00 to Friday, 14 October, 2016, 13:00

#### Objectives

The objectives of this applied course is to provide the theoretical and technical context of terrestrial modeling in high-performance scientific computing (HPSC) environments utilizing stand-alone and coupled hydrologic, land surface and atmospheric models. Utilizing the Terrestrial Systems Modeling Platform (TerrSysMP), the course will take a complete tour of terrestrial modeling and HPSC in connection with real-world observations and data assimilation including

- setting up a terrestrial model and performing simulations in massively parallel supercomputer environments at the Jülich Supercomputing Centre (JSC);
- parallel performance analysis and profiling;
- parallel data assimilation using TerrSysMP-PDAF (Parallel Data Assimilation Framework);
- post-processing and visualization in the age of big data.

#### Keynote Speakers

Olaf Kolditz, Helmholtz Centre for Environmental Research, Germany

Reed Maxwell, Colorado School of Mines, U.S.A.

Lars Nerger, Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Germany

Christoph Schär, ETH Zurich, Switzerland

Sophie Valcke, Centre Européen de Recherche et de Formation Avancée en Calcul Scientifique, France

#### Learning Outcomes

Completion of the course will provide the participants with the generic capabilities of terrestrial modeling and data assimilation in supercomputing environments with a focus on TerrSysMP(-PDAF) including parallel performance analysis and profiling utilizing freely available software tools, and handling of very large data sets in the analyses and visualization process.

#### Target Audience and Prerequisites

- Master or PhD students, PostDocs with a deep interest in terrestrial modeling (hydrology, land surface, atmosphere)
- Basic knowledge of LINUX/UNIX and programming languages such as R, Python, C/C++, or FORTRAN as well as data formats such as NetCDF is an advantage

Organized by

**Stefan Kollet and Klaus Goergen (Research Centre Jülich)**

**Centre for High-Performance Scientific Computing in Terrestrial Systems (HPSC TerrSys)**

<http://www.hpsc-terrsys.de> | Follow us on Twitter @HPSCTerrSys

## Registration deadline

**30 April 2016** later registrations might be considered but places are limited

## Agenda

### Monday

- 13:00-16:30: Introduction to fundamentals of environmental (climate, hydrology, georesources, terrestrial systems) modeling (lectures: Christoph Schär, ETH Zurich; Reed Maxwell, Colorado School of Mines; Olaf Kolditz, UFZ Leipzig)
- 16:30-18:00: Characteristics and handling of HPC resources (lectures and first hands on)

### Tuesday

- 08:30-11:00: Setup of regional terrestrial models and performing simulations (hands on)
- 11:00-12:00: The OASIS coupler (lecture: Sophie Valcke, CERFACS)
- Lunch break
- 13:00-16:00: Continue morning projects and inspection of results with real data (hands on)
- 16:00-18:00: Visualization and big data strategies (lectures: in-situ processing, Jens Hendrik Göbbert; big data analytics, Morris Riedel; parallel I/O, Wolfgang Frings and Sebastian Lühns; all JSC)

### Wednesday

- 08:30-12:00: Parallel performance and profiling (lecture: Markus Geimer, JSC)
- Lunch break
- 13:00-18:00: Performance and profiling analysis (hands on)

### Thursday

- 08:30-11:00: Ensemble data assimilation (lecture: Lars Nerger, AWI)
- 11:00-12:00: Ensemble data assimilation with TerrSysMP (hands on)
- Lunch break
- 13:00-18:00: Ensemble data assimilation with TerrSysMP (hands on)

### Friday (optional)

- 08:30-12:00: Continue projects and wrap-up (hands on)

## Registration procedures

Please apply for participation by sending an informal e-mail with the subject "HPSC TerrSys Fall School 2016 application" to the Geoverbund ABC/J coordination office at [geoverbund@fz-juelich.de](mailto:geoverbund@fz-juelich.de) including a short letter of motivation. Notifications will go out by the end of May 2016.

## Venue

Meteorological Institute  
Bonn University  
Auf dem Hügel 20  
53121 Bonn  
Germany

## Fees

The school is free for members of the Geoverbund ABC/J. For external participants, there is a 300 EUR contribution to expenses. Payment details, travel and accommodation information will be given with the notifications. All participants need to cover their expenses for travel and accommodation by themselves. Catering during the event will be provided.

Geoverbund ABC/J (<http://www.geoverbund-abcj.de>) is the geoscience network of