# 1st Workshop on Environmental Informatic Challenges

June 19-21, 2017
Jena, Germany

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# Workshop on Environmental Informatic Challenges

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Venue:

- Dornburger Schlösser
  Max-Krehan-Straße 2
  07774 Dornburg-Camburg

## Introduction

The current availability of huge databases offers unprecedented opportunities for analyzing and understanding our environment. We are able now to answer questions of great importance for the future of our planet. However, this new possibilities come together with new challenges to solve. At this point, computer science techniques like machine learning algorithms become really valuable. The interdisciplinarity between geosciences and computer sciences needs then for a mutual understanding and comprehension.

In BACI (http://baci-h2020.eu/) we are already facing these challenges, we are working with variables from very different nature and more often than not they have different spatio-temporal scales and resolutions. Additionally, the variety in backgrounds within our consortium needs for a special effort to reach collective agreements.

Therefore we are taking the opportunity of bring together researchers from various disciplines to stimulate discussions on the challenges we all face on our daily work.

## Key-note speakers

We are very happy that the following key-note speakers agreed to come to our workshop:

**Gustau Camps-Valls** focuses his research in the development of machine learning algorithms for applications on geosciences and remote sensing data. More specifically, he is currently involved in projects that face fundamental questions like: model inversion, bio-geophysical parameter retrieval, causality and attribution. He is interested in understanding the processes behind climate science problems.

For more info see: http://www.uv.es/gcamps/

**Diego Miralles**   is interested in the general understanding of the dynamics of the global water cycle and the impact of climate change in hydrology. He has also been working on the development of global satellite products. During the last years he has focused in the characterization of evaporation at regional extremes, the analysis of hydro-climatic extremes and the study of ocean-atmosphere oscillations.

For more info see: https://www.ugent.be/bw/dfwm/en/research/lhwm/staff/diego.htm

**Ribana Roscher**   addresses the development of pattern recognition methods particularly designed for the analysis of large scale remote sensing data. The key point of her research is try to develop methods with ensure a high discrimiation power and at the same time model the underlying structure of the data with a special application to earth observation data.

For more info see: http://www.ipb.uni-bonn.de/people/ribana-roscher/

**Jonas Peters**   focuses mainly on causal inference. The idea behind his research it to learn causal structures either from purely observational data or from a combination of observational and interventional data. Therefore, his work is also related to high-dimensional statistics, computational statistics or graphical models.

For more info see: http://www.math.ku.dk/ peters/

**Veronika Eyring**   works on Earth system modeling and process-oriented model evaluation with observations to better understand climate feedbacks and climate change, and to improve the models. She has contributed as author to the Intergovernmental Panel on Climate Change (IPCC) climate and World Meteorological Organization (WMO) ozone assessments since 2004, and is involved in the World Climate Research Programme (WCRP) through her roles as Chair of the Coupled Model Intercomparison Project (CMIP) Panel and member of several scientific steering committees.

For more info see: http://www.pa.op.dlr.de/ /VeronikaEyring/

**Patrick Griffiths**   focus his research on remote sensing and land changes. More in detail, he is currently working on the characterization of land use by means of long term remote sensing data archives.

For more info see: https://www.geographie.hu-berlin.de/de/Members/griffiths-patrick

# Programme

**Sunday, 18.06.2017**

18:30 Informal get-together (place tba).

**Monday, 19.06.2017**

| Time | Speaker | Topic |
|---|---|---|
| 8:15 | All | Bus pickup at Jena Center |
| 8:30-9:00 | All | Registration |
| 9:00-10:00 | D. Miralles | A data-driven perspective on global biosphere-climate interactions |
| | | **Coffee-break** |
| 10:30-11:30 | J. Peters | The benefits of invariant models |
| 11:30-12:30 | P. Griffiths | Characterizing land use dynamics using Earth Observation archives |
| | | **Lunch break** |
| 14:00-16:00 | All | Break-out sessions |
| | | **Coffee-break** |
| 16:00-17:00 | All | Break-out session report |
| | | **Reception and poster session** |
| 19:00 | All | Bus return to Jena Center |

**Tuesday, 20.06.2017**

| Time | Speaker | Topic |
|---|---|---|
| 8:15 | All | Bus pickup at Jena Center |
| 9:00-10:00 | G. Camps-Valls | Physics-aware machine learning for biophysical parameter retrieval |
| | | **Coffee-break** |
| 10:30-11:30 | R. Roscher | Unsupervised and self-taught learning for remote sensing image analysis |
| 11:30-12:30 | V. Eyring | Climate informatics opportunities for Earth system model evaluation |
| | | **Lunch break** |
| 14:00-16:00 | All | Break-out sessions |
| | | **Coffee-break** |
| 16:00-17:00 | All | Break-out session report |
| 17:00 | All | Bus return to Jena Center |

**Wednesday, 21.06.2017**

| Time | Speaker | Topic |
|---|---|---|
| 8:15 | All | Bus pickup at Jena Center |
| 9:00-10:00 | All | BACI break-out groups |
| | | **Coffee-break** |
| 10:30-12:30 | All | BACI break-out groups |
| 12:30-13:00 | All | Wrap-up and concluding remarks |
| 13:00 | All | Bus return to Jena Center |