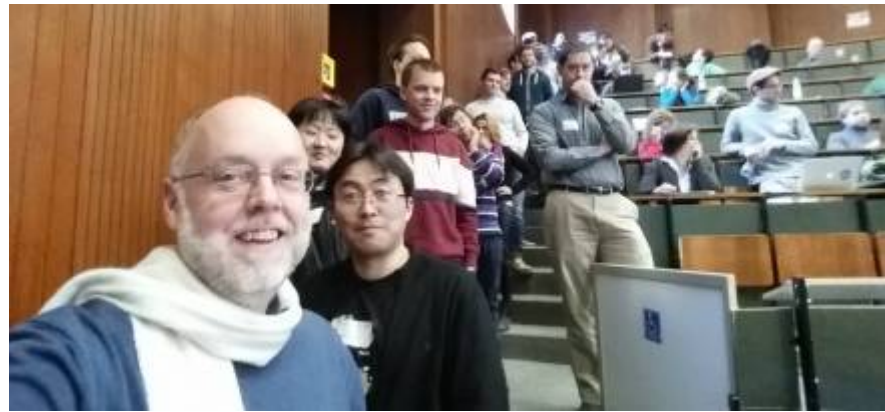
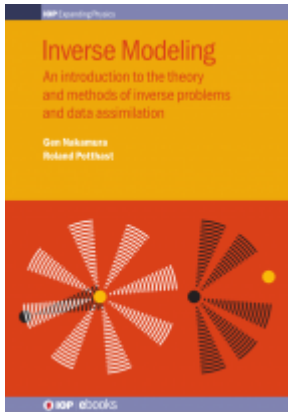


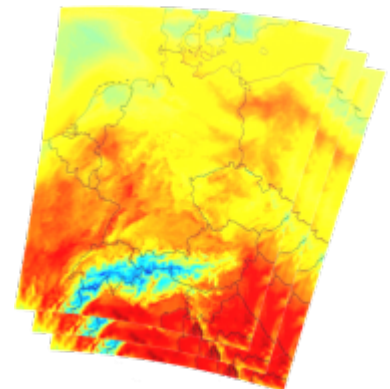
[[Welcome](#)] [[Group](#)] [[Research](#)] [[Publications](#)] [[CV](#)] [[MISC](#)] [[My Christian Blog](#)] [[Church Stuff](#)]



Recent Book "Inverse Modeling" ... Roland at the ISDA18 (Intern. Symposium on Data Assimilation in Munich) March 2018

Data Assimilation and Inverse Problems

Our *Division for Data Assimilation* (FE12) of the German Weather Service (DWD), a part of the German *Ministry of Transport and Digital Infrastructure* (BMVI), is working on [data assimilation for numerical weather prediction \(NWP\)](#). Our main task is to provide



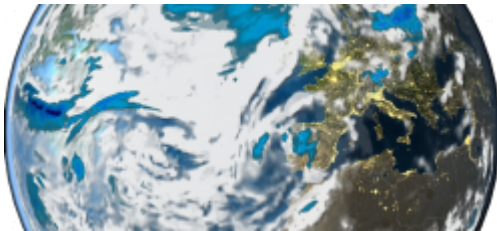
- **operational data assimilation** for the **global ICON NWP-model** (13km resolution, 90 layers 75km height), run every 3 hours 24/7,
- with its mesoscale two-way-nesting area over Europe (6.5km resolution) and the
- **high-resolution convection-permitting COSMO model** over central Europe (2.8/2.2km resolution, 24km height) every hour 24/7.

This includes *ensemble data assimilation* for the *ensemble prediction systems* ICON-EPS (40/20km resolution) as well as COSMO-DE-EPS (2.8/2.2km resolution) and a mean (best) state estimator for the deterministic runs (13/6.5km and 2.8/2.2km). A core goal is to replace COSMO by the ICON-LAM model with 2/1km resolution over central Europe **operationally** in about 2020/21. We run a hybrid ensemble-variational data assimilation scheme (EnVar) globally and a Local Ensemble Transform Kalman Filter (4D-LETKF) for our regional data assimilation.

Data Assimilation includes the use of a **broad variety of both direct and remote sensing measurements** from

- Ground Stations and Ships (SYNOP),
- Radio Sondes (TEMP) and dropsondes,
- Buoys,

- Air Planes (AMDAR, AIREP, ACAR, ...),
- Atmospheric Motion Vectors (AMV),
- Scatterometers (SCAT),
- Infrared Sounders (IR),
- Microwave Sounders (MW) and Microwave Radiometers (MWR),
- LIDAR including Cloud Bottom Height (CBH), Cloud Top Height (CTH), Backscatter Profiles, Line-of-Sight Winds (AEOLUS), Ceilometers,
- RADAR including RADAR Radial Winds, RADAR Reflectivity and RADAR Dual Polarization,
- GPS/GNSS including Radio Occultations (RO), Zenith Total Delay (ZTD), Slant Total Delay (STD),
- Cameras,
- Cars.



Geostationary satellites and **polar orbiting satellites** are used operationally, while a lot of research is going into the better use of **hyperspectral** observations (many thousand frequencies per observed atmospheric column) in particular over land and in cloudy situations. The observation and reconstruction of snow, ice, sea surface temperature, land surface temperature, coverage, emissivity and soil moisture is a very active area of research. Also, the observation and data assimilation of **clouds and convective processes** with high-impact phenomena such as thunderstorms, heavy rain and wind gusts with lead times from minutes to days is a special focus of our research.

The research of our group at the University of Reading, UK, is concerned with **inverse problems and data assimilation** in three areas:

- numerical weather prediction (NWP),
- cognitive neuroscience / neural field theory (NFT),
- inverse scattering problems / remote sensing.

These are extremely exciting areas scientifically and very important for society, for example for **air traffic control**, **severe weather warnings** and **national energy supply**, in medicine by **medical imaging** and for many industrial and environmental questions.

Workshop and Seminar News

2018

- Nov 21-23, 2018, Offenbach, Germany: IAFE Innovation in Applied Research Conference at DWD
- Oct 8-13, 2018, Berlin: Hans-Ertel Zentrum (HErZ) Conference 2018
- Sept 10-13, 2018 Reading, UK: ECMWF Data Assimilation Seminar, Talk on Invitation [Web](#)
- Sept 3-7, 2018, St. Petersburg, Russia: COSMO General Meeting
[Reduced Participation due to No-Government in Germany currently]
- June 2018: Visit and Seminar Talk of Prof. Matthias Morzfeld, Arizona, at DWD and our group
- June 4+5, 2018, Edinburgh, UK: Prediction and Data Assimilation for Non-Local Diffucion. From Crack propagation to random graphs and arctic sea ice. Invited Talk.

- May 14-20, 2018, Visit and Seminar Talk of Prof. Gen Nakamura, Sapporo, Japan, at DWD and our group
- May 7-9, 2018, London, UK: Workshop on Particle Filter Methods at Imperial College, Invited Talk [Web](#)
- April 27-28, 2018, Nanjing, China: NUIST Conference on Meteorology and Weather Prediction, Invited Speaker
- April 18-25, 2018, Shanghai, China: Invited Research Visit at Fudan University



- March 19-23, 2018, Munich, Germany: [GAMM Meeting](#) with a Mini-Symposium on Uncertainty Quantification, Invited Talk.
- March 5-9, 2018, Munich, Germany: [International Symposium on Data Assimilation 2018](#), Co-Organizer
- Feb 26-28, 2018, DWD, Germany: COSMO User Seminar ICCARUS [Web](#)



- Feb 9, 2018, Kobe Japan: RIKEN Data Assimilation Seminar Talk [Web](#)
- Feb 7-8, 2018, Kobe, Japan: 8th AICS International Symposium, Keynote Talk [Web](#)
- Jan 23-24, 2018, Reading, UK: NWP-SAF Steering Committee Meeting at ECMWF <https://www.nwpsaf.eu/site/>

For more news see [IP News](#) and [IP Events](#)!
Other News [News RP 2017](#), [News RP 2016](#).

Group

My group consists of more than 30 researchers on data assimilation and inverse problems in Frankfurt/Offenbach and Reading (UK) with further PhD studentships in partnerships, see [group](#).



Jan 2017: Meetings DWD Data Assimilation Group with our partners from the HERZ Center on Data Assimilation from LMU Munich.

My Christian Blog

Thinking about faith and life has always been a passion for me. I have become a Christian and have started to explore the world as someone who follows Jesus - that has turned out to be quite an adventure and highly exciting. In my daily blog I explore thoughts and arguments about faith, and monitor how faith works on a daily basis: [Jesus Network](#)

Publications



Recent publications can be found on [publications](#). A book [Inverse Modeling](#) by Nakamura and Potthast with an introduction into data assimilation and inverse problems has recently appeared at IOP.

Working in an operational center, our focus is to develop state-of-the-art inversion methods which can be run in a reliable way on a supercomputer in near real-time. It includes codes on scattering of waves, propagation of light and radiation, tomography, large-scale optimization and uncertainty quantification, ensemble and particle methods.

(Our supercomputers at Deutscher Wetterdienst are no 99 and no 130 on the TOP-500 Supercomputer List [Web](#))

However, the development of **insight** into the scientific problems we need to solve is an indispensable ingredient of our daily work. Part of this insight is based on mathematical analysis and the testing of computational methods for purpose-built small-scale demonstration systems.

COST Action 1303 "TOPROF" [Website](#);

Editorial Board

- [Inverse Problems in Science and Engineering Login](#)
- [Frontiers in Applied Mathematics and Statistics - Dynamical Systems](#)
- [Mathematical Inverse Problems](#)

Institutions

Prof. Dr. Roland Potthast
 Deutscher Wetterdienst (DWD)

Frankfurter Strasse 135
63067 Offenbach, Germany
Roland.Potthast@dwd.de

Professor for Applied Mathematics
Department of Mathematics and Statistics,
Whiteknights, PO Box 220,
Reading RG6 6AX, UK
r.w.e.potthast@reading.ac.uk

Web Statistics, for last 30 days on my webpages (1.4.2018)

	Visitors	Visits	Page Views	Robots
Sum	~ 20.000	~ 22.000	~ 160.000	~ 750.000

including <http://scienceatlas.com>, <http://inverseproblems.info> and <http://jesusnetwork.eu>.

From:

<http://www.scienceatlas.com/potthast/> - **Roland Potthast Webhome**

Permanent link:

<http://www.scienceatlas.com/potthast/start>

Last update: **2018/04/19 02:16**

