

2025 Helmholtz – OCPC – Programme for the involvement of postdocs in bilateral collaboration projects

PART A

Title of the project:

Remote sensing of land-atmosphere interactions

Helmholtz Centre and/or institute:

Helmholtz Centre for Environmental Research - UFZ

Project leader:

Prof. Dr. Jian Peng

Contact Information of Project Supervisor: (Email, telephone)

jian.peng@ufz.de, +49 341 235 482335

Web-address:

<http://www.ufz.de/remote-sensing>

Department: (at the Helmholtz centre or Institute)

Department of Remote Sensing

Programme Coordinator (Email, telephone and telefax)

Name: Kai Fornahl

Project Manager InHand@UFZ

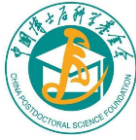
Address: Permoserstraße 15, 04318 Leipzig

Phone: +49-615971-3112

Email: kai.fornahl@ufz.de

Description of the project (max. 1 page):

Under the framework of Helmholtz Programme Oriented Research (POF-IV) program 'Changing Earth – Sustaining our Future', UFZ will bring competences in ecosystem- and water-related research, regional model-based predictions/projections, and social sciences. Specifically, the SMART Models and Monitoring Research Unit in UFZ aims to provide robust pictures of the future for sustainable development paths in landscape under climate change. To achieve this mission, multi-source remote sensing by satellite-borne and airborne instruments will be integrated to characterize and monitor the terrestrial water and ecosystem dynamics. Novel products derived from remote sensing data with sophisticated algorithms provide a unique opportunity to advance the understanding and quantification of complex processes and their interactions within the Earth system. Their



further integrations with Earth system models will lead to accurate climate change forecasts and development of mitigation and adaptation strategies.

The Remote Sensing Department is seeking a highly motivated Chinese scientist to join our team to develop new methodologies to exploit and synergize multi-source earth observations, to better understand land-atmosphere feedback processes and evaluate/improve state-of-the-art land surface modeling framework. Specific research topics could be, but are not limited to:

- Quantification of essential ecosystem variables (e.g., soil moisture, ET, precipitation, LAI) via the synergy of multi-source satellite observations: 1) development of a generic and flexible framework to integrate multi-source satellite observations; 2) internally consistent multi-scale gap-free EEVs datasets with quantified uncertainties.
- Apply machine learning methods to improve monitoring and modelling: 1) hybrid approach for the estimation of land surface parameters from satellite observations; 2) fusing and upscaling/downscaling of multi-source EO data and model simulations.
- Characterization of hydro-meteorological extremes via satellite observations: 1) unravel the processes driving long-term changes in hydro-meteorological extremes; 2) reveal the causal relationship between hydro-meteorological extremes and vegetation dynamics.

Description of existing or sought Chinese collaboration partner institute (max. half page):

The Remote Sensing Department plans to establish collaborations with Chinese Universities/institutions, including but are not limited to: Tsinghua University, Beijing Normal University, Fudan University, Nanjing University, Northwest University, Nanjing University of Information Science & Technology, Chinese Academy of Sciences (e.g., Institute of Geographic Sciences and Natural Resources Research, Institute of Tibetan Plateau Research).

Required qualification of the postdoc:

- PhD degree in earth system science, remote sensing, meteorology, hydrology, physical geography, environmental sciences, physics, statistics, computer sciences, or related field
- Domain knowledge in remote sensing and earth system dynamics
- Good programming skills (e.g., Python, Fortran, R, or Matlab)
- Good communication skills in English, and strong interest to work in an interdisciplinary research team
- A proven ability to publish in peer-reviewed journals