Impacts of Solar Farms on Surface-Atmosphere Exchange Processes (PVEC) – job opening for doctoral researcher/ PhD student (m/f/d)

Technische Universität Braunschweig Institute of Geoecology — Climatology and Environmental Meteorology Research Group

Contract duration	3 years
Working time	75% of full-time
Salary	Pay group 13 TV-L (German public-sector collective agreement)
Start date	01 March 2027
Application deadline	15 December 2026
Location	Braunschweig, with regular field work near Berlin

About us

The Climatology and Environmental Meteorology research group, led by Prof. Dr. Stephan Weber at the Institute of Geoecology, studies micro- and mesoscale climate processes in the atmospheric boundary layer, with a focus on urban and land-surface climate and eddy-covariance flux measurements. For the DFG-funded project **PVEC**, led by Dr. Jannik Heusinger and Prof. Weber, we are looking for a highly motivated doctoral researcher.

About the project

Solar photovoltaics (PV) is the fastest-growing renewable energy technology worldwide, and utility-scale solar farms are transforming land surfaces at a rapid pace. PV modules absorb most incoming solar radiation but convert only around 20% into electricity — the rest is released as heat. Together with their shading effect, PV alter the local exchange of energy, water and carbon between land surface and atmosphere. While such effects have been characterized in arid climates (e.g. Arizona), comparable observations for temperate, mid-latitude regions — including impacts on latent heat flux and the carbon uptake of vegetation growing beneath the panels — remain scarce.

PVEC combines field measurements with model development to close this gap with:

- Eddy-covariance measurements of sensible heat, latent heat and CO_2 fluxes at a large utility-scale solar park
- Evaluation of **UCRC-Solar**, a photovoltaic energy balance model previously developed by the PI (Heusinger et al., 2020)
- Coupling of UCRC-Solar with the land-surface model **NOAH-MP** into a new model, "NOAH-MP-Solar," applicable to different PV array designs and European climates

Your tasks

- Set up, operate and maintain eddy-covariance and auxiliary instrumentation
- Analyse differences in energy and carbon fluxes between the PV site and the reference grassland, including the role of wind direction, turbulence and vegetation state
- Evaluate the UCRC-Solar photovoltaic energy balance model against measured panel temperatures and power-production data
- Couple UCRC-Solar with NOAH-MP (Fortran) and apply the resulting model to assess how PV array design (tilt, azimuth, tracking system, row spacing) affects surface-atmosphere exchange in different European climates
- Write up results for peer-reviewed publication and present them at international conferences (e.g. AMS Annual Meeting, EGU General Assembly)

Your profile

- An above-average university degree (Master's, Diplom or equivalent) in meteorology, geoecology, environmental natural science, physical geography, environmental physics or a related field
- A background in (boundary-layer) meteorology; initial experience with eddy-covariance measurements is an advantage
- Interest in surface-atmosphere exchange, land-surface modelling and renewable-energy meteorology
- Willingness to learn/work with Python and Fortran for data analysis and model development
- Willingness to do fieldwork and regular travel to the field site; a driving licence is helpful
- Good written and spoken English; German is useful for site logistics but not required
- An independent, structured working style and enjoyment of interdisciplinary collaboration

We offer

- A fully funded, three-year doctoral position within an active DFG research project, with the option of a cumulative dissertation
- Close supervision by Dr. Jannik Heusinger and Prof. Dr. Stephan Weber
- Hands-on training in state-of-the-art eddy-covariance instrumentation and land-surface/energy-balance modelling
- Links to an established national and international network (e.g. Leibnitz University Hannover and University of Guelph)
- A collegial, supportive research environment at Technische Universität Braunschweig

How to apply

Please send your application — cover letter, CV, copies of relevant certificates/transcripts and contact details of two referees — with reference code 26-PVEC as a single PDF to **j.heusinger@tu-braunschweig.de**, by **15 December 2026**.

Informal enquiries about the project are very welcome and can be directed to:

Dr. Jannik Heusinger Institute of Geoecology — Climatology and Environmental Meteorology Technische Universität Braunschweig Langer Kamp 19c, 38106 Braunschweig, Germany Email: j.heusinger@tu-braunschweig.de · Tel.: +49 (0)531 391-5630

Technische Universität Braunschweig is committed to increasing the proportion of women in research and strongly encourages qualified women to apply. Applications from severely disabled candidates will be given preference in case of equal qualification. Technische Universität Braunschweig welcomes applications from all candidates regardless of gender, cultural or social background, religion, worldview, disability, age or sexual identity.