The Karlsruhe Institute of Technology (KIT) and its Institute of Meteorology and Climate Research / Atmospheric Environmental Research (KIT/IMK-IFU) at Campus Alpin in Garmisch-Partenkirchen, Germany, invites applications for:

PhD position: Functions and importance of exogenous nitric oxide (NO) for soil C and N turnover processes

The division of “BioGeoChemical Cycles” at IMK-IFU has a vacancy for a PhD position to study role of exogenous NO for plants, microbes, and their interactions in soil.

The position is for three years starting May 1, 2021 and is funded by the German Science Foundation (DFG) and within the French-German NO-PIMS project (What is the role of exogenous NO for plants, microbes, and their interactions in soil?) as jointly funded by DFG and the French ANR (Agence nationale de la recherche).

Nitric oxide (NO) is a nitrogen trace gas which is produced by microbes and physico-chemical processes in soils as well as by physiological processes in plants. NO is considered as a major physiological mediator with many functions such as stimulation of the plant innate immune system, stimulation of plant morphogenesis and nutrition, responses to abiotic stresses, antimicrobial agent against pathogens, regulation of nitrogen cycling processes in microorganisms, etc. Despite the relatively high emission of NO quantified from soil and the high concentrations of NO within the soil profile, it remains largely unexplored how organisms below and above ground as well as their interactions respond to variations in NO fluxes and concentrations. Considering the versatile role of NO on both microorganisms and plants, investigating the role of NO in plant-soil systems can lead to a greater understanding of plant-microbe and microbe-microbe interactions. Such interactions and feedbacks between plants and microbial communities are of importance for many soil functions such as plant productivity and health, soil filtration, climate regulation, and nutrient cycling and have therefore rapidly gained a lot of attention since they can offer promising avenues for practical application.

The overall objective of this project is to assess the importance of exogenous NO produced either by plants or by soil processes on soil microorganisms and plants as well as their interactions. In this project, we will use a model soil and the model plant Arabidopsis thaliana. Within a series of defined incubation experiments, we will expose soil micro-organisms, plants, plant-soil systems to defined exogenous NO concentrations and will study physiological, functional and process changes in plants and microbes to NO concentration changes. We will focus on nitrogen-cycling not only because NO is inherently linked to this cycle but also because nitrogen is the nutrient most strongly limiting plant growth in many terrestrial ecosystems.

Work will be done in close cooperation with our partners from France (PI: Prof. Dr. L. Philippot & colleagues) and the Jülich Research Centre (Prof. Dr. N. Brüggemann), Germany. The PhD position is based at KIT Campus Alpin in Garmisch-Partenkirchen. Some of the work will as well be carried out at partner institutes.
Requirements

The candidate should have strong interest in biogeochemistry, soil processes and soil microbe-plant interactions as well as practical experience in these fields, preferably including the use of stable isotope labelling for quantification of microbial processes in soils. The candidate should hold a MSc degree (or equivalent) in a relevant discipline. Good lab skills and technical knowledge in trace gas and data analysis are required.

We offer

State of the art technical research infrastructure, advanced training, close cooperation and interaction with interdisciplinary partners, and a vibrant and friendly, international research environment in the beautiful surroundings of Garmisch-Partenkirchen, Germany. The salary will be equivalent to the public service TV-L13 (65%).

For more information please contact Prof. Dr. Klaus Butterbach-Bahl (Klaus.Butterbach-Bahl(at)kit.edu)

Applications

Applications should be sent by email to Prof. Dr. Klaus Butterbach-Bahl (Klaus.Butterbach-Bahl(at)kit.edu) by February 28, 2021.

Applications must be made in the form of a Declaration of Interest including the following:

- A letter stating your specific interest, motivation and qualifications for the project in question (max. two pages)
- Detailed CV, including personal contact information
- Copies of diplomas, Bachelor as well as Master’s degree, including transcript of notes/grades
- Contact details for two referees, e.g. former or current scientific supervisors.

KIT strives to achieve gender balance at all levels of employment. We therefore particularly encourage female candidates to apply for this position. With appropriate qualifications, applications from persons with handicaps will be treated with preference.