

The Rheinische Friedrich-Wilhelms-Universität Bonn is an international research university that offers a wide range of degree programs. With 200 years of history, about 38,000 students, over 6,000 employees, and an excellent domestic and international reputation, Bonn University is among Germany's leading universities.

The Cluster of Excellence **PhenoRob – Robotics and Phenotyping for Sustainable Crop Production** is seeking for excellent candidates to carry out novel and high-quality research in line with the objectives and vision of PhenoRob (<https://www.phenorob.de>). In the project **“Crop Responses under Phosphate Deficiency: Integration of Plant Physiology in Sensing and Modelling”** we plan to fund

## 2 PhD student positions (TVL E13, 65%)

for up to 3 years to support the global PhenoRob vision to develop technologies that reduce the environmental footprint of agriculture, here specifically that of P pollution, while maintaining high crop productivity in the face of P as a limited resource.

### Description of the project

Phosphorus (P) is an essential macronutrient and a key determinant of agricultural yield. On the one hand, P is often poorly mobile in soils, resulting in low levels of plant available P. On the other hand, P pollution has huge negative environmental consequences on open water bodies. To meet the UN Sustainable Development Goals, it is therefore mandatory to increase crop P-use efficiency by improving management and breeding but also to develop virtual plant models that predict consequences of P deficiency. In this project we aim: (1) to better understand how physiological plant responses to P deficiency/availability correlate with data obtained by non-invasive sensors and digital phenotyping technologies; (2) to gain a better understanding of abiotic and biotic factors contributing to P-use efficiency, (3) to develop computational models of how P deficiency affects crop development, visual appearance and ultimately yield, (4) to diagnose P deficiency more accurately to facilitate application of P precisely and on demand, and to better understand above ground to below ground relationships under P-deficiency.

**We seek candidates for the following 2 PhD positions at the University of Bonn:**

- (1) **P mobilization by beneficial root-microbe interactions** (supervisor Dr. Peng Yu, Emmy Noether fellow, <https://www.rootbiology.uni-bonn.de/de>)
- (2) **Physiology of P sensing** (supervisor: Prof. Dr. Gabriel Schaaf, [https://www.ipe.uni-bonn.de/pflanzenernaehrung/mitarbeiter/g\\_schaaf](https://www.ipe.uni-bonn.de/pflanzenernaehrung/mitarbeiter/g_schaaf))

### What we do:

- Molecular physiology, genomics, transcriptomics, nutriomics & metabolomics
- Microbiology & metagenomics of root/soil microbes

### What we require:

- High interest and enthusiasm in interdisciplinary and collaborative scientific research
- Intensive interactions with the two other PhD candidates of this project working in “Metabolic responses to P deficiency” (supervisor: Prof. Dr. Peter Dörmann, University of Bonn) and “Virtual Plant Model” (supervisors: Prof. Dr. Andrea Schnepf and Prof. Dr. Guillaume Lobet, Forschungszentrum Jülich)
- Excellent degree in Plant Sciences, Agricultural Sciences, Biology, Genetics, Microbiology or related at Master level or equivalent
- Organized, critical thinking, willingness to learn and improve and to shape research in PhenoRob
- Excellent Communication/English skills and commitment to hard-work

**What we offer:**

- Contract: 3 years (TVL E13, 65%) starting from April 2022
- Extensive national and international collaborative network
- Full access to resources within the Cluster of Excellence PhenoRob

The University of Bonn is committed to diversity and equal opportunity. It is certified as a family-friendly university and aims to increase the number of women employed in areas where women are under-represented and to promote their careers. To that end, it urges women with relevant qualifications to apply. Applications will be handled in accordance with the *Landesgleichstellungsgesetz* (State Equality Act). Applications from suitable candidates with a certified disability or equivalent status are particularly welcome.

If you are interested in this position, please submit a single combined pdf including statement of motivation, CV, master's degree, transcripts and research interests **by January 30, 2022** to [ipe@uni-bonn.de](mailto:ipe@uni-bonn.de) (Kennziffer 111/21/3.202).