

# Job opportunities @ QTB

## IT Administrator / Scientific Programmer

The post-holder will be responsible for installation, maintenance and administration of the IT infrastructure of the research group 'Quantitative and Theoretical Biology'. The tasks include planning the infrastructure, installation and configuration of Linux operating systems, installation and configuration of software. The successful candidate will also support the research group by the development scientific software and user-friendly interfaces to software developed in-house.

**The position** is offered in the context of the German Excellence Initiative which promotes outstanding research at German universities. CEPLAS is a joint effort of University of Cologne, HHU Düsseldorf, Max Planck Institute for Plant Breeding Research and Forschungszentrum Jülich. Researchers of these institutions are pursuing inventive strategies for sustainable plant production ([www.ceplas.eu](http://www.ceplas.eu)).

**Job description:** The successful candidate will work in the research group 'Quantitative and Theoretical Biology' (75%) and the 'Centre for Advanced Imaging' (25%). A central task is to administer and maintain the computing infrastructures. This involves communication with the central computing facility at HHU, regular installation of security updates, purchasing new hardware and software, overseeing functionality of the internal communication tools (slack, Wiki, etc.) and in general staying in close with the group members and discuss their specific computational requirements.

### Your profile:

- Experience in IT-Administration (Hard- and software)
- Experience in the Administration of Unix/Linux operating systems
- Knowledge in IT security
- Programming skills (e.g. Python, C++, Julia, etc.)
- Reliability and Responsibility
- Good communication skills in German and English

**Payment** is according to the German civil servant pay scale TV-L E11. The position is permanent.

**Applications** from disabled persons are welcome. Disabled persons with equal qualifications will be given priority. Applications from women are expressly welcome. Women with comparable qualifications will receive particular consideration, unless another applicant displays compelling reasons to prefer this person.

Please send letter of application, CV, publication list, transcripts, and letters of recommendation electronically as **one** PDF document to Dr. Oliver Ebenhöh ([oliver.ebenhoeh@hhu.de](mailto:oliver.ebenhoeh@hhu.de)) who may also be contacted for further information.

We wish to recruit as soon as possible.

**Interested candidates please contact [Oliver Ebenhöh](#)**

## PhD "Mathematical Modelling of Microbial Communities"

The advertised project is integrated into CRC 1535 MibiNet "Microbial networking – from organelles to cross-kingdom communities" and the associated graduate research training group "MibiNet". The CRC 1535 includes five cooperation partners, including the Research Center Jülich (FZJ), the Technical University of Aachen (RWTH), the University of Bielefeld, the University of Cologne and the Max Planck Institute for Plant Breeding Research (MPIPZ) in Cologne.

Phototrophic microorganisms such as green algae interact synergistically with heterotrophic bacteria and fungi in their environment. These organisms assemble into stable communities in the regions neighbouring unicellular algae, known as the phycosphere, and play roles in global carbon and energy cycles. However, the fundamental principles that govern phycosphere community assembly and dynamics are relatively poorly understood, particularly in terrestrial ecosystems. We aim to use the eukaryotic, photo-synthetic model organism *Chlamydomonas reinhardtii* to build computationally designed, stable and robust synthetic consortia to establish a solid quantitative theory to explain fundamental principles governing microbial ecosystem establishment, dynamics and resilience.

**Job description:** The successful candidate will develop mathematical models to theoretically investigate of the dynamics of microbial communities. A major goal is to obtain a quantitative understanding how environmental factors determine the stability, resilience and diversity of a community. This requires to also understand the interaction mechanisms between species and how these lead to community properties, such as stability and resilience. For this, differential equations-based models will be developed. The initial approach will be based on extended MacArthur consumer-resource models, which describe ecosystem dynamics based on resource availability, metabolic competition and cross-feeding. During the course of the project, the models will evolve from abstract to highly quantitative and calibrated with experimental data. The models will be developed in direct collaboration with the experimental partners Ruben Garrido-Oter (MPIPZ) and Bart Thomma (UoC), who provide high-quality, time-resolved data on dynamic communities, and perform dedicated experiments to determine the metabolic functions of the community members. Model predictions will guide experimental design to challenge the model and optimise information gain.

### Your profile:

- A completed scientific university education (M.Sc./Diploma) in a natural science discipline (physics, chemistry, biochemistry, etc.)
- strong mathematical background
- experience with differential equations
- some programming skills
- a keen interest in the biological questions addressed in this project

- A spoken and written command of the English language is desirable
- Affinity to teamwork
- Good communication skills and enthusiasm for interdisciplinary exchanges are appreciated

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**There are currently no other open positions @ QTB.**

However, the situation may change in the future. People interested in working with us are invited any time to contact us and send motivation letters and CVs.

We also support candidates who wish to acquire their own funding.

**For further information please contact [Oliver Ebenh h](#)**