



The Collaborative Research Center SFB 1076 “**AquaDiva** – Understanding the Links between Surface and Subsurface Biogeosphere” is funded by the Deutsche Forschungsgemeinschaft (DFG). AquaDiva is an ambitious research center with more than 70 researchers and Institutes at four faculties of the Friedrich Schiller University Jena (FSU) and three non-university research institutes in Jena or Leipzig. The integrated Research Training Group AquaDiva is educating doctoral researchers in a structured, interdisciplinary training program. AquaDiva combines different research areas, such as ecology, microbiology, hydrogeology, soil science, geomorphology, geochemistry, geology, geophysics, chemistry, and information science, to a comprehensive picture of subsurface research (www.aquadiva.uni-jena.de).

The Integrated Research Training Group AquaDiva invites applications for a

Doctoral Researcher Position (m/f; Ref.No. 128/2017)

at the Theory in Biodiversity Science group at the German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig and at the Friedrich Schiller University Jena (FSU)
(subject to the final grant decision end of May)

**Unravelling the Complex Processes that Control the Biodiversity and Ecosystem
Functioning of Aquifers**

The project aims to understand the big picture on how the climate-driven aboveground events, aboveground land-use, and aboveground biodiversity affect the biodiversity, complexity, and ecosystem functioning of belowground aquifer microbial ecosystems in space and time. This should be realized by combining ecological modelling of complex microbial food webs to create prediction models that afterwards will be tested by synthesizing long-term data from the AquaDiva field sites.

Requirements:

- A Master’s degree (or equivalent) in **biology, ecology, physics, mathematics**, or related discipline; candidates expected to earn their degree by September 2017 are welcome to apply
- **Solid knowledge** of ecological principles including population ecology and ecological modelling, of statistics and programming; additional basic knowledge of microbiology, hydrology, and geology are beneficial
- **Excellent technical skills** in programming in one or more of these languages: R, C/C++, or similar languages; programming of population dynamics models (Ordinary Differential Equations); good basic knowledge of statistical methods, preferably Structural Equation Models
- Enthusiasm to play an active role in the **interdisciplinary research team** of AquaDiva
- Highly motivated and creative personalities, with an interest to shape their own thesis project
- Excellent written and oral communications skills in **English**

We offer:

- A doctoral researcher position (TV-L E13 - salary agreement for public service employees, 65%) with funding from Sep 1, 2017, until Jun 30, 2021, as well as generous research funding with the possibility of a three-months research stay abroad
- Opportunity for research on an innovative and unique Critical Zone research platform
- A comprehensive mentoring program with supervision by a team of advisors
- A communicative atmosphere within a scientific network providing top-level research facilities and training program, including participation in international and national conferences and workshops
- The place of work is **Leipzig**, Germany, a big and lively city with a vibrant cultural scene, dynamic business activities, and successful scientific centers of innovation, such as UFZ and iDiv, around the Leipzig University

Severely disabled applicants with equal qualification and aptitude are given preferential consideration.

Applications should be written in English. The **application deadline is June 16th**, 2017.

Applications are submitted exclusively via an online application tool: <https://apply.jsmc.uni-jena.de>

Selected applicants will be invited to a recruitment symposium in Jena, Germany, presumably in August, 2017.

For more **information on the position**, feel free to contact Björn Rall (bjoern.rall@idiv.de). For more **information on the application process**, please contact the coordinator, Maria Fabisch (maria.fabisch@uni-jena.de). More **project details**: <http://www.aquadiva.uni-jena.de/Graduate+school/Open+positions-p-213.html>.



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Doctoral Researcher Position (m/f; Ref.No. 129/2017)

at the Institute of Ecology, Aquatic Geomicrobiology, at the Friedrich Schiller University Jena (FSU)
(subject to the final grant decision end of May)

From the Forest Canopy to the Aquifer: the Role of Microbial Processes in the Origin and Fate of Nitrate in the Earth’s Critical Zone

This project aims to understand, which factors are driving nitrification and nitrogen loss via denitrification or anammox across two superimposed oligotrophic limestone aquifer assemblages in the Hainich Critical Zone Exploratory. To identify key processes and players, rate measurements will be complemented with the analysis of natural abundances of ¹⁵N isotopes in nitrate and ammonium and with molecular surveys of the corresponding microbial communities. To assess the influence of surface conditions in groundwater recharge areas, we will follow the microbial transformation of N compounds from forest canopies via soils and seepage water to the groundwater.

Requirements:

- A Master’s degree (or equivalent) in **microbiology, biogeochemistry, geo-ecology**, or a related discipline in the environmental sciences; candidates expected to earn their degree by September 2017 are welcome to apply
- **Solid knowledge** of microbial ecology of the nitrogen cycle and molecular approaches to investigate microbial communities in environmental samples
- **Excellent technical skills** in: standard methods of molecular microbial ecology (nucleic acid extraction from environmental samples, PCR, cloning, sequence analysis, standard cultivation techniques of microorganisms, photometric methods of water chemical analysis); experience in the analysis of next generation sequencing data and in ¹⁵N-based isotopic approaches would be desirable but are not mandatory
- Readiness to work for extended periods in the field
- Enthusiasm to play an active role in the **interdisciplinary research team** of AquaDiva
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For more **information on the position**, feel free to contact Dr. Martina Herrmann (martina.herrmann@uni-jena.de).

For more **information on the application process**, please contact the coordinator, Maria Fabisch (maria.fabisch@uni-jena.de). More **project details**: <http://www.aquadiva.uni-jena.de/Graduate+school/Open+positions-p-213.html>.



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The Integrated Research Training Group AquaDiva invites applications for a
Doctoral Researcher Position (m/f; Ref.No. 130/2017)
at the group Terrestrial Ecohydrology at the Friedrich Schiller University Jena
(subject to the final grant decision end of May)

Effect of Canopy-Induced Heterogeneity on Water Flux Patterns below the Root Zone

The project aims at understanding whether canopy-induced small-scale patterns of water fluxes have potential to affect area-averaged water fluxes below the rooting zone. This project goes beyond assessing the effect of canopies on precipitation, by accounting specifically also for vegetation-induced patterns of soil hydraulic properties and transpiration. This work will be conducted at an intensive monitoring site already equipped with an expansive soil sensor network and forest lysimeters. An important technical task will be the extension of the soil sensor network by potentiometers and the development of a low complexity soil water model for a model-data-fusion exercise.

Requirements:

- A Master's degree (or equivalent) in **hydrology, soil science, geo-ecology**, or related discipline in the environmental sciences; candidates expected to earn their degree by September 2017 are welcome to apply
- Solid knowledge of unsaturated water flow, including both modelling and observation; background in statistics; ideally with knowledge of geostatistics, sensing technology, and/or a script language (such as python, R, or Matlab)
- Readiness to work for extended periods in the field
- Enthusiasm to play an active role in the **interdisciplinary research team** of AquaDiva
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For more **information on the position**, feel free to contact Anke Hildebrandt (hildebrandt.a@uni-jena.de). For more **information on the application process**, please contact the coordinator, Maria Fabisch (maria.fabisch@uni-jena.de). More **project details**: <http://www.aquadiva.uni-jena.de/Graduate+school/Open+positions-p-213.html>.



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at the Institute of Physical Chemistry at the Friedrich Schiller University Jena (FSU)
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Development of Linear and Non-Linear Raman Techniques for Single Cell Sorting

In this project, different Raman techniques will be used for the detection and sorting of isotopically labeled single bacterial cells. In this subproject, all Raman spectroscopic and coherent Raman spectroscopic experiments will be established for the isotope experiments on single bacteria cells. In addition, also the layout and the combination of the spectroscopic methods with microfluidics will be addressed to sort the bacterial cells according to the respective isotope incorporation.

Requirements:

- A Master’s degree (or equivalent) in Natural Sciences (e.g., **chemistry, physics**, or related discipline); candidates expected to earn their degree by September 2017 are welcome to apply
- **Solid knowledge** of linear and nonlinear spectroscopy; **excellent optical expertise**
- Enthusiasm to play an active role in the **interdisciplinary research team** of AquaDiva
- Highly motivated and creative personalities, with an interest to shape their own thesis project
- Excellent written and oral communications skills in **English**

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For more **information on the position**, feel free to contact Dr. Petra Rösch (petra.roesch@uni-jena.de). For more **information on the application process**, please contact the coordinator, Dr. Maria Fabisch (maria.fabisch@uni-jena.de). More **project details**: <http://www.aquadiva.uni-jena.de/Graduate+school/Open+positions-p-213.html>.



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Development of Statistical Approaches to Differentiate between Raman Spectra of Isotopically Labeled Bacteria

In this project, different Raman techniques in combination with microfluidics will be used for the detection and sorting of isotopically labeled single bacterial cells. In this subproject, the Raman and CRS data will be used to establish different adapted chemometric algorithms, in order to differentiate normal from isotopically labeled bacteria. Here, a special emphasis will be on algorithms for the analysis of spectra from multi-labeling experiments. The output of these algorithms will then be used as triggering signal for the microfluidic device.

Requirements:

- A Master’s degree (or equivalent) in **chemistry, physics, computer science, mathematics**, or related discipline; candidates expected to earn their degree by September 2017 are welcome to apply
- **Solid knowledge** of statistics and/or mathematics
- **Profound programming skills in a higher programming language (Matlab, R, Python)**
- **Excellent technical skills** in data mining, multivariate statistics, mathematical modelling, statistics, image analysis
- Enthusiasm to play an active role in the **interdisciplinary research team** of AquaDiva
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