

## Helmholtz Call for 2017 CSC Fellowship Applicants

**Helmholtz Centre:** Forschungszentrum Jülich GmbH – [www.fz-juelich.de](http://www.fz-juelich.de)  
**Department/Institute:** Institute for Bio- and Geoscience, Agrosphere (IBG-3)  
[http://www.fz-juelich.de/ibg/ibg-3/EN/Home/home\\_node.html](http://www.fz-juelich.de/ibg/ibg-3/EN/Home/home_node.html)  
**Supervising scientist:** Dr. Roland Bol (FZ Juelich) & Dr. Eva Lehndorf (Bonn Univ). Prof. C. Mueller (Giessen University – 2 month research stay)  
**Research Field:** Agrosphere  
**Position:** Sandwich PhD Student X

**Research Area:** Limited knowledge exists on how SIC (inorganic C) amount in agricultural soils influences the overall soil potential to sequester SOC (organic C) under different N fertilizer management. Resulting feedbacks to plant available N for crop growth in soils also remain unexplored. The study will use soil from a range of both German (e.g. sampled within Bonares and Tereno projects) and Chinese (e.g. Huantai) long term field experiments with varying SIC, SOC and N stocks. Short term C and N dynamics will be examined using labelled and natural abundance isotope studies (<sup>13</sup>C and <sup>15</sup>N). Bulk soil and dynamic biomarker approaches (amino sugars, lignin, lipids) will be used. The outcomes will be modelled to evaluate interactions and strength of interactions (N, SIC, SOC) on potential crop growth.

### Specific Requirements:

A Ph.D student currently working in an University with a specific focus on agriculture or environmental science. An additional background in chemistry, biogeochemistry or, soil science or agriculture is beneficial. Experience in with (stable) isotope analyses or mass spectrometry as well as data analysis skills are beneficial. Experience in designing experiments is a plus. Good knowledge of the English language. Sandwich study will include a 2 month stay working at Giessen University under supervision of Prof. C Mueller a key expert in determining modelled N processes and process rate in agricultural systems. The research stay will be in close collaboration with the German Science Foundation research unit DASIM “Denitrification in Agricultural Soils: Integrated control and Modelling at various scales” (FOR 2337) which looks at gross N transformation dynamics with a focus on denitrification of various agricultural soils.

**Duration of stay:** 2 years  
**Work Place:** Research Centre Juelich, Germany (near Cologne)  
**Earliest Start:** September 2017  
**Language Requirement:** a very good level in spoken and written English.

A German language course will be offered parallel to the project

**Name and Address of the Supervisor:** Dr. Roland Bol, Forschungszentrum Jülich, Institute for Bio- and Geosciences (IBG-3), 52425 Juelich, Germany  
[r.bol@fz-juelich.de](mailto:r.bol@fz-juelich.de)

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**Helmholtz Centre:** Forschungszentrum Jülich GmbH – [www.fz-juelich.de](http://www.fz-juelich.de)

**Department/Institute:** Institute of Energy and Climate Research, Plasmaphysics (IEK-4)  
[http://www.fz-juelich.de/iek/iek-4/EN/Home/home\\_node.html](http://www.fz-juelich.de/iek/iek-4/EN/Home/home_node.html)

**Supervising scientist:** Prof. Dr. Yunfeng Liang

**University for Registration ( for those looking for a dissertation):**

**Research Field:** Energy; Plasma physics

**Position:** PhD Student  Sandwich PhD Student

## Research Area:

The stellarator is one major type of magnetic confinement fusion device. In contrast to tokamaks, no plasma current is needed to create the poloidal field, and the magnetic field lines are naturally twisted along the toroidal and poloidal directions in stellarators. Since no current needs to be induced, steady-state operation is possible. Wendelstein 7-X, the world largest stellarator for the next few decades, started operations in Nov. 2015, and under preparation of OP1.2 with an island divertor configuration. A detailed study of the 3D island divertor physics is important, and requires knowledge of the processes in the plasma edge and scrape-off layer.

The Institute of Energy and Climate Research (IEK-4) is one of the leading institutes in plasma edge diagnostics and physics of 3D edge physics. Its major contributions on W7-X are a multi-purpose probe system with probe heads to measure plasma parameters in the edge region, an endoscope system enabling a tomographic reconstruction of impurity radiation in the divertor region as well as divertor power load measurements and active gas injection diagnostics allowing for helium transport studies

We are seeking a sandwich PhD student researcher. He/She will work on the edge modelling and diagnostics for a study of “Edge transport and stability in H-mode plasmas with an island divertor on W7-X”.

## Specific Requirements:

A very good knowledge of mathematical and modelling skills, and good experiences of plasma transport physics on tokamak or stellarator are a prerequisite, as well as a very good level in spoken and written English.

**Duration of stay:** 2 years

**Work Place:** Research Centre Juelich, Germany (near Cologne)

**Earliest Start:** September 2017

**Language Requirement:** a very good level in spoken and written English.

**Name and Address of the Supervisor:** Prof. Dr. Yunfeng Liang, Forschungszentrum Jülich GmbH, IEK-4, D-52425 Jülich, Germany  
[y.liang@fz-juelich.de](mailto:y.liang@fz-juelich.de)