

Helmholtz Call for 2017 CSC Fellowship Applicants

Helmholtz Centre: Forschungszentrum Jülich - www.fz-juelich.de
Department/Institute: Institute for Bio- and Geosciences, Plant Sciences (IBG-2)
http://www.fz-juelich.de/ibg/ibg-2/EN/Home/home_node.html
Supervising scientists: Prof. Dr. Michelle Watt, Dr. Borjana Arsova, Dr. Andong Shi
Research Field: Resource efficient agriculture/ cereal root discovery/ phenotyping and genotyping
Position: PosiDoc
Research Area:

Root phenotyping and genotyping of *Poaceae* species under nitrogen and beneficial bacteria treatments to discover traits for future cereal crop productivity

Nitrogen (N) is the most abundant plant macronutrient taken up from soil, and its uptake and use efficiency is critical for plant performance and sustainable agriculture. Plant roots encounter complex abiotic and biotic conditions whose interplay influences the uptake of N from soil. Breeders require cereal root traits for effective N fertiliser use. *Poaceae* species include the cereal crops, e.g., wheat, maize and rice, supplying about 50% of human calories. This project aims to discover root traits of wheat and the model grass *Brachypodium* under limiting N conditions, using unique technology for non-invasive phenotyping, and Next Generation Sequencing at the research centre in Jülich. In addition to N treatments, a beneficial bacteria that improves plant vigour under limiting N condition, will be tested in custom-made temperature-controlling facility that mimic near-field conditions. The successful post-doctoral fellow will play a central role in researching root and rhizosphere traits for breeding crops for effective N fertiliser use and productivity.

Specific Requirements:

- PhD in Biology, Biochemistry, Plant physiology or Molecular biology
- Sound knowledge of, or experience in phenotyping
- Experience in RNASeq (library preparation and data analysis) and working with microorganisms will be highly preferred.
- Statistical knowledge for analysis of large datasets
- R (or similar)
- Ability to work both independently and as part of a team

Funding: CSC-scholarships will be increased by hosting institution (500 €/month and costs for health, emergency-call and liability insurance (50 €))

Duration of stay: 2 years

Work Place: Forschungszentrum Jülich, Germany (near Cologne)

Earliest Start: October 2017

Language Requirement: Excellent written and spoken English skills

Name and Address of the Supervisor: Prof. Dr. Michelle Watt, Forschungszentrum Jülich GmbH, Institute for Bio- and Geosciences (IBG-2), 52425 Jülich, Germany, email: m.watt@fz-juelich.de

Helmholtz Call for 2017 CSC Fellowship Applicants

Helmholtz Centre: Forschungszentrum Juelich GmbH – www.fz-juelich.de
Department/Institute: Institute for Energy and Climate Research, Plasmaphysics (IEK-4)
http://www.fz-juelich.de/iek/iek-4/EN/Home/home_node.html
Supervising scientist: Dr. Jan W. Coenen
Research Field: Materialsdevelopment for Energy Applications
Position: PostDoc X

Research Area:

The Position is offered for developing materials for high heat flux and high temperatures in future energy applications. The aim is to transfer the class of metal matrix materials developed for fusion into new areas such as direct solar hydrogen production, X-ray anodes and other high temperature high cyclic load cases. The materials in question are tungsten fibre tungsten composites and adaptations there of, consisting of e.g. Mo, V, Ta. Here especially materials should be considered that are typically not used in a fusion environment. The PostDoc assists in developing a new materials class moving from tungsten to other refractories (RM). In the 18 month of the project three main activities are envisioned.

- Supervision of PhD students in the Area of Materials Development.
- Studying possible applications for (RM)f/(RM)
- Initial Production and Characterisation of (RM)f/(RM) and others

Specific Requirements:

- Material Science Background
- Experience in Ductilisation of Refractory Metals
- Mechanical Testing of Materials including Microstructure Analysis
- FEM Modelling Basics
- Initial Knowledge of Energy Systems apart from Fusion.

Funding: CSC-scholarships will be increased by hosting institution (500 €month and costs for health, emergency-call and liability insurance (50 €))

Duration of stay: 18 month

Work Place: Forschungszentrum Juelich, Germany (near Cologne)

Earliest Start: September 2017

Language Requirement: very good English skills (writing and speaking)

Name and Address of the Supervisor: Dr. Jan W. Coenen , Forschungszentrum Juelich GmbH,
Institute for Energy and Climate Research (IEK-4), 52425 Juelich,
Germany
j.w.coenen@fz-juelich.de

Helmholtz Call for 2017 CSC Fellowship Applicants

Helmholtz Centre: Forschungszentrum Jülich GmbH – www.fz-juelich.de
Department/Institute: Institute for Energy and Climate Research, Photovoltaics (IEK-5)
http://www.fz-juelich.de/iek/iek-5/EN/Home/horrie_node.html
Supervising scientist: Dr. Kaining Ding
Research Field: Photovoltaics
Position: PostDoc X
Research Area:

The scientific goal of the project is the realization of high efficiency and low cost silicon heterojunction (SHJ) solar cells by minimizing the electrical and optical losses using beyond the state-of-the-art thin-film materials. The functional stack in silicon heterojunction solar cells consists of a contact layer, a transparent conductive oxide, and a metal coating in the order specified. Power losses occur in form of transport loss through the layers and across the interfaces. The focus of this work lies on the development of advanced coating of nickel, copper and silver metals via electro plating technique as well as the optimization of the grid design in interplay the underlying transparent conductive oxide film. These are considered to be crucial aspects that affect the fill factor of high efficiency SHJ solar cells. The patterning process, the Ni seed homogeneity, the contact adhesion as well as issues with back plating and long term reliability will be addressed in this work. In particular the process compatibility with transparent conductive oxide e.g. ITO and/or ZnO:Al will be analysed in detail.

Specific Requirements:

- Excellent knowledge in electrical and optical phenomena in semiconductors.
- Laboratory experience on electroplating for silicon solar cells mandatory.
- Experience with fabrication and/or characterization of Si wafer based PV.
- Knowhow in silicon heterojunction solar cell preferred.
- Business fluent spoken and written English.

Funding: CSC-scholarships will be increased by hosting institution (500 €month and costs for health, emergency-call and liability insurance (50 €))

Duration of stay: 24 months

Work Place: Forschungszentrum Jülich, Germany (near Cologne)

Earliest Start: September 2017

Language Requirement: English (fluent in speaking and writing)

Name and Address of the Supervisor: Dr. Kaining Ding, Forschungszentrum Jülich, Institute for Energy and Climate Research (IEK-5), 52425 Jülich, Germany, k.ding@fz-juelich.de

Helmholtz Call for 2017 CSC Fellowship Applicants

Helmholtz Centre: Forschungszentrum Jülich GmbH – www.fz-juelich.de
Department/Institute: Institute for Energy and Climate Research, Photovoltaics (IEK-5)
http://www.fz-juelich.de/iek/iek-5/EN/Home/home_node.html
Supervising scientist: Prof. Dr. Thomas Kirchartz
Research Field: Photovoltaics
Position: PostDoc

Research Area: Perovskite Solar Cells

Solar cells made from lead-halide based perovskites have been shown to enable efficiencies > 20 % using a solution-based fabrication process. However, the materials currently lack stability and are insufficiently well understood in many respects related to electrostatics and charge carrier recombination in these materials. We are looking for candidates that support our research efforts on fabricating and characterizing layers of lead-halide perovskites made from solution or alternatively by co-evaporation. We aim to focus on efforts to reduce and understand recombination in the bulk and at interfaces and will use methods like transient photoluminescence to study the recombination. In addition, we are interested in improving material stability e.g. by using alternative cations. Depending on the profile of the applicant a slightly different focus of the project is possible and candidates with a background in physics or in chemistry are both encouraged to apply.

Specific Requirements:

The successful candidate should have a background in physics, chemistry, materials science or electrical engineering and be familiar with the fabrication and characterization of semiconductor devices and semiconducting materials (ideally solar cells).

Funding: CSC-scholarships will be increased by hosting institution (500 €/month and costs for health, emergency-call and liability insurance (50 €))
Duration of stay: 2 years
Work Place: Forschungszentrum Jülich, Germany (near Cologne)
Earliest Start: September 2017
Language Requirement: Very good English skills (writing and speaking)
Name and Address of the Supervisor: Prof. Dr. Thomas Kirchartz, Forschungszentrum Jülich, Institute for Energy and Climate Research (IEK-5), 52425 Jülich, Germany, t.kirchartz@fz-juelich.de

Helmholtz Call for 2017 CSC Fellowship Applicants

Helmholtz Centre: Forschungszentrum Jülich GmbH – 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

Supervising scientist: Prof. Dr. Yunfeng Liang

Research Field: Energy; Plasma physics

Position: PostDoc

Research Area:

On the way to a reactor design, power and particle exhaust are of major importance in terms of impurity screening, helium removal and power loads on plasma-facing components in both tokamak and stellarator concepts. Wendelstein 7-X, the world largest stellarator for the next few decades, will begin operations in the middle of 2015. 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 plasma-wall interaction. 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 post doctor researcher. He/She will work on the divertor physics and edge diagnostics for understanding the physics of "Edge transport with a island divertor on W7-X".

Specific Requirements:

University studies with a PhD degree in physics. A good basic knowledge of mathematical and modeling skills, and good experiences of divertor physics, plasma wall interaction and spectrometer diagnostics on tokamak or stellarator are a prerequisite, as well as a good level in English.

Funding: CSC-scholarships will be increased by hosting institution (500 €month and costs for health, emergency-call and liability insurance (50 €))

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