



HELMHOLTZ RESEARCH FOR
GRAND CHALLENGES

Position Profile for Chinese Applicants running for 2019 Helmholtz – OCPC – Program

PART A (Info about the Position)

Title of the project:

In situ transmission electron microscopy of electrical transport and magnetism in highly strained Ni nanowires

Helmholtz Centre and institute:

Forschungszentrum Jülich
Ernst Ruska-Centre for Microscopy and Spectroscopy with Electrons

Project leader:

Prof. Dr. Rafal E. Dunin-Borkowski

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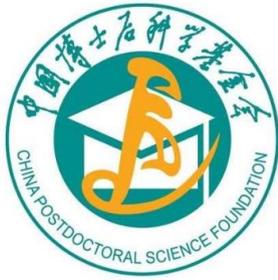
Web-address:

www.er-c.org, <http://www.fz-juelich.de/er-c/EN/>

Description of the project (max. half page):

In semiconductor nanowires that contain combinations of III-V semiconductors, such as InAs/InP/GaSb, inhomogeneities in dopant concentration can strongly modify electronic transport properties. The ability to quantify local charge density distributions in individual nanowires, in combination with accurate compositional and structural measurements, promises to provide new insight into structure-property relationships and the underlying physics of electron transport. In this project, the advanced transmission electron microscopy technique of off-axis electron holography will be used to measure charge density distributions in a wide range of individual electrically contacted semiconductor nanowires. This challenging project will require advanced sample preparation of electrically biased nanoscale devices and technique development for electron microscopy, in order to study the morphologies, compositions, strain distributions and electrical properties of the very same electrically contacted nanowires *in situ* in the transmission electron microscope.

Required qualification of the post-doc:



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- PhD in materials science, physics or a related discipline
- Experience with advanced transmission electron microscopy
- Additional skills in semiconductor physics