



Job ID: #JOB28/2017

Job Description

Job Title: Post-Doc

Job Summary:

Determination of 3D lattice distortions in strained semiconductor hetero-nanowires by nanobeam electron diffraction

Job Description:

The Post-Doc will be involved in research in the frame of the project "The anisotropy of 3D lattice strain distribution and plastic relaxation in hetero-nanostructures investigated by tomographic electron diffraction". Post-Doc will study the plastic relaxation mechanism at atomic level of strained individual nano objects such as semiconductor core-shell nanowires [1]. Understanding the mechanism of the formation of structural defects and their impact of on property is essential for the design and optimization of optically and electrically active core shell nano-objects (such as single nanowire laser [2]). Thanks to very fine electron probe of diameter of 200-500 pm in STEM and 10000 times higher interaction of high energy electrons with matter comparing to X-ray synchrotron nanobeams, it will be possible to perform 3D mapping of strain field with spatial resolution of about few nm. It means that in reconstructed distortion field it will be possible to separate contribution of the core and the shells as well as fields related to individual defects. This is impossible with ~100 nm resolution (comparable with diameter of whole nanowire) of synchrotron reconstructions [3]. The main objective of Post-Doc work will be experimental determination of 3D distortion tensor of strained and partially relaxed hetero nanowires on the base of sets of electron diffraction patterns taken along different crystallographic zone axis. This investigation will be completed with HRTEM/STEM visualization of the atomic structure of defects cores and interfaces in hetero-nanowires. Additionally, the Post-Doc will help to supervise PhD Student in the project.

[1] J. Sadowski et al. *Nanoscale* 9, 2129-2137 (2017)

[2] B. Mayer et al. *Nature Communication* 4, 2931 (2013)

[3] T. Stankevič et al. *Applied Physics Letters* 107, 103101 (2015)

Profile of a candidate for the PostDoc position:

- PhD degree obtained (or PhD thesis submitted) in one of the following domain: physics, material science, applied mathematics, computational physics or related,
- scientific publications in international journals related to: transmission electron microscopy, modeling of mechanical propriety of solids by finite elements methods or by molecular dynamic, plastic relaxation of crystals, pattern recognition algorithms, tomographic reconstruction algorithms and other computational physics areas,
- ability to work in a team,
- good spoken and written English,
- an additional advantage will be programming skills in C ++, Python Matlab, Mathematica

Main research field: Physics

Sub Research Field: Solid state physics

Career Stage: Experienced researcher or 4-10 yrs (Post-Doc)

Research Profile ([details](#)): Recognised Researcher (R2)

Type of Contract: Temporary two years

Status: Full-time

Salary: Depends on qualifications

From 4500 to 5000 PLN per month (before taxes).

Contact

More information can be obtained from dr hab. Sławomir Kret (e-mail: kret@ifpan.edu.pl,).

https://www.researchgate.net/profile/Slawomir_Kret

<http://www.researcherid.com/rid/D-5585-2012>

<http://www.wkraj.pl/index.php?page=vr&start=50464#/50464/0>

<http://www.ifpan.edu.pl/SL-1/index.html>

Application details

Application deadline: November 30, 2017 .

Applications after deadline are not considered.

Required materials:

- Curriculum Vitae
- List of publications
- One page summary of professional accomplishments
- Two reference letters from scientists familiar with candidate research submitted by referees directly to jobs@ifpan.edu.pl

Candidates may be asked for additional documents and public presentation of the results of their previous work in the form of seminars and/or additional explanations.

We reserve the right to cancel the competition without giving a reason.

All materials should be submitted in electronic form to the address: jobs@ifpan.edu.pl with Job ID in the subject.