

INSTITUTION: **The National Centre for Nuclear Research**



CITY: Otwock / Świerk

POSITION: **PhD candidates - Assistant Research (PL form “Asystent”)**

DISCIPLINE: physics, materials theory, materials science, corrosion, material characterization

POSTED: 27/10/2021

EXPIRES: 14/12/2021

WEBSITE: <http://nomaten.ncbj.gov.pl/phd-candidates-assistant-research-advanced-multifunctional-materials-science>

KEY WORDS: Physics, Materials Theory, Materials Science, Material Characterization, Condensed Matter Physics, Computational Physics, Mechanics, Corrosion

**PhD candidates - Assistant Research (PL form “Asystent”)
Advanced Multifunctional Materials Science**

**NOMATEN Centre of Excellence
National Nuclear Research Centre (NCBJ)
Poland**

NOMATEN Centre of Excellence (CoE) is formed through a scientific partnership between the National Centre for Nuclear Research (NCBJ-Poland), the French Alternative Energies and Atomic Energy Commission (CEA-France) and the Technical Research Centre of Finland (VTT-Finland) with joint financial support from the Foundation for Polish Science (FNP) and the European Commission. NOMATEN focuses research on the characterization, analysis and development of advanced multifunctional materials, specifically those designed to work in extreme conditions, with primary examples being radiation, high temperature and corrosion.

More info about NOMATEN CoE and the detailed project descriptions at <http://nomaten.ncbj.gov.pl>
Multiple positions exist on the PhD student levels in NOMATEN Research Groups. Below are topical projects in the groups:

Complexity in Functional Materials:

Understanding materials' deformation with material informatics. Plasticity in metals and metal alloys is a complex phenomenon. In this PhD project we apply imaging techniques and machine learning-like approaches to instabilities on plasticity.

Plasticity in metals and metal alloys depends at the fundamental level on the behavior of individual dislocations. In this project, you will develop the theory of how to understand the depinning and pinning of dislocations in disordered landscapes in complex alloys.

Preferred background: Statistical mechanics, computational simulations, machine learning.

Contact person: prof. Mikko Alava (mikko.alava@ncbj.gov.pl)

Functional properties

Mechanical properties and radiation resistance of fcc and bcc type materials. Understanding mechanical and structural properties of complex alloys working closely with structural and numerical groups at the CoE. Second goal of this work will be to understand radiation damage mechanism of these new families of materials.

We know that multiple atoms in random solid solutions are able to effectively reduce the mean free path of electrons, phonons and magnons. In so doing, it is good for delaying the formation of defects at the initial stage of radiation. However, limited amount of information about the nature of such remarkable irradiation tolerance in HEAs (fcc) or bcc type structures exist. PhD candidates will be using variety of methods like SEM/EBSD/EDX/FIB system, nanoindentation platforms, XRD and RBS/C. One of the goals of this work will be to study high temperature nanomechanical properties of binary and ternary systems.

Preferred background: Materials science, materials engineering, nuclear engineering, mechanics.

Contact person: dr. hab. Lukasz Kurpaska (lukasz.kurpaska@ncbj.gov.pl)

Materials Structure, Informatics and Function:

Nanoindentation size effects and Digital Image Correlation in in-situ testing (Collaboration with EC Joint Research Center) - for the experimental method development for the elucidation of size effects in metals, in combination with in-situ microscopy data that may be used for digital image correlation purposes.

Materials Discovery, Composition search and machine learning for lightweight Ti-based alloys: An Ab-Initio Approach (cross-industrial project) – the position is focused on the advancement of recently developed machine learning methods for materials discovery through the use of ab-initio data, for targeting light weightness as a key component.

Dimensional reduction in crystal plasticity: Convolutional Neuronal Networks For Strain Maps - focused on the advancement of dimensional reduction approaches for machine learning in crystal plasticity applications, especially through the use of convolutional neural networks.

Preferred background: Multiscale modelling, mechanical characterization, applied physics/math, machine learning.

Contact person: dr. Stefanos Papanikolaou (stefanos.papanikolaou@ncbj.gov.pl)

Materials Characterization:

Understanding and explaining the processes taking place in structural materials under the influence of radiation and high temperature. The PhD student will be engaged in studies on impact of radiation damage and high temperature on the structural properties of materials like: ODS and HEAs, Al₂O₃ coatings, zirconium, nickel alloys and polymers, working closely with functional and numerical groups of the CoE. Specific topics on the development of 3-D structural models of materials and development of methods of materials structure validation using SEM/FIB/EBSD/TEM/Raman/XRD techniques will be proposed.

Preferred background: Physics, materials science, materials engineering, nuclear engineering.

Contact person: dr. Iwona Jóźwik (Iwona.Jozwik@ncbj.gov.pl)

Our ambition is to build a team composed of world-leading researchers and young, highly motivated people who are passionate about multifunctional materials science.

During their employment, the PhD candidates will be required to timely fulfil all the obligations connected with the process of obtaining the Doctoral degree in the chosen scientific disciplines (such as evaluation, passing exams, participating in lectures and other activities).

Location:

National Centre for Nuclear Research (NCBJ), ul. Andrzeja Sołtana 7, 05-400 Otwock, Poland (Suburb of Warsaw, efficient and free daily bus transport service provided).

Gross Salary:

7,000 PLN per month (at current exchange rate 1,550 € per month); the details in each case depend on qualifications and experience, and the compensation is composed of the base salary and seniority addition, project bonus).

Read more about contributions in Poland at <https://www.ncbj.gov.pl/en/hrcareer/contributions-poland>

We offer:

2 years initial employment with extension after a positive evaluation.

Work in international networks with research institutes and industrial companies.

Access to the research potential of NOMATEN's three partners between NCBJ (Poland), CEA (France) and VTT (Finland).

Some of the positions are for joint collaborative research with NOMATEN partners CEA (France) and VTT (Finland) and thus include extensive visits to the collaborating institution.

Travel funds for participation in conferences and collaboration, attractive working conditions, atmosphere of teamwork, family-friendly environment with flexible working hours. support of an experienced local team in legal, financial and organisational issues as well as logistic support and advice related to working in Poland - enabling smooth relocation and equal opportunities.

Required documents:

- ✓ cover letter that explains the motivating factors for considering the position(max. 1 pp)
- ✓ CV with complete publication list
- ✓ brief description of important scientific achievements and scientific outlook (max. 2 pp)
- ✓ a list of 2 reference persons including their positions and contact details (e-mail address)
- ✓ MSc diploma copy/scan

The recruitment is open to candidates who, at the time of submitting their applications, do not have a diploma confirming MSc, but who have a fixed date for obtaining this title before the planned date of employment. In this case, it is necessary to provide documents that prove that.

- ✓ as an attachment to your application please sign and enclose the following declaration:
I agree to the processing of my personal data included in this application for the needs necessary to carry out the recruitment.

Application deadline: December 14th, 2021

Applications in electronic form should be submitted in English to:
magdalena.jedrkiewicz@ncbj.gov.pl.

Candidates may be asked to provide additional documents. We reserve the right to contact only selected candidates and the right to inform about the decision to fill the post only to the selected candidate.

Candidates may be asked to provide additional documents. In the selection process, short-listed candidates will be interviewed in person or remotely.

Position starts on: February 1st, 2022 (at the earliest).

Read more about positions: <http://nomaten.ncbj.gov.pl/job-vacances>

INFORMATION CLAUSE ON PERSONAL DATA PROCESSING:

1. The controllers of the personal data processed during the recruitment process are:
 - 1) National Centre for Nuclear Research, ul. Andrzeja Sołtana 7, 05-400 Otwock and
 - 2) Foundation for Polish Science, ul. I. Krasickiego 20/22, 02-611 Warszawa.
2. The data protection officer can be contacted by using the following address:
 - 1) Personal Data Protection Officer, National Centre for Nuclear Research, Sołtana 7, 05-400 Otwock, Poland
 - 2) iod@ncbj.gov.pl
3. Providing data contained in recruitment documents is a condition for applying for a job at NCBJ.
4. Processing of the personal data for the purpose of filling the position listed in this announcement and to conduct subsequent recruitment is done on the basis of expressed consents. You have the right to withdraw your consent at any time, without affecting the lawfulness of the processing based on consent before its withdrawal.
5. Your personal data will not be made available to other data recipients.
6. Your personal data will not be transferred to a third country or to an international organization.
7. No automated individual decision-making and profiling as referred in Article 22 (1) and (4) GDPR is done during recruitment conducted by NCBJ. This means that no decisions regarding job candidates are made automatically and that no job candidate profiles are made.
8. In the case you have been unsuccessful in applying for the position listed in this announcement and you haven't given consent to store the collected personal data in the NCBJ recruitment database, your data will be erased no later than 12 years from the completion of recruitment process, but no longer than the date of the end of the durability period of the project, which will find its basis in the provisions governing project financing.
9. You have the right to access your personal data, request its rectification or erasure. Filing a request to erase data is tantamount to withdrawal from the recruitment process. You have also the right to request restriction of processing in cases specified in Article 18 GDPR.
10. You have the right to lodge a complaint with a supervisory authority (President of the Office for Personal Data Protection) about unlawful processing of your personal data. The right to file a complaint only concerns the lawfulness of the processing of personal data, not the recruitment process.



HR EXCELLENCE IN RESEARCH

The National Centre for Nuclear Research is awarded by [HR Excellence in Research](#)". Recruitment in NOMATEN is based on OTM-R system (Open, Transparent and Merit-based recruitment practices in Research Performing Organisations).



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 857470

