

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



CITY: Otwock / Świerk

POSITION: **Postdoc positions**

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

POSTED: 09|11|2022

EXPIRES: 30|11|2022

WEBSITE: <https://www.ncbj.gov.pl/praca/postdoc-positions-nomaten>

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

**Postdoc positions**  
**NOMATEN Centre of Excellence,**

**National Nuclear Research Centre (NCBJ),**  
**Poland**

NOMATEN Centre of Excellence is formed through a partnership between NCBJ (Poland), CEA (France) and 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 about NOMATEN CoE and the detailed project descriptions at <http://nomaten.ncbj.gov.pl>

Multiple positions exist on the postdoctoral levels in NOMATEN Research Groups conducting research in the field of:

**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 dislocation simulation and machine learning-like approaches to plasticity. Example publications are Phys. Rev. 5, 073601 (2021) and 4, 083602 (2020). We are also interested in complex alloys from this methodological angle.

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

**Contact person:** prof. Mikko Alava ([mikko.alava@ncbj.gov.pl](mailto:mikko.alava@ncbj.gov.pl))

**The functional properties group** studies the impact of radiation damage on the mechanical and structural properties of materials devoted to Gen. III+ and IV nuclear reactors. Experiments are conducted on ion-damaged materials and their working temperatures using techniques like nanoindentation, X-ray diffraction, tensile tests, and Raman spectroscopy. Structural properties are determined in collaboration with the “Materials Characterization” team using SEM/FIB/EBSD/EDS and TEM. We also act as an umbrella to the NOMATEN Corrosion Team (MCSA Fellow Aleksandra Baron-Wiechec).

Manufacturing of ODS-CSA and HEA materials. It is projected that, as nano-sized oxide particles are introduced into CSAs, the resulting oxide dispersion strengthened (ODS) concentrated solid-solution alloys (ODS-CSAs) may exhibit substantial performance improvement in extreme environments. Such ODS-CSAs may possess superior performance because they combine the advantages of CSAs and ODS materials. We are also developing Co-free HEAs via Arc Melting technology. This work is carried out in close collaboration with numerical teams of NOMATEN.

A full-time position will be devoted to the analysis/characterization of such materials. Understanding radiation damage resistance is one of our prime goals.

The second position will be devoted to studying the functional properties of different bcc-type materials submitted to the ion irradiation process. The goal of this work will be to develop a fundamental understanding of why refractory HEAs with bcc lattice show less ductility, but they appear to have much higher yield strengths than fcc-type HEAs, even at high temperatures. Understanding the impact of radiation damage will be one of the significant challenges in this work. The candidate will be responsible for conducting complex mechanical and structural experiments by using nanoindentation, XRD, and TEM devices on ion irradiated materials.

Postdoc candidate in Electrochemistry and Corrosion team: In-situ study of phenomena between surface of functional materials and environment, including but not limited to aqueous solutions. Key challenges are: corrosion and electrochemical phenomena at flowing electrolytes, elevated temperature and magnetic fields. The research methodology combines electrochemical methods, high resolution microscopy, magnetic/electric properties measurements. Preferred background: experimental (hands-on lab) experience in chemical engineering or electronics (electrical engineering) or physics with solid background in electric and magnetic properties of solid state matter.

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

**Contact person:** dr. hab. Lukasz Kurpaska ([lukasz.kurpaska@ncbj.gov.pl](mailto:lukasz.kurpaska@ncbj.gov.pl)) and for corrosion Aleksandra Baron-Wiechec ([aleksandra.baron-wiechec@ncbj.gov.pl](mailto:aleksandra.baron-wiechec@ncbj.gov.pl)).

**Materials Characterization** The main goal of the group is to conduct advanced characterization of novel multifunctional materials (“process-structure-property”) at the atomistic level using state-of-the-art equipment. The focus is on studying the impact of high temperature, oxidizing atmosphere and radiation on the structural properties of materials using a wide range of techniques, including SEM/FIB/EBSD/EDX tools, TEM analysis, as well as advanced and in-situ X-ray diffraction and Raman spectroscopy. The structural characterization of the studied materials under extreme conditions fills the gap between simulations and functional properties of the material, by verification of the structural model, analysis of material response on various conditions occurring in real environments, analysis of mechanisms of damage accumulation and studies of microstructure influence on the mechanical properties.

We have two full time positions, with expectations of experience in TEM operation including EDS analysis and structural analysis by XRD technique (in-situ at high temperature) in application to

material science:

First position will be devoted to studies focused on understanding of the radiation induced damage in optimized Ni-based HEA by means of TEM analysis.

Second position will be devoted to XRD study of the stress/strain and phase transformations in refractory HEA in broad range of temperature.

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

**Contact person:** dr. Iwona Jóźwik ([iwona.jozwik@ncbj.gov.pl](mailto:iwona.jozwik@ncbj.gov.pl))

### Requirements:

- ✓ The academic degree of PhD (no longer than for a period of 5 years from obtaining the degree)

If you have more experience and are interested in working for NOMATEN, please contact: [magdalena.jedrkiewicz@ncbj.gov.pl](mailto:magdalena.jedrkiewicz@ncbj.gov.pl)

- ✓ Fluency in English, spoken and written

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

Outstanding candidates are also encouraged to and supported with parallel applications to the Polonez Bis COFUND Fellowship call organized by the Polish National Science Centre ([polonezbis.eu](http://polonezbis.eu)).

### 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:

11,250 - 15,000 PLN per month (at current exchange rate 2,200- 3,000 € per month); the details in each case depend on qualifications and experience, and the compensation is composed of the base salary, seniority addition, functional addition and project bonus)

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

### We offer:

1 year 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).

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)
- ✓ Two references letters arranged by applicants and directly submitted by the letter writers before the application deadline.
- ✓ PhD diploma copy/scan

The recruitment is open to candidates who, at the time of submitting their applications, do not have a diploma confirming PhD, 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.*

Applications in electronic form should be submitted in English to: [magdalena.jedrkiewicz@ncbj.gov.pl](mailto: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: January 1st, 2023 (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](mailto: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.



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).



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