

INSTITUTION: **The National Centre for Nuclear Research (NCBJ)**  
**Joint Research Centre of the European Commission (JRC)**

CITY: Otwock / Świerk

POSITION: **PhD student**

DISCIPLINE: physics

POSTED: 13|12|2024

EXPIRES: 31|01|2025

WEBSITE: <https://nomaten.ncbj.gov.pl/unlock-your-potential-phd-student-materials-science>

KEY WORDS: PhD student in physics of materials, neutron/ion irradiation damage, ferritic/martensitic steels, nanoindentation, models for size effects, atomic force microscopy, ion beam tomography, machine learnin

---

## Unlock Your Potential as a PhD Student in Materials Science

### Join the National Centre for Nuclear Research (NCBJ) and the Joint Research Centre of the European Commission (JRC) in a Cutting-Edge Research Project

We are seeking a highly motivated and talented PhD student to join our teams under the Collaborative Doctoral Partnership (CDP) in the field of "Non-power nuclear and radiological technologies". As a PhD student, you will have the opportunity to work on a project that aims to improve our understanding of the phenomena associated with radiation damage in ferritic/martensitic (f/m) steels.

#### Project Overview

##### Radiation Damage: A Complex Phenomenon

When materials are exposed to neutron irradiation, they undergo significant changes in their mechanical properties. Studying these effects in a research reactor is challenging, time-consuming, and expensive. To overcome these limitations, we propose to emulate neutron irradiation damage using ion irradiation, a faster and more cost-effective method. However, this approach is not without its challenges, as transferability issues and experimental uncertainties need to be addressed.

### Your Research Focus

As a PhD candidate, you will investigate the formation and evolution of ion irradiation-induced defects in f/msteels, including pure Fe, Fe9%Cr, Fe9%Cr-NiSiP, and Eurofer97.

Your research will involve:

- Nanoindentation studies using different indenter shapes to investigate irradiation hardening. Additionally, you will contribute to the development of models for size effects in irradiated steels using a statistical sampling approach and machine learning techniques
- Transmission Electron Microscopy (TEM) to identify radiation-induced defects
- Complementary analyses, including atomic force microscopy and plasma-focused ion beam tomography of indents
- A multidisciplinary approach.

To support your experimental work, you will also develop and validate a testing protocol using numerical simulations.

### Benefits of the PhD Program

- Work in a dynamic and international research environment at the forefront of nuclear science and development
- Collaborate with renowned scientists from NCBJ and JRC
- Participate in the creation of a new international unit and contribute to the development of CoE NOMATEN
- Opportunities for personal growth and professional development through a diverse range of tasks and challenges
- Participate in international and national scientific conferences, projects, and collaborations
- A vibrant, international work environment with exposure to EU policies and the chance to engage in ground-breaking scientific research
- Free transportation to research sites, and a family-friendly environment at both institutions
- Competitive salary and benefits package: at NCBJ (Poland) 9500 PLN/month (gross), at JRC (Netherlands) 39,240 EUR/year (gross), with possible additional allowances.

### PhD Program Structure

- The selected candidate will be enrolled in the PhD program in Physics of the NCBJ following regulations in force
- The PhD program is expected to last three to four years
- You will spend up to 24 months at JRC in Petten, Netherlands, with the possibility of commuting from Amsterdam or Alkmaar
- Afterwards, you will return to NCBJ to continue your research and complete your PhD.

## Requirements and Eligibility

- MSc degree (or equivalent) in a relevant scientific field (e.g., physics, materials science, chemistry, mechanical engineering, nuclear engineering)
- Scientific experience documented by scientific publications
- Knowledge of electron microscopy and experimental methods of solid-state physics
- Theoretical background in physics-based modelling and numerical methods is an advantage
- Excellent oral and written English language skills

Candidates should be **nationals of EU Member States or of an Associated Country to the program Horizon Europe** ([https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/europe-world/international-cooperation/association-horizon-europe\\_en](https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/europe-world/international-cooperation/association-horizon-europe_en)), or **must have resided in a EU Member State for at least five years prior to the start of the grantholder contract.**

## Application Procedure

- Submit your application, including a cover letter, resume (with the following personal data processing consent statement: "I agree to process my personal data for the purposes necessary for the recruitment process."), letter(s) of recommendation, and a copy of your diploma
- Prepare a self-presentation outlining your scientific achievements, projects, and other relevant experience
- **Apply** by email to the HR manager at NCBJ: [magdalena.jedrkiewicz@ncbj.gov.pl](mailto:magdalena.jedrkiewicz@ncbj.gov.pl)
- **Deadline: 31/01/2025**

## Selection Procedure

Applications will be evaluated by a commission composed of scientific staff members and HR representatives from NCBJ and JRC

Interviews will be held in English and may be conducted remotely by video call

Final decision and notification from **JRC**, followed by **NCBJ** for the enrolment process.

Within six months from the request for confirmation of interest in the position, the selected candidate will have to enrol in the NCBJ doctoral study program. The enrolment process includes an online oral exam in the field of Physics.

Do not miss this opportunity to join a cutting-edge research project and advance your career as a PhD student in materials science. **Apply now** and take the first step towards an exciting and rewarding research experience. For more details, please contact:

[magdalena.jedrkiewicz@ncbj.gov.pl](mailto:magdalena.jedrkiewicz@ncbj.gov.pl)

As an attachment to your application please sign & enclose the following declarations:

*I agree for my personal data included in the application documents to be processed by National Centre for Nuclear Research with its registered office in Otwock, 7 Andrzej Sołtan Street, 05-420 Otwock, for a period of 12 months from their submission, in order to carry out future recruitment processes.*

Others information:

We reserve the right to contact only selected candidates & the right to inform about the decision to fill the post only to the selected candidate.

At NCBJ there is the internal procedure for the report of breaches of law. Anyone interested in its content can access it at any time on the

website: <https://www.ncbj.gov.pl/sites/default/files/prasa/INTERNAL%20NOTIFICATION%20PROCEDURE.pdf>

Information in accordance with Article 13 RODO on the processing of personal data:

1. The Personal Data Controller of your personal data is the National Centre for Nuclear Research (hereinafter referred to as Controller or NCBJ) with its registered office in Otwock, 7 Andrzej Sołtan Street, 05-400 Otwock.
2. Your personal data will be processed for recruitment purposes on the basis of applicable law, including the Labour Code. Data not required by law, provided by you in your documents, will be processed on the basis of your consent. Your consent is given by the transfer of this data.
3. The full content of the information clause of Article 13 RODO is available at <https://www.ncbj.gov.pl/en/gdpr>



*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).*