



**Institute of Molecular Physics**

**Polish Academy of Sciences**

Mariana Smoluchowskiego 17, 60-179 Poznań

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**Recruitment for the Ph.D. position in OPUS-21 Research Project  
and for the Poznan Doctoral School of the Institutes of the Polish Academy of Sciences  
at the Institute of Molecular Physics, PAS in Poznań  
Procedure No. 11/2023/IFM/PSD**

**Institution:** Institute of Molecular Physics Polish Academy of Sciences (IMP PAS)  
**City:** Poznań, Poland  
**Position:** Ph.D. student  
**Positions available:** 1  
**Scientific discipline:** physics  
**Publication date:** 6 April 2023.  
**Application deadline:** 8 May 2023; 15:00 CEST  
**IMP PAS website:** <https://www.ifmpan.poznan.pl>  
**PDS website:** <https://www.ifmpan.poznan.pl/BIP/index.php/edukacja/psd-ipan>

**RESEARCH PROJECT OFFER:**

**Research topic:** Searching for free rare earth and rare earth free permanent magnets using machine learning  
**Keywords:** condensed matter physics, computational physics, applied physics, first-principles calculations, atomistic spin dynamics simulations, magnetic materials, machine learning.  
**Research group:** Department of Solid State Theory (Z2)  
**Principal Investigator:** D.Sc. eng. Mirosław Werwiński, Associate Professor

**Project description:**

The goal of the project is to discover replacements for currently used permanent magnets. Using machine learning algorithms, a universal model will be developed based on the database we will prepare, which then will be used to predict optimal permanent magnet compositions. The database will be created on the basis of quantum-mechanical calculations, called first-principles calculations, in which materials will be modeled at the atomic level in terms of the spatial distribution of atomic nuclei and electrons.

**Research objectives:**

- ab initio calculations (using the density functional theory DFT) of magnetic properties of permanent magnets;
- implementation of machine learning algorithms and development of universal model for predictions of permanent magnet compositions.

### **Additional information:**

1. Research and the doctoral thesis will be carried out within the OPUS-21 project *Searching for free rare earth and rare earth free permanent magnets using machine learning no. UMO-2021/41/B/ST5/02894*, funded by the National Science Center;
2. Ph.D. students shall receive a stipend in the gross amount of 3650,00 PLN till the month of mid-term assessment and in the amount of 4910,00 PLN after the month when the mid-term assessment will be performed (the period of receiving the scholarship is 48 months);
3. The Ph.D. student will be covered with the costs of social insurance pursuant to Article 6(1)(7b) and Article 12(1) of the Act of 13<sup>th</sup> October 1998 on the social insurance system (Journal of Laws of 2019, item 300, as amended), in accordance with the principles described below:
  - a. Social security contributions are co-financed by the Ph.D. student (insured) and the Institute of Molecular Physics of the Polish Academy of Sciences (payer).
  - b. The pension insurance contribution is financed in equal parts by the insured and the payer from their own resources, 9.76% of the calculation base each.
  - c. The disability pension insurance premium is financed by the insured person in the amount of 1.5% of the calculation base and 6.5% of the calculation base of the payer.
  - d. The insured person's sickness insurance contribution is financed entirely from his own resources.
  - e. The accident insurance contribution for doctoral students is financed entirely from the payer's own funds.

### **Requirements for candidates:**

1. M.Sc. degree in physics, mathematics, or material engineering, or fulfilling the conditions stipulated in article 186, section 2 of the act of 20th July 2018 Law on Higher Education and Sciences (Journal of Laws of 2018, item 1668, as amended);
2. The candidate cannot hold the doctoral degree and be a participant in the doctoral school before entering the competition;
3. The candidate is obliged to follow the education program at the doctoral school, which will end with the submission of a doctoral dissertation along with a positive opinion of the supervisor.
4. Preferable experience in first-principles calculations or simulations of atomistic spin dynamics or machine learning;
5. Computer skills;
6. Commitment, critical thinking skills, and problem-solving abilities;
7. High motivation for further development, communication skills, and ability to work in a team and individually
8. Fluency in English (both in speech and writing) on the level of B2-C2;
9. Skills that will be an advantage of the applicant: extended knowledge of the subject of self-organizing soft matter systems, ionic conductivity processes, and related experimental methods;

### **Job benefits:**

- additional funds for participation in conferences and scientific schools;
- additional funds for tools necessary for the implementation of the project (laptop, external drive, etc.)
- work in a young active team;

**Expected date of employment start:** 1<sup>st</sup> June 2023

## Required documents:

1. Application for admission to Poznań Doctoral School of the Institutes of the Polish Academy of Sciences (PDS IPAS) along with the consent for processing personal data upon the recruitment procedure and a statement on having acknowledged the regulations of recruitment for PDS IPAS, using the form downloaded from:  
<https://www.ifmpan.poznan.pl/BIP/edukacja/psd-ipan.html?task=article.downloadAttachment&id=319&version=898>
2. Certified copy of the diploma confirming graduation or a certificate confirming graduation (in the case of diplomas issued by foreign higher education schools, diploma stipulated in article 326, section 2, passage 2 or article 327, passage 2 of the act of 20<sup>th</sup> July 2018 – Law on Higher Education and Science (Journal of Laws of 2018, item 1668, as amended), entitling to apply for conferment of a doctoral degree in the state in where the relevant higher education school-issued such a certificate. In the event that the candidate does not have the aforementioned documents, he/she is obliged to submit them before admission to PDS IPAS. Additional information on foreign school diplomas is available at <https://nawa.gov.pl/en/recognition/recognition-for-academic-purposes/applying-for-admission-to-doctoralstudies>;
3. Scientific CV encompassing track record of previous education and employment;
4. A cover letter featuring a short description of research interests, scientific accomplishments, a list of publications, information on involvement in scientific activity (membership of student scientific groups, participation in scientific conferences, completed internships and training courses, prizes and distinctions received), and reasons for wishing to study at the doctoral school;
5. Certificates or other documents confirming the degree of proficiency in English, if the candidate owns such materials;
6. Consent for the processing of personal data for recruitment purposes (Appendix 1);
7. Contact details of at least one previous scientific supervisor or another researcher who is entitled to issue an opinion on the candidate.

## Documents in languages other than Polish or English should be translated into Polish or English.

**Applications should be submitted** electronically to the e-mail address [office@ifmpan.poznan.pl](mailto:office@ifmpan.poznan.pl) with the subject of the message "*Competition for the Ph.D. position No. 11/2023/IFM/PSD*" as the attachment in the pdf file format.

**Alternatively**, if the electronic delivery is not possible, applications can be sent to the postal address of the Secretariat of the Institute of Molecular Physics, Polish Academy of Sciences.

ul. Mariana Smoluchowskiego 17, 60-179 Poznan, Poland

with an annotation on the envelope: "*Competition for the Ph.D. position No. 11/2023/IFM/PSD*".

## Please do not send the originals of the documents.

## Recruitment Procedure:

Recruitment will take place in two stages. Based on the comparison of applications, the competition for the Ph.D. position in the OPUS-21 Project will be decided in the first stage. To start working on the OPUS-21 project, the candidate is obligated to admission to the Doctoral School. The highest-ranking candidates will be invited to a video-conference interview. The candidates will be informed at least 7 days before the planned interview.

### **Criteria for evaluation of candidates for Ph.D. position in OPUS-21 project:**

The scholarship will be awarded in accordance with the NCN regulations. The Commission will take into account the following criteria:

- the candidate's academic achievements, including publications in reputable scientific journals (50% of the final grade);
- achievements resulting from scientific research, fellowships, awards and scientific experience gained at home or abroad, scientific workshops and trainings, participation in research projects (20% of the final grade);
- competence to carry out specific tasks in the research project (30% of the final grade).

The scholarship will be awarded to the person who obtains the highest number of points. If the top candidate does not sign the contract, we reserve the right to choose the next candidate from the ranking list due to the resignation.

### **Criteria for evaluation of candidates for Doctoral School:**

1. Candidate's research achievements, according to the grades obtained in the course of studies, scientific publications, awarded scholarships, and distinctions resulting from conducting scientific research or student activities or other achievements;
2. Candidate's scientific and professional experience, according to participation in conferences, workshops, training sessions, and internships, implementation of research and commercial projects, involvement in scientific trusts and societies, international and professional mobility, experience in other sectors, including industry;
3. Candidate's knowledge of the following discipline: physical sciences;
4. Knowledge of the subject matter described in the recruitment advertisement.

**The recruitment procedure shall be concluded until 26<sup>th</sup> May 2023.**

The description of the recruitment process for Doctoral School is stipulated in the Regulations of Recruitment for PDS IPAS. Following the recruitment procedure, the unadmitted candidates shall be informed about the scores obtained at various stages of the recruitment process.

**For additional information, don't hesitate to get in touch with the Principal Investigator of the OPUS-21 project:**

Mirosław Werwiński, PhD  
e-mail: [werwinski@ifmpan.poznan.pl](mailto:werwinski@ifmpan.poznan.pl)  
phone: +48 (0)61 8695150

**The Institute of Molecular Physics Polish Academy of Sciences, does not provide accommodation.**

**PRINCIPAL INVESTIGATOR**

**dr hab. inż. Mirosław Werwiński, prof. IFM PAN**

**DIRECTOR**

**prof. dr. hab. Zbigniew Trybuła**



### **Information clause:**

According to the content of art. 13 of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27th April 2016 on the protection of individuals with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46 / EC (General Data Protection Regulation ), hereinafter referred to as GDPR, we inform that:

1. The administrator of the collected personal data is the Institute of Molecular Physics of the Polish Academy of Sciences, Mariana Smoluchowskiego 17, 60-179 Poznan, Poland, VAT No. PL 777-00-20-870 (hereinafter referred to as the Institute).
2. The administrator has appointed a Data Protection Inspector who can be contacted in writing, by traditional mail, writing to the Institute's address: Data Protection Inspector, Institute of Molecular Physics of the Polish Academy of Sciences, Mariana Smoluchowskiego 17, 60-179 Poznan, Poland or by sending an e-mail to [iod@ifmpan.poznan.pl](mailto:iod@ifmpan.poznan.pl).
3. Personal data are processed to implement the administrator's tasks related to the recruitment to the Poznań Doctoral School of the Institutes of the Polish Academy of Sciences.
4. The legal basis for data processing is the Act of 26th June 1974 - Labor Code, the Act of 30th April 2010 on the Polish Academy of Sciences, the Act of 20 July 2018 Law on Higher Education and Science, and consent of the data subject.
5. Personal data collected in the current recruitment process will be stored for three months from the moment the recruitment process is resolved. After this period, personal data will be effectively destroyed.
6. Personal data will not be conveyed to a third country.
7. Personal data of the candidate selected in the competition may be made available to third parties authorized under the law.
8. The person whose data is processed has the right to:
  - access to the content of your personal data, demand their correction or deletion, on the terms set out in art. 15-17 GDPR;
  - set restrictions on data processing, in cases specified in art. 18 GDPR;
  - data transfer, on the principles set out in art. 20 GDPR;
  - withdrawal of consent at any time without affecting the lawfulness of the processing that was carried out based on consent before its withdrawal;
  - lodging a complaint to the President of the Office for Personal Data Protection.

Providing personal data in the scope resulting from art. 22 (1) of the Act of 26th June 1974 - Labor Code, is mandatory, providing data in a broader scope is voluntary and requires consent to their processing. Refusal to provide personal data prevents the application from being considered.

## Appendix 1

### Consent for the processing of personal data for recruitment purposes

I agree to the processing of personal data provided in this document for realising the recruitment process pursuant to the Personal Data Protection Act of 10th May 2018 (Journal of Laws 2018, item 1000) and in agreement with Regulation (EU) 2016/679 of the European Parliament and of the Council of 27th April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation).

Name .....

.....

Date and signature