



Institute of Molecular Physics
Polish Academy of Sciences
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**Recruitment for the Ph.D. position in OPUS 20 Research Project
and for the Poznan Doctoral School of the Institutes of the Polish Academy of Sciences.
Procedure No. 25/2021/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: 23 August 2021.
Application deadline: 23 September 2021; 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: *Artificial magnetic domains without domain walls in magnetically patterned Rare-Earth–Transition-Metal ferrimagnetic films (TWIST)*

Keywords: solid state physics, condensed matter properties, , surface physics, physics of magnetism.

Research group: Department of Thin Films (Z3)

Principal Investigator: dr hab. inż. Piotr Kuświk, *prof.* IMP PAS

Project description:

Our research is focused on the development of methods allowing for local control of the dominance of a specific subnetwork in the surface plane of ferrimagnetic (FI) rare earth (RE) - transition metal (TM) layered systems. Recently, we have shown that by local ion bombardment of films with domination of RE (RE+), we can create a regular two-dimensional network with TM domination (TM +). An important feature of such a pattern is that a unique magnetic structure is created exactly on the border between the area subjected to ion modification (TM +) and the matrix (RE +), showing the presence of domains without domain walls, which ensures its high stability. This specific structure, on the one hand, breaks the paradigm related to the simultaneous presence of magnetic domains and domain walls, on the other, it can be used to produce two-dimensional networks of ordered domains (bits) smaller than is currently possible, which is particularly important to develop new generation of high-density magnetic memories.

Research objectives:

In this project we intend to fabricate artificial FI for use in different applications, e.g. controlled propagation of spin waves, magnetophoresis devices, and information technologies that rely on controlled propagation of magnetic domain walls. It is important to identify the optimal patterning method for the FI layer using various figures of merit, such as: minimum resolution attainable and durability of magnetic properties. This requires an appropriate choice of layered system and the optimization of the ion modification process towards higher resolutions. For this purpose, masks will be manufactured by various methods and types of ion beams. As an alternative method to ion bombardment, we will deposit ferrimagnetic materials on

ferromagnetic islands using the state-of-the-art fabrication equipment available in our laboratory. An important goal of this project is to exceed the current limits of miniaturization of magnetic structures.

Additional information:

1. Research and doctoral thesis will be carried out within the OPUS 20 project *Artificial magnetic domains without domain walls in magnetically patterned Rare-Earth–Transition-Metal ferrimagnetic films (TWIST)* no. UMO- 2020/39/B/ST5/01915, funded by the National Science Center;
2. Ph.D. students shall receive a stipend in the gross amount of 2380,00 PLN, till the month of mid-term assessment and in the amount of 3660,00 after the month when the mid-term assessment will be performed (the period of receiving the scholarship is 48 months);
3. Ph.D. students shall be subjected to social insurance, pursuant to article, 6 section 1 passage 7b of the act of October 13th, 1998 on the social insurance system (Journal of Laws o 2019, item 300, 303 and 730).

Requirements for candidates:

1. M.Sc. degree in physics or related sciences, or fulfilling the conditions stipulated in article 186, section 2 of the act of July 20th, 2018 Law on Higher Education and Sciences (journal of Laws of 2018, item 1668, as emended);
2. A person not holding the qualifications described in paragraph 1 may take part in a competition, but must obtain those qualifications before commencing study at Poznan Doctoral School of the Institutes of the Polish Academy of Sciences.
3. Knowledge in the field of solid state physics;
4. Experience in the subject of solid state physics, condensed matter properties, applied physics;
5. Ability to use programs supporting research, for example: mathematica, origin, spreadsheet, etc.;
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 and achievements, which will be an advantage of the applicant:
 - Experience in the field of experimental or/and theoretical research on a magnetic thin film;
 - Knowledge of experimental methods or/and computational packages implemented for magnetic materials, especially for magnetic thin films
 - Participation in research, co-authorship of publications, scholarships, awards, internships, and trainings.

Job benefits:

- Access to unique technological and measuring equipments
- Conducting research jointly with foreign partners
- Additional funds for participation in conferences and scientific schools;

Expected date of employment start: 11th October 2021

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 form downloaded from:
<http://www.physics.pl/BIP/edukacja/psd-ipan.html?task=article.downloadAttachment&id=319&version=669>;
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 July 20th, 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 such a certificate was issued by the relevant higher education school. In the event when 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 other languages than Polish or English should be translated into Polish or English.

Applications should be submitted electronically on e-mail address office@ifmpan.poznan.pl with the subject of the message “*Competition for the Ph.D. position No. 25/2021/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 Poznań, Poland

with an annotation on the envelope: “ *Competition for the Ph.D. position No. 25/2021/IFM/PSD*”.

Please do not send the originals of the documents.

Recruitment Procedure:

Recruitment will take place in two stages. In the first stage, based on the comparison of applications, the competition for the Ph.D. position in the OPUS 20 Project will be decided. To start working in the OPUS 20 project the candidate is obligated to admission to the Doctoral School. The highest-ranking candidates will be invited to a videoconference 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 20 Project :

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

- previous scientific achievements of candidates, including publications in the renowned publishers/scientific journals, (50 % of the final grade).
- achievements resulting from conducting scientific research, scholarships, awards and scientific experience gained in the country or abroad, workshops and scientific training, participation in research projects (20 % of the final grade);
- competences of candidates for specific tasks in a research project, (30 % of the final grade);

The scholarship will be awarded to the person who obtains the highest number of points and will become a Ph.D. student at Poznan Doctoral School of the Institutes of the Polish Academy of Sciences. If the top candidate does not sign the contract, due to the resignation, we reserve the right to choose the next candidate from the ranking list.

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 October 6th, 2020.

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 on the strong and weak sides of their applications. The recruitment results are public.

For additional information, please contact the Principal Investigator of OPUS 20 project:

dr hab. inż. Piotr Kuświk, prof. IMP PAS
e-mail: kuswik@ifmpan.poznan.pl
tel.: +48 (0)61 8695135

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

PROJECT LEADER

Dr hab. inż. Piotr Kuświk, *prof.* IMP PAS

DIRECTOR

prof. dr. hab. Zbigniew Trybuła



INSTITUTE OF MOLECULAR PHYSICS
Polish Academy of Sciences

Information clause:

According to the content of art. 13 of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 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.
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 26 June 1974 - Labor Code, the Act of 30 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 26 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 10 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 27 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

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Date and signature