Institute of Molecular Physics
Polish Academy of Sciences

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**Recruitment for the position of a doctoral student in the research project OPUS-26 (LAP)
and to the Poznan Doctoral School of Institutes of the Polish Academy of Sciences at the Institute
of Molecular Physics of the Polish Academy of Sciences in Poznan.
Procedure no. 23/2024/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:	29 November 2024
Application deadline:	5 January 2025; 15:00 CEST
IMP PAS website:	https://www.ifmpan.poznan.pl
PDS website:	https://www.ifmpan.poznan.pl/BIP/index.php/edukacja/psd-ipan

I. Offer description

Research and doctoral thesis will be carried out within the OPUS 26 (LAP) project funded by the National Science Center

Project title: *RE-free magnetoelastic materials for efficient and environmentally friendly cooling*

Keywords: magnetocaloric effect, barocaloric effect, negative thermal expansion

Project acronym: BaroCool

Research group: Department of Physics of Magnetics in IMP PAS

Principal Investigator: prof. dr hab. Tomasz Toliński

II. Project objectives

The issue of ecological cooling may be addressed through a technology that relies on solid materials rather than gases, as seen in traditional refrigerators and air conditioners. When a solid material is subjected to various conditions, such as a magnetic field or pressure, its temperature can change. This principle allows for the development of cooling and heating devices, known as heat pumps.

The effects of temperature change are categorized based on the external factor applied: the magnetocaloric effect (MCE) occurs when the magnetic field changes, while the barocaloric effect (BCE) arises from changes in pressure. The BaroCool project aims to discover new materials with strong magnetocaloric and barocaloric effects. The research will employ both experimental and theoretical methods and will be conducted by a international team of scientists.

We anticipate that these materials will possess unique properties suitable for constructing environmentally friendly cooling systems. Additionally, we intend to investigate how magnetoelastic effects influence the values of MCE and BCE in a selected group of materials.

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III.   Responsibilities

- Conducting experimental research:
    - Synthesis of materials, including design and execution of sample fabrication processes.
    - Structural, magnetic, thermal and mechanical analysis of materials using advanced methods (e.g. XRD, SEM, EDS, VSM, DSC).
    - Measurement and evaluation of the magneto- and barocaloric effect of the materials under study.
- Development of theoretical models and data analysis
    - Modeling the relationship between the magnetic, elastic and structural properties of the materials.
    - Analysis of the obtained results to identify key mechanisms responsible for improving magnetocaloric performance.
- Collaboration with the project team
    - Participation in regular meetings of the research team.
    - Collaboration with other project participants, including exchange of knowledge and research results.
- Scientific publications and presentations
    - Preparation of scientific publications in reputable international journals.
    - Presentation of research results at scientific conferences at home and abroad.
- Development of research skills
    - Expanding knowledge in magnetic materials, magnetic cooling technology and research methods.
    - Participation in trainings, workshops and courses related to the project topics.
- Support in the organization of project activities
    - Assist in the preparation of project reports.
    - Support in obtaining necessary materials and research tools.

IV.   Job benefits

- The research will be carried out in close cooperation with the Institute of Low Temperature and Structure Research of the Polish Academy of Sciences (ILT&SR) in Wrocław and the IT4Innovations Supercomputing Center at VSB - Technical University of Ostrava in the Czech Republic.
- The project provides the opportunity to participate in international conferences.

V.   Additional information

1. As part of the project, the Ph.D. student will receive a doctoral scholarship in the amount of PLN 3,260.00 net (PLN 3,675.00 gross) till the month of mid-term assessment and for the next 12 months, in the amount of PLN 4,739.00 net (PLN 5,341.00 gross). The last 12 months of doctoral studies will be financed by the IFM PAN, pursuant to Article 209(4)(1) of the Act of July 20th, Law on higher education and science. The period of receiving the scholarship is 48 months.
2. 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 October 13th, 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 sickness insurance contribution is financed entirely by the insured person from his own resources.

e. The accident insurance contribution for doctoral students is financed entirely from the payer's own funds.

VI. 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 and experience in the field of solid state physics.

4. Ability to use programs supporting research, for example: Mathematica, Origin, MS Office, etc.

5. Fluency in English (both in speech and writing) on the level of B2-C2.

6. The ability to independently solve problems as well as to work in a group, commitment and positive motivation.

7. An additional advantage will be the expanded knowledge of the subject of magnetic materials and related experimental methods.

VII. 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:
https://www.ifmpan.poznan.pl/BIP/edukacja/psd-ipan.html?task=article.downloadAttachment&id=946&version=1172

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-doctoral-studies;

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. 23/2024/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: Secretariat of the Institute of Molecular Physics, Polish Academy of Sciences, Mariana Smoluchowskiego 17, 60-179 Poznan, Poland, with an annotation on the envelope: " *Competition for the Ph.D. position No. 23/2024/IFM/PSD*".

Please do not send the originals of the documents.

VIII. Recruitment Procedure

Recruitment will take place in accordance with the Recruitment Regulations for PDS IPAS. The highest-ranking candidates will be invited to an interview (in a hybrid form: on-line or on-site). The candidates will be informed at least 7 days before the planned interview.

IX. Criteria for evaluation of candidates for the position of doctoral student in the Opus-26 project (LAP).

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

- the candidate's scientific achievements, including publications in reputable scientific publications/journals (50% of the final grade);

- achievements resulting from scientific research, fellowships, awards, and scientific experience gained at home or abroad, scientific workshops and training, participation in research projects (20% of the final evaluation);

- competence to carry out specific tasks in a research project (30% of the final evaluation).

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

X. 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 and experience in the subject matter described in the recruitment advertisement.

The recruitment procedure shall be concluded until 24 January, 2025.
Estimated scholarship start date: 1 April, 2025.

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 the OPUS-26 LAP project, prof. dr hab. Tomasz Toliński
e-mail: tomtol@ifmpan.poznan.pl
tel.: +48 (0)61 8695 122

the PhD thesis supervisor: dr hab. inż. Karol Synoradzki
e-mail: karol.synoradzki@ifmpan.poznan.pl
tel.: +48 (0)61 8695 282

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

/signed by:
Prof. dr hab. Tomasz Toliński
Project leader/

/signed by:
dr hab. inż. Michał Bielejewski, prof. IFM PAN
Coordinator of physical sciences at the Poznań Doctoral School
of the Institutes of the 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.

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 …………………………..

....
 Date and signature

POZNAŃSKA SZKOŁA DOKTORSKA
INSTYTUTÓW POLSKIEJ AKADEMII NAUK