



WROCŁAWSKA SZKOŁA DOKTORSKA INSTYTUTÓW POLSKIEJ AKADEMII NAUK

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Special Recruitment to the Wrocław Doctoral School of Institutes of Polish Academy of Sciences in the Division of Low Temperature and Superconductivity of the Institute of Low Temperature and Structure Research of Polish Academy of Sciences for PhD Student – Scholarship holder in the Research project OPUS 23 (NCN)

Institution: Wrocław Doctoral School of Institutes of Polish Academy of Sciences,

Institute of Low Temperature and Structural Research, Polish Academy of Sciences

Position: PhD student – scholarship holder in the NCN research project

Scientific discipline: physical sciences

Date of announcement: 05.08.2025

Application deadline: 04.09.2025

Online interview date: 12-19.09.2025

Date of competition settlement: Recruitment results will be announced within 7 days after the end of the interviews.

Planned date of commencement of education and participation in the project: 01.10.2025

Link to WDS IPAS website: <https://www.intibs.pl/en/for-students/doctoral-school.html>

Link to ILTSR PAS website: <https://www.intibs.pl/en>

Keywords: thermal conductivity, diffusons, heat capacity

Wrocław Doctoral School of Institutes of Polish Academy of Sciences (WDS IPAS) announces a special recruitment for a PhD student – scholarship holder in the research project: " Diffuson-mediated heat transfer: experimental verification of the unified theory of thermal transport ", carried out on behalf of the National Science Center (grant no. 2022/45/B/ST3/02326) in the Division of Low Temperature and Superconductivity of the Institute of Low Temperature and Structure Research of Polish Academy of Sciences in Wrocław.

Recruitment is conducted in accordance with the Rules of Recruitment to the Wrocław Doctoral School of Institutes of Polish Academy of Sciences <https://www.intibs.pl/en/for-students/rules-of-recruitment.html>

Requirements for the candidate

The application should include a filled **application form** at the link <https://www.intibs.pl/en/for-students/rules-of-recruitment.html> and presented in Polish or English:

- **diplomas:** matriculation or higher secondary school certificate, Bachelor's (engineering), Master's Degree diploma in chemistry, Physics, material engineering or related disciplines or an equivalent certificate of graduation, legalized according to the Rules of Recruitment.*
- **a duplicate** (certified copy) of the entire grade book/Transcript of Records of the first- and second-cycle program (or full-cycle Master's degree program), or a **supplement** to the degree with grades from the entire course of study, or **a student's grading report from all years of their studies confirmed by the Dean's Office**, together with the calculated average grade from their studies, but the supplement (transcript) to the Master degree should be legalized according to the Rules of Recruitment *;

** In the case of obtaining a professional title MSc outside the European Union - additionally originals of MSc diploma and its transcript with grades, both certified with an apostille or authenticating (legalization) in the diplomatic representation of the Republic of Poland (in that country). Documents submitted without proper authentication will be considered as not meeting formal requirements.*

- **a certificate of English-language skills at B2 level** or higher or information in the diploma supplement that the candidate completed an English course at the required level as part of the university program (if the supplement does not describe the level of the course, a certificate from the Dean's Office is required; the certificate is not required from citizens of countries where English is the official language or English was the language of instruction during the implementation of the study program (Bachelor's, Master's or double-degree),
- **a cover letter** with an indication of the research topics within the framework of the research project;

- **additional documents** proving the candidate's suitability for scientific work (list of publications and conference presentations, list of completed courses and postgraduate studies, obtained language certificates, activity in scientific circles, and activities popularizing science, etc.).

Doctoral Student Responsibilities

The PhD student working on the project will actively participate in the research team's work, focusing on experimental investigation of heat transfer mechanisms in materials exhibiting a dominant contribution from the diffusion channel. Their primary responsibilities will include:

Conducting experimental research: Measuring the thermal conductivity and specific heat of selected materials over a wide temperature range. Utilizing advanced measurement techniques to identify the contribution of the diffusion channel to heat transfer.

Data analysis: Developing and interpreting experimental results in the context of a unified heat transfer theory. Comparing the obtained data with theoretical models and the relevant literature.

Contributing to scientific publications: Participating in the editing of scientific articles presenting research results. Collaborating with team members on preparing materials for publication in prestigious journals.

Presentation of results: Participating in national and international conferences and scientific workshops. Presenting research results in the form of oral and poster presentations.

Preparation of doctoral dissertation: Developing a doctoral dissertation based on the results obtained during the project. The doctoral dissertation will be completed under the supervision of a member of the research team.

Scholarship

The doctoral scholarship will be paid a maximum of 4 years in the monthly amount of:

3.076,53 PLN net (3.466,90 PLN gross), until the month in which the doctoral student's mid-term evaluation at the doctoral school was conducted,

4.739,51 PLN net (5.340,90 PLN gross) after the month in which the student's mid-term evaluation at doctoral school was conducted.

The scholarship will be paid after deduction of all components, in accordance with the applicable regulations and in accordance with the Act of 20 July 2018 Law on Higher Education and Science (Journal of Laws of 2024, item 1571 ct. 2024.10.24).

Joining the competition

Candidates wishing to enter the competition should submit all documents specified in the Rules of Recruitment to the Wrocław Doctoral School of Institutes of the Polish Academy of Sciences

<https://www.intibs.pl/en/for-students/rules-of-recruitment.html>

Candidates' applications for admission to the School must be submitted by **04.09.2025**

- by email to the address wsdipan@intibs.pl (preferred method of application); however, the original documents should be delivered before the studies start (a failure to meet this requirement will result in the candidate's name being removed from the list of doctoral students),
- in person at the School's Secretariat Office at the Institute of Low Temperature and Structure Research of the Polish Academy of Sciences, Okólna Street 2, Wrocław, Poland; from 9 a.m. to 3 p.m.

Description of the research project and the PhD thesis

The project, titled "Diffusion-mediated Heat Transfer: Experimental Verification of the Unified Theory of Thermal Transport," focuses on one of the fundamental problems of solid-state physics—the mechanisms of heat conduction. Thermal conduction, alongside convection and radiation, is a key mode of thermal energy transport in materials. Although Peierls's classical theory from 1929 provides a good description of heat transport in crystals at low temperatures, it does not explain phenomena observed in amorphous materials nor in crystals at room temperature. A breakthrough in this field was a 2019 publication proposing a unified theory of thermal conductivity, incorporating both the classical wave channel and the diffusive tunnel channel. The project aims to experimentally verify this theory by measuring the thermal conductivity coefficient over a wide temperature range for selected materials exhibiting unusual, non-Peierlsian behavior. The research will be complemented with computer simulations, allowing for comparison of experimental results with theoretical predictions. The

project's results are not only of scientific importance but also of application—they will enable the design of materials with controlled thermal properties, used in applications such as electronics, nuclear energy, and construction.

The doctoral dissertation, conducted as part of the project, will be devoted to the experimental study of heat conduction mechanisms in solids, with particular emphasis on the contribution of the diffusion channel to energy transport. The doctoral student will conduct:

- Measurements of thermal conductivity and specific heat of selected materials over a wide temperature range.
- Analysis of experimental data in the context of a unified heat transport theory.
- Comparison of results with computer simulations to assess the qualitative agreement between theory and observations.
- Co-authoring scientific publications and presenting results at conferences and workshops.

The main goal of the work will be to assess the validity of the new heat transfer theory and identify materials in which the diffusion channel plays a dominant role. This work will make a significant contribution to the development of solid-state physics and may influence future technological applications in the design of modern functional materials

Additional information

For additional information, please contact the project manager Andrzej Jeżowski , (email: a.jezowski@intibs.pl , tel. +48 71 395 4 140.

Personal information

Candidates' personal data are collected and processed by the Institute of Low Temperature and Structure Research of Polish Academy of Sciences in Wrocław in accordance with the information on personal data processing available at <https://bip.intibs.pl/artykuly/rodo-1>