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Special Recruitment to the Wrocław Doctoral School of Institutes of Polish Academy of Sciences in the Division of Optical Spectroscopy of the Institute of Low Temperature and Structure Research of Polish Academy of Sciences for PhD Student (assistant, PhD 4) in the research project FunctiGlass

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 – assistant in the MSCA–DN–Functiglass research project**

Scientific discipline: Chemical sciences / Physical sciences

Date of announcement: **07.08.2025**

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: **03.10.2025**

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

PhD project topic: **Photonic platforms for the detection of pathogens in food production**

Keywords: glass, photonics, optical biosensors, food pathogen

Wrocław Doctoral School of Institutes of Polish Academy of Sciences (WDS IPAS) announces a **special recruitment for a PhD student – assistant in the MSCA-DN-FunctiGlass research project**: "*Structured functional glasses for lasing, sensing and health applications*", carried out on behalf of the European Research Executive Agency (grant no. 101169415) in the **Division of Optical Spectroscopy** of the **Institute of Low Temperature and Structure Research of Polish Academy of Sciences in Wroclaw, Poland.** The doctoral thesis will be conducted in cooperation with the **University of Milano Bicocca in Italy** on the basis of awarding a double degree.

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

Candidates

- according to the MSCA Mobility Rule, must not have resided or carried out their main activity (work, studies, etc.) in the country of the recruiting beneficiary (Poland) for more than 12 months in the 36 months immediately before their date of recruitment;
- must not have a doctoral degree on the date of recruitment;
- should have knowledge in materials science, inorganic materials processing and characterization, as well as work experience in a chemical laboratory; knowledge in microbiology and work experience in microbiological laboratory will be considered a merit;
- should possess a Master's degree in chemistry, physics, materials engineering, or related discipline;
- At the start of the program, candidates must hold a Master's degree valid in Poland (the diploma must be recognized in Poland not only for the purposes of pursuing further education, but also for the rights arising from holding a professional master's degree).
- must first be qualified by the FunctiGlass Project Recruitment Committee, i.e. must send an application to recruit@functiglass.eu before August 25th, and receive and submit a letter of recommendation from the Project Coordinator (Wilfried Blanc, contact@functiglass.eu); information at https://functiglass.eu.

The application should include a filled application form at the link https://www.intibs.pl/en/for-students/rules-of-recruitment.html together with the following documents 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's 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);
- **CV**;
- **a cover letter** with an indication of the research topics within the framework of the research project (*Photonic platforms for the detection of pathogens in food*);
- A **recommendation letter** from the Project Coordinator;
- **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 goal of the research will be to design, fabricate, and test glass-based structures able to give an optical response to selected food pathogens. The experimental work will be preceded by literature research on current development of the proposed optical sensing in the food industry, particularly for bacteria detection. Structures proposed for detection of selected pathogens will be fabricated by a chemical synthesis using sol–gel technology. Different glass-based compositions, metal nanoparticles, system configurations, biomolecules, and surface

functionalization for selective pathogen identification will be tested. Studies will include morphological, structural, mechanical, and optical characterization of the developed photonic systems. Particular attention will be devoted to investigating the interaction of light with the glass and nanoparticles as well as the changes caused by the presence of microorganisms. Eventually, response of the optical platform as a function of pathogen concentration will be described. The expected result is the development of sensitive and selective platform for optical detection of chosen food pathogens.

Salary

Instead of receiving a scholarship, the PhD student will receive a salary by signing a fixed-term contract with ILTSR PAS under the MSCA – Doctoral Networks rules (a maximum duration of 4 years). The gross monthly salary will be around 1900€ (including employee's taxes and contributions; salary will be paid by ILTSR PAS regardless of the location of the research). The student will also receive a mobility allowance and a family allowance (depending on family situation) of up to 600 € and 495€ per month, respectively.

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 Doctoral 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 job position is offered within a FunctiGlass project (https://functiglass.eu). The main objective of this project is to deliver advanced high-tech materials for three sectors: light sources, sensors, and biomaterials. FunctiGlass, coordinated by CNRS, is a unique interdisciplinary research and training programme, delivering double degree doctorates as part of Horizon Europe's Doctoral Networks (Marie-Skłodowska Curie Actions, project 101169415). It will train 11 doctoral candidates who will take part in a joint research training programme based on very close cooperation between academia and industry. It will ensure that the trainees are exposed to 11 academic environments (universities and research institutes) and 9 non-academic environments (industry and SMEs) representing 9 countries (France, Finland, Germany, Italy, Poland, Sweden, Kazakhstan, Belgium, and Czech Republic). Each PhD candidate will be supervised by two academic tutors from different countries (research will be performed at two institutions in both countries) and one mentor (industrial partner) to ensure cross-sector knowledge sharing and the acquisition of transferable skills with a focus on entrepreneurship and innovation. Through the multi-dimensional training of the FunctiGlass programme, the 11 PhD candidates will excel in the future economy by acquiring a multi-dimensional perspective and mindset to become future leaders in glass science and in particular glass-based nano/micro-structured materials. PhD topic introduction: Detecting food pathogens is essential for ensuring food safety and protecting public health. Traditional methods, such as culturing and PCR, are often time-consuming, labor-intensive, and lack real-time capability. Photonic structures offer a promising, rapid, sensitive, and selective detection alternative. These include optical fibers, waveguides, optically active nanoparticles, and metamaterials, which can be functionalized to interact with light in ways that enhance the detection of specific biomarkers linked to bacteria, fungi, or other pathogens. For instance, waveguides can detect changes in refractive index, fluorescence, or Raman scattering in the presence of analytes. This research aims to design, fabricate, and test glass-based photonic structures that optically respond to selected food pathogens. It will begin with a literature review on optical sensing technologies in food safety, particularly for bacterial detection. Structures will be fabricated using sol–gel chemical synthesis. Various glass compositions, metal nanoparticles, biomolecules, and surface functionalization will be explored. Characterization will include morphological, structural, mechanical, and optical studies, emphasizing light interaction and microorganism-induced changes. The optical response to varying pathogen concentrations will be assessed, with the goal of developing a sensitive and selective detection platform.

Additional information

Recruiting institution: ILTSR PAS

Supervisor: Maciej Ptak, Prof.

Co-host laboratory: University of Milano Bicocca, Milan, Italy

Second supervisor: Roberto Scotti, Prof.

Industrial mentor from Scout Scientific Outsourcing Company (Poland)

Secondments: University of Milano Bicocca, Italy (about 20 months), Université Côte d'Azur, Institut de Physique de Nice, France (1 month)

For additional information, please contact the national project leader Anna Lukowiak (email: A.Lukowiak@intibs.pl).

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