

THE INSTITUTE OF AGROPHYSICS
OF THE POLISH ACADEMY OF SCIENCES IN LUBLIN
IS SEARCHING FOR:

PhD FELLOWSHIP (f/m)

in the Department of Natural Environment Biogeochemistry

within research project no. 2022/47/D/ST10/02480 entitled *Determination of soil moisture and texture impact on water origin in splashed soil-water droplets using deuterium-labelled water* funded by National Science Center within programme SONATA-18

1. Requirements:

- a) Master's degree in life sciences or engineering sciences;
- b) knowledge of soil physics or analyzes using stable isotopes;
- c) experience in laboratory work;
- d) good command of the English language;
- e) ability to use Microsoft Office;
- f) good communication skills and ability to work as a part of a team;
- g) availability to field trip and/or measurements;
- h) experience in: soil material sampling and preparation; stable isotope ratio measurements; laser diffraction particle size distribution measurements; organic carbon content measurements.

2. Job description:

The Institute of Agrophysics, Polish Academy of Sciences, [Department of Natural Environment Biogeochemistry](#) is looking for PhD student in the [Doctoral School of Quantitative and Natural Sciences](#).

PhD thesis proposal:

The impact of various soil properties on the origin of water from splashed water droplets.

- The PhD studies will take place for 48 months (from 01.10.2023) at the Department of Natural Environment Biogeochemistry, Institute of Agrophysics, Polish Academy of Sciences, Lublin, Poland under scientific supervision of prof. dr hab. Andrzej Bieganowski (a.bieganowski@ipan.lublin.pl) the supervision of the Project Principal Investigator - dr inż. Cezary Polakowski (c.polakowski@ipan.lublin.pl).
- The doctoral scholarship is co-financed by the National Science Centre, Poland – SONATA-18 project and a subsidy from the Minister of Education and Science. The scholarship is guaranteed for a period of 48 months.
- Language of PhD course and thesis: English or Polish.

- The condition for the Candidate's involvement and payment of the scholarship in the SONATA-18 project under the conditions set out in the Act on Higher Education and Science of 20 July 2018 (Journal of Laws 2022 item 574 as amended) is his/her admission to the Doctoral School of Quantitative and Natural Sciences. Details (documents, procedures, deadlines) are available on [the website](#).

Soil is the top layer of the earth's crust, which undergoes continuous degradation, induced by a variety of different factors, including unfavorable phenomenon of water erosion. In order to prevent it, it is necessary to get to know it thoroughly, at all stages. Soil splash, frequently identified as one of the first stages of water erosion, occurs when a droplet of water hits the soil surface. This impact causes several phenomena. Soil particles detachment and displacement; aggregates destruction, soil surface deformation. This promotes subsequent surface runoff which causes alluvial and deluvial processes, impacting soil physical properties, cultivation and yields. Surface runoff can also cause dangerous mudslides. Good understanding and physical description of the water erosion at each stage is important because it will allow better counteracting it. Physical description can include i.a. : i) parameterization and determination of physical quantities describing the phenomenon itself and its effects, ii) development of physical models. The development of models is possible by obtaining the values of specific physical quantities and/or their relationships. Moreover, soil splash can carry pollutants and pathogens or wash carbon and other nutrients. Soil splash is influenced by factors like slope, vegetative cover, precipitation, soil wettability, particle size distribution, moisture content and compaction. The combination of these quantities determines the amount and distance of transported matter. The origin of soil particles is obvious but the origin of splashed water is not clear (it can come from the falling drop and the soil). As pollutants, pathogens and nutrients, are found in soil water, it is important to know where the splash water comes from. Developed methodology of soil splash water isotope labelling and the results obtained can deepen research of water erosion and dependent phenomena (proposed technique has not been used in this type of research so far). Labelled water has already been used in investigations of splash and surface runoff by coloring it. However, i) addition of dye can change water properties and alter the results; ii) determination of the degree of mixing is hardly or not possible. Caesium isotope labelling has been also used, however, it has similar flaw – it can change water properties. Enriching water with a stable isotope of hydrogen (deuterium) can lead to production of a marker without such drawbacks. D₂O concentration in water can be monitored using isotope ratio mass spectrometry. Such spectrometry is widely applied in various areas environmental, geomorphological, environmental engineering, archaeological, energy science, medical and microbiological research. However, it has never been used for monitoring splash and runoff phenomena, or soil parameters impact on these.

The main aim of the project is to determine the origin of water from splashed water droplets depending on such soil properties as moisture content and texture or energy of hitting water drop. There are two sources of this water origin: water from the drop hitting the soil surface and water present in the soil. The use of water labelling (by isotopes) makes it possible to determine the ratio of the water in the splashed droplets from both sources.

Do not hesitate to contact with dr inż Cezary Polakowski (c.polakowski@ipan.lublin.pl) with any question related to the PhD project.



3. **Funding scheme:** SONATA-18
4. **NSC panel name (Research field):** ST10
5. **Deadline for submitting applications:** till 17.08.2023, 2:00 p.m. UTC+2
6. **How to apply:** in electronic form via our Recruitment System:
<https://career.ipan.lublin.pl/en/announcements/> and additionally in person or by traditional mail or by e-mail in accordance with the rules presented on [the website](#).
7. **Interview:** 31.08.2023, with the stipulation the deadline can be changed.
8. **Results will be announced by:** 29.09.2023, with the stipulation the deadline can be changed.
9. **Terms of employment:**

The successful candidate will receive scholarship for 48 months, under the rules of Act on Higher Education and Science of 20 July 2018 (Journal of Laws of 2022 item 574 as amended) in the amount of PLN 5,000.00 per month, reduced by ZUS due contributions on the side of the scholarship holder and the Institute up to the month of a mid-term evaluation and in the amount of PLN 5,000.00 monthly, reduced by ZUS due contributions on the side of the scholarship holder and the Institute after a positive mid-term evaluation result. **Please be informed the amount stated above also include contributions and benefits payable by the Institute (total scholarship cost), therefore the gross amount of scholarship will be calculated as the above values being reduced accordingly.**

10. Additional information:

- a) The recruitment process is organized as an open competition pursuant to the terms and conditions stated in The Act on Higher Education and Science of 20 July 2018 (Journal of Laws of 2022 item 574 as amended).
- b) After the deadline for submitting applications will expire, the Committee may conduct interviews with candidates. In this case, each candidate will be informed individually about the first stage results, as well as the date of the interview.
- c) The Institute reserves the right to award the fellowship to the candidate ranked 2nd, only if the chosen candidate resigns before signing the fellowship agreement.

11. Required documents:

- 1) letter of application addressed to the Chairperson of the Committee – dr inż. Cezary Polakowski;
- 2) Curriculum Vitae with an information on meeting requirements regarding competences and abilities, a summary of scientific accomplishments and awards (including in particular: published scientific papers, conference speeches, participation in research projects, internships, training courses as well as other research achievements and scientific distinctions);
- 3) copy of MSc diploma;
- 4) recommendation letter issued by the research supervisor;
- 5) declaration of availability to work in the Project with the indication of the starting date 1st October 2023;
- 6) declaration of consent to the processing of personal data contained in the fellowship offer for the needs of the recruitment process in accordance with the example below:

*„I allow my personal data stated in the abovementioned applications to be processed for the purpose of the recruitment by the Institute of Agrophysics of the Polish Academy of Sciences (20-290 Lublin, ul. Doświadczalna 4), in accordance with the General Data Protection Regulation (EU) 2016/679.”**

*) Information clause on personal data is available on the following website:

<http://www.ipan.lublin.pl/wp-content/uploads/2019/02/information-clause-IA-PAS.pdf>



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P A S

If you are interested in this position please send your application via our Recruitment System by 17.08.2023, 2:00 p.m. UTC+2: <https://career.ipan.lublin.pl/en/announcements/>

In addition, the Candidate should submit an application to Doctoral School of Quantitative and Natural Sciences according to information on [the website](#).

We kindly inform that we contact only chosen candidates and also applications that are incomplete, submitted after the deadline or in the different form than required will not be processed.