

Competition notice

PRELUDIUM BIS

Project title: Impact of allergenic pollen on the optical and microphysical properties of the urban aerosol

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Project description

In an increasingly polluted air, rich in different atmospheric aerosol types, the plant pollen and fungal spores have a huge impact on people's lives, being often a source of allergies and respiratory diseases. This aerosol appears during the growing season of plants, from early spring until late autumn. Climate change - currently courting more and more attention in the media – affects the growing season by prolonging pollination of plants, which in return increases public exposure to this type of aerosol. In Poland, an important role in warning about the severity of allergenic pollen episodes is taken by the Allergology Service of the Allergen Research Center (OBAS). The number of researchers dedicating their work to atmospheric aerosol investigations is growing. Anthropogenic pollution, biomass burning, etc., are considered highly important. But currently, it is pollination being referred to in the scientific community as a so-called hot topic, especially in the field of remote sensing measurements.

Unique lidar measurements conducted at the *Remote Sensing Laboratory (RS-Lab) of the Faculty of Physics of the University of Warsaw* provide information on the distribution of aerosols in the atmosphere. Modern Lidar measures continuously the aerosol optical properties in 12 channels in the altitude range up to 25 km. These measurements can be used to derive the amount of aerosol, the size, and shape of aerosol particles, as well as the height and thickness of the formed aerosol layers. Lidar provides high-quality data for the European Aerosol, Clouds and Trace Gases Research Infrastructure (ACTRIS). As part of this project, the RS-Lab research infrastructure will be enriched with advanced automated in-situ measurements of plant pollen and fungal spores. The observations will be carried out using the optical Pollen Monitor of the *Institute for Research and Development in Optoelectronics (INOE, Romania)*. Pollen Monitor and RS-Lab Lidar will simultaneously perform continuous measurements for 8 months in Warsaw. Based on the information provided by the afore-mentioned instruments, it will be possible to describe the physical and optical properties of the aerosol associated with pollination episodes in the city. This work will be done in close collaboration with the *Polytechnic University of Catalonia (UPC, Spain)* (6 months internship). We will examine these properties in terms of their differences depending on the type, shape and amount of pollen. The obtained optical properties will be used as an input for microphysical properties retrieval done in collaboration with *University of Potsdam (UP, Germany)*. Taking into account the specificity of the urban agglomeration, we will undertake studies on the possible mixing of allergenic pollen with other types of aerosol. Specifically, anthropogenic pollution monitored by the Mazovian Voivodship Inspectorate for Environmental Protection (WIOŚ).

This will allow us to conduct a more complete assessment of the impact of pollen on the aerosol properties observed in the urban environment in Warsaw. The project results may be used as a source of information for both modeling and prediction of plant pollination and air quality, and thus, indirectly improve the life-quality of Warsaw inhabitants.

Requirement

The call is open to all those who *are not PhD holders* and *are not students* at the doctoral schools.

Education: M.Sc. in physics or similar (specialization in atmospheric physics will be an advantage but it is not required).

Good knowledge of the English language (spoken and written).

Willingness to work hard (both in the laboratory and in the field), including a 6-month research internship in Spain under the NAWA program.

Ability to meet deadlines, in particular a doctoral student participating in the PRELUDIUM BIS 2 project is obliged to obtain a doctoral degree within 12 months from the end of the project.

Discipline: Earth and environmental sciences

Admission limit: 1

Recruitment schedule

- registration in the Internet Registration of Candidates, referred to as "IRK", submitting an application to the IRK: 10-30 August 2021
- qualification procedure: 2-6 September 2021
- announcement of the ranking list: until 9 September 2021
- accepting documents from qualified candidates: 10-24 September 2021
- announcement of the list of accepted candidates: until 28 September 2021

Recruitment fee

150 PLN

Form of the selection procedure

Evaluation of the following elements shall be taken into account in the selection process:

- 1) scientific activity of the candidate based on a CV or resumé, documented with scans of materials attached to the application for admission to the School;
- 2) interview with the candidate / qualification examination
- 3) other achievements.

Language of the selection process, including the interview

The interview shall be carried out in Polish or English – in accordance with the candidate's preferences presented in IRK. If the Polish language is selected, the interview may include parts in English.

Required documents

The candidate shall submit a School admission application only through the IRK. The application shall include the following:

- 1) indication of the selected discipline in which the candidate plans to pursue education, PESEL number or passport number, nationality, contact information (residence address, e-mail address, telephone number), information whether the candidate agrees to receive administrative decisions by means of electronic communication, consent for processing of personal data for the purposes of the admissions procedure;
- 2) a scan of the graduation diploma of uniform master's degree or postgraduate studies or an equivalent diploma obtained under separate regulations. In the case of a diploma equivalent to a uniform master's degree or postgraduate studies graduation diploma, a candidate shall justify such equivalence. In case the diploma was issued in a language other than Polish or English, the candidate shall attach its certified translation;
- 3) a resume or CV outlining the candidate's scientific activity, including scholarly interests and achievements during the five calendar years preceding the application (if a candidate became a parent during this time, as evidenced by a scan of the child's birth certificate attached to the application, this period shall be extended by two years for each child), including, but not limited to:
 - publications,
 - research and organizational work at student research groups,
 - participation in scientific conferences,
 - participation in research projects,
 - awards and honorable mentions,
 - research internships,
 - research skills training programs completed,
 - activities promoting science,
 - activity in science movement representative bodies,
 - average of their university grades,
 - professional career,
 - level of proficiency in foreign languages;
- 4) scans of materials evidencing scientific activity mentioned in their CV and/or resume;
- 5) a document confirming at least B2 proficiency level in English or a declaration of the level of proficiency in English allowing education at the School;
- 6) the scan of a declaration by the planned supervisor, confirming their agreement to undertake the duties of a supervisor and of the number of doctoral students, for whom they perform the duties a designated supervisor, in accordance with the template constituting Appendix no.4 to the Resolution no. 17 of the Senate of the University of Warsaw of 20th January 2021 on rules of admission to doctoral schools at the University of Warsaw (the University of Warsaw Monitor of 2021, item 13, as amended), the candidate may also attach a scan of their planned supervisor's opinion and opinions of other academics about the candidate and their scientific activity;
- 7) the photograph of a candidate's face that allows for their identification;
- 8) a declaration confirming whether the candidate was or is a doctoral student or a participant of doctoral studies or whether they have initiated a doctoral dissertation process or whether proceedings to award them a doctoral degree have been initiated – and if yes, the title of their doctoral dissertation or the research project prepared by a candidate, including the name and last name of the candidate's tutor or supervisor;
- 9) a declaration confirming that they have reviewed the Resolution no. 17 of the Senate of the University of Warsaw of 20th January 2021 on rules of admission to doctoral schools at the University of Warsaw (the University of Warsaw Monitor of 2021, item 13, as amended) and Articles 40 and 41 of the Code of Administrative Procedure;
- 10) scanned transcripts of records of the graduate and postgraduate studies or the uniform Master's degree studies, or equivalent documents (e.g. diploma supplement);
- 11) abstract of the master's thesis or master's project in English (up to 3,000 characters with spaces);
- 12) other documents as scans: motivation letter.

Evaluation criteria

- a) competencies to perform specific tasks in a research project (70% of the final score)
 - 3 points - very good
 - 2 points – good

- 1 point – poor
 - 0 points - no competencies
- b) publication track record, including publications in renowned scientific papers / magazines (30% of the final score)
- 4 points – prominent
 - 3 points - very good
 - 2 points – good
 - 1 point – poor
 - 0 points - no publication track record

Education program

The education lasts 4 years. It includes obligatory classes (no more than 300 hours in total during the whole period of education) and the implementation of an individual research program, carried out under the supervision of a supervisor. Beginning of education – October 1, 2021.

Scholarships

PRELUDIUM BIS doctoral scholarships shall amount to:

- PLN 5,000,- gross gross per month, by the month in which a PhD student's mid-term evaluation is performed at the doctoral school and
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shall be awarded pursuant to the Act on Higher Education and Science of 20 July 2018.

NOTE: A doctoral student may receive a doctoral scholarship for a maximum of 4 years. For 36 months, it will be financed from the PRELUDIUM BIS grant. For the next 12 months, the doctoral student may receive a scholarship in the amount provided for in the general regulations (in the academic year 2021/2022 it is 3,653.70 gross PLN).