



ul. Będzińska 60 41-200 Sosnowiec tel. +48 32 368 93 80 polarknow@us.edu.pl www.mssd.us.edu.pl

Title of PhD project: Loads and fluxes of heavy metals associated to suspension discharged with glacier meltwaters (Hornsund, Svalbard)

The leading unit: Institute of Oceanology Polish Academy of Sciences **Co-leading Unit:** Institute of Geophysics Polish Academy of Sciences

Requirements:

1. Master's degree in a discipline related to the proposed research (oceanography, chemistry, environmental protection)

2. Knowledge of research topics related to chemical and physical oceanography and the polar environment

3. Basic knowledge of laboratory techniques (pollutant analysis)

4. Basic knowledge of analytical and measuring equipment used in chemical and physical oceanography

5. Good knowledge of the statistical, mathematical and GIS (the ability to use Matlab program will be an asset)

6. Knowledge of the English language enabling communication, reading and writing scientific papers

7. Participation in research cruises, experience in collecting environmental samples

Tasks description:

- 1. Participation in research cruises, collection of environmental samples
- 2. Analysis of heavy metal concentrations in water, suspension and bottom sediment samples
- 3. Analysis of sedimentation processes in the foreground of tidewater glaciers
- 4. Statistical analysis and interpretation of the obtained data
- 5. Preparation of scientific articles and conference presentations
- 6. Participation in lectures and classes offered by the MSSD
- 7. Regular reporting of work progress

Project abstract:

Global warming is affecting the transport of pollutants and their fate in the Arctic. Increasing temperature intensifies the melting of glaciers and permafrost thawing. Pollution discharges from primary sources (atmospheric circulation, sea currents, and transport of ice from distant locations) are generally well recognized and relatively low. There is a knowledge gap concerning the pollution loads from secondary sources, e.g. melting of glaciers, however. The intensive melting of glaciers may increase the supply of pollutants accumulated on the surface of the glacier ice over the last century. Thus fjord ecosystems may nowadays receive higher loads of pollutants than before. This may endanger their functioning. Unfortunately, this issue is currently not well studied. One of the groups of pollutants in the Arctic environment are heavy metals (e.g. Hg, Cd, As, Pb, Zn and Cu). Some of the heavy metals in the environment are of natural origin, but the greater part (> 90%) is released into the environment as a result of human activities.

Uniwersytet Śląski w Katowicach ul. Bankowa 12 40-007 Katowice www.us.edu.pl Instytut Geofizyki Polskiej Akademii Nauk ul. Księcia Janusza 64 01-452 Warszawa www.igf.edu.pl Instytut Matematyczny Polskiej Akademii Nauk ul. Śniadeckich 8 00-656 Warszawa www.impan.pl



ul. Będzińska 60 41-200 Sosnowiec tel. +48 32 368 93 80 polarknow@us.edu.pl www.mssd.us.edu.pl



The Hornsund fjord (Spitsbergen) was selected for the study as tidewater glaciers located there are characterized by the highest melting rates on the island. The overall objective of this project is to assess the loads of heavy metals absorbed onto suspension discharged by glacier meltwaters into the Arctic fjord (Hornsund, Spitsbergen). The project will analyze and model the contemporary supply of suspended matter from melting glaciers, and the concentration of heavy metals in seawater and suspended matter at the glacier's forehead. The suspended matter will be sampled continuously throughout the year in an automatic sedimentation trap anchored at the glacier front. Moreover, in the period from spring to autumn, water samples and suspended solids will be collected at least once a month using a bathymetric rosette at the glacier foreground and in the vicinity of the ice cliff using remotely controlled surface and underwater research platforms. The main field work period will start in May 2022 and end in October 2022. The load of heavy metals delivered to the fjord's environment during will be estimated, and then we will also estimate the rate of heavy metal sedimentation in the glacier foreland. Based on the determined heavy metal levels the risk they pose to the marine ecosystem will be finally assessed.

Other information:

The work will be carried out under supervision of: dr hab. Agata Zaborska (Institute of Oceanology Polish Academy of Sciences) and dr hab. Mateusz Moskalik (Institute of Geophysics Polish Academy of Sciences) <u>agata@iopan.pl</u>, <u>mmosk@igf.edu.pl</u>

Amount of the scholarship: 5000 PLN gross

Deadline for applications, conditions and procedure of admission as well as the date of the competition result:

• 01.09-09.09.2021 - online recruitment in the IRK system (https://irk.us.edu.pl/), including setting up an account in the IRK online recruitment system; payment of the enrollment fee (the date of the transfer is decisive); entering relevant information and documents.

- 09/09/2021 deadline for delivery of documents (title and outline of the project, list of achievements with their confirmation and others).
- 10/09/2021 individual information on admission to the next stages of recruitment to IEDS and the date of the interview
- 13/09/2021 deadline for sending presentations for job interviews.

• 14–16/09/2021 - interviews with candidates (date and place of interviews depends on the number of applications for specific topics).

- 09/17/2021 announcement of the lists of candidates and reserve lists.
- 20–23/09/2021 registration of candidates qualified for admission.
- 30/09/2021 the date of announcing the list of people admitted to the IEDS.

Uniwersytet Śląski w Katowicach ul. Bankowa 12 40-007 Katowice www.us.edu.pl Instytut Geofizyki Polskiej Akademii Nauk ul. Księcia Janusza 64 01-452 Warszawa www.igf.edu.pl Instytut Matematyczny Polskiej Akademii Nauk ul. Śniadeckich 8 00-656 Warszawa www.impan.pl



ul. Będzińska 60 41-200 Sosnowiec tel. +48 32 368 93 80 polarknow@us.edu.pl www.mssd.us.edu.pl

Requirements to admission

The recruitment committee shall evaluate the candidates' research achievements, their researchrelated achievements and competencies as regards specific tasks in the research project, expressed as a point score:

the candidate's research achievements, including publications in prestigious academic press /journals (50% of the final score):

- 4 points outstanding;
- 3 points very good;
- 2 points good;
- 1 points poor;
- 0 points no scientific achievements.

research-related achievements, scholarships, awards and research experience gained in Poland or abroad, research workshops and training courses, participation in research projects (20% of the final score):

- 4 points outstanding (e.g. scholarships, fellowships at leading foreign research centres, prestigious international prizes or awards, workshops or training courses at the leading research centres, participation in international or foreign projects);
- 3 points significant (scholarships, fellowships at good Polish and foreign research centres, national prizes or awards, domestic or foreign workshops or training courses, participation in Polish or foreign projects);
- 2 points moderate (local prizes or awards, workshops or training courses, participation in university projects);
- 1 point poor achievements;
- 0 points no achievements.

the candidate's competence to carry out specific tasks in the research project (30% of the final score):

- 3 points very good;
- 2 points good;
- 1 point poor;
- 0 points no competence.

Conditions for admission to the qualification procedure

- 1. registering an account in the www.irk.us.edu.pl system and filling in a form containing appropriate declarations and consents;
- 2. submission in the system <u>www.irk.us.edu.pl</u>:
- a copy of the graduation diploma with a supplement;

Instytut Geofizyki Polskiej Akademii Nauk ul. Księcia Janusza 64 01-452 Warszawa www.igf.edu.pl

Instytut Matematyczny Polskiej Akademii Nauk ul. Śniadeckich 8 00-656 Warszawa www.impan.pl





ul. Będzińska 60 41-200 Sosnowiec tel. +48 32 368 93 80 polarknow@us.edu.pl www.mssd.us.edu.pl

- curriculum vitae;

- title and outline of a doctoral project, the form of scientific achievements and the documents certifying them, as well as other documents specified in the eligibility criteria for specific topics (admissible submission at the office of the IEDS, via polarknow@us.edu.pl or the IEDS website.

3. paying the enrolment fee in the amount of PLN 190.

Information on the conditions for awarding a scholarship:

The scholarship is financed by NCN under the NCN OPUS funding schemes and consists of a doctoral scholarship within the meaning of Article 209 of the Law on Higher Education and Science of July 20, 2018 and the NCN scholarship for doctoral students as defined in Annex 2 to the Regulations on awarding funding for the research tasks founded by the National Science Centre as regards research projects, set forth in NCN Council Resolution No. 95/2020 of September 14, 2020. The competition may be entered by a person who does not have a doctoral degree and is not a doctoral school participant.

Uniwersytet Śląski w Katowicach ul. Bankowa 12 40-007 Katowice www.us.edu.pl Instytut Geofizyki Polskiej Akademii Nauk ul. Księcia Janusza 64 01-452 Warszawa www.igf.edu.pl Instytut Matematyczny Polskiej Akademii Nauk ul. Śniadeckich 8 00-656 Warszawa www.impan.pl