Międzynarodowa Środowiskowa Szkoła Doktorska
przy Centrum Studiów Polarnych
w Uniwersytecie Śląskim w Katowicach

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Reference No: IEDS/2020/IO PAN/06

Title of PhD project: ***Significance of submarine groundwater discharge (SGD) in the Arctic***

Leading unit: International Environmental Doctoral School associated with the Centre for Polar Studies at the University of Silesia in Katowice (IEDS) - Institute of Oceanology Polish Academy of Sciences

Mode of study: full-time

Degree to be obtained: PhD in the field of natural sciences, in the discipline of Earth and related environmental sciences

Duration: 4 years (8 semesters), from October 2020

Language: English

Scholarship: 5000 PLN per month throughout the 36 months (3 years), with the possibility of extension for 12 months

Required documents and registration online:

Requirements and regulations: www.mssd.us.edu.pl/kandydat-mssd/
Registration: www.irk.us.edu.pl

Conditions of recruitment:
https://www.mssd.us.edu.pl/wp-content/uploads/2020/06/Regulamin_projekty-NCN.pdf

Deadline: 27th August 2020

Required documents: § 8, section 3:
https://www.mssd.us.edu.pl/wp-content/uploads/2020/06/requirement_IEDS_2020_2021.pdf

Requirements:

1. MSc degree in chemistry, geology, oceanography or related disciplines.
2. Experience in laboratory work and chemical analyses (e.g. DIC, DOC, and nutrients).
3. Very good written and spoken English.
4. High motivation for scientific work.

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5. Experience in field research and research cruises, public presentation of research results and writing of scientific articles will be appreciated.
6. An additional advantage will be experience in the Ra and Rn isotope analyzes.

Tasks description:

1. Identification of submarine groundwater discharge (SGD) controlling factors in the Arctic region.
2. Reconstruction of SGD history in the Arctic.
3. Performing geochemical analyses of fluids, sediments and authigenic precipitates to quantify the fluxes of groundwater and accompanying solutes to the water column.
4. Preparation and conducting fieldwork, participation in research cruises in the N. Norwegian margin and European Arctic (e.g., Spitsbergen).
5. Performing statistical analyzes, interpretation of the obtained data, and writing scientific publications.
6. Preparation of conference speeches and participation in national and international scientific conferences.

Abstract

The flow of land-derived groundwater in the ocean environment (or submarine groundwater discharge - SGD) is a common global observation however poorly studied so far. The groundwater discharge has been recognized as an important source of freshwater and chemical substances for some coastal areas. Besides, the strength of SGD is known to associate with climate changes, especially in the Arctic region. Large bodies of ice, such as glaciers in the ocean and frozen soils on land, can change the flow of groundwater; the shrinking of these ice bodies could, therefore, have an immense impact on the water cycle. Up to date, scientists know very little about how much of this fresh groundwater is discharged to the Arctic Ocean, SGD composition, and SGD influence on the benthos organisms living in the ocean. The proposed investigations will provide an opportunity to demonstrate how multidisciplinary approaches, including biology, geochemistry, and geology, should be integrated to understand the ecosystem functioning with an in-depth understanding of the biogeochemical processes involved. It will bring together scientists with various oceanography background (biology, ecology, chemistry, geology) and experience (from senior and young researchers to prospective PhD student) and provide a

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holistic approach to problem-solving. Field studies will be conducted around Svalbard and in the Lofoten-Vesterålen continental slope off northern Norway.

The main goal of the doctoral dissertation will be to estimate the groundwater inflow in the Arctic region and to determine its range and biogeochemical impact.
The proposed PhD work will be part of the ArcticSGD project (Submarine Groundwater Discharge in the Changing Arctic: Scale and Biogeochemical Impact) funded by the Polish National Science Centre and conducted at both the Institute of Oceanology of the Polish Academy of Sciences, Sopot, Poland and Geological Survey of Norway Trondheim, Norway.

Other information:

1. The supervisors will be Dr. Beata Szymczycha; Institute of Oceanology Polish Academy of Sciences, Sopot, Dr. Aivo Lepland, Geological Survey of Norway, Trondheim, Norway, and Dr. Wei-Li Hong, Department of Geological Sciences, Stockholm University, Sweden
2. The scholarship will be paid as a part of the Polish National Science Centre funded project in the frame of GRIEG programme – ArcticSGD.
   The candidate must additionally undergo competitive recruitment for the NCN project. Information about the competition procedure for the NCN - GRIEG project ArcticSGD: https://www.ncn.gov.pl/baza-ofert/?akcja=wyswietl&id=182778
3. Contact to the Secretary of the IEDS Admission Committee: +48 32 3689 380, polarknow@us.edu.pl, www.mssd.us.edu.pl