



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

ul. Bedzińska 60
41-200 Sosnowiec
tel. +48 32 368 93 80
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Recruitment is open for two positions at the International Environmental Doctoral School (IEDS).

Proposed PhD dissertation topics:

1. "Glacier–ocean interactions in Hornsund Fjord, Spitsbergen: characteristics of frontal ablation processes and their controlling factors"
2. "Analysis of the variability of ice coverage in the bays of Hornsund Fjord, Spitsbergen: driving factors, dynamics and impact on glacier–ocean interactions"

Host institution: Institute of Geophysics, Polish Academy of Sciences (IG PAS) in Warsaw

Requirements for candidates:

1. Completed Master's degree (or equivalent) in oceanography, geography, geology, physics, mathematics, or a related discipline
2. Interest in polar research and readiness to fully engage in scientific work, including participation in field measurements
3. Basic knowledge of mathematics and physics
4. English proficiency sufficient for fluent discussion and further development toward writing scientific publications
5. Ability to work both independently and in a team
6. Creativity and ability for critical and analytical thinking

The following will be considered as additional strengths of the candidate:

1. Practical programming skills (e.g., Python, MATLAB)
2. Experience in applying remote sensing tools and the use of spatial analysis software (e.g., ArcGIS, QGIS, Global Mapper)
3. Documented scientific achievements – diplomas, awards and distinctions, scientific publications, conference presentations, participation in scientific projects
4. Experience in fieldwork or recreational activities related to marine, mountain, or polar environments (e.g., motorboat operation, sailing, diving, skiing, climbing, bicycle expeditions)

Description of tasks:

1. Post-processing and analysis of satellite, oceanographic, and meteorological data and time-lapse imagery (depending on the dissertation topic)



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2. Participation in field measurements based on the Polish Polar Station Hornsund (campaigns lasting several weeks; <https://www.youtube.com/watch?v=3k1DXFwZ3xg>)
3. Critical interpretation of obtained scientific results
4. Preparation of scientific articles and science-communication materials
5. Scientific development through literature studies as well as participation in trainings, workshops, and scientific conferences
6. Engagement in establishing and maintaining scientific collaborations at national and international levels
7. Assistance in the activities of the Department of Polar and Marine Research at IG PAS

Summary

Glacier bays—locations where glaciers terminate in the sea—are among the most fascinating and at the same time least understood environments on Earth. It is there that icebergs the size of multi-story buildings detach from glaciers in the spectacular and hazardous process of calving. These bays are also places where glacier cliffs melt at the ice–ocean interface deep below the sea surface, processes that cannot be directly observed with the naked eye or measured using typical approaches (e.g., relying only on satellite imagery). Finally, ice drifting on the sea surface modifies oceanographic conditions and thereby affects the intensity of calving and submarine melting of glaciers. A better understanding of these processes is essential for predicting the consequences of ice loss in a changing climate, including sea-level rise, ocean freshening, and abrupt alternations of ecosystems.

The first PhD project will focus primarily on the analysis of frontal ablation—namely the mechanisms of glacier calving and submarine melting—for selected glaciers terminating in Hornsund Fjord on Spitsbergen. An important task will also be to identify and characterize factors that control the course and intensity of these processes. Such factors include, among others, sea temperature and depth, meteorological conditions, and the physical characteristics of individual glaciers. The work will require analysis of oceanographic, glaciological, meteorological, and satellite data.

The second PhD project will involve the analysis of variability in ice conditions across numerous glacier bays of Hornsund Fjord. The research will focus on two main types of ice: (i) glacier ice produced by glacier calving and (ii) sea ice formed by freezing of seawater. The main objectives will include: developing maps showing the degree of ice coverage in the bays based on satellite data and time-lapse imagery; tracking temporal and spatial variability of ice occurrence; identifying environmental factors controlling this variability; and analyzing the potential influence of ice conditions on the retreat rates of marine-terminating glaciers.



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Both PhD projects will include involvement in fieldwork based on the Polish Polar Station Hornsund, presentation of research results at national and international conferences, and participation in trainings, workshops, and meetings with international partners.

Information about the project: The PhD dissertations will be carried out within the research project “Studying glacier/ocean interactions using a natural laboratory of Hornsund fjord, Svalbard”, funded by the Polish National Science Centre (NCN) and led by Assoc. Prof. Oskar Głowacki. Project partners include renowned institutions from the USA, the United Kingdom, Norway, and Singapore: Scripps Institution of Oceanography (University of California San Diego), University of Connecticut, British Antarctic Survey, Scott Polar Research Institute (University of Cambridge), UiT the Arctic University of Norway, and the National University of Singapore.

Other information:

The work will be carried out under the supervision of dr. hab. Oskar Głowacki (oglowacki@igf.edu.pl), dr. Zuzanna Świrad (zswirad@igf.edu.pl) and dr. Michał Cieply (michal.cieply@us.edu.pl). Contact to the secretary of the IEDS doctoral school: +48 32 3689 380, e-mail: polarknow@us.edu.pl. Website: <https://www.mssd.us.edu.pl/en/grant-admission-2026-2027/>

Profiles of the PhD supervisors



Dr. hab. Oskar Głowacki: oceanographer and geophysicist, professor at the Department of Polar and Marine Research, IG PAS. His main research interests are the interactions between glaciers and the ocean, the development of new measurement methods in glaciology, and underwater acoustics. He spent more than a year doing fieldwork in the Arctic, and completed a 2.5-year postdoctoral fellowship at Scripps Institution of Oceanography, University of California San Diego (USA). He was awarded the Prime Minister's PhD Dissertation Award, a scholarship for outstanding young scientists from the Polish Ministry, the Maurycy Pius Rudzki Prize of the Polish Academy of Sciences, and the Prof. Kacper Rybicki Scholarship (twice).



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Dr. Zuzanna Świrad: geomorphologist, employed as an adjunct at the Department of Polar and Marine Research, IG PAS. She specializes in the study of coastal erosion and analysis of ice processes using remote sensing. She gained her experience at the Arctowski Polish Antarctic Station, Durham University (PhD), Scripps Institution of Oceanography, University of California San Diego (Postdoc), and during the numerous research trips abroad. She has won prestigious awards and prizes: the L'Oréal-UNESCO "For Women in Science" award, the scholarship for outstanding young scientists of the Ministry of Science and Higher Education, the Prof. Kacper Rybicki scholarship, and awards from the Rector of the University of Wrocław.



Dr. Michał Cieplý: geographer and glaciologist, employed as an adjunct at the Institute of Earth Sciences, Faculty of Natural Sciences, University of Silesia in Katowice. His research focuses on the mechanisms of frontal ablation of tidewater glaciers. Since 2009, he has participated in 13 polar expeditions to Spitsbergen (High Arctic), during which he conducted glaciological and oceanographical research. He has served as both principal investigator and researcher in projects carried out in polar regions. Since September 2024, he has been serving as the Dean of the International Environmental Doctoral School (IEDS) at the Centre for Polar Studies.