

❖ Scientific conferences:

Conference on the occasion of World Water Day, presentation of the latest UNESCO Report "Partnership and Cooperation for Water" at the Institute of Geophysics of the Polish Academy of Sciences in Warsaw, 22nd March 2024 (53 participants)

On 22nd March, we celebrated World Water Day in the historic interiors of the Staszic Palace. We celebrated it with a conference organized together with the Committee on Water Management of the Polish Academy of Sciences. The UN report entitled "Water for Prosperity and Peace" was presented by MSc Eng. Anna Mitraszewska from the Polish Committee of the Global Partnership for Water. Then, the results of a two-hour workshop meeting of the Committees of the Polish Academy of Sciences on "Water in Industry and Energy" were presented by Dr. Eng. Anna Dubel (AGH) and Prof. Tomasz Walczykiewicz (IMGW). Current scientific needs were analyzed for identifying synergies in research areas related to energy, industry and water management, and recommendations for creating research programs, as well as policies and strategies in these areas were indicated. The next item on the Conference program were presentations on regions that struggle with extremely different problems related to water. Water shortage and the interaction of water resources, geopolitical dynamics and economic development in the Middle East was presented by Dr. Hossein Hamidifar, and Dr. Hab. Eng Robert Banasiak talked about water excess, flood protection and strategies for adaptation to sea level rise in the Benelux countries. After the expert presentations, a panel discussion was held with the participation of Prof. Dr. Hab. Eng Krzysztof Szamałek (Director of the Polish Geological Institute PIG NRI), Mateusz Balcerowicz (Deputy President of the State Water Management Authority Polish Waters for Flood and Drought Protection), Dr. Hab. Eng Monika Kalinowska (Institute of Geophysics PAS), Dr. hab. Eng Robert Banasiak (Institute of Meteorology and Water Management), Anna Mitraszewska (Polish Committee of the Global Partnership for Water), Dr. Eng Anna Dubel (AGH University of Science and Technology in Kraków), Prof. Dr. Hab. Eng. Tomasz Walczykiewicz (Institute of Meteorology and Water Management).

❖ Initiatives promoting and popularizing scientific research results:

In 2024, educational and informational stands and activities were organized during various science-related events, including the Science Picnic, Science Festival, Science and Passion Festival, school science picnics, activities for universities of the third age and for children's universities, as well as activities in schools as part of the Geophysics at School program. Below we present the individual activities carried out by the Institute of Geophysics of the Polish Academy of Sciences in 2024.

Lectures, talks and workshops as part of the Geophysical Mobile University:

1. 29.02.2024 Nature Education Centre of the Tuchola Forest National Park in Chociński Młyn, "Electricity in nature, atmosphere and space around the Earth" Dr. Marek Kubicki, 60 people
2. 14.03.2024 Polar Research Museum in Puławy, "Where is the Arctic heading?" Dr. Jerzy Giżejowski, 125 people
3. 14.03.2024 XXXV Bolesław Prus High School, "Healthy Sunbathing" Dr. Eng. Agnieszka Czerwińska, 30 people

4. 29.04.2024 University of the Third Age in Łuków, "The Polish Polar Station Hornsund on Spitsbergen – history, life and work" Dr. Jerzy Giżejewski, 45 people
5. 16.05.2024 University of the Third Age in Puławy, "The Polish Polar Station Hornsund on Spitsbergen – history, life and work" Dr. Jerzy Giżejewski, 110 people
6. 18.05.2024 Polar Night of Museums at the Polar Research Museum in Puławy, Workshops for children – Dagmara Bożek, 273 people
7. 08.06.2024 Sopot Science Picnic at the Institute of Oceanology of the Polish Academy of Sciences, educational stand of Dr. Agata Goździk and Dagmara Bożek, 1000 people
8. 15.09.2024 Polar stand as part of the 2nd Charity Bike Rally under the slogan "We're cycling for health" at the Public Primary School in Lipie, Dr. Agata Goździk and Justyna Szymkowska, 240 people
9. 21.09.2024 Polar Science Day at the Science Festival, 200 people
10. 8.11.2024 Polar stand and inaugural lecture "Mysterious interiors of glaciers" at the Festival of Science and Passion in Grodzisk Mazowiecki, Prof. Piotr Głowacki, Maria Skorupska, Szczepan Bal, Adrian Bróż, Filip Bojdecki, 850 people

Festival lessons – Science Festival 2024:

1. 24.09.2024 "Glaciers and glacial landforms" for the CX Robert Schuman High School, 18 people
2. 24.09.2024 "The Colourful World of Rocks and Minerals" for Primary School No. 41 named after the Home Army Soldiers of the "Krybar" Combat Group, 15 people
3. 25.09.2024 "The Colourful World of Rocks and Minerals" for Primary School No. 221 named after Barbara Bronisława Czarnowska, 36 people
4. 26.09.2024 "The Arctic – a litmus test of climate change" - online lesson, 296 people

GEOPHYSICS AT SCHOOL classes for schools conducted by employees and PhD students of the Institute of Geophysics of the Polish Academy of Sciences (14 lessons for a total of 339 students):

1. Szczepan Bal, 11 lessons titled "Visitors from Outer Space":
 - 07.03.2024 at the Primary School in Bogdanówka, 6 people
 - 08.03.2024 at the Primary School in Tokarnia (for five classes), 91 people
 - 07.03.2024 at the Primary School in Skomielna Czarna (for two classes), 28 people
 - 06.03.2024 at the Primary School in Krzczonów (for two classes), 41 people
 - 06.03.2024 at the Community School in Myślenice (for two classes), 43 people
2. Dagmara Bożek "Penguins on King George Island"
 - 23.02.2024 Stefan Meller International Primary School in Warsaw, 18 people
3. Dagmara Bożek, "Fauna of the Arctic and Antarctic"
 - 16.02.2024 Municipal Kindergarten in Kielce, 87 people
4. Dr. Agata Goździk, "Life and work at the Polish Polar Station"
 - 06.06.2024 Primary School No. 225 in Warsaw named after Józef Gardecki, 25 students

The Institute of Geophysics of the Polish Academy of Sciences also conducted shows during the 27th Science Picnic on 15th June 2024 at the stand of the Geoplanet Earth and Planet

Research Center. The Institute was also the coordinator of the entire stand. The Institute organized three shows:

1. Surprising facts about water: a show coordinated by Dr. Hab. Eng. Monika Kalinowska from the Department of Hydrology and Hydrodynamics, which included a knowledge competition about water "How much water is suitable for drinking", crosswords, crosswords and coloring books, a family competition "Water consumption", in which participants estimated how much water the average Pole uses daily, the activity "Your idea for saving water".
2. Sea gels - visible or invisible: a show coordinated by Dr. Hab. Eng. Magdalena Mrokowska from the Department of Hydrology and Hydrodynamics, concerning the results of her NCN project (No. 2019/35/D/ST10/01135). As part of this show, it was possible to create hydrogels and learn why their presence in the seas is dangerous. The show used sodium alginate, which comes from brown algae. In the presence of calcium, alginate macromolecules combine, creating a structure resembling an egg crate. This is how a hydrogel is created.
3. Rock or brawn: a show coordinated by Dr. Piotr Król from the Department of Polar and Marine Research, which included a presentation of some of the oldest rocks on Earth in the form of the "Stone Path of Time" exhibition, viewing a cut rock from Greenland that is over 3.7 billion years old under a microscope. You could also hear about the results of the "Poles together. The missing link" project led by a team of Prof. Dr. Hab. Eng. Monika Kusiak. An additional challenge was a magnetic puzzle, in which you had to distinguish between rock and... brawn.

A screening of the film "Polar Women" and a conversation with the creators and protagonists of the film about the history of women in the polar regions were also organized. The meeting took place on 8th March 2024 at the Atlantik cinema and gathered 259 participants.

The Institute of Geophysics conducted **24 publicly available webinars** on popular science topics, in which **1,386 people** participated: 16 as part of the Fascinating Earth project (for **659 participants**) and 8 as part of the "Geogadka – promotion of geophysics and Earth sciences" project (for **727 participants**).

1. 17.01.2024, "5 polar puzzles" (22 participants)
2. 31.01.2024, Krzysztof Mizerski, "The dynamic history of our planet" (44 participants)
3. 07.02.2024, Artur Szkop, "Climate-friendly energy" (16 participants)
4. 12.02.2024, "Inspiring stories of geophysicists" (5 participants)
5. 14.02.2024, Radek Kiraga, "Let's look for benefits from CO₂" (17 participants)
6. 21.02.2024, Oskar Głowacki, "When the glacier meets the sea" (10 participants)
7. 28.02.2024, Jerzy Giżejowski, "Oceanographic research of the Arctic - from Jeannette's expedition to the RAW project" (23 participants)
8. 06.03.2024, Anna Wielgopolan, "Polar Migrations" (8 participants)
9. 13.03.2024, Michał Brennek, "15 years of sailing in the Arctic - what has changed?" (16 participants)
10. 22.03.2024, Łukasz Przyborowski, "Day of water - our sensitive treasure" (136 participants)

11. 03.04.2024, Eslam Rohsdy, "Geophysical contribution in Egyptian historical archeology discoveries" (6 participants)
12. 10.04.2024, Artur Szkop, "Exhaust emission standards from the perspective of an atmospheric physicist" (7 participants)
13. 17.04.2024, Marek Lewandowski, "Coral reefs, or the world on the other side of the water surface" (29 participants)
14. 22.04.2024, Grzegorz Lizurek, "Why is the Earth shaking?" (301 participants)
15. 24.04.2024, Krzysztof Mizerski, "The Earth's Magnetic Dynamo" (13 participants)
16. 25.04.2024, Dagmara Bożek, "Do penguins have knees?" (6 participants)
17. 15.05.2024, Szymon Oryński, "How to test the earth with electricity?" (9 participants)
18. 3.07.2024, Jerzy Giżejewski, "Polish Polar Station Hornsund yesterday and today" (13 participants)
19. 24.07.2024, 47th Polish Academy of Sciences Polar Expedition, "100 Questions for a Polar Explorer" (18 participants)
20. 26.09.2024, Agata Goździk, "The Arctic – a litmus test of climate change" (296 participants)
21. 13.11.2024, Jerzy Giżejewski, "Race to the South Pole" (18 participants)
22. 6.12.2024, Piotr Ostrowski, "Seasons in the immediate vicinity of PSP Hornsund on Spitsbergen" (366 participants)
23. 11.12.2024, Anna Nadolna, "Aurora Borealis - a magical spectacle in the sky" (7 participants)

The Institute has also prepared a series of podcasts entitled "**Geogadka**". The series was initiated in 2022 and continued in 2023 and 2024. In 2024, 4 podcasts were made available:

Podcast #1 Exotic, unique... - what can coasts be like and what do they tell us about... the world? The guest of the popular science podcast GEOGADKA was Dr. Zuzanna Świrad, geomorphologist, assistant professor at the Department of Polar and Marine Research of IG PAS. In a conversation with Dagmara Bożek, she talked about her main area of research interests - coasts.

Podcast #2 Red River and Computer Models. Will They Help Us Prevent River Disasters? In the next episode of the popular science podcast GEOGADKA, the guest was Dr. Hab. Eng. Monika Kalinowska, from the Department of Hydrology and Hydrodynamics IG PAS, head of the International School of Hydraulics. In a conversation with Dagmara Bożek, she talked about computer modeling of environmental changes and tracer experiments on rivers.

Podcast #3 "And Yet It Turns, or the Dynamic Evolution of the Earth Through the Eyes of a Physicist"

The guest of the next episode of the popular science podcast GEOGADKA was Dr. Hab. Krzysztof Mizerski, a physicist from the Department of Magnetism IG PAS. In a conversation with Dagmara Bożek from the Department of Scientific Communication and Promotion, he talked about how the Earth was created and why it is unique compared to other planets in the Solar System.

Podcast #4 "Polish House Under the Pole" in polar explorer's stories

The guest of the popular science podcast GEOGADKA was Dr. Jerzy Giżejewski - geologist, polar explorer and popularizer of science, who has participated in numerous research expeditions to the Polish Polar Station Hornsund named after Stanisław Siedlecki

on Spitsbergen in the Arctic. In a conversation with Dagmara Bożek, he told how the station has changed over the years.

A series of short films was also created entitled **"GEOGADKA IN A MINUTE!"**:

1. What are the biggest challenges related to water today? Prof. Paweł Rowiński
<https://www.youtube.com/shorts/19PA7fgYF-U>
2. Is the flood risk in Poland increasing due to climate change? Dr. Hab. Iwona Kuptel-Markiewicz
<https://www.youtube.com/shorts/bixvC07Qlag>
3. What is the situation with droughts in Poland? Dr. Emilia Karamuz
<https://www.youtube.com/shorts/HQt5tX9wKX8>
4. Why do auroras appear over Poland and are they dangerous? Dr. Hab. Anne Neska
<https://www.youtube.com/shorts/AmlzYPm0ns8>
5. How do we test for road dust contaminants? Dr. Sylwia Dytłow
<https://www.youtube.com/shorts/WKRvRug0xd0>
6. What are paleogeographic reconstructions? Dr. Krzysztof Michalski
https://www.youtube.com/shorts/5RE_6sbR3bY
7. Is the spring sun safe? Dr. Eng. Agnieszka Czerwińska
<https://www.youtube.com/shorts/0D9rbvbxBb4>
8. What can we expect from climate change? Michał Brennek
<https://www.youtube.com/shorts/zBx7VfXrWNC>
9. El-Niño and La-Niña – what are they and why are they important? Dr. Dariusz Baranowski
<https://www.youtube.com/shorts/WFTkPYeJGzk>
10. How are the fjords in the Arctic changing? Dr. Hab. Mateusz Moskalik
<https://www.youtube.com/shorts/eYu2ycpcGDY>
11. What does polar research have to do with space? Prof. Dr. Hab. Eng. Monika A. Kusiak
<https://www.youtube.com/shorts/v4iHM5BXbZk>
12. Why do we study glaciers? Dr. Bartłomiej Luks
<https://www.youtube.com/shorts/TXsS1dF6poE>
13. What is the Polish Polar Station Hornsund? Łukasz Mazurkiewicz
<https://www.youtube.com/shorts/WJjez8Lry5s>
14. What does a meteorologist do at the Polish Polar Station Hornsund? Anna Nadolna
https://www.youtube.com/shorts/Vx23p_R2i1g

15. Where does an adventure with polar exploration begin? Łukasz Mazurkiewicz
<https://www.youtube.com/shorts/FHjRj8H53QA>
16. What is glacier calving? Dhruv Maniktala
<https://www.youtube.com/shorts/I1JaWGV13Lk>
17. Are electrical discharges dangerous? Dr. Marek Kubicki
<https://www.youtube.com/shorts/O2PBTu4Uv1c>
18. Why does the Earth rotate? Dr Hab. Krzysztof Mizerski
<https://www.youtube.com/shorts/5eCduaC3Tkg>
19. Why do we study flows in rivers with vegetation? Dr. Hab. Eng. Monika Kalinowska
<https://www.youtube.com/shorts/UKiiNFr5hmk>
20. Why do seismologists need optical fibers? Dr. Eng. Wojciech Gajek
<https://www.youtube.com/shorts/SgGcZ3z4qYE>
21. Why does the Earth shake? Dr Hab. Grzegorz Lizurek
<https://www.youtube.com/shorts/djxP6CulkDY>

In 2024, the video mapping "**Elements of the Earth**" was continued, prepared by the Institute of Geophysics of the Polish Academy of Sciences as part of the "Fascinating Earth" project. We presented several examples of natural disasters, including earthquakes, floods, droughts and hurricanes, storms. In the video mapping, we talked about scientists working at the IG PAS, who in their daily work study the causes of these phenomena and develop forecasts of the intensity of their occurrence in the short and long term. The "Elements of the Earth" mapping was prepared to be displayed on the façade of the Jan III Palace in Wilanów as part of the Royal Garden of Light. It was presented every Friday, Saturday and Sunday in the winter season (1 January - 28 February 2024 and 9 October - 31 December 2024). According to information received from the employees of the Wilanów Museum, in 2024 the "Elements of the Earth" mapping was viewed by **119,704 people**.

In addition, in 2024, IG PAS organized a **competition for primary and secondary school students entitled "Geophysics? It's easy!"**. The aim of the competition was to promote interdisciplinary knowledge of mathematics and natural sciences, to interest students in choosing studies in natural and technical fields, and to increase the interest of young people in a scientific career. The competition task was to prepare a short film on one of two topics: advertising a place in Poland related to Earth sciences and what a geophysicist does. The prize in the competition was participation in a **two-day science camp** for 5 people, as part of which classes were organized at the Institute of Geophysics of the Polish Academy of Sciences (a lecture on earthquakes, the polar wheel of fortune, films from Spitsbegen on VR goggles), visiting the Institute's exhibition entitled "Beauties and Beasts" at the Museum of the Earth of the Polish Academy of Sciences, and classes at the Observatory in Świdar. There, a presentation of selected measuring equipment used to measure the Earth's magnetic and electric fields, meteorological parameters and air pollution took place. The program also included a visit to the polar exhibition, which presents both measuring devices used in Arctic research and everyday equipment. The youth were guided around the exhibition by Dr. Jerzy Giżejewski, who also led fieldwork in the Świdar Valley, where participants made a morphological profile of the valley.

❖ **Initiatives of a general environmental nature:**

1. The exhibition **"Beauties and Beasts. Natural Phenomena in Contemporary Scientific Research"** at the Museum of the Earth of the Polish Academy of Sciences

The exhibition concerned the following phenomena studied by geophysicists: earthquakes, floods and droughts, storms, aurora borealis, glacier calving. The presented phenomena were accompanied by an exhibition of historical measuring instruments. An additional attraction was the Stone Path of Time, with specimens of some of the oldest rocks in the Polish collection. The artistic complement to the exhibition were stone images of the presented phenomena, prepared by children of employees of IG PAS. The exhibition was available until 6th May 2024.

2. **The Stone Path of Time - an exhibition of geological specimens at the Central Geophysical Observatory in Belsk**

The exhibition was officially opened on 27th September 2024. The Stone Path of Time contains 18 exhibits, 16 of which are rock specimens. The first is a conglomerate containing the oldest mineral on Earth - zircon (age approx. 4.4 billion years). Next, we can admire a meteorite found in Antarctica (age 4.2 billion years). Next, we will find archaic rocks that formed when the Earth was still young and not fully formed, but there were already fragments of the oldest crust, which are currently located in parts of the world that are far apart from each other (Antarctica, Canada, Greenland). Continuing along the Stone Path of Time, we will go on a journey to the distant ends of our planet, including the area of two Polish polar stations managed by IG PAS. It is also a journey through time – from the oldest available rocks to the relatively young ones, which were formed a little over 300 million years ago in the Polish Karkonosze Mountains. The penultimate specimen – the skull of Australopithecus symbolically prepares us for the inevitable arrival – the Anthropocene, in which harmful human activity is visible even in the geological record.

3. The exhibition **"Healthy tanning"** at the B. Prus High School, accompanying the science festival

The exhibition consisted of 9 boards and concerned the following issues: what is UV radiation and what does the UV index mean, what is the impact of radiation on human health, what are the threats resulting from sunburn, what are the benefits of sensible tanning, what role does vitamin D play in our body, how to determine your skin phototype and how to calculate the time of safe outdoor exposure on this basis. WHO guidelines on photoprotection were also presented. The exhibition was displayed during the school Science Festival in March 2024, and was viewed by about **500 people**.