



**Institute of Geophysics
Polish Academy of Sciences**

BULLETIN 1/2019, MAY 2019

Dear Friends,

Welcome to the first issue of the IG PAS BULLETIN. We would like to briefly summarize the most important news in the Institute from the last month, invite you to the upcoming events and encourage you to read the latest issue of Acta Geophysica (vol. 68). In the BULLETIN you will also find a Management's view and a preview of the op-ed column. Enjoy your reading!

Latest events

April brought us new international projects, new scientific degrees and a completely new installment of our observatory in Książ

Polish-Chinese success

The results of first ever SHENG call for proposals, organized within the framework of cooperation between the National Science Center of the National Natural Science Foundation of China (NSFC) - and we already have a success! 2 out of 5 projects of the PAS institutes that were among the winners were prepared in our Institute. Both applications submitted by the IG PAS have received funding; thanks to this prof. dr hab. Renata Romanowicz from the Department of Hydrology and Hydrodynamics will investigate the 'Human and climate impacts on drought dynamics and vulnerability, and prof. Michał Malinowski from the Geophysical Imaging Department will develop methods that will allow for the best. 'Active and passive source multiscale subsurface imaging and monitoring based on the full seismic waveform'.

New scientific degrees

Both abovementioned Departments can be proud of newly defended doctorates: dr. Mikołaj Karpiński presented the results of his work devoted to the issue of modeling river flows over bottom forms using the Boltzmann method; dr. Jacek Trojanowski in his thesis proposed solutions that

facilitate detection even weaker ones microseismic shocks, important for mining processes, e.g. in the hydraulic fracturing process for shale gas extraction. Additionally, IG PAS gained new associate professors: Łukasz Rudziński from the Department of Seismology and Krzysztof Michalski from the Department of Magnetism.

Doctoral studies co-financed under the STER program

NAWA - the National Academic Exchange Agency - is a new institution on the Polish "map" with a wide range of funding for scientific ventures. As part of the STER program (PhD scholarships for foreigners), our Institute obtained funding for the support of the PhD studies in the field of geophysics - 6 PhD foreign students will join us, ensuring widening network of contacts with other scientific units.

Książ Castle: the underground tour

At the beginning of April, an educational exhibition was opened to the public in the Książ Castle underground. Many tourists visiting this popular destination did not realize that almost 50 meters below the beautiful castle courtyard, the seismic observatory of the Institute of Geophysics PAS operates.

Opening the underground for the general public is a big challenge for the observatory - and it is not about concealing the secrets of the famous "golden train", which for some time was intensively sought in this area, but for reliable measurements made by sensitive equipment. But the new, open underground is also a great opportunity to bring the general public closer to the Institute's activities. Visitors will learn why the earth is shaking, whether earthquakes can be predicted, and what the work of a seismologist is all about. There will be a history of this place in a nutshell, information on natural and anthropogenic seismicity, the construction of the Earth's crust and the explanation of tectonic movements. Special model allows to simulate shocks and see what their record looks like, and the brave guests will be able to play the seismic "jenga". There are banners, models, short films and a huge map of the world waiting for tourists, presenting the top 5 megathrust earthquakes in history.

Upcoming events

As always, we organize the prestigious conference - International School of Hydraulics, presenting the latest trends in environmental hydraulics. In Paris, we will summarize the international polar project EDU-ARCTIC, in Warsaw next prof. Kacper Rybicki scholarship will be awarded, and in Świder we will investigate the electromagnetic fields of ultra-low frequencies.

May 21-24 - every two years - this time in Łąck - the Institute is the host and organizer of the International School of Hydraulics (ISH). ISH 2019 will be devoted to the latest trends in environmental hydraulics. As always, this event provides outstanding world lecturers, interesting panels and a particularly important event for PhD students and young scientists.

May 23-24 - the final conference summarizing the EDU-ARCTIC project coordinated by the IG PAS. In Paris and at the Université de Versailles Saint-Quentin-en-Yvelines Atmospheric Observatory, we will listen to representatives of Arctic diplomacy and polar experts, meet the teachers and students involved in a project, take a look at project results and exchange good practices

June 25 - ceremony of awarding the scholarship prof. Kacper Rafał Rybicki, combined with the awarding of doctoral and postdoctoral diplomas (room 213, 11:00)

July 3-5 -ULF / ELF Electromagnetic Field Conference on Earth and Space 2019 will be held in Świder; the event is co-organized by the IG PAS and the Department of Interior and Space Physics - Polish Geophysical Society. The conference is a continuation of the series of "Bieszczady Meetings" organized from 1996 on the initiative of the Krakow ELF Field Laboratory and dedicated to the subject of ultra low frequency electromagnetic fields: Ultra Low Frequency (ULF) and Extremely Low Frequency (ELF). Note that registration is only available until May 15!

Management's view

We have a decision! In total, 701 million PLN will fund the institutes of the Polish Academy of Sciences this year. The Ministry of Science and Higher Education introduced a special "stabilizing" mechanism, thanks to which the institutes are not threatened with a drastic drop in subsidies for research, which regulates maximum growth (up to 10%) and a decrease (up to 5%) year to year subsidy.

Director Beata Fromeliusz informed that this year's subsidy for our Institute amounts to PLN 14,722,900, i.e. PLN 274,430 (1.9%) more compared to last year (the sum of the statutory subsidy and funding for young scientists). We are still waiting for decisions regarding applications for Special Research Equipment (so called SPUBs). Ministrie' decision ensures our undistorted activity!

(Non)scientific op-ed

We would like to give this column to the employees of the Institute - scientists, PhD students, employees of support departments. We cordially invite everyone who would like to share their reflections, experiences and ideas. The form of the column allows for a personal point of view, light tone and thematic freedom. We encourage all interested parties to contact the Science Communication and Education Unit: gozdzik@igf.edu.pl

Acta Geophysica – specially recommended

How to measure the spread of thermal pollution in watercourses, do flood control plans take into account all relevant factors, what affects the uncertainty of flood forecasts, and ... what does the gravity have to do with climate change? ACTA GEOPHYSICA, Vol. 68 is a very "hydrological" or rather "hydrodynamic" issue of our journal: 3 of the 4 most popular (most frequently downloaded according to records for the beginning of May 2019) articles refer to "water" issues, of which 2 are independent studies of our employees : dr. Michael Nones and dr. Monika Kalinowska from the Department of Hydrology and Hydrodynamics. **Here we present 4 most popular articles from Acta Geophysica vo.**

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Dr. Michael Nones ([Dealing with sediment transport in flood risk management](#)) investigated the estimation of the flood hazard in Europe, associated with changing climatic conditions. Dr. Nones notes that according to the so-called EU Floods Directive and morphological changes in freshwater environments, such as rivers, are not considered as a significant factor in the construction of the so-called flood prevention plans, which leads to a probably incorrect estimation of the impact of floods in the case of watercourses transporting large amounts of sediments. In the article, on the example of the Secchia River in Italy, Dr. Nones argues that in the case of upcoming changes to flood risk management plans by 2021, water managers should include in their models and strategies the dynamic behavior of surface watercourses, taking into account sediments not only as a factor carrying pollution, but also as a key aspect shaping the environment. Dr. Monika Kalinowska article focused on the precise prediction of the increase in the temperature of water in rivers due to the spread of thermal pollution. She analyzed the challenge of gathering the necessary data for this purpose, and summarized the existing knowledge and practice on the calculation of heat transfer between water and air ([Effect of water-air heat transfer on the spread of thermal pollution in rivers](#)). However, the most popular of this edition was the article by Tomasz Dysarz, Joanna Wicher-Dysarz, Mariusz Sojka and Joanna Jaskuła ([Analysis of the extreme flow in the Warta River](#)). This item also applies to the EU Floods Directive, but from a slightly different perspective: the authors analyzed the impact of the uncertainty of the maximum flow on the flood hazard zone. Two factors were taken into account: (1) the method of determining the maximum flows and (2) the limited length of the data series available for calculation. These factors seem to belong to the most important elements responsible for the potential uncertainty and inaccuracy of the developed flood hazard maps. Two methods were analyzed in the article: the quantile method and the maximum likelihood method. Maximum flows (a long series of measurements from as much as 44 years) were estimated for the Wronki station located within the Warta River.

With best regards,

Science Communication and Education Unit