



Polish  
Academy  
of Sciences

PAN  
POLSKA AKADEMIA NAUK



# Polish Academy of Sciences

informational folder

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## Table of Contents

Introduction	6
The past... and the present	8
Committees	12
Divisions	14
<i>Division I of Humanities and Social Sciences</i>	16
<i>Division II of Biological and Agricultural Sciences</i>	20
<i>Division III of Mathematics, Physics, Chemistry and Earth Sciences</i>	26
<i>Division IV of Engineering Sciences</i>	32
<i>Division V of Medical Sciences</i>	38
Territorial Branches	42
International cooperation	44
Science promotion	50
National heritage protection	56
Focus on	70
<i>The Gdańsk Library</i>	71
<i>The Kórnik Library</i>	76
<i>The Museum of the Earth</i>	82
<i>The PAS Botanical Garden</i>	86
Prizes	90

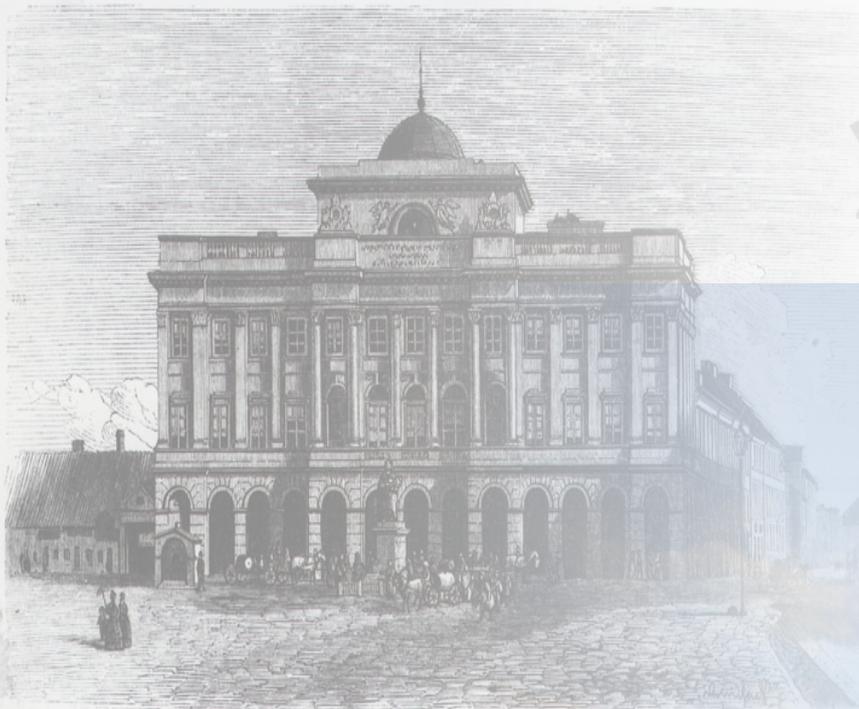


prof. Michał Kleiber  
President of the PAS

The Polish Academy of Sciences (PAS) is Poland's leading scientific and research institution, founded in 1952. Its roots stretch back to the enlightenment period, as it is a successor institution to the Warsaw Society of Friends of Learning, founded in 1800 by Stanisław Staszic (1755-1826) and other notable scholars of that era. Today's Academy is a national institution continuing and cultivating the finest traditions of Poland's scientific organizations, operating on the legal foundation provided by the „Act on the Polish Academy of Sciences” dated 30 April 2010. The Academy supports the development, integration, and promotion of science, and contributes to the advancement of education and the enrichment of Poland's culture. The Academy's key tasks include:

- 1) conducting both scientific research and R&D work;
- 2) supporting the professional development of individuals during the early stages of their scientific careers;
- 3) providing education at PhD, post-doc, and other levels;
- 4) formulating ethical principles in science;
- 5) putting forward opinions and proposing agendas concerning science-related issues and the practical application of research results;
- 6) drawing up opinions, expert reports, and forecasts addressing key issues of planning and policy-making, either when requested to do so by the President of the Republic of Poland, the Speaker of the Sejm or the Senate, the Ministers, or central governmental administration departments, or at the initiative of the Academy itself;
- 7) expressing opinions on normative acts that pertain to science, its applications, and education;
- 8) working together with universities, research institutes, and scientific associations;
- 9) working with social and economic circles in terms of both research work and application-focused R&D efforts;
- 10) pursuing international scientific cooperation projects by setting up research consortiums and conducting research projects together with international partners.

POLSKA AKADEMIA NAUK



AKADEMIA MEDYKO-CHIRURGICZNA W WARSZAWIE



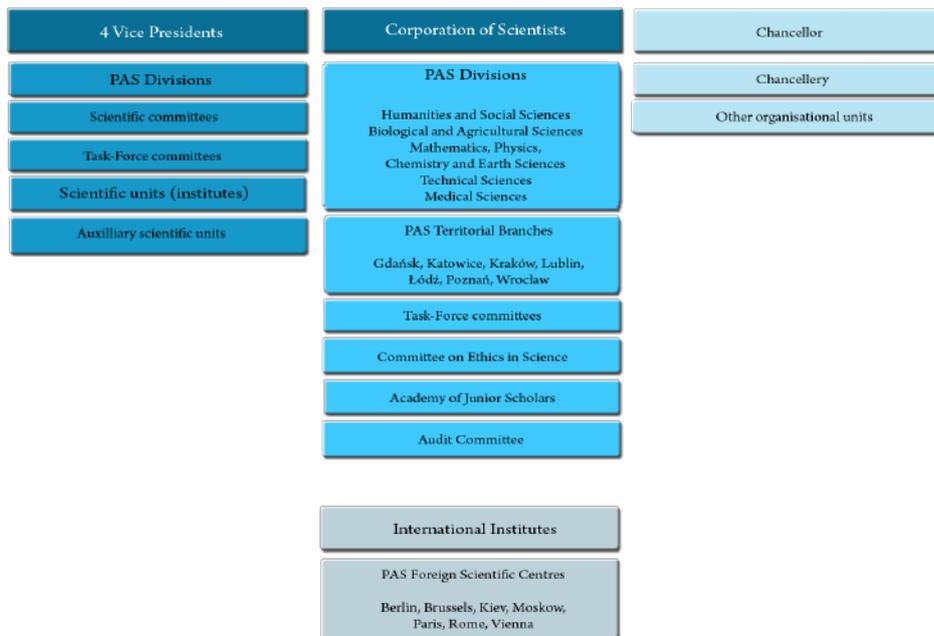
The Polish Academy of Sciences (PAS) was founded 60 years ago. This was preceded by an event unprecedented in the history of Polish science: the 1st Congress of Polish Science (Warsaw, 29 June – 2 July 1951), which brought together nearly 2,000 scholars. The resolution these participants then adopted to found the Polish Academy of Sciences was subsequently finalized in a statutory act passed by the Sejm (Polish parliament) on 30 October 1951. The first members of the Academy and its Presidium were nominated on 9 April 1952.

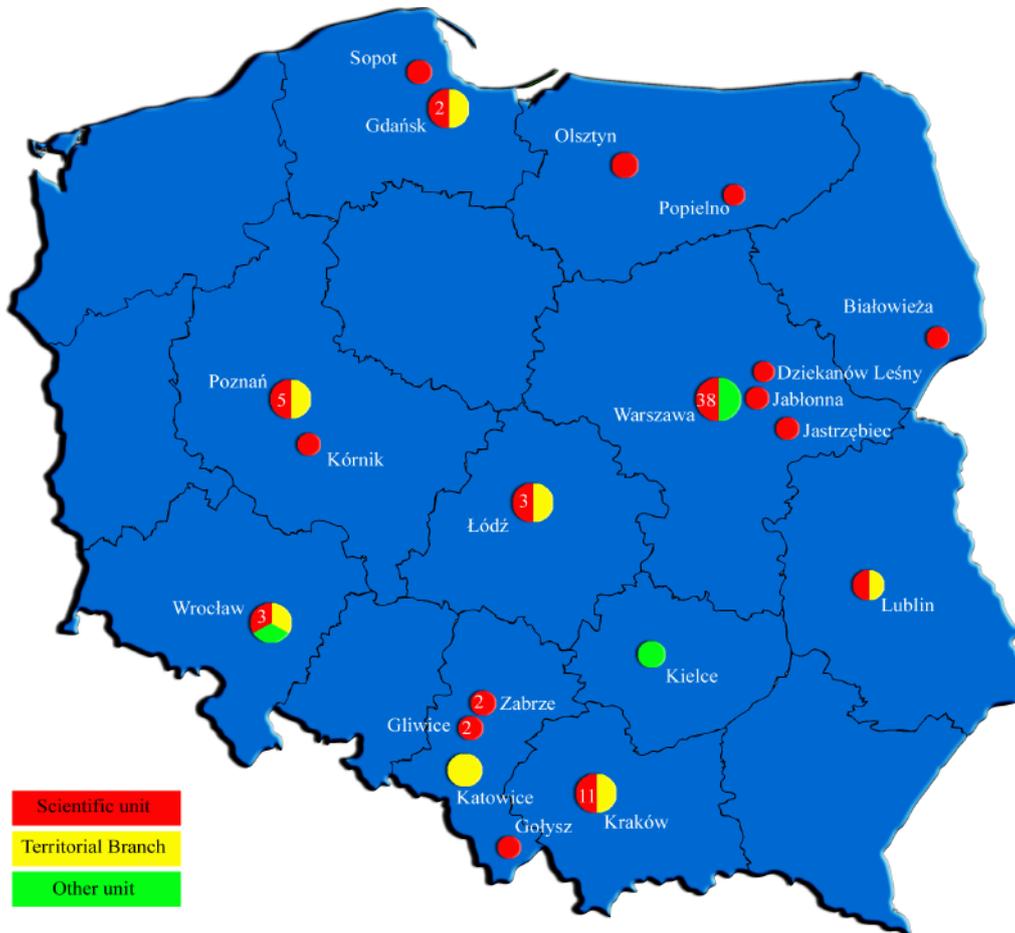
Our country has a longstanding and venerable tradition of learned associations organizing the life of its scientific community. A particularly notable one, founded back when Poland had lost her independence in the wake of the partitions, was the Society of Friends of Learning (1800-1832), set up in Warsaw by Stanisław Staszic and other outstanding scientists of the era. Starting in 1816, the Kraków region was home to the Cracovian Scientific Society, which went on to become the Polish Academy of Arts and Sciences (PAAS, Polish abbreviation „PAU”) in 1918, whereas the Warsaw Scientific Society, founded in 1907, had a powerful intellectual position in the (Russian-controlled) Kingdom of Poland region. During the partitions, when the Polish lands were dominated by various foreign powers, the political situation prevented the formation of a unified scientific association for Polish scholars. Attempts to form such an organization representing Polish scientific circles as a whole began to be made after the Republic of Poland finally regained her independence after the First World War. The year 1936 even saw the foundation of an institution widely regarded as a precursor of today’s Polish Academy of Sciences: the Council of

Pure and Applied Sciences. The drive to form a national scientific association remained present during the Second World War, making itself felt in underground debates concerning how science should be organized in post-war Poland.

The overarching concept of the PAS, as laid out in the founding act and further confirmed in subsequent statutes, defines it as an organization with a complex structure, combining the traditional functions of an autonomous corporation (elected body) of scholars with those of a scientific academy directly involved in the pursuit of research projects.

We continue to pursue the Academy’s mission, defined as a comprehensive endeavor for the advancement of science, while taking great care to maintain the highest quality of research and ethical standards. Trying to meet these challenges involves striving to fulfill key tasks: \*conducting advanced research of strategic import for the development of science and the economy, \*forming large, interdisciplinary research teams and acquiring state-of-the-art equipment, \*creating the conditions necessary to foster the development of „schools” of scientific thought, focused around outstanding Polish and foreign scholars, \*integrating Poland’s scientific circles by working closely with universities and research institutes, \*supporting a range of forms of international scientific collaboration, \*educating future generations of scientists, \*applying research findings in innovative ways, individually and together with the business community, \*formulating opinions and expert reports on key issues that pertain to innovation and development policies, \*popularizing science.





**COMMITTEES**



There are two kinds of PAS committees: scientific committees and task-force committees. The scientific committees are autonomous bodies that represent individual scientific disciplines or focus on multidisciplinary research problems, integrating researchers from across Poland. The members of the scientific committees include national Academy members of various specialties; outstanding researchers who represent Polish universities, PAS research institutes, and other R&D centers; and representatives of social and economic institutions and organizations. Since they bring together eminent representatives of scientific circles, the PAS scientific committees are the most representative groups of specialists in a given field.

To ensure the pursuit of specific research objectives, the PAS Presidium (at the request of the Academy's President) also sets up a number of task-force committees for the duration of its term, defines their tasks and structures, and appoints their members. Such committees may operate in affiliation either with the PAS Presidium itself or with the relevant Division. Task-force committees are not meant to represent a particular field, but form a specially selected team of experts.

The scientific and task-force committees both largely function as advisory bodies. The main task of the committees is to promote the advancement of a given scientific discipline on a national scale, integrate the respective scientific centers and groups, and to resolve specific research problems. The committees' advisory role is of particular importance, including in particular their preparation of expert reports, assessments, and opinions for the purposes of public administration institutions. They also play an important role in disseminating research results, helping to

generate broader economic and social impact, in particular by organizing conferences and scientific meetings and initiating research. Some of the committees issue their own journals and other publications covering activities within their disciplines.

Moreover, in order to maintain and further develop collaboration with international scientific organizations, the Presidium (again at the request of the Academy's President) also sets up the appropriate Polish national committees for the duration of its term. These national committees may operate in affiliation either with the PAS Presidium itself or with the relevant Division. The Presidium can bestow this „national committee” function on any of the scientific or task-force committees.

For the 2011-2014 term of office, a total of 95 scientific committees affiliated with specific PAS Divisions were set up by Resolution 2/2011 passed by the PAS General Assembly on 26 May 2011. A further 6 task-force committees plus three councils (with the status of task-force committees affiliated directly with the PAS Presidium) were established by Resolution 17/2011, passed on 22 March 2011.

*Each of the Academy's Divisions, as an elected body of researchers, pursues the Academy's tasks within the fields within its scope of activity – through the participation of its members in the work of the PAS branches, the PAS scientific committees, national committees and problem committees, as well as the scientific councils of the PAS research institutions.*

(Statutes of the Polish Academy of Sciences, § 35 ust. 1)



Stanislaw Staszko.

**INCERTVS DE REBUS  
ZMA RAC DE ABBE IH  
REGULA S. BENEDICTI  
INCERTVS DE SA TLO IN EA  
DE REGULA METRICA BICCA**

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Delegione potest in se peccare calle  
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E. Monachi scilicet bene de regula  
parant. p. f. h. plena sua uis  
Asperit se pueri. nec non tyrombo  
Quos alius gremio lacte uita dicit  
Hic est se una precludit femina et  
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Admonet monachos. sublimis re  
gala ante hos  
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Arguit erudient. & sine felle manent  
Hic patienti eos tenent. cu. ubere uirtus  
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**Division I of Humanities and Social Sciences** gathers together the most outstanding scholars representing the extensive domain of humanities and social sciences both from Poland and abroad. The Division comprises 14 scientific institutes. It also supervises four auxiliary research units: the PAS libraries in Gdańsk and Kórnik, the PAS Archives in Warsaw, and the joint PAS-PAAS Archives in Kraków (together with the Polish Academy of Arts and Sciences). One important element of the Division's structure consists of scientific and task-force committees. During the 2011-2014 term, the PAS General Assembly established 24 scientific committees affiliated with Division One, and the PAS Presidium founded 4 task-force committees.

The vast potential of Poland's humanities and social sciences is reflected in the broad and varied spectrum of scientific fields to be found under Division One. Here we find the history of art standing alongside economics and econometrics, psychology standing alongside theology, and literature studies and linguistics standing alongside philosophy and the sometimes mathematically-inclined field of sociology. History is also an important research domain, ranging from studies of ancient times in their material context to the contemporary expression of history as studied by political science. Scholars representing the social sciences use their skills for the pursuit of an objective that is an ever-greater priority nowadays: the advancement of Poland's cultural and intellectual capital. Collaboration with foreign institutes also plays an important role. The various partnership agreements signed by the Academy, the activities of the scientific committees, and the efforts of the individual scholars themselves as part of their own projects have all earned the Division a wide circle of partners

among foreign research institutions, such as numerous universities, research centers, and scientific associations.

Research efforts, conferences, symposiums, publications, and individual and team achievements all serve to showcase the Division's wealth of fields and scale of achievement. We can illustrate this here by presenting the results of selected research conducted at the Division's institutes. The PAS Institute of Philosophy and Sociology has produced publications including *Propaganda wizualna słusznej wojny. Media wizualne XX wieku wobec konfliktów zbrojnych* [Visual Propaganda of the Just War: Visual Media of the Late 20th Century in Armed Conflict], and – on a contrasting topic – the book *Ucieleśnienia II. Płeć między ciałem i tekstem* [Carnality II: Gender Between the Body and the Text], discussing gender in a social and cultural context. Scholars from the PAS Institute of History have prepared the first-ever full investigation of the history of Poland's intellectual circles in a three-volume publication *Dzieje inteligencji polskiej do 1918 roku* [History of Polish Intelligentsia Up To 1918] as well as *Demografia Rzeczypospolitej przedrozbiorowej* [Demographics of Pre-Partition Poland], the first in a new series of monographs dealing with the auxiliary sciences that historians use as tools. Research work at the PAS Institute of Psychology, in turn, focuses on political psychology, intercultural psychology, and the psychology of decision making. This research sphere includes publications such as Poland's first manual of intercultural psychology *Kulturowe ramy zachowań społecznych* [Cultural Frameworks of Social Behavior], the monograph *Psychologia decyzji ryzykownych* [Psychology of Risky Decisions], and the monograph *Polska paranoja polityczna* [Polish Political Para-

noia] describing the psychosocial circumstances that underlie conspiracy theories. Research conducted by the PAS Institute of Rural and Agricultural Development into younger generations living in the countryside has helped illuminate the sociological processes behind young people's decisions to migrate, the declining educational aspirations of less-well-off young people from rural areas, and the incremental nature of the aspirations of university students from rural areas. The six-volume Kashubian Etymology Dictionary, written by researchers from the PAS Institute of Slavic Studies, is the first dictionary of its kind in Slavic linguistics, focusing on the etymology of a regional language. The nine-volume Comparative Bulgarian-Polish Grammar, in turn, is the first complete comparative description of the Bulgarian and Polish languages, with an innovative approach to linguistic confrontation using semantics as its starting point. The PAS Institute of Political Studies has produced the report Euro-scepticism and the Emergence of Political Parties in Poland analyzing the background to the 2003 referendum concerning Poland's ascension to the EU, and Country with No Way Out? Migrations from Poland 1949-1989 discussing the phenomenon of mass foreign migration.

The Division's scientific units are involved in numerous national and international research projects. For instance, the empirical, interdisciplinary research network "Disintegration and new order: Society, nation, and culture during times of great change," which aims to study the condition of society, national identity, and culture since Poland's EU accession, embraces a number of Division One units: the PAS Institute of Psychology, Institute of Political Sciences, Institute of history, Institute of Literary Stu-

dies, Institute of Philosophy and Sociology, Institute of Legal Studies, Institute of Economic Sciences, and Institute of Rural and Agricultural Development. The PAS Institute of Philosophy and Sociology is part of the European Social Survey (ESS), one of Europe's largest research projects in sociology. "Panorama of Polish Literature" is a large-scale online project by the PAS Institute of Literary Studies, intended as a modern database of Polish literature and culture. The PAS Institute of Political Sciences is conducting the project "In the melting pot of generations: 1968 and its effects on Polish-German relations (1968-2007)".

Division One grants its own scientific awards for excellence and creative work, including achievements in popularizing science, as well as outstanding PhD and DSc (habilitation) theses in the following disciplines: the Erazm Majewski Prize in archaeology, the Fryderyk Skarbek Prize in economics, the Tadeusz Kotarbiński Prize in philosophy, the Joachim Lelewel Prize in history, the Aleksander Brückner Prize in literature and philology, the Kazimierz Nitsch Prize in linguistics, the Władysław Spasowski Prize in education, the Leon Petrażycki Prize in law, the Władysław Witwicki Prize in psychology, and the Ludwik Krzywicki Prize in sociology, as well as prizes in the history of culture, history of art, political science, and oriental studies.

DEMIA NAUK

#### Scientific units:

Institute of Archeology and Ethnology of the PAS, Institute of Art of the PAS, Institute of Economic Sciences of the PAS, Institute of Legal Studies of the PAS, Institute of Literary Research of the PAS, Institute of Mediterranean and Oriental Cultures of the PAS, Institute of Philosophy and Sociology of the PAS, Institute of Polish Language of the PAS, Institute of Political Studies of the PAS, Institute of Psychology of the PAS, Institute of Rural and Agricultural Development of the PAS, Institute of Slavic Studies of the PAS, Institute of The History of Science of the PAS, Institute of History of the PAS

#### Ordinary members:

Jerzy Marian Brzeziński, Jacek Izidor Fisiak, Michał Głowiński, Franciszek Gruzca, Maria Janion, Józef Koziellecki, Czesław Eugeniusz Kupisiewicz, Ewa Łętowska, Henryk Markiewicz, Władysław Markiewicz, Karol Cyryl Modzelewski, Stanisław Maria Mossakowski, Henryk Anastazy Olszewski, Hubert Orłowski, Zbigniew Leon Radwański, Henryk Samsonowicz, Jan Strelau, Jerzy Ryszard Szacki, Piotr Sztompka, Stanisław Wojciech Tabaczyński, Janusz Tazbir, Andrzej Walicki, Stanisław Waltoś

#### Corresponding members:

Jerzy Axer, Henryk Chołaj, Stanisław Roman Filipowicz, Stanisław Gajda, Wiesław M. Grudzewski, Jan Hertrich-Woleński, Andrzej Krzysztof Koźmiński, Kazimierz Zbigniew Kwieciński, Mirosława Marody, Karol Myśliwiec, Edward Nęcka, Ryszard Nycz, Aleksander Hubert Posern-Zieliński, Janusz Reykowski, Andrzej Jan Rottermund, Zdzisław Lech Sadowski, Piotr Skubiszewski, Jerzy Strzelczyk, Aleksander Welfe, Władysław Welfe, Jerzy Wilkin, Elżbieta Maria Witkowska-Zaremba, Bogdan Wojciszke





**Division II of Biological and Agricultural Sciences** focuses together research in a wide range of fields, including agronomy, agrophysics, biochemistry, biophysics, bioinformatics, bioorganic chemistry, biotechnology, botany, climatology, dendrology, ecohydrology, ecology, environmental management and protection, food technology and nutrition, forestry, genetics, genomics, genetic engineering, hydrobiology, molecular biology, molecular genetics, neurobiology, neurochemistry, neurophysiology, paleontology, parasitology, physiology, and zootechnics. The Division includes 24 research units and 26 committees.

Many of the results obtained by the Division's research units are applied in healthcare, environmental protection, and by the food and agricultural industries. For instance, the PAS Institute of Agrophysics has developed a method of using broadband dielectric spectroscopy technologies to gauge frequency variability in the complex permittivity of soils, fruit, vegetables, grains, seeds, and semi-processed and processed food products, in order to quickly assess their quality without damaging the substance. Such dielectric spectroscopy can be used to assess the ripeness of fruit, detect potential falsification of certain products, and track the quality of semi-processed products during processing. Research conducted at the PAS Institute of Experimental Biology has found that following stroke, inhibition of the activity of matrix metalloproteinases (MMP) reduces the damaging effects of ischemic stroke on the plasticity of the cerebral cortex. The PAS Institute of Animal Physiology and Nutrition has worked to improve the quality and yield of pork without increasing the overall fat content: following the assessment of poultry meat quality, animal feed was supplemented with carefully selected

proportions of rapeseed and linseed, as well as fish oil, without compromising the flavor and smell of the meat. The PAS Institute of Parasitology studies trichinosis, a parasitic zoonotic disease. Having identified two species of the worm in animals in Poland, they have been shown to exhibit distinctive protein profiles containing species-specific antigens which can be used as diagnostic markers. This makes it possible to establish the source of human infection and select the best course of therapy. The PAS Institute of Plant Genetics uses research tools including structural genomics, proteomics, and phytopathology in order to reduce susceptibility to disease, protect plants against adverse weather conditions, and improve structure and quality of crops. Biotechnology research has indicated that it should be possible to develop oral vaccines against diseases such as the hepatitis B virus (HBV). As part of its program of conservation of farm and wild animals, the PAS Institute of Animal Breeding and Nutrition runs a Genetic Resources Bank using cryopreservation to store the semen of fish species including rainbow trout, sturgeon, European whitefish, and huchen, as well as black grouse, wood grouse, European bison, and red deer. The Institute also keeps the Microorganism Bank, focusing on milk fermentation bacteria and Bifidobacterium from a range of natural sources, used in basic and applied research, mainly for obtaining strains with probiotic properties. The PAS Botanical Garden – Centre for Biological Diversity Conservation uses cryopreservation to store seeds, spores, and gametophytes for research into preserving the diversity of rare and endangered plant species in Poland. The aim of the research is to create a National Bank of Seeds and Spores of Poland's Natural Fauna. Research conducted at the

PAS Museum and Institute of Zoology, in turn, ranges from working out the taxonomy of fossil organisms to the reintroduction of the European bison. Genetic research is conducted in order to define genetic variability of endangered species in order to develop conservation strategies. The methodology manuals for bird monitoring, developed and published by the Museum and Institute of Zoology, are used to implement European Union legislation covering biological diversity. The institution works on the reintroduction of the bison in the Carpathian Mountains, including managing and protecting the species throughout the region, and selecting the best locations for reintroducing the animals. Genetic studies of the species are also conducted at the PAS Institute of Mammal Biology, covering the Białowieża population. The Institute also studies the genetics of wolf and red deer populations in Poland in order to observe the animals' migrations throughout the country.

Division Two research units participate in numerous international research projects. The activities of the European Regional Centre for Ecohydrology are focused on the development of an innovative methodology and solutions for the implementation of the European Union Water Framework Directive and the United Nations International Hydrological Programme. Research focuses on the ecohydrology of the agricultural environment and urban lands, and on developing innovative biotechnology methods in order to improve the quality of inland waters and reduce eutrophication. To this aim, the project Life+EKOROB "Ecotones for Reducing Diffuse Pollution" is constructing ecotone zones in the Sulejów Reservoir. The PAS Institute of Botany conducts a research project as part of the Polish-Swiss Re-

search Programme "DRYADE: Complex ecological interactions in the context of climate change: using next generation sequencing technology to study the history and adaptive processes in systems of evolutionarily-linked Arctic and Alpine organisms." This research aims to explain the effects of long-term climate change on the spatial reach of populations and the evolution of ecological interactions. The PAS Institute of Dendrology is part of the project "Alternative uses of poplars: phytoremediation of soils contaminated with effluent from the food industry." Phytoremediation refers to the method of using plants to address environmental problems in soils; poplar trees are one of the species that are suitable for this purpose. Tested by the agricultural and food industries, the method proves to be less cost-intensive than physicochemical methods, has an extremely low impact on the environmental balance and biological structure of the soil, and is widely socially acceptable. As part of the Polish-Swiss Research Programme, the PAS Institute of Agricultural and Forest Environment is working on the FLORIST project assessing the risks of flooding in the northern region of the foot of the Tatra Mountains. The project intends to increase the amount of data on flooding and its causes, enhancing the existing database. Using results of observations and climate forecasts makes it possible to assess the risk of flooding.

Each year, Division Two awards prizes and distinctions for significant scientific discoveries published in journals with an international circulation, as well as a prize for an outstanding book or research monograph. The Division also awards the Michał Oczapowski Medal (founded in 1988 in recognition of significant achievements in agricultural sciences) to individuals or

institutions, for exceptional input into the development of agricultural sciences and applied biological sciences.

#### Scientific units:

Institute of Agrophysics of the PAS, European Regional Centre for Ecohydrology, Institute of Agricultural and Forest Environment of the PAS, Institute of Animal Reproduction and Food Research of the PAS, Institute of Biochemistry and Biophysics of the PAS, Institute of Bioorganic Chemistry of the PAS, Institute of Plant Physiology of the PAS, Institute of Dendrology of the PAS, Institute of Nature Conservation of the PAS, Institute of Systematics and Evolution of Animals of the PAS, Institute of Genetics and Animal Breeding of the PAS, Institute of Plant Genetics of the PAS, Institute of Animal Physiology and Nutrition of the PAS, Mammal Research Institute of the PAS, Museum and Institute of Zoology of the PAS, Nencki Institute of Experimental Biology of the PAS, Institute of Paleobiology of the PAS, Institute of Parasitology of the PAS, Institute of Botany of the PAS, Botanical Garden - Center for Biological Diversity Conservation of the PAS in Powsin, Centre for Ecological Research of the PAS in Dziekanów Leśny, Department of Antarctic Biology of the PAS in Warsaw, Institute of Anthropology of the PAS in Wrocław, Institute of Ichthyobiology and Aquaculture of the PAS in Gołysz, Research Station for Ecological Agriculture and Preservation of Native Breeds of the PAS in Popielno

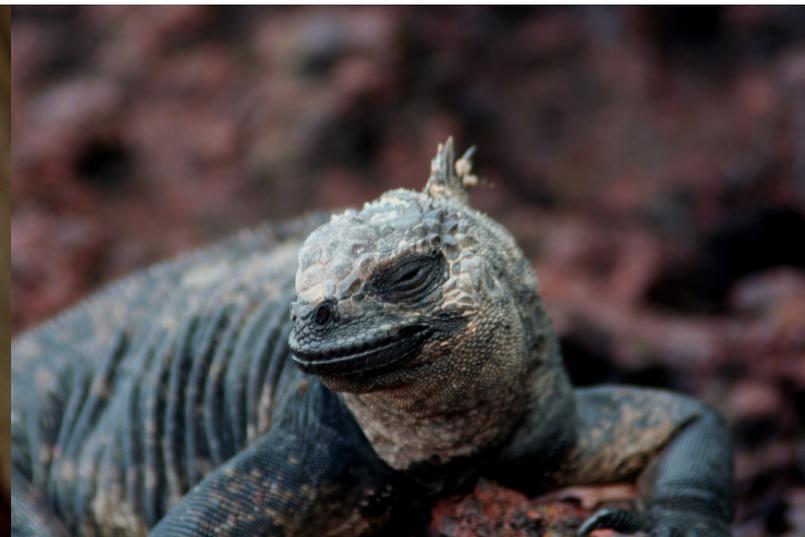
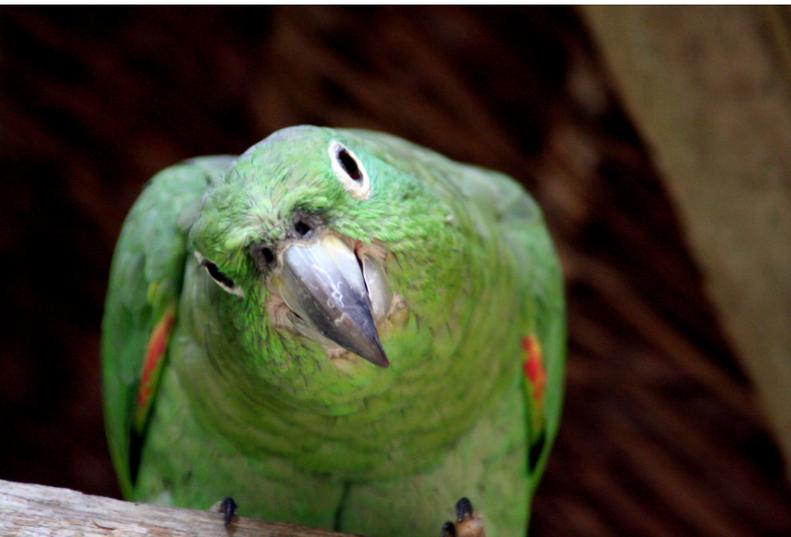
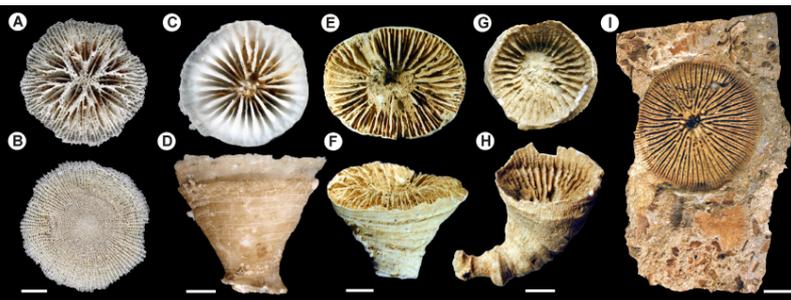
#### Ordinary members:

Eugeniusz Feliks Bernadzki, Tadeusz Bielicki, Tadeusz Chojnacki, Czesław Cierniewski, Jerzy Fabiszewski, Jan Gliński, Zbigniew Maciej Gliwicz, Andrzej Grzywacz, Janusz Haman, Adolf Horubała, Zofia Kielan-Jaworowska, Wincenty Kilarski, Romuald Zdzisław Klekowski, Tadeusz Krzymowski, Leszek Kuźnicki, Andrzej Bogusław Legocki, Jerzy Lipa, Adam Łomnicki, Rudolf Michałek, Stanisław Nawrocki,

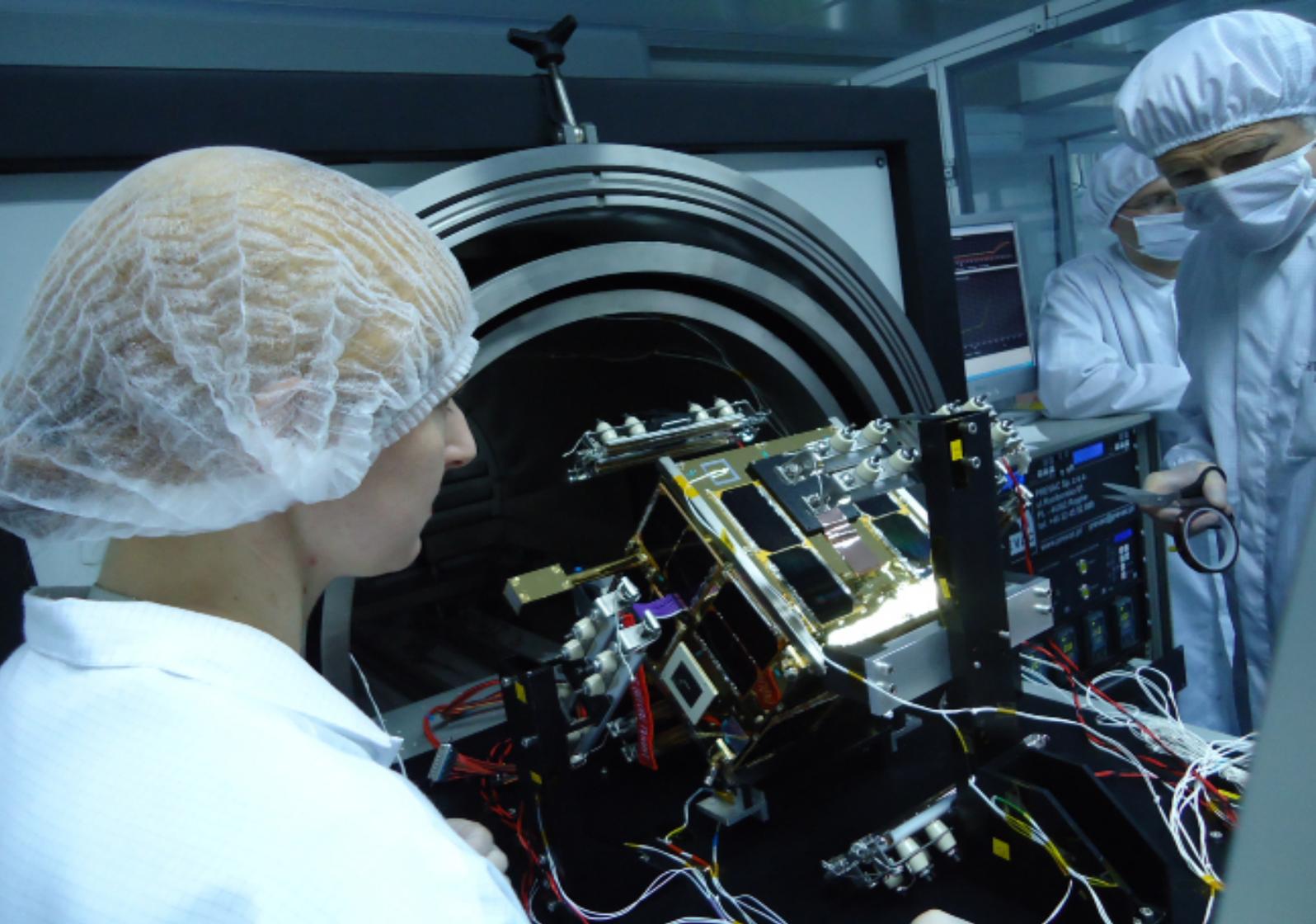
Włodzimierz Ostrowski, Zygmunt Pejsak, Zygmunt Reklewski, Antoni Rutkowski, Marian Saniewski, Andrzej Szujecki, Andrzej K. Tarkowski, Franciszek Tomczak, Marian Truszczyński, Adam Urbanek, Janu-ary Weiner, Kazimierz Lech Wierzchowski, Lech Wojtczak, Kazimierz Zarzycki, Teresa Żebrowska, Maciej Żurkowski, Maciej Żylicz

#### Corresponding members:

Grzegorz Bartosz, Włodzimierz Bednarski, Barbara Bilińska, Szczepan Biliński, Jerzy Duszyński, Jerzy Dzik, Ryszard Górecki, Mariusz Jaskólski, Andrzej Jerzmanowski, Leszek Kaczmarek, Marek Konarzewski, Małgorzata Kossut, Jan Kotwica, Jan Kozłowski, Włodzimierz Krzyżosiak, Zbigniew Kundzewicz, Jacek Kuźnicki, Stefan Malepszy, Małgorzata Mańka, Janusz Nowicki, Jacek Oleksyn, Wiesław Oleszek, Jacek Otlewski, Stanisław Rakusa-Suszczewski, Marian Różycki, Zdzisław Smorąg, Kazimierz Strzałka, Wojciech Święcicki, Marek Świtowski, Katarzyna Turnau, Erwin Wąsowicz, Piotr Węgleński, Grzegorz Węgrzyn, Adam J. Zięcik, Jan Żmudziński







**Division III of Mathematics, Physics, Chemistry and Earth Sciences** draws together individual scientists, scientific committees, and research units working in two key research areas: one covering the „hard” sciences (mathematics, physics and chemistry), the other focusing on Earth sciences. During the 2011-2014 term, the PAS General Assembly set up 12 scientific committees representing the Division’s scientific disciplines. Overall, Division Three has a network of 19 research units.

Work in the field of interdisciplinary space studies includes observational astronomy and astrophysics, space experiments, and physical and geodynamic research of the Earth and other planets. Chemistry-related research within the Division includes physical chemistry, organic chemistry, biochemistry, the physics and chemistry of polymers, as well as surface catalysis and physicochemistry. Interdisciplinary research in the physical sciences focuses on theoretical physics, the physics and technology of materials, quantum nanostructures of semiconductors, magnetic, superconductor and molecular materials, state-of-the-art research methods in condensed matter physics, atomic, molecular, and nuclear physics, high-pressure physics, and materials engineering. Other research includes physicochemical theoretical and experimental studies of solids, with a particular focus on low-temperature research. Mathematical studies form another, separate area of research. Work in the Earth sciences includes research into Earth physics, including seismology, geomagnetism, atmospheric physics, hydrology, marine and geological environmental issues, as well as planetary and polar studies.

The results of the research conducted by the Division’s scientific teams reflects well the wide-ranging scale, the caliber, and

the variety of topics studied. For instance, research conducted at the PAS Centre of Molecular and Macromolecular Research into dislocations in PE crystallites has identified the dominant role played by the generation and transport of moving dislocations during plastic deformation. The Institute has also developed a method of synthesizing nanoparticles of precious metal alloys (Au, Ag) and nanoparticles with a core-sheath morphology, with the aim of using them as contrast during tomography of tissues and organs. The PAS Institute of Catalysis and Surface Chemistry, in turn, has been engaged in research aimed at assisting the conservation and restoration of artwork and monuments. At the PAS Institute of Physics, scientists are pursuing new, groundbreaking avenues of research, such as the field of spintronics and studying intracellular mechanisms of the photostability of biological systems, in particular DNA and functional molecules. The PAS Institute of Molecular Physics conducts research into electron transport in graphene with ferromagnetic contacts, demonstrating that the recently-discovered graphene can have wide applications in spintronics. The discovery of the effects of contact between liquid crystal and air on the properties of ferroelectric layers of liquid crystals opens up new ways of modifying the technical parameters of liquid crystal displays. As part of the experiment “Pi of the Sky”, a team of researchers from the PAS Centre for Theoretical Physics has for the first time managed to observe a gamma flash in visible light at a very early stage (GRB 080319B), just before and in the seconds following an explosion. The Centre also studies universal spectral properties of evolution operators of chaotic quantum systems interacting with their surroundings; the theory of non-linear systems and

chaos has applications in various fields of physics, as well as other disciplines such as chemistry and biology. The PAS High Pressure Institute has demonstrated a violet laser minimatrix with a total optical power of 2.5W, paving the way for the rapid introduction of laser matrices with many Watts of power. The matrix demonstrates one of the highest optical powers originating from monolithic integrated nitrate sources. Using hydrostatic extrusion with significant plastic deformations, the Institute has created a semi-manufactured product, and, together with specialist centers, prepared dental implants using Ti grade 2 titanium, with significantly improved properties (non-toxic, hypoallergenic) than existing alloys. This technology makes it possible to manufacture a wide range of different types of implants used widely in medicine, such as traction pins and elements of the hip joint. The PAS Institute of Mathematics is involved in solving various theoretical problems, such as calculating cohomologies with compact support – standard implementations of arbitrarily chosen, locally compact buildings. Regular measurements of the ozone layer taken by the Central Geophysical Observatory at the PAS Institute of Geophysics are regarded by experts as some of the most reliable, and the measurement data is used by climatology institutions across the globe. The measurements and models of UV radiation conducted by the Institute have found medical applications, such as evaluating levels of vitamin D3 in the body, and treatments for certain skin disorders. The Institute initiated and conducted major, globally unique, international seismic experiments (projects POLONAISE '97, CELEBRATION 2000, ALP 2002, SUDETES 2003 and GRUNDY 2003) investigating the deep structures of the Earth's lithosphere in Central

Europe, with key research applications for the rational management of the Earth's natural resources and for planning global development.

The Division's scientific units participate in numerous national and international research projects. As examples of such projects significant for environmental protection, we can list those implemented and coordinated by the PAS Centre for Molecular and Macromolecular Research, such as "Biodegradable fibers (BIOGRATEX)," "New generation packaging materials made of organically-recycled polymers (MARGEN)," and "Technology for producing biodegradable polyesters using renewable resources (BIOPOL)." This also includes a project coordinated by the PAS Institute of Catalysis and Surface Chemistry, "New catalytic materials as a basis of environmentally-friendly chemical processes," which has resulted in the solution of a range of problems in reducing hazardous waste generation and energy consumption at individual levels of technological processes. Similarly, such projects conducted by the PAS Institute of Low Temperatures and Structural Research in Wrocław include "Sensors for measuring environmental dangers: modeling and monitoring" and "Novel efficient luminophores for illumination and solar condensers." The PAS Institute of High Pressures conducts the projects "New metallic materials with a nanometric structure with applications in novel branches of the economy," and "Quantum semiconductor nanostructures with applications in biology and medicine." The PAS Institute of Geological Sciences participates in a long-running project of regional geophysical studies, PolandSPAN, covering a significant area of Poland and the adjacent Baltic. The project aims to take a regional seismic

photo, with the supporting data to be used in prospecting for hydrocarbon deposits, in particular natural gas from unconventional shale gas deposits or tight gas. The PAS Institute of Oceanology is engaged in research projects studying the condition of the marine environment and the effects of human development on the environment, such as the CHEMSEA “Chemical munitions search and assess” program of transborder Baltic Sea region collaboration dealing with risk assessment of chemical munitions abandoned near Bornholm, and the “Wetlands, algae, biogas: a South Baltic Sea eutrophication counteract project (WAB)” aiming to utilize the hitherto underused energy source of biomass (algae) from coastal areas and to propose solutions that would not upset the ecological balance and would benefit the marine and land environments while reducing eutrophication processes and the generation of gases. The PAS Institute of Geophysics is conducting a project studying electrical storms that is innovative on a national and European scale: the planning, implementation, and rollout of Poland’s first six-point local ground network for detecting lightning as part of a special research project. Studying and recording the actual electrical structure of multiple discharges is essential from the point of view of effective protection of terrestrial buildings against lightning. The THAIS initiative (“Teamwork for Hazard Assessment for Induced Seismicity”), with the participation of the PAS Institute of Geophysics, aims to create a platform for international scientific collaboration in the field.

Division Three annually awards its own prizes for outstanding achievement in research: the Marie Skłodowska-Curie Prize in chemistry and physics; the Waław Sierpiński Prize in mathe-

matics; the Stefan Pieńkowski Prize in physics; the Włodzimierz Kołos Prize in chemistry; the Ignacy Domeyko Prize in geology and mineralogy; and the Maurycy Pius Rudzki Prize in geophysics, meteorology, and oceanology.

#### Scientific units:

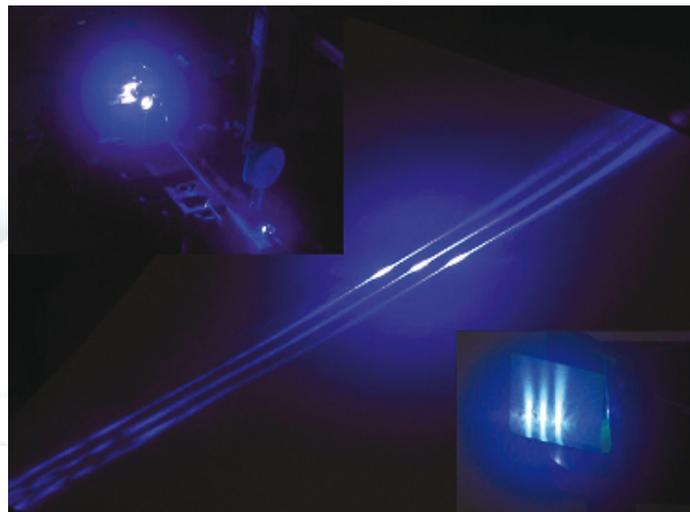
Center for Theoretical Physics of the PAS, Center of Polymer and Carbon Materials of the PAS, Institute of Nuclear Physics of the PAS, High Pressure Research Center of the PAS, Institute of Geological Sciences of the PAS, Institute - Center for Molecular and Macromolecular Studies of the PAS, Institute of Catalysis and Surface Chemistry of the PAS, Institute of Geophysics of the PAS, Institute of Oceanology of the PAS, Institute of Mathematics of the PAS, Institute of Molecular Physics of the PAS, Institute of Organic Chemistry of the PAS, Institute of Physical Chemistry of the PAS, Institute of Physics of the PAS, International Laboratory of High Magnetic Fields Low Temperatures in Wrocław, Nicolaus Copernicus Astronomical Center of the PAS, Space Research Center of the PAS, Institute of Low Temperature and Structure Research of the PAS, Museum of The Earth in Warsaw of the PAS

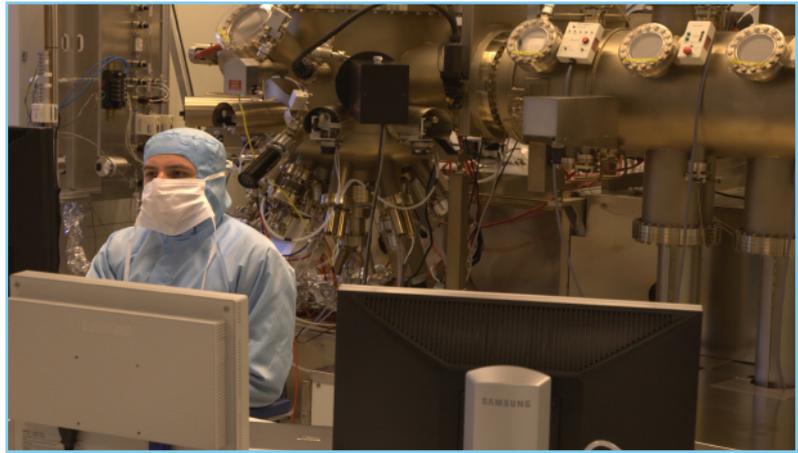
#### Ordinary members:

Bogdan Baranowski, Czesław Bessaga, Andrzej Białas, Andrzej Białynicki-Birula, Iwo Białynicki-Birula, Adam Bielański, Krzysztof Birkenmajer, Bogdan Bojarski, Zbigniew Ciesielski, Wiesław Czyż, Jerzy Dera, Tomasz Dietl, Czesław Druet, Wojciech Dziembowski, Zbigniew Jerzy Galus, Robert Rafał Gałązka, Zbigniew Ryszard Grabowski, Ryszard Gradziński, Aleksander J. Guterch, Andrzej Hryniewicz, Jerzy Jankowski, Janusz Jurczak, Jerzy Kołodziejczak, Janusz Kotlarczyk, Jerzy Kroh, Wojciech Królikowski, Jan Kutek, Stanisław Kwapień, Bogdan Józef Marciniak, Stanisław Massel, Mieczysław Mąkosza, Jan Józef Michalski, Marian Mikołajczyk, Stanisław Mrowec, Czesław Olech, Aleksander Pełczyński, Stefan Pokorski, Henryk Ratajczak, Czesław Ryll-Nardzewski, Andrzej Schinzel, Józef Siciak, Józef Smak, Andrzej Z. Smolarski, Lucjan Sobczyk, Ryszard Hilary Sosnowski, Leszek Starkel, Wojciech Stec, Michał Szulczewski, Henryk Szymczak, Roman Teisseyre, Andrzej Mariusz Trautman, Stanisław L. Woronowicz, Andrzej K. Wróblewski, Kacper Zalewski, Jerzy Znosko

#### Corresponding members:

Józef Barnaś, Jan Burchart, Marek Chmielewski, Marek Grad, Paweł Haensel, Krzysztof Haman, Ryszard Horodecki, Adam Hulanicki, Henryk Iwaniec, Bogumił Jeziorski, Jerzy Kaczorowski, Jan Kisiński, Henryk Kozłowski, Cyryl Latos-Grażyński, Janusz Stanisław Lipkowski, Tomasz Łuczak, Kazimierz Łukaszewicz, Roman Mienas, Stanisław Pasynkiewicz, Stanisław Penczek, Marek Pfützner, Wiesław Pleśniak, Krzysztof Redlich, Paweł Rowiński, Andrzej Skowroński, Adam Sobieczewski, Andrzej Staruszkiewicz, Józef Szudy, Andrzej Udalski, Małgorzata Witko, Andrzej Witkowski, Aleksander Wolszczan, Henryk Woźniakowski, Jerzy Zabczyk, Andrzej Żelaźniewicz







**Division IV of Engineering Sciences** provides scientific and organizational supervision over its own affiliated research units, scientific committees, and task-force committees. It contributes to the advancement of the technological sciences by expressing opinions on proposed and existing research projects for central administration, coordinating the activities of national research committees, developing scientific collaboration with foreign institutions, and helping organize conferences and scientific symposiums. The Division includes 21 scientific committees, 3 task force committees, and 13 research units. Division Four publishes its own quarterly journal, the *Bulletin of the Polish Academy of Sciences: Technical Sciences*.

The Division's activities cover scientific disciplines related to the technological and Earth sciences, such as architecture and town planning, automation and robotics, biocybernetics and biomedical engineering, biotechnology, chemical engineering, chemical technology, construction and exploitation of machinery, electronics, electrotechnics, energetics, environmental engineering, geodesics and cartography, geography, informatics, manufacturing engineering, materials engineering, mechanics, metallurgy, mining and engineering geology, telecommunications, and transport.

Results obtained by the Division's research units have widely-reaching practical applications. For instance, the PAS Institute of Systems Research has devised computer systems for the management of communal water and sewage systems, and an integrated model of atmospheric pollution. Research teams from the PAS Institute of Biocybernetics and Biomedical Engineering have developed systems for the measurement and control of oculomotor

ability with applications in the early diagnostics of disorders of the central and peripheral nervous system, in rehabilitation, and in studies of the human factor in aviation (SACCADOMETER, XY-MRI, Oculometer, X-Stimuli Oculometer); a system for measuring the speed of repetitious reciprocal movements in the upper limbs, including studying motor side preference; and the stationary system Jazz-novo for defining oculometric activity accompanying visual interaction with the patient's surroundings. Research conducted at the PAS Institute of Hydroengineering, in turn is helping elucidate the reasons behind significant shifts in port quays seen during earthquakes, and prepare scenarios for the Southern Baltic to deal with raised sea levels as a result of climate change. Joint Polish-Indian research conducted in the Himalayas by the PAS Institute of Geography and Spatial Organization has yielded assessments of the role of extreme rainfall in monsoon regions as a result of human intervention, as well as evaluations of the degree of erosion in mountain regions and aggradation at the foot of mountains. The PAS Mineral and Energy Economy Research Institute has assessed the quality of geothermal waters in the water reservoirs of the Małopolska and Silesian Voivodeships, and developed a system balancing the supply of coal for the purposes of long-term planning of electricity generation subsystem development. Research conducted at the PAS Institute of Theoretical and Applied Informatics has led to the creation of a unique database of hand movements based on a list of selected natural gestures registered using motion capture. The database makes it possible to study the classifiers and to create models of human hand movement; the methods are being applied in the development of a non-contact interface as

part of the Virtual Museum system. The Institute has also developed a system for detecting and analyzing surface parameters of spatial objects on the basis of their 3D images, and technology supporting the automation of the process of scanning and reconstructing damaged spatial objects, in particular museum exhibits. The PAS Institute of Strata Mechanics, in turn, has developed VentGraph, a professional ventilation engineering system used in the analysis of ventilation networks of mines in normal and emergency situations, as well as simulations of airflow, fire gas and methane flow. The PAS Institute of Metallurgy and Material Engineering has developed a technology for building a new generation of silicon solar cells, as well as multilayer nanocrystal coatings for cardiovascular applications, created using laser technology. Other types of medically-related technology include systems for the extraction of structural information from descriptions of mammography images (developed by the PAS Institute of Computer Science) as well as a mathematical model of non-specific immunological defense and a technology of electrospinning nanofibers for biomedical purposes (developed by the PAS Institute of Fundamental Technological Research). The PAS Institute of Environmental Engineering has studied emissions of selected toxic air pollutants and worked on the detection of certain trace elements present in coal and during the process of coking, including those regarded as hazardous in coal combustion outputs and exhaust gas purification outputs (dedusting and desulfurization). The Institute has also devised effective, low-demand methods of protecting aquatic environments from pollution washed away from mining landfills using widely-available natural and waste materials as isolative and reactive barriers.

The research units of Division Four of Engineering Sciences are also engaged in numerous research projects, both at home and abroad. The PAS Systems Research Institute, for instance, working towards the elimination of barriers preventing people with disabilities from participating fully in the information society, is involved in the Braille Score project, which has created a computer system for converting musical information for people with visual impairments. The THESEUS project, implemented with the participation of the PAS Institute of Hydroengineering, develops methods for discovering low-risk solutions for societies living in coastal regions protecting the natural environment during climate change. The PAS Institute for Mineral and Energy Economy Research is engaged in the GEOCOM “Geothermal societies” project, a demonstration of the cascade use of geothermal energy in heat generation integrated on a small scale with other renewable energy sources, together with modernization and metering. The PAS Institute of Fluid-Flow Machinery participates in a project developing integrated technologies for generating fuels and energy from biomass, agricultural waste, and other wastes. The PAS Institute for Environmental Engineering participates in AIR SILESIA, a project creating systems of information on air quality in the Polish-Czech border region in Silesia and Moravia, which sees Europe’s highest levels of air pollution. The PAS Institute of Fundamental Technological Research likewise participates in international undertakings, such as the iNTeg\_RISk project to develop early detection, monitoring, and integrated management of risks related to new technologies, and the UPWIND project for integrated design of wind power stations.

Division Four awards its own annual individual prizes for published research work in technological research.

Scientific units:

Institute of Metallurgy and Materials Science of the PAS, Institute of Environmental Engineering of the PAS, Institute of Biocybernetics and Biomedical Engineering of the PAS, Institute of Chemical Engineering of the PAS, Mineral and Energy Economy Research Institute of the PAS, Institute of Computer Science of the PAS, Institute of Fundamental Technological Research of the PAS, Institute of Hydroengineering of the PAS, Institute of Theoretical and Applied Informatics of the PAS, Institute of Fluid-Flow Machinery of the PAS, Institute of Geography and Spatial Organization of the PAS, Strata Mechanics Research Institute of the PAS, Systems Research Institute of the PAS

Ordinary members:

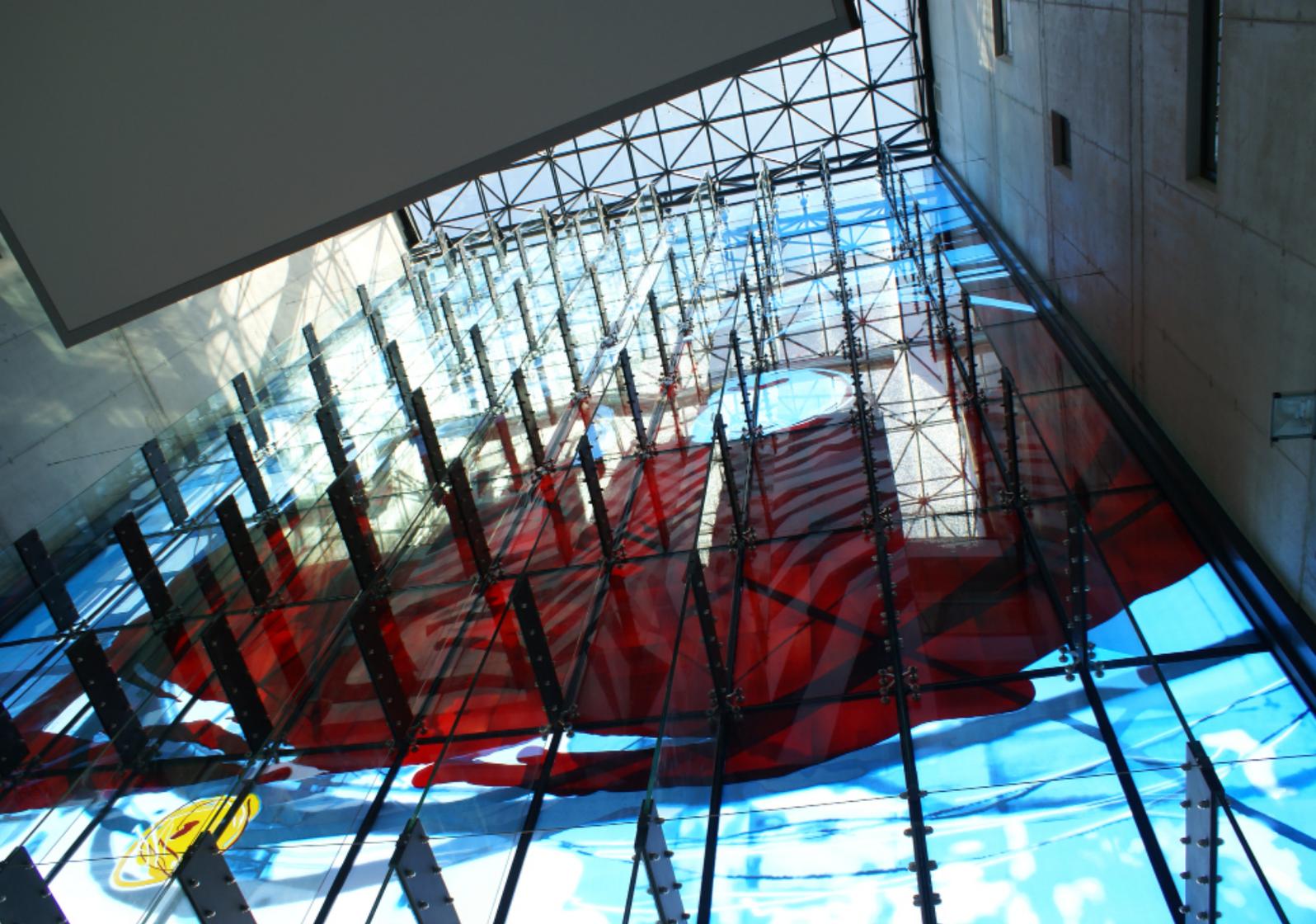
Daniel J. Bem, Michał Białko, Jacek Błazewicz, Andrzej Burghardt, Henryk Bystron, Witold Cęckiewicz, Zbigniew Ciok, Ryszard Domański, Władysław Findeisen, Witold Gutkowski, Stefan Hahn, Janusz Kacprzyk, Tadeusz Kaczorek, Jerzy Klamka, Michał Kleiber, Stanisław Knothe, Piotr Korcelli, Roman Kulikowski, Leon Łukaszewicz, Zdzisław Marciniak, Jacek Marecki, Zenon Mróz, Bogdan Ney, Roman Ney, Roman Pampuch, Włodzimierz Prosnak, Andrzej Rakowski, Jerzy Seidler, Kazimierz Sobczyk, Czesław Strumiłło, Jan Szargut, Tadeusz Śliwiński, Kazimierz Thiel, Waclaw Trutwin, Zenon Waszczyszyn, Zbigniew Wesolowski, Jan Węglarz, Władysław Włosiński, Wiesław Woliński

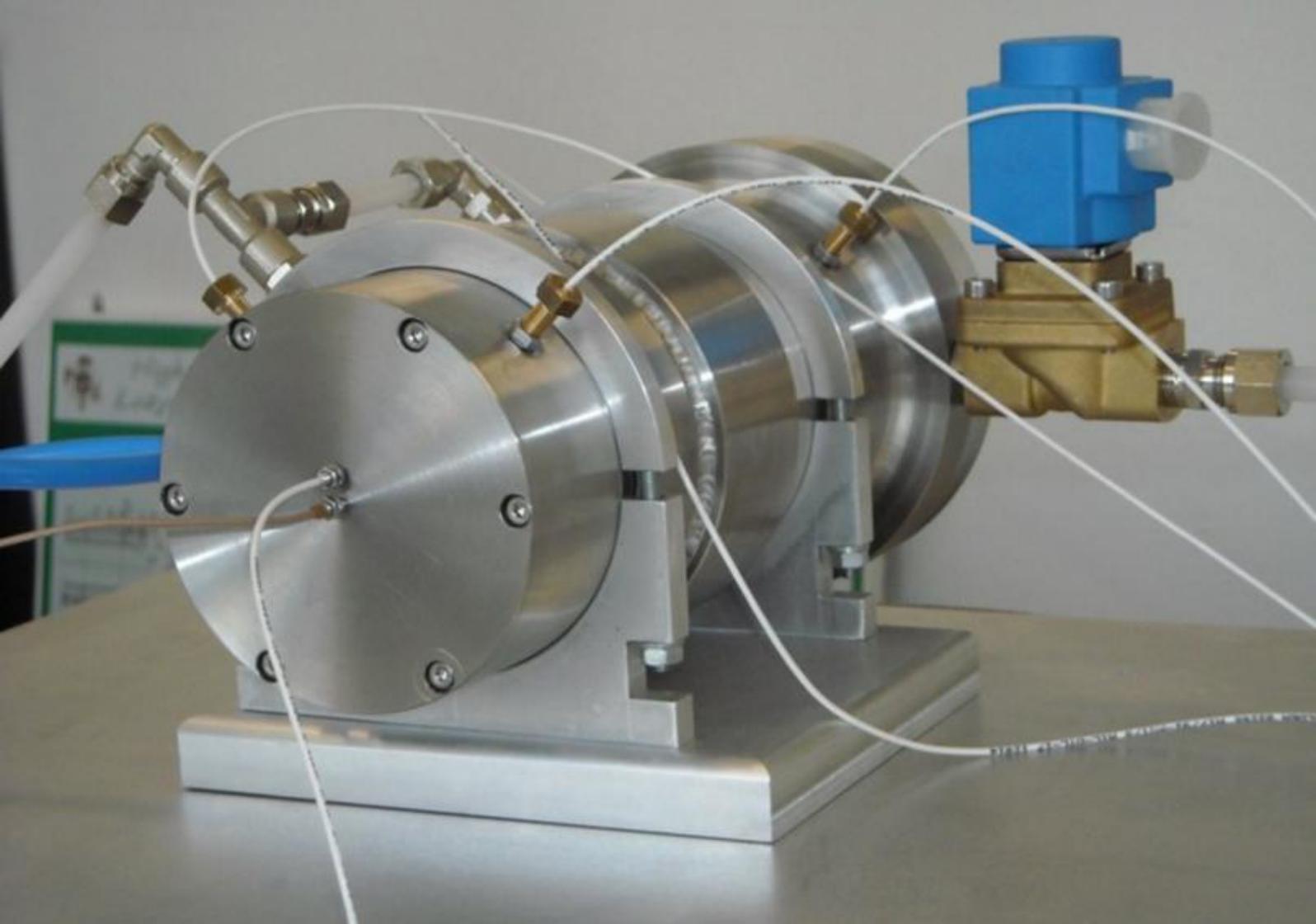
Corresponding members:

Romuald Będziński, Tadeusz Burczyński, Czesław Cempel, Tadeusz Chmielniak, Mirosław Dąbrowski, Józef Dubiński, Adam Gierek, Józef Głomb, Maciej Grabski, Andrzej Hopfer, Adam Janiak, Marian P.

Każmierkowski, Lech Kobylński, Józef Korbicz, Adam Kotarba, Piotr Kowalik, Henryk Krawczyk, Bogusław Major, Krzysztof Malinowski, Edmund Małachowicz, Roman Maniewski, Jarosław Mikielwicz, Józef Modelski, Janusz Mroczka, Andrzej Nowicki, Lucjan Pawłowski, Henryk Petryk, Ryszard Pohorecki, Antoni Rogalski, Leszek Rutkowski, Jakub Siemek, Roman Słowiński, Ryszard Tadeusiewicz, Jan M. Wójcicki









**Division V of Medical Sciences** represents Poland's medical research community. It promotes medical research, supports education, and fosters scientific collaboration with centers in Poland and abroad. Division Four includes 5 scientific institutes focusing on medical research, plus 12 scientific committees. The Division focuses on endocrinology, epidemiology, genetics, immunology, medical physics neurobiology, neuropathology, pathophysiology, pharmacology, pharmacy, physiology, radiobiology, and rehabilitation. The Division also evaluates the condition and requirements of medical sciences in Poland, promotes the practical application of research findings, and disseminates medical knowledge through the Division's "Medical University" website.

The Division conducts a wide range of scientific research. The PAS Institute of Medical Biology has discovered new ligands for H-ficolin with natural, bacterial origins. Researchers have shown that when the ligands are conjugated with albumin, they can be used for marking the concentration and activity of H-ficolin and for obtaining and purifying the protein from system fluids. The process is currently subject to a patent application. Researchers at the PAS Institute of Immunology and Experimental Therapy are using iNOS knockout mice to show an increased anti-angiogenic activity of interleukin 12 (IL-12), an inhibitor of the angiogenesis process. The researchers have developed a method of inhibiting angiogenesis in cancer, which in turn inhibits malignancy. Studies of biochemical markers as exponents of inflammatory processes due to infection have led to the development of a method for measuring levels of endotoxins, muramine, and sialic acid, making it possible to trace out the

clinical picture of sepsis and septic shock. The PAS Institute of Human Genetics has developed genetic constructs for transgenic animals for xenotransplantation of heart valves and bone and skin tissue that are not rejected by the human immune system. The Institute has developed a genetic library of archive DNA of the aurochs (*Bos primigenius*) as part of research into reviving extinct species. A research team from the PAS Institute of Experimental and Clinical Medicine has developed methods for isolating and growing mononuclear cells from umbilical cord blood for obtaining proliferating neural progenitors. Results of the research have been used in Poland's first clinical experiment of autologous transplantation of umbilical cord blood in a child suffering from brain damage. Researchers have also demonstrated a new function of glutamine in the central nervous system: regulation of the synthesis of nitric oxide (NO) by controlling the transport of arginine, a substrate of NO synthesis, into cells. They have also demonstrated the physiological significance of the competition between nitric oxide and the arachidic acid pathway dependent on cytochrome P-450 in regulation of kidney function and arterial blood pressure.

Research projects conducted by the scientific units of the Division of Medical Sciences mainly focus on various aspects of human healthcare and its social impact. The international project "Prenatal and perinatal infections with the human cytomegalovirus (CMV)" is conducted by the PAS Institute of Medical Biology in order to investigate the mechanisms guiding prenatal and perinatal CMV infections, improve detection of CMV infections during pregnancy, and improve treatment. Effective diagnostic techniques and prevention of prenatal and perinatal

CMV infections are extremely important in the absence of an effective vaccine. The PAS Institute of Pharmacology conducts research projects aiming to develop new treatments for mental disorders. The ProKog “Antagonists of the 5-HT<sub>6</sub> receptor: innovative antipsychotic drugs with procognitive effects” project develops and characterizes new compounds with applications in the treatment of psychoses (in particular schizophrenia) showing better effectiveness, lower adverse reactions, and exhibiting procognitive effects. The project “Depression: mechanisms and treatment” aims to improve the diagnosis and etiology of depression and mechanisms behind resistance to antidepressant therapy. The PAS Institute of Immunology and Experimental Therapy conducts the project “NeoLek: Integrated Laboratory for Experimental Oncology and Innovative Technologies” in order to develop and study an innovative anticancer therapeutic acting on a defined molecular target in cancer cells as an alternative to classical chemotherapy in the treatment of cancer.

Division Five also promotes research by awarding annual scientific prizes and distinctions, including the Jędrzej Śniadecki Medal and the Jędrzej Śniadecki Research Prize. The Division takes particular pride in the initiative of recognizing outstanding scientific achievements achieved by students by awarding the Waław Mayzel Medical Laurel.

Scientific units:

Institute of Human Genetics of the PAS, Institute of Pharmacology of the PAS, Institute of Medical Biology of the PAS, Institute of Immunology and Experimental Therapy of the PAS, Mirosław Mossakowski Medical Research Center of the PAS

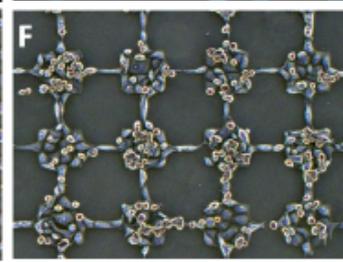
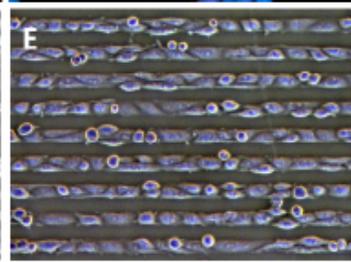
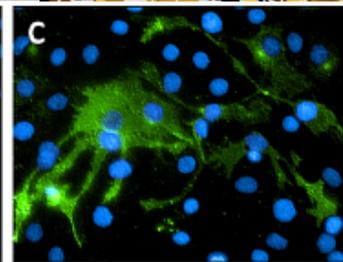
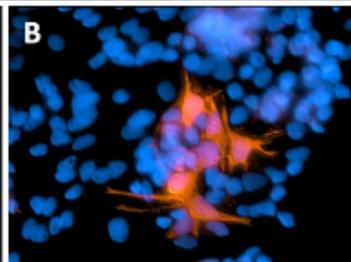
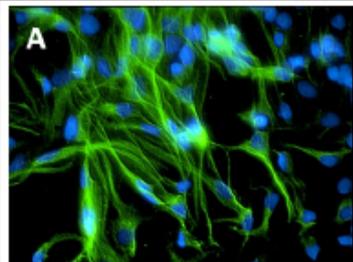
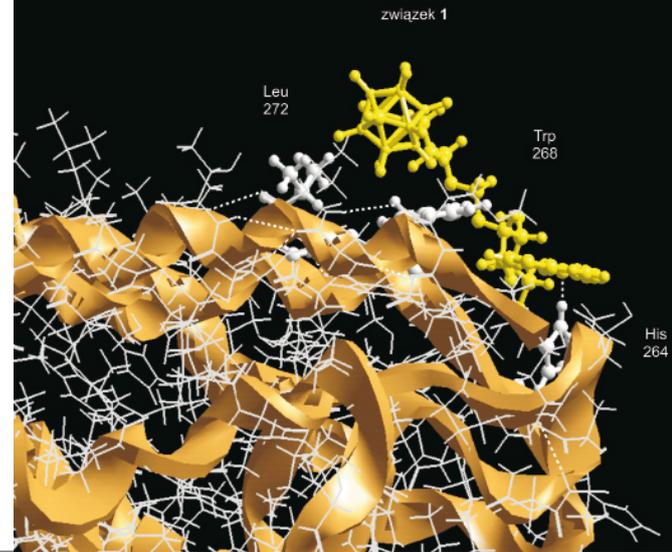
Ordinary members:

Stefan Angielski, Mieczysław Chorąży, Ryszard Gryglewski, Irena Hausmanowa-Petrusewicz, Włodzimierz Januszewicz, Aleksander Koj, Franciszek Kokot, Janusz Komender, Stanisław Konturek, Maria Kopeć, Jerzy Kościelak, Bohdan Lewartowski, Edmund Przegaliński, Włodzimierz Ptak, Andrzej Trzebski, Marek Zembala

Corresponding members:

Jan Albrecht, Anna Członkowska, Andrzej Górski, Andrzej Januszewicz, Roman Kaliszan, Paweł Kisielow, Wojciech Kostowski, Marek Krawczyk, Janusz Limon, Sławomir Majewski, Krzysztof Narkiewicz, Wiesław Pawlik, Tadeusz Popiela, Witold Rużyło, Ewa Szczepańska-Sadowska, Tomasz Trojanowski, Jerzy Vetulani, Jacek Zaremba

POLSKA AKADEMIA NAUK



The Polish Academy of Sciences has territorial branches centered in Gdańsk, Katowice, Kraków, Lublin, Poznań, and Wrocław. Their purpose is to further the Academy's objectives within a given region of Poland, particularly to integrate the local communities. They also act on behalf of the Academy in contacts with state administration, local governments, and NGOs within a given region. Each branch is composed of the national members of the Academy who reside within the given region. Each branch has its own General Assembly of Branch Members, Branch Presidium, and Branch President.

The territorial branches of the Polish Academy of Sciences are as follows:

- Gdańsk Branch of the Academy was established in 1980. Its zone of activity includes the northern four of Poland's provinces – the Kujawsko-Pomeranian, Pomeranian, Warmian-Mazurian and Western Pomeranian Voivodships.
- the Katowice Branch of the Academy was established in 1974. Its scope covers the Silesian and Opole Voivodships.
- the Kraków Branch of the Academy Branch of the Academy was established in 1957. Its geographical scope covers the city of Kraków and the Lesser Poland and Subcarpathian Voivodships.
- the Lublin Branch of the Academy began operations in 1998. Its zone of activity covers the Lublin Voivodship.
- the Łódź Branch of the Academy began operations in 1977. Its geographical scope covers the Łódź Voivodship.
- the Poznań Branch of the Academy was established in 1972. Its scope covers the Greater Poland and Lubusz Voivodships.
- the Wrocław Branch of the Academy established in 1970 roku. Its zone of activity covers the Lower Silesian Voivodship.

POLSKA AKADEMIA NAUK

Gdańsk Branch



Lublin Branch



Łódź Branch



Kraków Branch



Poznań Branch



Wrocław Branch



Pursuant to the „Act on the Polish Academy of Sciences” dated 30 April 2010, the tasks of the Academy include fostering international research cooperation by setting up research consortia and pursuing research projects together with foreign partners; participating in international research organizations and agendas and collaborating with foreign research institutions; and signing research cooperation agreements with international research organizations and foreign research institutes.

The Academy’s international collaboration is pursued primarily under the framework of bilateral agreements with more than 75 foreign academies of science and equivalent organizations from Europe, Asia, North America, and Africa. Here the priority is on joint research projects, usually agreed upon for three-year periods. Their results are presented at international research conferences and symposia and published in renowned Polish and foreign research journals.

Under the framework of cooperation between the Polish Academy of Sciences and the Russian Academy of Sciences, for instance, every three years the two Academies award joint prizes for outstanding research achievements made as a result of joint Polish-Russian research work. Moreover, in conjunction with the Polish Consulate in Cologne and Cologne University, every year the Polish Academy of Sciences awards the Polish-German Young Researcher Prize to scholars engaged in cooperation with Poland.

Each year, around 1,000 Polish researchers travel abroad under bilateral research cooperation agreements, mainly from the PAS research units. A similar number of foreign scholars pursue their research at Polish institutes and higher-education schools.

Regional collaboration is also cultivated: the Forum of Academies of Sciences from the Visegrad Group Countries (V4) is a platform for discussing the problems and achievements of the Polish, Czech, Slovak, and Hungarian Academies, joint research projects are conducted, and outstanding young scholars are distinguished with the V4 Academies Young Researcher Award (with each successive edition encompassing different fields of science).

The Polish Academy of Sciences is engaged in multilateral cooperation via its participation in around 80 international organizations, including the International Council for Science (ICSU), the European Academies Science Advisory Council (EASAC), the International Center for Genetic Engineering and Biotechnology (ICGEB), and the Inter-Academy Panel on International Issues (IAP). The Polish Academy of Sciences prioritizes the involvement of Polish researchers in research programs conducted under the framework of these organizations, and also the involvement of Polish scholars in the management bodies of international organizations.

Research work underway at the international institutes and centers that function within the structure of the Polish Academy of Sciences is particularly important, especially in the context of educating young scholars. Under an agreement with the Max Planck Foundation, a Polish-German Joint Research Group operates within the International Institute for Molecular and Cellular Biology. The Polish Academy of Sciences also participates in research and R&D projects under the 7th EU Framework Programme, including: SEA-EU-NET (Facilitating the Bi-Regional EU-ASEAN Science and Technology Dialogue), BILAT-UKR

(Enhancing the bilateral S&T Partnership with Ukraine), and KORANET (Initiative to Intensify and Strengthen the Regional S&T-Cooperation between Korea within the Asian Region and the ERA).

The Polish Academy of Sciences organizes cyclical international conferences on topics of crucial impact for contemporary science. For instance, conferences concerning the „dual use” of technologies help raise awareness among the research and academic world, and also among society as a whole, about the potential danger of research achievements being utilized in a way not originally intended (for instance for the purposes of bioterrorism) and about the ethical challenges that arise due to the advancement of science.

The PAS foreign scientific centers in Paris, Vienna, Rome, and Moscow, the Historical Research Center in Berlin, and the POLSCA Science Promotion Office in Brussels all play an important role in popularizing the achievements of Polish science abroad. They use their premises to organize readings, lectures, exhibitions, and presentations of a research-focused or popular-science nature, international conferences embracing a broad scope of fields -- ranging all the way from the humanities, through the

natural sciences, to medicine and engineering technology. They also help facilitate the mutual contacts between Polish and foreign researchers and research units. The PAS scientific centers in Paris and Vienna moreover offer convenient and low-cost guestrooms to Polish researchers.

There is a Representative Office of the Russian Academy of Sciences in Poland, and work is now underway on creating a PAS scientific center in Kiev and a research center of the National Academy of Sciences of Ukraine in Warsaw.

International research collaboration is also pursued by each of the more than 70 research units of the Polish Academy of Sciences, each within its own scope of activity. They collaborate with a total of nearly 600 foreign partners, conducting more than 1,100 and research projects. Moreover, there are three high-caliber international research institutes functioning within the structure of the Polish Academy of Sciences itself: the European Regional Center for Ecohydrology in Łódź, the International Institute of Molecular and Cell Biology in Warsaw, and the International Laboratory of High Magnetic Fields and Low Temperatures in Wrocław.





PoISCA Science  
Promotion Office  
in Brussels



The Historical  
Research Centre  
in Berlin





PAS  
Scientific Centre  
in Moscow



PAS Scientific Centre in Paris





PAS Scientific Centre  
in Rome



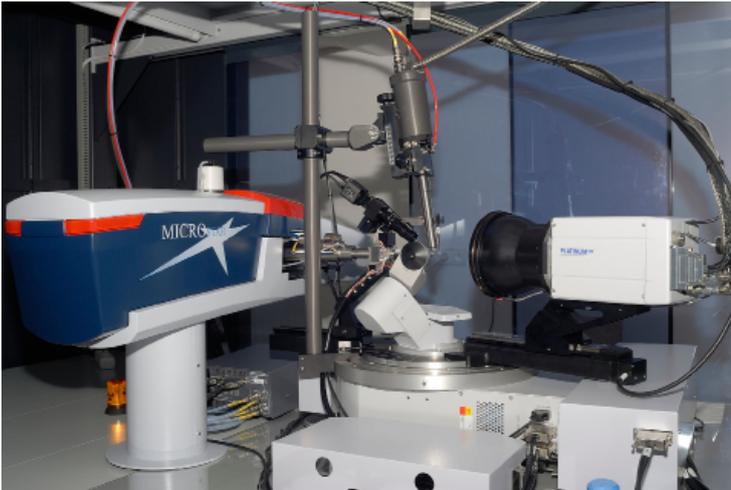
PAS Scientific Centre  
in Vienna



European Regional Centre  
for Ecohydrology



International Institute of Molecular  
and Cell Biology



International Laboratory of  
High Magnetic Fields and Low  
Temperatures



In keeping with the „Act on the Polish Academy of Sciences” dated 30 April 2010, the set objectives of the Academy and its various organizational units include efforts to develop, promote, and integrate science, to raise public science awareness, and to support the development of education and the enrichment of Polish culture. The Academy strives to achieve these objectives through its publishing activity, by playing an expert role, creating databases, and making its library, museum, and archive collections available for scientific pursuits, by organizing conferences, exhibits, and popular-science lectures, and by showcasing science-related information and scholarly achievements on the PAS website.

In terms of publishing activity, the Academy ensures the continual publication of the most important research journals and series within each given specialization, as well as scientifically sound, high-caliber publications documenting the activity of the PAS research communities. Various PAS series and periodicals, published in English and foreign languages, have a scientific and/or popular-scientific profile, highlighting the links between science and economic processes, illustrating current trends in international cooperation, supplying full information about all the Academy’s fields of activity, and also promoting the Academy’s image. Here we should mention the process now underway of posting the various PAS research periodicals online, making them available via a common Internet platform.

The research institutes, scientific committees, task-force committees, and territorial branches of the Academy publish a grand total of about 600 books and periodical volumes per

year. Some of these are publications issued by the Chancellery of the Academy on an ongoing basis, including the quarterly *Science in Polish*, the quarterly *Academia: The Magazine of the Polish Academy of Sciences* in parallel English and Polish editions, the informational guidebooks *Members of the PAS* in Polish and *Directory in English*, the *Academy’s Annual Report* in English, and *Reports in Polish* on the Academy’s activities, as well as other publications marking special occasions, such as the book *Traditions, Modernity, Future: Anniversary Reflections 1952-2012* issued in connection with the 60th anniversary of the Academy’s inception.

The Academy organizes popular-science lectures in its „*Wszechnica*” series, featuring lecturers who are outstanding researchers and cultural figures from many national and foreign centers. The Academy also participates (as organizer or co-organizer) in nationwide projects popularizing science and culture in attractive and innovative ways, such as science picnics, science festivals, and „museum night” events.



Polska Akademia Nauk  
Towarzystwo Naukowe Warszawskie  
**WSZECHNICA**

prof. Krzysztof Szusterman  
Młodzież  
jako naskakujący społeczny fenomen

Polska Akademia Nauk  
Towarzystwo Naukowe Warszawskie  
**WSZECHNICA**

prof. Marek Narkiewiczem  
Gaz łupkowy w Polsce  
- między geologią a nadzieją

Wstęp wolny

Polska Akademia Nauk  
Towarzystwo Naukowe Warszawskie  
**WSZECHNICA**

prof. Marek Bartosikim  
Głód energetyczny  
- szkoła przetrwania cywilizacji

Wstęp wolny

Polska Akademia Nauk  
Towarzystwo Naukowe Warszawskie  
**WSZECHNICA**

prof. Ryszardem Horodeckim  
Kwantowe splątanie  
- tajemniczy wynalazek natury

Polska Akademia Nauk  
Towarzystwo Naukowe Warszawskie  
**WSZECHNICA**

Prof. Andrzej Kamiński i inwazyjne  
Dwie twarze roślin energetycznych,  
wiele twarzy miśkanta olbrzymiego

Wstęp wolny

PAN  
WYKŁAD OTWARTY  
**WSZECHNICA**

Aktualne problemy  
gospodarki światowej

dr Paweł Kowalczyk  
MSP Euro-dł. Integracji ze Strefą Euro  
i skutki w Polsce

Wykład odbędzie się 28 stycznia (czwartek) o godz. 17.30  
w Instytucie Geografii, Pałac Akademicki, ul. Śmiały 17, Warszawa

ZAPRASZAMY  
www.pan-ol.lublin.pl www.ita.lublin.pl

PAN  
WYKŁAD OTWARTY  
**WSZECHNICA**

Etyczne aspekty redagowania prac naukowych  
("medical writing") i ich praktyczne implikacje

prof. dr hab. med. A. Gierski  
odk. katedry PAN, emerytura Państwowej Akademii Nauk

Wykład odbędzie się 30 września (czwartek) o godz. 16.30  
w Pałacu Czerniechowski, Pałac Łazienki 2, Łódź  
w siedzibie UTM (UM) Centrum Łódź

ZAPRASZAMY  
www.pan-ol.lublin.pl www.ita.lublin.pl

Polska Akademia Nauk  
Towarzystwo Naukowe Warszawskie  
**WSZECHNICA**

prof. Andrzejem Januszewiczem  
Nadciśnienie tętnicze  
jako choroba społeczna

Wstęp wolny





# POLSKA AKADEMIA NAUK

SPRAWOZDANIE  
2010

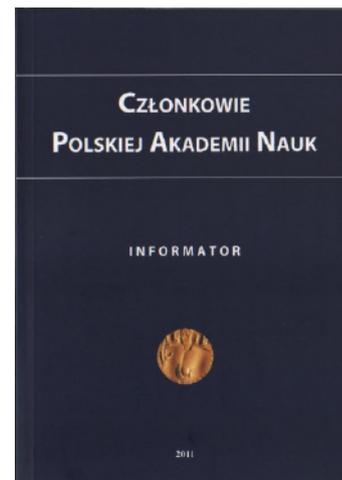
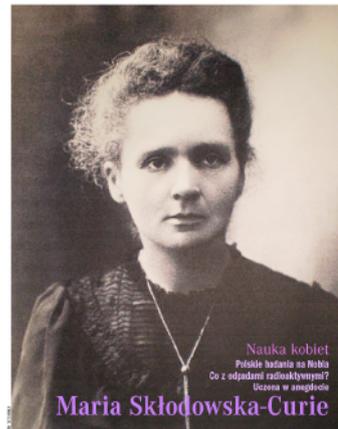
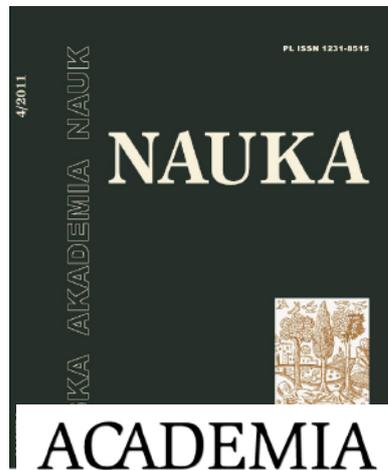
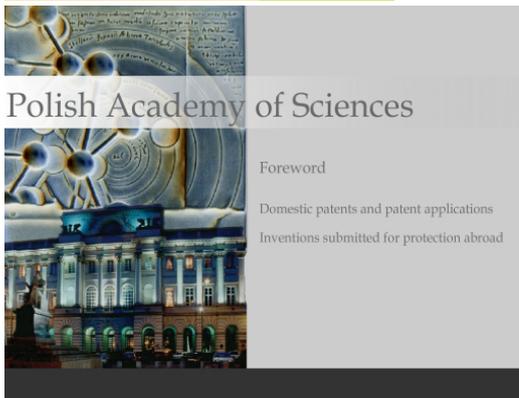
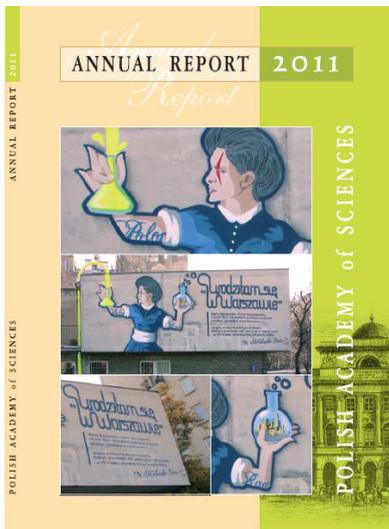


medycyna naukowcy  
inżynieria roślino  
ekonomia  
środowisko polski  
człowiek  
polimery  
parazytologia  
literatura fizyka kataliza  
kosmos paleobiologia fizyka język  
doświadczenia  
zoologia genetyka biocybernetyka  
patenty filozofia botanika organika  
socjologia systematyka dendrologia  
geologia mechanika kultura innowacje  
maszyny prawo fizjologia  
sławistyka archeologia paleontologia matematyka  
chemia oceanologia górnictwo sztuka  
farmakologia odkrycia  
badania etnologia przyroda  
budownictwo ssaki cisnienie żywienie  
agrolizyka metalurgia zwierzęta  
biologia immunologia molekuly  
psychologia terapia astronomia informatyka

PAN  
POLSKA AKADEMIA NAUK

TRADYCJA  
WSPÓŁCZESNOŚĆ  
PRZYSZŁOŚĆ

REFLEKSJE  
JUBILEUSZOWE  
1952-2012



Protecting Poland's and the world's cultural and natural heritage has been recognized by the Academy as both its honorable duty and privilege. This is an important aspect of the Academy's activity, visible in practically all the main groups of scientific disciplines practiced, ranging from the humanities and social sciences (in some sense predestined to have such a profile) all the way to the medical sciences.

This trend is excellently illustrated by the activity of the archives (the main PAS Archives in Warsaw and the Joint PAS-PAAS Archives in Kraków) and libraries (the Gdańsk Library and the Kórnik Library), described in more detail below. Moreover, the Tadeusz Manteuffel Institute of History publishes unique series of a bibliographical nature, including the Bibliography of Polish History and the encyclopedic-bibliographic Polish Biographical Dictionary, one of the most valuable publications for all of the humanities. The PAS Institute of Literary Studies is also engaged in long-term projects related to the protection of the national and world cultural heritage, including the Dictionary of 16th Century Polish, the Polish Literary Bibliography, and the „Panorama of Polish Literature” online resource.

Other culturally-committed PAS units include the PAS Institute of Archeology and Ethnology and the Institute of Mediterranean and Oriental Cultures are engaged in interdisciplinary research focused on ancient and modern civilizations, including cultural and religious traditions that differ from those of contemporary Europe – the prehistoric and medieval archeology of the Polish lands, ancient archeology, and general archeology. This research, carried out at various points on

the globe including Poland, other European countries, Egypt, Sudan, Syria, Israel, India, China, and elsewhere, helps to preserve and enrich our world heritage by describing and interpreting monuments and by obtaining new archaeological and ethnographic sources. The PAS Institute for the History of Science, in turn, is engaged in the study of the history of scientific inquiry (broadly defined), focused on bettering our understanding of the intellectual roots of human thought, something of fundamental significance for devising positive intellectual social models. In this regard, the Institute is working on an edited publication of the materials of the Polish National Education Commission (on UNESCO's list of world cultural heritage), a critical edition of astronomer Johannes Hevelius's correspondence, a critical edition of the complete works of Marie Skłodowska-Curie, and a catalogue of the oldest monuments of intellectual culture in Poland. The PAS Institute of Art is an interdisciplinary research unit whose objectives include studying and documenting Polish art and artistic culture within the scope of the graphic arts, architecture, music, theater, film, and audiovisual arts, taking account of the European and world context, and it holds the country's largest collection of archived materials (and one of the largest in Europe). The objective of the project now underway is to create and implement an integrated IT system facilitating the digitization of historic audio materials and photographs, so as to preserve the cultural and artistic heritage in digital form, protecting it from loss and destruction.

The PAS Institute of Political Studies maintains a set of Political Party Archives, which collects and organizes various

political materials, documents illustrating Polish political life and programmatic schools of thought, documenting the activity of Polish parties and political groups since 1989. The special collections gathered by the Joint Libraries of the Warsaw University Faculty of Philosophy and Sociology, the PAS Institute of Philosophy and Sociology, and the Polish Philosophical Society are of great importance for Polish national heritage, including the legacies of Kazimierz Twardowski, the founder of the Lwów-Warsaw School, the archive materials of Janina and Tadeusz Kotarbiński, Mieczysław Wallis, the philosophical book collection of Stanisław Ignacy Witkiewicz, and unique audio recordings. The library has been included in the list of facilities comprising Poland's National Library Base.

A „Consortium for a Digital Repository of Research Institutes” has been formed by 16 research institutes and their respective libraries, with the main objective of creating a publically-accessible, cross-region, multidisciplinary Repository comprised of digitized archive materials, research publications, research documentation, and elements of written cultural heritage selected from the Institutes collections. The Consortium includes a set of PAS institutes: the Institute of Archeology and Ethnology, Institute of Literary Studies, Institute of Experimental Biology, Institute of Mammal Biology, Institute of Physical Chemistry, Institute of Organic Chemistry, Institute of Philosophy and Sociology, Institute of Geography and Spatial Organization, Institute of History, Institute for the Polish Language, Institute of Mathematics, Institute of Experimental and Clinical Medicine, Institute of Fundamental Technological Research, Institute of Slavic Studies, and the Museum and Institute of Zoology.

The „Electronic Archive of Polish Written Relics” is a project being implemented by a consortium consisting of the Polish National Library, the National Directorate of the Polish State Archives, the National Academic Computer Network, the PAS Institute of Literary Studies, and the PAS Institute of History, with the objective of working out a concept for digitizing Polish written relics up to the year 1600 owned by state, private, or church institutions, and to prepare an IT system facilitating the necessary management of digital copies and providing online public access to them.

Work is also underway on the „National Corpus of the Polish Language”: a language corpus is a set of texts that can be searched for typical uses of words or constructions and that can provide other information about their meaning and function. Access to such a language corpus is crucial for state-of-the-art linguistic research, for writing dictionaries and foreign-language textbooks, for designing Internet browsers smart enough to handle the declension of Polish words, electronic translation software, and other advanced language technologies. Such corpuses are a key tool for linguists, but they are also used by computer scientists, historians, librarians, scholars of literature and culture, and specialists in many other fields of the humanities and information technology. The National Corpus is a joint project of the PAS Institute of Computer Science (the coordinator), the PAS Institute for the Polish Language, PWN Scientific Publishers, and the Computer and Corpus Linguistics Department at Łódź University, where aside from practical pursuits it also performs the function of preserving and developing the resources of the Polish language. These institutions are jointly building a referen-

ce corpus for Polish of several hundred million words. The list of sources includes not just classic Polish literature, but also the regular and specialist press, recorded conversations, pamphlet texts and web pages: ensuring the diversity of topics and genres, the balanced representation of speakers of both genders and of different ages, is just as important for the reliability of a corpus as its size.

The PAS Institute of Catalysis and Surface Chemistry has for years been involved in research aiming to protect precious heritage. Its „Protecting Cultural Heritage” research group, set up in 1986, conducts diverse studies related to the conservation and protection of historically valuable objects, including wooden items, particularly as concerns the structure and properties of historical materials and their mechanisms of deterioration. Protecting such heritage is particularly important for Poland, which possesses a set of polychrome sacral wooden objects unique on a worldwide scale – the most precious of them being listed on the UNESCO World Heritage List. The Institute has developed novel research tools for monitoring environmental responses and the occurrence of damage in wooden sculptures or images on wood. The knowledge gleaned by the Institute has yielded a classification of the usefulness of various heating systems to heat historically significant churches, as well as a novel system, developed under the 6th EU FP, for locally heating the area in which people are immediately situated in such places, causing minimal disturbance to the conditions surrounding precious elements and objects. Another avenue of research pursued by the Institute, this one initiated back under the 5th EU FP, has reinstated the practice of using Roman cements in conservation work – a historical

binding agent used to recreate the original decoration of building facades. Authentic materials recreated as a result of work on this project have been used in a pioneering restoration of the façade of the former Commercial Academy building in Kraków, erected in 1904-1906. That conservation effort set new standards for the renovation of architectural heritage from the period in the city, and Kraków has become an example for specialists throughout Europe interested in similar restoration projects in their own countries. In the wake of this success, the European Commission decided to fund another project under the 7th EU FP, supporting the development of industrial production and commercialization of Roman cements, in which Polish manufacturers, restoration specialists, and researchers are again playing a key role.

The PAS Institute of Theoretical and Applied Informatics has developed visual techniques for gathering, processing, and accessing spatial objects of hierarchical multimodal representation for the purposes of digitizing the resources of cultural heritage. The Optoelectronics Laboratory of the PAS Institute of Fluid-Flow Machinery is involved in a project of analyzing historical materials and laser-cleansing surfaces in the Cathedral of St. John the Baptist and St. John the Evangelist in Toruń, together with a conservation team. The PAS Institute of Fundamental Technological Research is engaged in several research projects with the objective of protecting architectural monuments in Poland and elsewhere. This work includes methods of monitoring strains and deformations in buildings, such as the subsiding of walls and pillars in St. John’s Cathedral in Gdańsk, the use of ultrasound surface evaluation using Rayleigh waves to evaluate the degradation of a wall in the Basilica di Santa Maria del Fiore

in Florence. The Institute has developed an innovative method for studying historical materials without doing damage to the substance of the object studied, using small samples in the form of micro-cores. This method has been used in practice for the mechanical, optical, and ultrasound study of the monastery in Supraśl. Participating in the „European Charter for the Documentation of Monuments” initiative, the Institute is also engaged in a project to coordinate efforts to catalog fixed cultural monuments, with the objective of developing guidelines, strategies, and tools for monitoring the impact of human activity and the environmental influence on the physical condition of historically important sites.

Protecting the cultural heritage also has an important natural aspect, such as furthering our knowledge of important stages in the history of the planet, traces of ancient life, and significant active geological processes. This also includes the preservation of exceptional natural phenomena or areas of particular natural beauty, ecological and biological processes significant for evolution and the development of today’s land, fresh-water, coastal, and sea ecosystems or communities of plants and animals, and the protection of the most important natural habitats, biodiversity, and threatened species of universal value from the standpoint of science and natural conservation.

Among the PAS units active in this regard is the PAS Museum of the Earth, a successor institution to the Earth Museum Society founded back in 1932. Its main task is to amass collections and protect the geological heritage, in this respect it does research and documentation work, plus a broad range of activity to popularize the Earth sciences and promote public awareness of

natural phenomena. The Geological Museum of the PAS Institute of Geological Sciences in Kraków boasts unique geological collections gathered over more than 150 years, since the days of the Physiographic Commission of the Cracovian Scientific Society. Its collections include paleontological, mineralogical, and lithological specimens, its collection of meteorites is one of the largest in Poland, and its mineralogical holdings include the 19th-century collections of Antoni Waga and Ignacy Domeyko (from South America). The Museum of Evolution of the PAS Institute of Paleobiology has the mission of popularizing knowledge about the evolution of life on Earth. The topics of museum classes and trainings are focused around significant problems in modern evolutionism, such as mankind’s origins, the vertebrates’ conquering of land, and the causes of the dinosaurs’ extinction.

The PAS Botanical Garden is considered the leading botanical garden in Poland and one of the leading such facilities in Europe. Its extensive plant collections are maintained for research purposes, protecting the floral biodiversity, and for the purposes of education and popularization. Its research objectives include developing and maintaining a gene bank for crop plants and wild plants, including species threatened with extinction. The Kórnik Arboretum of the PAS Institute of Dendrology has been in existence since 1826, holds an extensive collection of trees and bushes native to various climactic zones on the globe. They are the object of comprehensive research conducted by the Institute, the results of which are utilized in forestry and landscaping (tree cultivation in cities and residential areas), and are increasingly helping protect the environment and promote the afforestation concept. The PAS Institute of Botany pursues projects and re-

search programs that are aimed at cultivating the landscape and the biological diversity of Poland and Europe, creating effective strategies for protecting natural genetic resources, and defining European-rank floral-haven areas on Polish territory. The PAS Institute of Pharmacology maintains the Garden of Medicinal Plants with a collection of domestic and foreign plants (cultivated in field or greenhouse), which provides a base of materials for phytochemical research.

The mission of the PAS Mammal Biology Institute is to acquire, expand, and disseminate knowledge about nature and natural processes in order to ensure scientific support for effective protection of nature and for sustainable development, especially of the Białowieża National Park, a unique research area (a UNESCO Biosphere Reserve and a site of World Heritage). The PAS Nature Protection Institute, which has tradition stretching back to 1919, addresses issues in the fields of ecology, biology, and conservative geology, laying the scientific groundwork for modern protection of the natural environment. It is involved in devising species- and area-protection strategies, as well as strategies for managing Poland's natural abiotic and biotic resources. As part of its application-focused activity, the Institute runs part of the nationwide-scope NATURA 2000 program and is involved in a regional international program called „Carpathian Biodiversity,” aiming to provide expert support for authorities devising new legal regulations pertaining to the protection of the natural environment, forest management, and hunting and fishing management. The PAS Institute of Oceanology, as a partner in the European program ZOSTERA, is involved in reviving fundamental elements of the environment in the Bay of Puck (fish, reeds, and

sea grass), and as coordinator of the „Habitat Mapping” project it has participated in preparing the first comprehensive map of the habitats of Poland's sea regions, crucial for preserving biodiversity and also for special planning within the maritime regions of NATURA 2000.

The Antarctic Biology Department of the PAS Institute of Biochemistry and Biophysics conducts monitoring research at a year-round Antarctic station (including ecological, glaciological, and meteorological monitoring) and is also engaged in a cycle of geological and paleolimnological research in East Antarctica. This work is of particular scientific importance, and it also boosts Poland's position among the countries deciding about the future of Antarctica – an area that constitutes a unique natural environment, while at same time exerting significant impact on how the global climate develops.

The PAS Research Station for Ecological Agriculture and Preservation of Native Breeds has for more than half a century been pursuing an agenda of enriching and rescuing Poland's natural resources. In view of its unique location and natural advantages—at the heart of the Pisz Forest, on a peninsula surrounded by Poland's biggest lakes—the facility is excellently poised for making such a research agenda a reality. The station has initiated and implemented a program of free-range breeding of the Polish primitive horse, farm-breeding programs for beaver and deer, and conservational breeding programs with rare Polish breeds of cattle, as well as work in the field of proecological agriculture, biological shaping of diverse forest ecosystems, regenerating natural forest resources, and studying the impact of tourism on forest ecosystems.















**The PAS Archives** facility, since its inception in 1953, has focused on its fundamental statutory objectives of gathering, preserving, compiling, safeguarding, researching, and providing access to archival materials, in addition to its informational and popularizing activity. The Archives has a branch office in Poznań, as well as another in Katowice. The Archives holds various types of historical materials on trust, including the records of various research institutions, editorial boards, and committees, documents produced by the bodies of the Polish Academy of Sciences, as well as the personal legacies and archives of outstanding Polish scholars and scientists. In order to safeguard the collections, including photographic records, the archival materials are gradually undergoing digitization and conservation. One important task of the Archives is to facilitate access to its archival materials to all interested users.

The central Warsaw branch of the PAS Archives acts as the organizer and co-organizer of numerous conferences, seminars, and workshops. These meetings are usually devoted either to archival methods, or to the prominent scientists whose legacies are preserved in the collections. In 1990, the PAS Archives developed and produced Poland's only guidelines for handling and organizing such sets of personal files. The PAS Archives also published the annual journal *Biuletyn*, describing the results of ongoing archival work and publishing indexes of the sets of records preserved in the collections.

As a way to popularize the history of science and publicly showcase the archival holdings, the PAS Archives organizes thematic exhibitions. The poster exhibition „History of the Staszic Palace”, e.g., currently installed at the Staszic Palace, offers a

chance to get to know the history of this outstanding building. Another exhibit that continues to enjoy unwavering popularity is „Polish Researchers of Siberia,” which officially opened in Moscow in 2008, as part the „Polish Science Days” event in the Russian Federation. The exhibit has been shown to the public in Irkutsk, Yeniseysk, Krasnoyarsk, Ulan Ude, Kyakhta, Tomsk, Novosibirsk, Warsaw, Gdańsk, and Barnaul. Two other poster exhibitions devoted to Marie Skłodowska-Curie and Leon Barszczewski have for several years now been put on display in numerous cities in Poland and Europe.

The PAS Archives is involved in organizing the annual nationwide „Museums Night” event in Poland. It also acts as an initiator and one of the co-organizers of the „Archives Picnic” event, aimed at attracting attention to the role of documents in our daily lives and the function of archival institutions in the modern world.

Another notable project co-organized by the Archives is the „Days of the Polish Museum in Rapperswil” event, together with 11 participating Warsaw-based archives, libraries and museums whose collections contain remnants of the Polish library-in-exile once functioning in Rapperswil, Switzerland, and other related items.

Information about all the scientific and popularizing events sponsored by the PAS Archives is posted on the PAS Archives website, as well as in the multimedia kiosk station situated in the main hall of the Staszic Palace. The individual events are also recorded in promotional films.

**The Joint PAS-PAAS Archives in Kraków** preserves and provides access to the archival materials of the Cracovian Scientific Society, the Polish Academy of Arts and Sciences (PAAS, also known by the Polish abbreviation „PAU” for *Polskie Akademia Umiejętności*), and other learned societies and research institutions, as well as the archival materials of the Polish Academy of Sciences – the PAS institutes, departments, units, and territorial branch in Kraków, plus the personal archives of prominent scientific and cultural figures affiliated with the region. Preserved archival book collections also act in a supplementary role, such as the personal book collection of the late Prof. Henryk Barycz and the „Rozdół Library” of the Lanckoroński family. The PAS-PAAS Archives facility systematically studies and safeguards its archival materials. In 2006 it embarked on a program of digitizing its archival materials, and work is also underway on cataloging and digitizing the photographic records.

Twice a year, exhibitions are organized in the cycle „In the service of science...”, devoted to Polish scholars. In 1996-2010, 26 exhibitions were organized. On display since June 2011 is the exhibition „Pathways of Life and Science: Andrzej Pelczar (1937-2010).” Since 2005, the Joint PAS-PAAS Archives has continued its „Travels of the Scholars...” and „Natural Sciences in Archives” cycles. An exhibit entitled „Turn Your Eyes to Nature: The Floral World as Reflected in Archives” was put on display in the Palace of Culture and Science in Warsaw.

The Joint Archives in Kraków organized a conference, in conjunction with the PAAS Commission on the History of Science, devoted to various aspects of archival work. The facility also collaborates with other domestic and foreign archives. Particu-

larly noteworthy in this respect is its cooperation with the Archives of the Academy of Sciences of the Czech Republic and the Archives of Charles University in Prague under the framework of the joint research project „Czech-Polish Scientific and Cultural Contacts in the 19th and 20th Centuries.” Source editions of materials have been jointly published covering Tadeusz Kowalski’s Correspondence with Jan Rypka and Bedřich Hrozný and Scientists Amidst Big Politics: The Paris Peace Conference in the Diary of Adolf Černý and the correspondence between Kazimierz Nitsch and Václav Vilém Štech. The Archives collaborates with scientists from Shimane University in Japan and the Department of Turkish and Inner Asian Peoples at Warsaw University’s Faculty of Oriental Studies with the aim of studying and publishing materials pertaining to the Buddhist monastery of Erdene Dzuu from the private collections of Władysław Kotwicz (1872-1944).

The collections of the Joint PAS-PAAS Archives have served as the basis for monographs concerning the history of science, such as the *Poczet członków Akademii Umiejętności i Polskiej Akademii Umiejętności w latach 1872-2000*, a thorough listing of the members of the Polish Academy of Arts and Sciences and its predecessor institution.



- **The Gdańsk Library**
- **The Kórnik Library**
- **The Museum of the Earth**
- **The PAS Botanical Garden-Centre for Biological Diversity Conservation**

**The Gdańsk Library**, incorporated as a auxiliary research unit within the structure of the Polish Academy of Sciences on 1 January 1955, was first founded in 1596 as Bibliotheca Senatus Gedanensis and is one of the most extensive and oldest libraries in Europe. It grew mainly out of the Renaissance book collection of the Italian humanist Giovanni Bernardino Bonifacio, when he bequeathed 1,140 volumes of immense value to the city. That donation (plus the collections to which it was added, which the city had already previously begun to accumulate) ultimately became the core of the collections of the Library of Gdańsk City Council, inaugurated in the final years of the 16th century.

Successive centuries saw the collections continuously expanded by means of various bequests, donations, and also purchase acquisitions. Theological and historical works, tomes on natural science, medicine, mathematics, and astronomy, logical and legal treatises, and also works of literature – all of these expanded and enriched the broad profile of the Gdańsk Library's historical collections. With time, however, the collections became largely focused on their current profile of the humanities (in the broad sense). Both centuries ago and today, there has been a special emphasis on topics particularly related to Gdańsk, the region of Prussia, Pomerania, and the Baltic Sea areas.

The Gdańsk Library collections, now numbering more than 850,000 catalogued items, include a vast array of books and periodicals, manuscripts, incunabula, old prints, graphic and cartographic works, ex libris bookplates, numismatic items, photographs, materials documenting social life, theatrical and musical documents, museum exhibits, as well as microfilm, audiovisual and electronic documents, and digital copies of the most precio-

us items. Full-text copies are nowadays being made available on the „Pomeranian Digital Library” website.

In view of its centuries-long existence, the Gdański Library is both a natural center for scholarly activity and a exhibition-oriented institution holding precious, often unique items listed as part of the National Library Base.

The vast collections of the Gdańsk Library, having previously been cataloged by traditional means, for more than a decade now have been successively cataloged in the VTLS VIRTUA system (accessible at [www.bgpan.gda.pl](http://www.bgpan.gda.pl)).

Alongside its statutory tasks of gathering, compiling, and providing access to its collections, the Library also strives to fulfill important educational and popularizing functions. Research conferences, sessions, exhibits and demonstrations, library lessons, book promotions, readings, and visits by foreign guests are all additional activities performed by the Library. The Library moreover does bibliographical work on its own collections, publishes catalogs of the most precious holdings, and issues its own library-science periodical *Libri Gedanenses*.

All of the treasures of cultural heritage in the Library's possession are subject to continual processes of preservation and protection – ranging from ensuring optimal storage conditions, through conservation intervention and archiving efforts (scanning, microfilming), all the way to physical and electronic security and monitoring. The Library is continually striving to remain a modern institution staying abreast of the modern age, devoted to the service of science, skillfully protecting the cultural heritage entrusted to it while at the same time broadly promoting the value inherent in them.









The **Kórnik Library**, founded by Tytus Działyński back in 1826, is today one of the country's oldest institutions with unique collections of written material and museum items, comprising part of Poland's National Library Base. The library has offices in Poznań and in Kórnik, housed in historic listed buildings. In keeping with its statutes, the Library collects publications linked to the history of Polish and foreign literature and culture, organizes source materials, archives, digitizes, and provides access (via the „Digital Library of Wielkopolska” platform) to its special collections and 19th-century prints and periodicals, as well as publishing its own periodical, *Pamiętnik Biblioteki Kórnickiej*.

The Library's precious holdings of manuscripts and old prints, plus newer publications, are being systematically expanded. The same can be said for the museum holdings, as the Kórnik Library is also a museum boasting collections of paintings, graphic art, sculptures, photography, cartography, numismatic and military materials, porcelain items, furniture, and day-to-day items.

Protecting the wealth of cultural heritage gathered by the founders of the Kórnik Library (the Działyński and then Zamoyski families), is one of the most important statutory objectives of the facility. Such precious holdings require constant care, in terms of both conservation and prevention, and both the library and the museum collections are kept by professional staff. In addition, the Działyński Palace on Poznań's Old Market Square and the Kórnik Castle with attached buildings are also the subject of revitalization work to restore their former glory. Moreover, the historic buildings in Kórnik are under round-the-clock physical security and video monitoring.

The Kórnik Library is currently engaged in a number of research projects:

- „16th-17th Century Printing in Wielkopolska,” aiming to develop a database of old prints from the region,
- „The Journals of Baron Tassil von Heydebrand on His Voyage Around the World,” in which the memoirs left behind by a Prussian diplomat from Osieczna (the owner of the world's largest chess library which was bequeathed to the Kórnik Library after the war) as a record of an around-the-world trip will be interpreted and translated into modern German and further supplemented with an introduction, notes, indexes, iconography, and a translation into Polish,
- „Catalog of Old Polish Manuscripts from the 16-17th Centuries at the Kórnik Library, vols. 3 and 4,” in which very precious materials concerning Polish history and culture will be cataloged (traditional and electronic form), including sources on the reigns of Polish kings, on the history of Polish parliamentarianism, the history of the Polish church and clergy, and the property ownership documents of many prominent landowning families,
- „Description of the Journey of Lucjan Jurkiewicz and His Stay in Sakhalin 1886-1892 (from the collections of the Kórnik Library,” examining the interesting descriptions provided by Jurkiewicz (a Pole serving in the Russian military) of the life of local Russian officials, forced settlers, and the indigenous population in the Russian Far East,
- „The Poetics of Gallus Anonymous against the Backdrop of Contemporary Latin Writings,” with the aim of situating the writing style of Poland's first historian within the wider context of Latin writings during his age.

The Library has completed the following research projects:

- „POLONIA MAYOR – FONTES,” with the aim of developing an electronic version of selected manuscript sources for the 13th-18th century history of the Wielkopolska region and making them available via the „Digital Library of Wielkopolska” platform; the digitized sources include the oldest visitations by the Gniezno and Kalisz archdeaconry in the 17h-18th centuries, cartularies of documents listed among the records of the Gniezno consistory in the 15th-16th centuries, audits of royal assets in the Kalisz and Poznań voivodships in 1765 and 1789, documents from the 13th-15th centuries and copies of selected materials concerning the history of cities, castles, crafts, plus cartographic plans, visualizations, and pictures of monuments (the results can be accessed at <http://www.wbc.poznan.pl/publication/76602>),

- „CACAO (Cross-language Access to Catalogues And Online libraries),” with the objective of developing the proper infrastructure to enable interested users to search for content in various languages based on queries posed in their own language. The project was a joint effort by partners from: the Xerox Research Center, France (Cité des Sciences et de l’Industrie – CSI), Germany (Goettingen State and University Library), Italy (Free University of Bozen-Bolzano – FUB, CELI – Language & Information Technology; Gonetwerk), Hungary (Hungarian Academy of Sciences – Research Institute for Linguistics – HAS-RIL; the National Széchényi Library – NSL) and Poland (the PAS Kórnik Library). Design work led to the development of a common access point to the catalogs of all the libraries taking part in the project (<http://demo.celi.it:8095/cacaoUI/>) as well as three thematic portals: for mathematics ([\[cross-library.com/mathematics-portal/\]\(http://cross-library.com/mathematics-portal/\)\), geography \(<http://geography.cross-library.com/>\) and European history: \(<http://history-of-europe.cross-library.com/>\), meant to serve as demonstration examples applying the tools developed under the project,](http://mathematics.</a></li></ul></div><div data-bbox=)

- „Creating a Digital Collection of the Manuscripts and Prints of Józef Maria Hoene-Wroński (from the collections of the Kórnik Library),” during which the manuscripts and printed works of an outstanding mathematician and philosopher, a precious part of the Kórnik Library collections, were made available online via the „Digital Library of Wielkopolska” platform.







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**The Museum of the Earth** continues the traditions initiated by the Polish Earth Museum Society back in 1932, and has been operating within the structure of the Polish Academy of Sciences since 1959. The Museum is housed in two historic buildings situated on the Vistula escarpment in Warsaw, within a 18th-century park-and-palace complex known as „Na Górze.” The museum is a multifaceted institution which, aside from its basic mission of gathering collections and preserving geological heritage, is engaged in research and documentation work as well as broad activity to raise public awareness about the Earth sciences and the natural world. The collections include extensive collections of minerals and rocks, meteorites, fossil flora and fauna found in Poland and elsewhere in the world, and also valuable archive materials documenting the history of the Earth sciences. Of particular import are the extensive collections of Baltic amber and other fossilized resins, considered one of the largest such museum collections of its type in the world. It is also noteworthy that the Museum is home to Poland’s only research unit gathering and compiling archive materials that pertain to the history of the Earth sciences.

The Museum puts together standing and temporary exhibits to display in its own premises, as well as travelling exhibitions showcased at numerous Polish and foreign museums. The exhibitions „Only One Earth,” „Processes Shaping the Earth,” „The Earth’s Geological Past,” „When Coal Was Formed,” „History of Geology,” „Granites, Granites...,” „Amber – From Liquid Resin to Decorative Art” and „Meteorites – Stones from the Sky” have been presented at the Museum’s own facilities. The exhibitions „Construction Stone,” „Glacial Erratic Stones,” and

„Relict Plants” can be found in the Museum’s outside space. The temporary exhibitions comprise two different thematic cycles: „Nature and Technology” and „Nature and Art.”

Work on studying and compiling the Museum’s holdings are mainly done by the Museum staff on its own, but also in cooperation with other national research institutions (such as the PAS Institute of Botany, the Warsaw University Institute of Basic Geology, and the Polish State Geological Research Institute) and foreign research bodies (such as the Institute of Paleontology of the Russian Academy of Sciences, the RAS Institute of Archeology, and the Hungarian Museum of Natural History). Museum staff members also participate in research teams pursuing projects coordinated by other institutions.

The Museum also organizes annual „Amber Researcher Meetings,” confirming its own prominent reputation in this field. These events serve as a national and international forum for exchanging research information concerning amber and other fossilized resins.

For many years, the Museum has also been supporting regional museums in terms of valorizing geological collections, assisting with specialist conservation work (such as with the fossilized bones of Pleistocene mammals), and providing selected specimens on loan.

The Museum systematically takes part in special events of a nationwide and worldwide scope, preparing special exhibition and education programs, such as the „Museum Night” events, the Science Festival, the Science Picnic organized by Polish Radio and the Copernicus Science Center, the Jurassic Picnic in the Holy Cross Mountains, and the European Heritage Days.

Striving to seize sometimes unconventional opportunities to promote broader public awareness of the natural world and reach out to the broadest possible audience, exhibition demonstrations prepared by the Museum's staff are frequently featured even at commercial/hobbyist events such as the „Amberif” International Amber Fair, the „Gold-Silver-Time” Jeweller's Fair, and the „Geological Fair.”

The Museum is particularly active in terms of Earth-science educational efforts addressed to a broad range of recipients (from preschoolers all the way up to „Third Age University” students) and in diverse forms (exhibition tours, museum lessons and workshops, online information), and it also provides geological consultation to collectors, combined with general specimen-marking services.







**The PAS Botanical Garden – Centre for Biological Diversity Conservation** is a research unit of the Polish Academy of Sciences with very distinctive profile of activity: alongside its high-caliber, typical research activity in the fields of botany, genetics, biotechnology, ecology, and horticulture, it is also broadly involved in education and science-popularizing activity on topics broadly related to protecting the environment, the natural world, and biodiversity.

The creation of the Botanical Garden in 1974, as an independent research unit of the Polish Academy of Sciences situated in Powsin on the southern edge of Warsaw, marked the culmination of more than 40 years of efforts by botanists to establish a large, modern botanical garden in Poland. Initial plans called for the Garden to occupy more than 200 ha on both the upper and lower terraces of the Warsaw Escarpment; these plans were later altered in the 1980s and the Garden's size reduced to 40 ha, solely on the upper terrace of the Warsaw Escarpment, between the Park of Culture in Powsin and the municipality of Klarysew. In 1990, the Garden was made open for public visitation. It is currently active throughout the year, and visited by 130,000-180,000 individual annually. Interested guests particularly throng to the Garden in the springtime months, especially April and May, when the impressive magnolias, rhododendrons, and azaleas are in bloom.

The Garden's main divisions are a section for Polish flora, an arboretum, a section for decorative plants, a second for horticultural plants, and (in greenhouses) a section for warm-climate plants. Numerous events promoting botanical awareness are organized for visitors, especially concerning threats to the environment and biological diversity, as well as exhibitions of

nature-inspired art – including paintings, artistic photography, and sculpture. In the spring and summer months, piano concerts renowned throughout the country (and even abroad) are held on the grounds, including the annual „Musical Floralia Festival – Music Amidst Flowers.” A very important social role is played by the Nature and Ecology Education Center, in operation for 16 years now. Throughout the year, the Center's modern facility is used to provide educational classes to school pupils on all levels (from preschool to high school), concerning general biology, environmental protection, biodiversity, and horticulture.

The PAS Botanical Garden in Powsin is considered Poland's leading botanical garden and one of the top-ranking centers in Europe. Its extensive plant collections, including more than 9,000 taxons (species and varieties) of plants, are used for research purposes, for safeguarding floral biodiversity, and for the purposes of education and science-popularization. Some of them represent the largest collections in the country, such as the collection of historical and modern varieties of roses, recognized as a national collection by the Polish Botanical Garden Society. Efforts to popularize domestic flora are facilitated by an extraordinarily rich collection of species of plants that grow wild in Poland, including nearly 700 species, representing around one-quarter of all Poland's vascular flora. The plants are cultivated in artificial habitats under similar-to-natural conditions. The collection of plants from the Polish mountains is presented in artificial environs providing conditions typical of the Tatra, Pieniny, and Bieszczady mountain ranges, making it possible to enjoy an impressive „mountain hike” without leaving Warsaw.

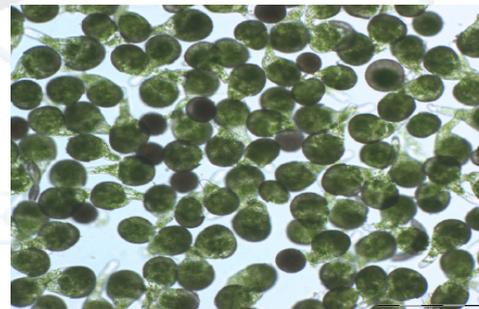
The Garden's main activity, however, remains research-focu-

sed, involving the description of plant types, evaluating the threat to them, protecting them under artificial (*ex situ*) conditions, and safeguarding biodiversity. Hence the full name of the facility: the PAS Botanical Garden – Centre for Biological Diversity Conservation. Since its inception, the Garden has been engaged in researching the genetic resources of crop plants. In the 1990s, this research was expanded to include protecting Poland's natural flora. At present the Garden is one of the world's significant gene banks for the rye plant and the apple tree. It boasts a collection of more than 2,500 taxons of the rye genus *Secale*, including genetic material unique on a worldwide scale of the „primitive germplasm” of the genus, representing wildly occurring *Secale* species, locally cultivated forms, and old historical varieties of rye, as well as cultivar lines that are sources of rare genes for breeding. Another very valuable collection, embracing historical varieties of the apple tree, includes more than 700 varieties that have at some point been cultivated in the historical Polish lands from the Middle Ages until World War Two. This collection is maintained in the form of a pomological orchard, accessible to visitors. In recent years work has been initiated on creating a gene bank for these apple trees, in the form of liquid-nitrogen cryopreservation of buds. Liquid-nitrogen cryopreservation has also been used to preserve the seeds of endangered plants from native Polish flora.

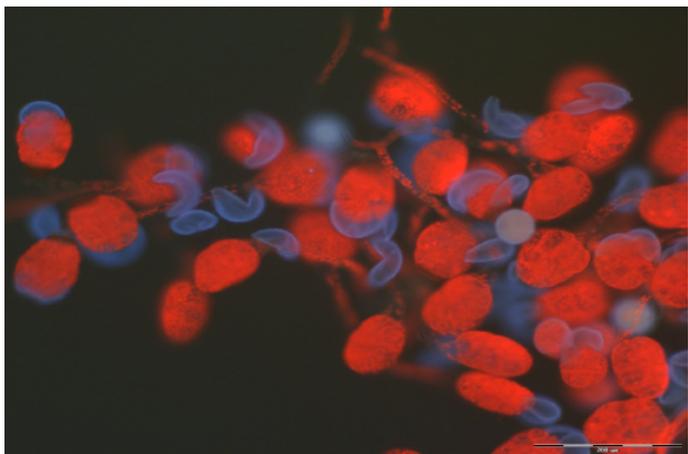
The Garden's unique cryogenic seed bank of the vascular flora of Poland is considered a national-rank seed bank, and includes more than 100 species of plants facing the highest degree of endangerment, taken from more than 300 naturally occurring locations. The Garden's long-term plans call for this bank to include seeds of all the species threatened in their natural habi-

tats. To develop effective methods for preserving the diversity of plants under artificial conditions, broad research is conducted into population genetics, ecology, physiology, and biotechnology. Also noteworthy is the research utilizing biotechnological techniques for cryopreservation of ferns and vegetatively propagated ornamentals. The Garden's research on urban vegetation is of great importance to Warsaw and its inhabitants, studying the condition and endangerment of such vegetation and introducing new methods for cultivating and caring for trees on the streets of Warsaw, with the aim of eliminating the harmful impact of pollutants. The Garden also maintains a branch facility in Mikołów in the Upper Silesia region, where alongside the newly created Silesian Botanical Garden there is a Plant Structure Laboratory conducting highly respected research on the functional and developmental anatomy of woody plants.

The PAS Botanical Garden – Centre for Biological Diversity Conservation works in very close collaboration with all the botanical gardens in Poland and with many renowned botanical gardens in Europe, Asia, Africa, and North America.





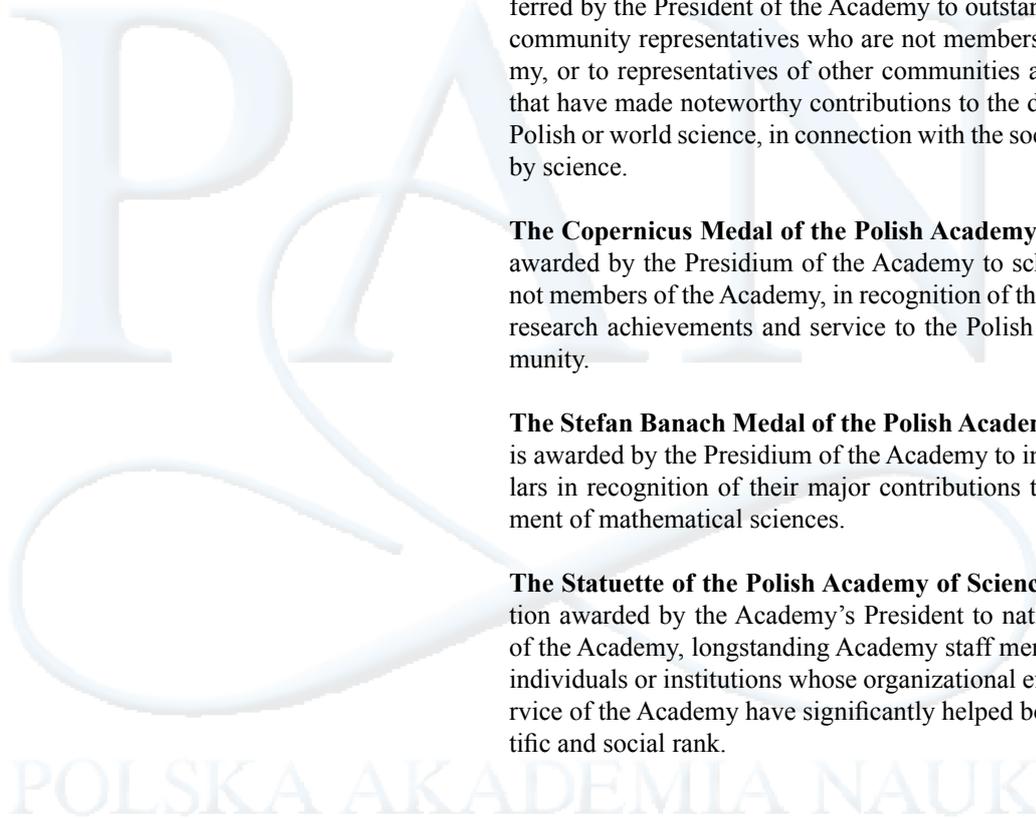


**The Medal of the Polish Academy of Sciences** is an award conferred by the President of the Academy to outstanding research-community representatives who are not members of the Academy, or to representatives of other communities and institutions that have made noteworthy contributions to the development of Polish or world science, in connection with the social role played by science.

**The Copernicus Medal of the Polish Academy of Sciences** is awarded by the Presidium of the Academy to scholars who are not members of the Academy, in recognition of their outstanding research achievements and service to the Polish research community.

**The Stefan Banach Medal of the Polish Academy of Sciences** is awarded by the Presidium of the Academy to individual scholars in recognition of their major contributions to the development of mathematical sciences.

**The Statuette of the Polish Academy of Sciences** is a distinction awarded by the Academy's President to national members of the Academy, longstanding Academy staff members, or other individuals or institutions whose organizational efforts in the service of the Academy have significantly helped bolster its scientific and social rank.





Medal of the Polish Academy of Sciences

Statuette of the Polish Academy of Sciences

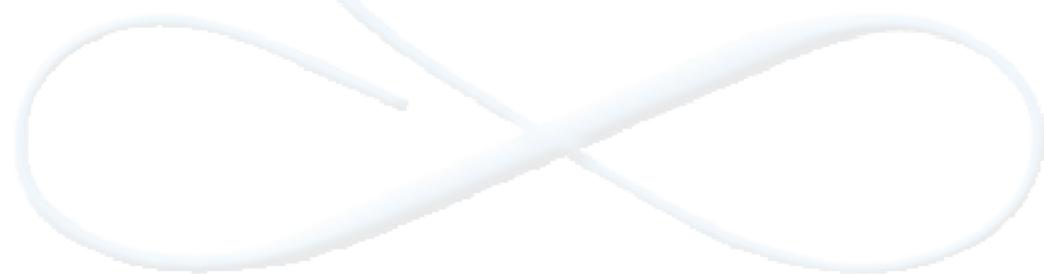


Stefan Banach Medal  
of the Polish Academy of Sciences



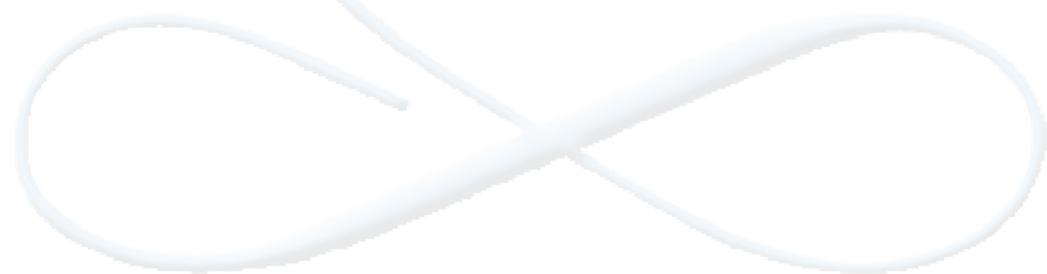
Copernicus Medal  
of the Polish Academy of Sciences

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