2023
Annual Report

of the Czech Academy of Sciences

Top research in the public interest

Czech Academy of Sciences

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Interview with the President of the Czech Academy of Sciences

Economically, 2023 was a very difficult year for the Czech Republic. How would you characterise 2023 from the perspective of the Czech Academy of Sciences?

The impact of the energy crisis and high inflation have understandably had an adverse effect on the work of our research institutes, despite the many cost-saving measures we have taken. In an effort to protect staff capacity at our research institutes to the greatest extent possible, we have pursued savings primarily in building and equipment investments and have focused only on essential maintenance of buildings, laboratories and other facilities. In 2023, for example, we financed the purchase of only two costly instruments, both of which had already been contracted the previous year. A further complication was the fact that, at the end of the third quarter, we had to transfer CZK 100 million to the Ministry of Labour and Social Affairs' budget to reinforce pension insurance benefits, from a subsidy of CZK 200 million we had just received for partial compensation of energy prices. It was indeed a year of tough austerity measures. I consider it a great success, therefore, that the co-financing of the COMPASS-U - Tokamak project of the Institute of Plasma Physics has been secured from 2023 on. I am likewise pleased that the Czech Academy of Sciences is, despite limited institutional funding, unequivocally the most productive scientific research institution in the Czech Republic, with a number of research teams which are global leaders in their fields.

The role of science is crucial in times of crisis. The CAS has put forth research priorities such as resilient societies, food security and clean energy. Why have these areas been chosen?

These priorities have not been chosen randomly, of course - they are based on longstanding research concentrated in our Strategy AV21 programmes. These are therefore priority areas through which we respond to current challenges and issues of contemporary society in line with our vision of "Top research in the public interest". Accordingly, we also chose them as topics for the Czech Presidency of the Council of the European Union in the second half of 2022. A resilient society encompasses various aspects: from resilient communities, families and individuals to circular economies, to trust in institutions and resilience to disinformation and its dissemination. The issue of food security responds to future problems of food scarcity and climate change, as well as recent progressive developments in molecular genetics methods. Looking forward, we will focus on low-emission and safe energy. The current situation around energy and extreme weather events confirms how timely these issues are.

Which CAS institute scientific results excited you the most?

We have achieved a number of significant scientific results across research areas. Let me mention at least two examples with outstanding application potential. Researchers from the Institute of Scientific Instruments developed a unique VDI technology for monitoring cardiac activity, which provides physicians with easy and fast diagnostics, simplifies procedures, and above all improves patients' quality of life. The technology has won many awards, led to the founding of a start-up and is protected by European and US patents. Another example of successful transfer of basic research into practice is the SophoMer technology for preparation of polymer biomaterials, developed by scientists from the Institute of Macromolecular Chemistry. It has the potential for application in biochemical laboratories, monitoring of environmental contamination and determination of allergens in food laboratories. The SophoMer technology led to the founding of a start-up and signing of a licensing agreement. Congratulations on these achievements.

Last year was also significantly affected by the international situation, especially Russia's ongoing war against Ukraine and the Hamas terrorist attack on Israel. How is the CAS assisting Ukrainian and Israeli scientists?

Since the beginning of the conflict in Ukraine, we have been offering internships, jobs as well as accommodation and other forms of support to university students, postdocs and researchers from Ukraine. We also introduced the Researchers at Risk Fellowship programme, an international collaborative effort to support Ukrainian researchers. Through the fellowship, we have supported 58 researchers with approximately CZK 44 million to date. Immediately after the terrorist attack in Israel, the Academy of Sciences offered assistance to Israeli scientists and expressed support to partner organisations. Scientists cannot remain silent in the face of these armed conflicts.

Prof. RNDr. Eva Zažímalová, CSc., dr. h. c.
President of the Czech Academy of Sciences

Mission and Structure

of the Czech Academy of Sciences

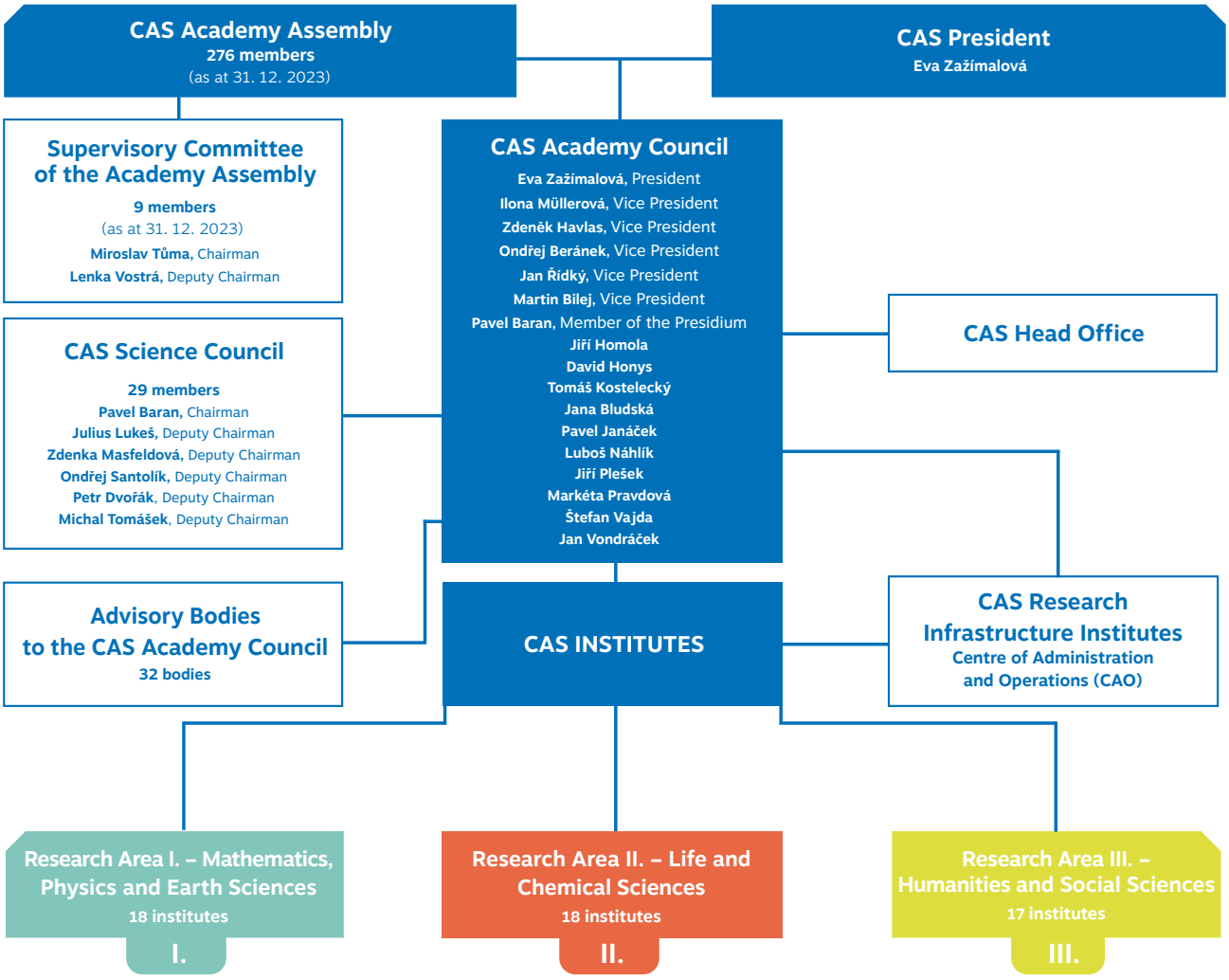
The Czech Academy of Sciences (CAS) was established by Act No. 283/1992 Coll. The CAS conducts research through its institutes which are established as public research institutions. More than 11,000 employees work at the Academy, over 7,000 of whom are university-educated.

The primary mission of the CAS and its institutes is to conduct research in a broad spectrum of natural, technical and social sciences and the humanities. This research, whether highly specialised or interdisciplinary in nature, aims to advance the development of knowledge at an international level while respecting the current needs of Czech society and culture.

The institutes of the CAS take part in education, primarily by educating young researchers in doctoral study programmes, as well as through the pedagogical activities of CAS researchers at universities.

The CAS also develops cooperative ties with applied research and industry. The Academy's numerous joint international projects and exchanges of researchers with partner institutions abroad reinforce the integration of Czech science into the international context.

The structure of the CAS is illustrated on the following page.



Section 1
of Mathematics, Physics and Computer Science

Astronomical Institute
Institute of Physics
Institute of Mathematics
Institute of Computer Science
Nuclear Physics Institute
Institute of Information Theory and Automation

Section 2
of Applied Physics

Institute of Photonics and Electronics
Institute of Physics of Materials
Institute of Plasma Physics
Institute of Scientific Instruments
Institute of Theoretical and Applied Mechanics
Institute of Thermomechanics

Section 3
of Earth Sciences

Institute of Geophysics
Institute of Geology
Institute of Atmospheric Physics
Institute of Geonics
Institute of Hydrodynamics
Institute of Rock Structure and Mechanics

Section 4
of Chemical Sciences

Institute of Analytical Chemistry
Institute of Inorganic Chemistry
J. Heyrovský Institute of Physical Chemistry
Institute of Chemical Process Fundamentals
Institute of Macromolecular Chemistry
Institute of Organic Chemistry and Biochemistry

Section 5
of Biological and Medical Sciences

Institute of Biophysics
Institute of Biotechnology
Institute of Physiology
Institute of Microbiology
Institute of Experimental Botany
Institute of Experimental Medicine
Institute of Molecular Genetics
Institute of Animal Physiology and Genetics

Section 6
of Bio-Ecological Sciences

Biology Centre
Institute of Botany
Institute of Vertebrate Biology
Global Change Research Institute

Section 7
of Social and Economic Sciences

Library of the CAS
Economics Institute
Institute of Psychology
Institute of Sociology
Institute of State and Law

Section 8
of Historical Sciences

Institute of Archaeology, Brno
Institute of Archaeology, Prague
Institute of History
Masaryk Institute and Archives
Institute of Art History
Institute of Contemporary History

Section 9
of Humanities and Philology

Institute of Ethnology
Institute of Philosophy
Oriental Institute
Institute of Slavonic Studies
Institute of Czech Literature
Czech Language Institute

Czech Academy of Sciences in the System of Research, Development and Innovation

The Czech Academy of Sciences (CAS) is part of a Czech tradition of scientific institutions that dates back almost 300 years which began with the founding of the first enlightenment society, Societas incognitorum, in Olomouc (1746), continued with the Prague-based Private Society of Sciences (1769), which was the basis for the Royal Czech Society of Sciences (1784), and led finally to the founding of the Emperor Franz Josef Czech Academy for Science, Literature and Art (1890–1952), the direct predecessor of the contemporary CAS.

Although in 2023 the Czech Academy of Sciences – like all of Czech society – grappled with the impacts of the energy crisis, which, despite a number of austerity measures, adversely affected the budgets of all CAS institutes, it continued the legacy of its predecessors and, in accordance with its long-term development concept, in rigorous research, educational, popularisation and cultural work. Despite all of the issues it faced, the Czech Academy of Sciences continues to maintain its position as the most productive Czech scientific research institution. According to the latest data from the Research, Development and Innovation Council, the CAS contributed to the production of approximately 45% of excellent scientific results in the Czech Republic according to the Methodology M17+, although the CAS has less than 12% of researchers in FTE (according to data from the Czech Statistical Office). The quality of research at the Czech Academy of Sciences is also evidenced by its numerous award-winning researchers. On the national holiday on 28 October, 2023, President Petr Pavel bestowed Czech state awards to individuals who included researchers from the Academy of Sciences. Microbiologist Helena Tlaskalová-Hogenová and astrophysicist Jiří Grygar received the Medal of Merit of the First Degree for services to the state in the field of science. From these examples and many other data – you can find the details in the specific chapters of the Annual Report – it is clear that the CAS strives to use public funds as effectively as possible and add value to the invested funding.

Special attention was also paid to supporting educational activities and further development of cooperation with universities, in almost all regions of the Czech Republic. The CAS' close links with universities are also demonstrated by more than 50 joint research institutes, several hundred joint research projects and grants and dozens of agreements on cooperation in the implementation of doctoral study programmes (a total of 216 jointly accredited programmes with universities). In connection with the planned reform of doctoral studies financing and the amendment to the Higher Education Act, which is overseen by the Ministry of Education, Youth and Sports, the CAS recommended that the amendment be modified to enable greater engagement of cooperating institutions' representatives in the work of doctoral study subject area boards. The CAS also raised a comment to clarify how income from collaborating CAS institutes can be included in doctoral scholarships. These recommendations are intended to further deepen partnerships between CAS institutes and universities in mentoring and educating doctoral students.

The CAS also continued collaborating with the business sector by seeking new contacts, supporting knowledge and technology transfer (KTT) to economic and social practice and creating an enabling organisational and legal environment for KTT. In 2023, the Academy Council, in cooperation with the Technology Transfer Office (TTO), prepared a new transfer support programme called the Programme for Application Development and Commercialisation (abbreviated as PRAK) and selected ten projects for inclusion in this programme. The objective of the programme to accelerate the transfer of scientific results with application potential into practice, secure funding for related activities and motivate researchers to pursue KTT, thereby supporting fields with high added value of knowledge and highly qualified human labour in the Czech economy. The programme envisages interconnections between transfer activities and the priorities of Strategy AV21 programmes.

The CAS also built on previous fruitful efforts that have significantly advanced cooperation with both chambers of the Parliament of the Czech Republic and the Government of the Czech Republic. The aim is to provide Parliament, the Government and other state and regional administrative authorities with qualified expertise to improve the quality of decision-making processes (e.g. through AVex expert opinions). The Strategy AV21 platform has proven effective in addressing concrete scientific issues that are crucial to contemporary society and has been exceptionally well-received by the political and business sectors and the general public.

In 2023, the CAS and its representatives played an active role in the preparation and implementation of a number of conceptual documents of fundamental importance for R&D&I. The key documents include the following:

- National Research, Development and Innovation Policy of the Czech Republic 2021+ (R&D&I 2021+)

- National Priorities of Oriented Research
- National RIS3 Strategy
- National Recovery Plan in the context of the Economic Strategy of the Czech Republic
- Innovation Strategy of the Czech Republic 2019–2030
- National Methodology M17+
- Amendment to Act No. 341/2005 Coll., on Public Research Institutions
- Preparation of a new law on research, development, innovation and knowledge transfer
- Development of the Czech state budget for 2022–2024
- Memoranda regarding support of research, development and innovation in the Czech Republic

National Research, Development and Innovation Policy of the Czech Republic 2021+ (R&D&I 2021+)

The National R&D&I 2021+ Policy is the overarching strategic national document on research, development and innovation, which plays an important role in the development of the state R&D&I budget. It is also a strategic framework for development of all components of the R&D&I system in the Czech Republic and sets forth measures ensuring the effective operation of the system. The policy was approved by Government Resolution No. 759 of 20 July 2020 and contains five strategic objectives, which are further elaborated into specific objectives. The CAS is actively engaged in implementation of all relevant parts of the National R&D&I 2021+ Policy. Major social challenges, as well as new technological trends, are consistently highlighted. In particular, the CAS focused on implementation of measure no. 27, which aims to redefine research priorities to increase the resilience of Czech society to global threats. These include e.g. climate change, environmental sustainability, energy, healthcare, quality of life, food security, the aging population, digitalisation and robotisation. The CAS addresses all of these issues rigorously via Strategy AV21 programmes, through which it responds to current social challenges in accordance with the CAS vision of conducting "top research in the public interest".

National Priorities of Oriented Research

The National Priorities of Oriented Research, Experimental Development and Innovation (NPOR) complement the National R&D&I 2021+ policy by setting long-term priority areas and objectives for R&D&I sectoral and thematic focal points. The priority areas are grounded in crucial societal needs and are set through a top-down analysis and consultation process. They serve to stimulate the implementation of interdisciplinary research, strengthen collaboration between various R&D&I actors and ensure a coordinated approach to R&D&I support. A political decision was made with the intention of accelerating the development of new NPOR, despite the fact that the existing NPOR are valid until 2030. The Research, Development and Innovation Council (R&D&I Council) therefore initiated preparation of these priorities, which are intended to direct part of future national R&D&I to areas that will help address the major current and foreseeable future societal issues and challenges of the Czech Republic. CAS representatives participate in the process of formulating and preparing implementation of NPOR through relevant expert panels.

National RIS3 Strategy

The National Research and Innovation Strategy for Intelligent Specialisation of the Czech Republic 2021-2027 (National RIS3 Strategy) is one of the implementation tools of the National R&D&I Policy in regard to applied research in the Czech Republic. Priority themes are derived from identified market opportunities, build on strengths and are set through a bottom-up consultation process. The National RIS3 Strategy focuses mainly on supporting promising sectors and their transformation in relation to activities with a higher added value, through e.g. greater emphasis on support for digitalisation, nanotechnologies, biotechnology, photonics, artificial intelligence, advanced materials, etc. It is also an essential prerequisite for EU cohesion policy R&D&I interventions. CAS representatives participated in the preparation of the strategy. The European Commission approved a total funding allocation of EUR 4.7 billion for RIS3 priorities in the Czech Republic in 2021-2027.

National Recovery Plan in the context of the Economic Strategy of the Czech Republic

The CAS plays an active role in the implementation of the National Recovery Plan (NRP), which is part of the Economic Strategy of the Czech Republic under component 5.1 Excellent research and development in priority public interest areas in healthcare, which is overseen by the Ministry of Education, Youth and Sports (MEYS). This component supported the establishment of the National Institute of Virology and Bacteriology from the MEYS Exceles programme, whose main coordinator is the Institute of Organic Chemistry and Biochemistry, as well as a number of other projects engaging other CAS institutes. At its meeting on 14 June 2023, the Government of the Czech Republic discussed and approved the NRP update. A new science and research component was proposed, 5.3 A Strategically Managed and Internationally Competitive R&D&I Ecosystem, through which one of the reform measures, namely "Harmonize the methodological environment for provision of support for research, development and innovation from public funds and eliminate excessive administrative burden in research, devel-

opment and innovation" will be implemented, overseen by the R&D&I Council. CAS representatives, in cooperation with the component owners, will continue to closely monitor developments in this important area with the aim of engaging CAS institutes in activities implemented under this R&D&I policy reform.

Innovation Strategy of the Czech Republic 2019–2030

The CAS played a key role in the preparation, overall development and implementation of the Innovation Strategy of the Czech Republic, which contains the key goals and framework tools for anchoring science and research as one of the key components of the economic and public policy transformation in the Czech Republic. It is comprised of nine interconnected pillars that contain the existing situation, basic strategic goals and tools leading to implementation of the strategy. The pillars include: Funding and evaluation of research and development, Innovation and research centres, National start-up and spin-off environment, Polytechnic education, Digitalisation, Mobility and construction environment, Intellectual property protection, Smart investment and smart marketing. The strategy assumes an annual increase of 0.1% of GDP for science and research funding starting in 2020, reaching 2.5% of GDP in 2025 and 3% of GDP in 2030 (including 1% from public funding and 1.5% from business sources in 2025 and 2% in 2030). The fulfilment of objectives from the National R&D&I Policy and Innovation Strategy of the Czech Republic is also supported by essential documents concerning the financial stabilisation of science and research in the Czech Republic, and the Czech government's commitment to systematically increase institutional support for long-term conceptual development of research organisations by at least 4% per year.

National Methodology 2017+

Since 2017, research organisations have been evaluated at the national level in line with the Methodology for Evaluating Research Organisations and Research, Development and Innovation Purposed-tied Aid Programmes, approved by Government Resolution No. 107 on 8 February 2017 (Methodology 2017+). 2023 saw the completion of the sixth year of implementation of Methodology 2017+ at the national level, which includes the evaluation of research results in Module 1 - Quality of selected results and Module 2 - Research performance.

Based on the evaluation results in these modules, a tripartite meeting about the Methodology 2017+ evaluation results was held, which was attended by CAS representatives, the Vice-Chairman of the R&D&I Council and representatives of expert panels. The meeting resulted in an indicative ranking of research organisations according to the procedure prescribed by Methodology 2017+, which confirmed the CAS' continued position as a high-performing component of the national R&D&I system. The Institute of Psychology was moved to the highest category of the scale due to its excellent results in Modules 1 and 2.

In early 2023, taking into consideration its experience with the Methodology 2017+ evaluation process, the CAS prepared a document summarising the main comments and recommendations on Methodology 2017+ design and implementation and submitted it to the R&D&I Council.

Amendment to Act No. 341/2005 Coll., on Public Research Institutions

The Academy Council discussed the amendment to Act No. 341/2005 Coll. at an extraordinary meeting on 25 August 2023. The Academy Council requested that the text of the proposed amendment respect the competences of the CAS Academy Assembly and the specific position of CAS institutes. Specifically, it asked that any changes to the founder of a public research institution, whose founder is the Academy of Sciences, be made only on the basis of the approval of the given institute's board. It also sought to ensure that the dissolution, merger, consolidation or division of any institute may only be implemented with the approval of the given institute's board. The Academy Council's requests were accepted, thus enabling CAS institutes to retain purview of their key self-governing components.

The proposed changes also included the submitter's intention to strengthen the powers of the founder (at the CAS this is the President of the CAS) to remove an institute's director at his or her own discretion. In this context, the Academy Council prepared the Guideline of the Academy Council of the CAS - Rules for Filling Positions of Directors of Institutes of the Czech Academy of Sciences, which, in accordance with legal regulations and the CAS Statutes, regulates the procedures that the founder takes to select candidates for a directorship, to submit and discuss proposed appointments and dismissals, and to set the given director's remuneration. According to this guideline, institute directors are appointed by the President of the CAS on the basis of a selection process to fill the given directorship, after discussion of the proposal at the Institute Board, Supervisory Board and Academy Council. For proposals to dismiss a director based on a decision by the President (without a proposal or approval by the Supervisory Board or the given Institute Board), the guideline requires prior discussion in the Academy Council. The amendment was approved by the Chamber of Deputies of the Parliament of the Czech Republic on 13 October 2023 with effect from 1 January 2024.

Preparation of a new law on research, development, innovation and knowledge transfer

The preparation of a new law on research, development, innovation and knowledge transfer is of crucial importance to the R&D&I system. The bill was submitted by the Minister for Science, Research and Innovation, in relation to the Government's programmatic declaration and in accordance with the R&D&I Council's resolution of 27 July 2023, particularly because the existing Act on R&D&I support has already been amended twenty-two times. While discussing the amendments, the working committees of the Legislative Council of the Government (LCV) repeatedly called for the need to replace this act with a new law. On the basis of consultations and in accordance with the subsequent opinion of the LCV Section of the Office of the Government of the Czech Republic dated 26 July 2022, however, no substantive plan was drawn up. The bill was prepared in cooperation with the Working Group for preparation of the R&D&I and knowledge transfer act, which includes representatives of a number of providers, including the CAS.

According to the submitters, the main intentions of the new act are to create a legislative environment for knowledge transfer, improve conditions for human resources in science and research, set forth ethical principles, protect state security interests, protect intellectual property, forge closer links between basic and applied research, reduce the administrative burden, increase flexibility and simplify the system of conditions for targeted and institutional support and new forms of supporting innovation using funding tools and securing transparent decision-making processes at the provider level. The bill was sent for inter-ministerial comments on 2 November 2023 and the CAS submitted substantial comments.

Development of the Czech state budget for 2024–2026

At its 384th session on 25 November 2022, the R&D&I Council approved a draft proposal for R&D&I funding from the state budget of the Czech Republic for 2024 with a mid-term outlook to 2025-2026. CZK 7,091 million was proposed per year for the CAS budget chapter for 2024-2026. The CAS expressed objections to this proposal. After negotiations with providers, the R&D&I Council, at its 389th meeting on 28 April 2023, approved a new proposal for R&D&I funding from the state budget of the Czech Republic, which proposed CZK 8,160 million for the CAS budget chapter for 2024-2025 and CZK 7,860 million for 2026 (excluding CZK 300 million for co-financing of the COMPASS-U project - Tokamak of the Institute of Plasma Physics).

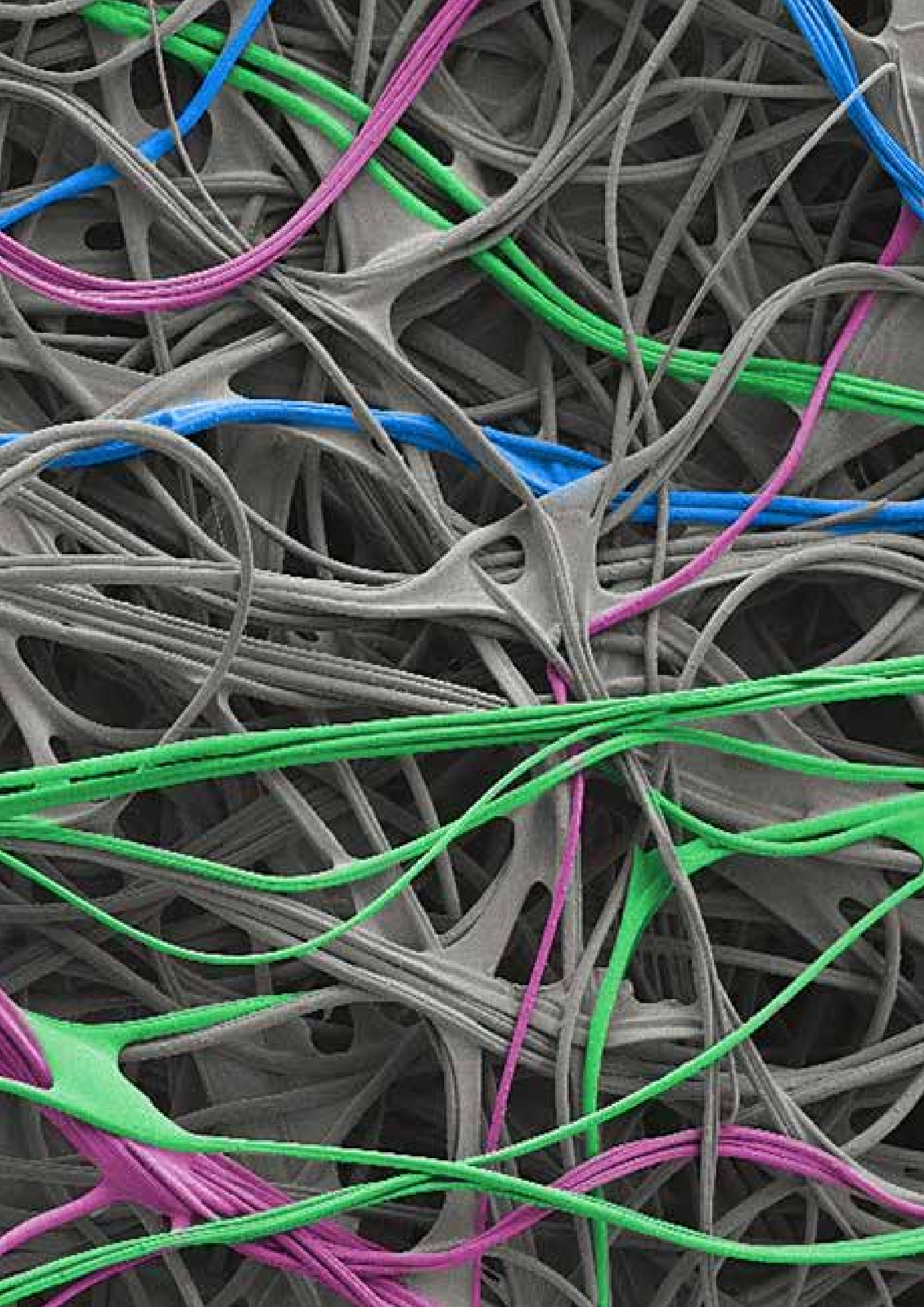
Subsequently, the Ministry of Finance of the Czech Republic submitted a preliminary draft schedule of income and expenditures for the chapters of the state budget of the Czech Republic for 2024-2026, which the Government approved through Czech Government Resolution No. 449 of 21 June 2023. In this draft, CZK 6,566 million was listed for the CAS chapter of the state budget for 2024 and an annual allocation of CZK 7,298 million was listed for 2025 and for 2026. The Government of the Czech Republic noted the R&D&I Council's previous proposal of 28 April 2023 through Resolution No. 493 of 28 June 2023.

The CAS raised a fundamental objection to the Ministry of Finance of the Czech Republic's submitted draft for 2024-2026, particularly in regard to the unprecedented growth in inflation and impact of the energy crisis on its institutes, and called for an increase in funding for the CAS budget chapter in accordance with the R&D&I Council proposal of 28 April 2023 and also with reference to the Memorandum on support of research, development and innovation in the Czech Republic of 19 December 2019. The Memorandum expresses a commitment to systematically increase state budget institutional funding for the long-term conceptual development of research organisations by at least 4% annually.

After complicated budgetary negotiations, on 27 September 2023 the Czech Government adopted Resolution No. 703, which listed CZK 7,642 million per year for the CAS budget chapter for 2024-2026. The Act on the State Budget of the Czech Republic for 2024 was approved by the Chamber of Deputies of the Parliament of the Czech Republic on 29 November 2023 with effect from 1 January 2024.

Implementation of the Memorandum on support of research, development and innovation in the Czech Republic

The financial stability of the scientific research environment is one of the main prerequisites for the successful development of CAS institutes and other research organisations operating in the R&D&I system. An adequate level of basic institutional funding will enable CAS institutes to concentrate on conceptual scientific and educational work and effective performance of their primary functions. To this end, the CAS participated in the elaboration of the Memorandum on support of research, development and innovation in the Czech Republic, in which it made a commitment to effective fulfilment of the objectives of the Innovation Strategy of the Czech Republic, while the government committed to an increase in institutional funding for long-term conceptual development of research organisations of at least four percent per year. The long-term goal is to increase direct institutional support to key actors in Czech science and research - the Czech Academy of Sciences and universities - up to 80% of their total budgets. For these reasons, this document should be annually considered during the development of the state budget for R&D&I, while the CAS will strive to ensure that it is updated, also in regard to persisting high inflation.



Organisational Measures

The key topics for 2023 were the continued preparation of the evaluation of the research and professional activities of CAS institutes for 2020-2024, support for CAS knowledge and technology transfer and the CAS' involvement in the preparation of the amendment to the Act on Higher Education Institutions, the draft Act on Research, Development, Innovation and Knowledge Transfer and on the amendment of some related acts.

The CAS continued to expend significant efforts to raising CAS institutes' awareness by organising regular informational seminars focused on current topics and finding solutions to institutes' concrete practical problems.

Sessions of the Academy Assembly in 2023

In 2023, there were two regular sessions of the Academy Assembly, the CAS' highest body.

The LXI. session of the Academy Assembly was the second meeting of the Academy Assembly in its ninth term of office of 2022-2026. 221 members of the Academy Assembly (80%) took part in the session, which was held on 18 April 2023 at the National House Vinohrady. The Academy Assembly approved all the submitted materials without comments, including the 2022 Annual Report of the CAS, 2022 CAS financial report, an excerpt from the 2022 CAS closing account and the change in the classification of the Institute of Hydrodynamics within Research area I from the Applied Physics Section to the Earth Sciences Section. The Academy Assembly also expressed its support for the proposal of the state budget R&D&I funding for 2024 with an outlook to 2025-2026 adopted by the R&D&I Council, including funding intended for the CAS chapter, and acknowledged the continuous efforts of the Minister for Science, Research and Innovation, Helena Langšádlová, to promote the field of science and research.

The LXII. session of the Academy Assembly was the third meeting of the Academy Assembly in its ninth term of office of 2022-2026. It was held on 12 December 2023 at the National House Vinohrady and 215 members of the Academy Assembly took part (78%). The Academy Assembly approved all the materials according to the approved agenda of the session, including the 2023 CAS financial report and the CAS draft budget for 2024.

Renewal of bodies of CAS institutes

The President of the CAS appointed 5 CAS institute directors in 2023 based on selection processes and nominations from the boards of the relevant CAS institutes.

Due to expiring mandates or termination of employment, the Academy Council appointed 5 new chairpersons, 3 vice-chairpersons and 14 members to CAS institute supervisory boards in 2023.

International advisory boards

In 2023, in accordance with the Guideline of the Academy Council of the CAS on the Support of International Advisory Boards (IABs), the CAS helped to establish two new IABs - at the Institute of Experimental Botany and the Institute of Psychology. Subsequently, given that most institutes already have an international advisory board in place, the Academy Council supported a proposal to annul the existing guideline and, in future, to only keep records of international advisory boards.

CAS cooperation with academic and public sector partners

The CAS Academy Council consistently emphasises the importance of R&D collaboration between various institutions on the national and international level. In 2023, the CAS initiated collaboration with additional key partners.

The focal point of cooperation with universities in the Czech Republic shifted from negotiations on agreements between the CAS and university rectors to faculties and specific CAS institutes, which jointly prepare documents for accreditation of study programmes and work together to educate doctoral students. In 2023, CAS' efforts to further international cooperation with universities concentrated on expanding collaborative ties with European universities.

In regard to cooperation with the state and public sector, in February 2023, the CAS concluded a Memorandum of cooperation related to energy and nuclear power with the Ministry of Industry and Trade of the Czech Republic.

In the context of regional cooperation, a Memorandum of cooperation was concluded with the Statutory City of Brno in September 2023.

In 2023, the CAS concluded six new international cooperation agreements, with, for example, Goethe University Frankfurt, Kyungpook National University, the Mongolian Academy of Sciences, Max-Planck-Gesellschaft, Munich, and the University of Toyama, Japan, and also extended several previously concluded agreements. The CAS also joined the international association MEDIPIX 4.

In accordance with archaeological heritage preservation obligations, in 2023 the Czech Academy of Sciences concluded seven agreements to conduct archaeological research with organisations with authorisations pursuant to the state monument preservation law.

Activities related to CAS internal regulations

In 2023, 13 internal CAS regulations and 14 internal CAS Head Office regulations were approved and issued.

In November 2023, a new Guideline of the Academy Council of the CAS, No. 13 on Specimen Filing and Shredding Rules of CAS Institutes, was issued to ensure the proper handling of documents and the judicious execution of filing and shredding procedures at CAS institutes in accordance with applicable legislation. Supervision of the filing service at the CAS remains the responsibility of the Masaryk Institute and Archives.

In November 2023, the Academy Council approved an intention to amend CAS internal regulations in relation to the amendment to Act No. 341/2005 Coll., on Public Research Institutions, contained in the "consolidation package". Based on this intention, following the completion of the legislative process with the signature of the President of the Republic, a new Guideline of the Academy Council of the CAS - Rules for Filling Positions of Directors of Institutes of the Czech Academy of Sciences was prepared, along with an amendment to the Instruction of the Academy Council of the CAS on Supervisory Boards of Institutes of the Czech Academy of Sciences, and a package of other CAS internal regulations, so that they could be submitted to the Academy Council at its first meeting in 2024.

At the end of the year, the Organisational Regulations of the CAS Head Office were amended and the Working Regulations of the CAS Head Office were updated,

in particular the section outlining the appointment of senior staff. Amendment No. 2 to the President's Order No. 2/2020, Internal Control System at the Academy of Sciences of the Czech Republic, was also issued.

Expansion and support of Strategy AV21 research programmes

The Academy Council continued to devote considerable energy to the expansion and support of Strategy AV21 research programmes. In March 2023, the Academy Council approved the Strategy AV21 Council's statement on the final and interim reports of the research programmes and the draft budget of the 2023 Strategy AV21 grant programme. In April 2023, the Academy Council took note of materials on national and international grants submitted and received through collaborative efforts within Strategy AV21 research programmes, as well as a review of the reports on the use of grant funds provided to support Strategy AV21. In November 2023, on the proposal of the Strategy AV21 Council and the recommendation of the Science Council, the Academy Council approved the establishment of three new Strategy AV21 research programmes (Space for Mankind, Identities in a World of Wars and Crises, and Fungi – New Threats and Opportunities) from January 2024 for a period of five years, and also appointed the new programmes' coordinators.

Activities of the CAS Science Council

The Science Council provided conceptual support in matters of science policy development and implementation, and regularly submitted its suggestions and recommendations to the Academy Council.

The most important discussions pertained to the state of doctoral studies at CAS institutes, the preparation of the amendment to the Higher Education Act, and the draft of the new Act on Research, Development, Innovation and Knowledge Transfer.

In connection with the amendment of Act No. 341/2005 Coll., on Public Research Institutions, the Science Council discussed the topic of appointing and dismissing directors of public research institutions at the Academy of Sciences of the Czech Republic. The Science Council recommended to the Academy Council that if, according to the amendment to the Act, the founder will be able to dismiss a director of a public research institution at his/her discretion, the Academy Council's approval of such a decision, or the prior discussion of such a decision in the Academy Council, would be required.

An important activity of the Science Council was discussion of the draft law amending Act No. 283/1992 Coll., on the Academy of Sciences of the Czech Republic, as amended, with the objective of achieving national recognition of the "Research Professor" degree. The Science Council adopted a resolution recommending that the Academy Council approve the draft amendment to Act No. 283/1992 Coll. In June 2023, the Academy Council gave its consent to the draft amendment of Act No. 283/1992 Coll. and to initiation of steps leading to submission of the amendment to the legislative process.

The Science Council considered the arguments supporting a transfer of the Institute for Hydrodynamics within the physical sciences research area from the Applied Physics Section to the Earth Sciences Section and recommended this transfer. The Science Council also discussed a proposed change to the organisational relationship between the Institute of Geology and the Institute of Rock Structure and Mechanics, and recommended maintaining the research direction of research on the physical properties of rocks and keeping it based at the Institute of Rock Structure and Mechanics.

The Science Council discussed 13 submitted Strategy AV21 research programme proposals and recommended that three of them receive funding. The Science Council commented on the process of preparation of the evaluation of CAS institutes' research and professional activities for 2020–2024. The Science Council Presidium was also discussed in depth a proposal to amend the Code of Ethics for Researchers at the Czech Academy of Sciences, which was prepared and submitted by the Scientific Integrity Committee of the CAS.

During a retreat, the Science Council visited the Centre for Plant Structural and Functional Genomics at the Institute of Experimental Botany in Olomouc, where it toured the new Application Laboratory for Agricultural Research and got acquainted with its work and the modern methods used at this institute.

As part of the Current Scientific Topics series, Michael Komm from the Institute of Plasma Physics gave the Science Council a presentation on Pubpeer.com as a tool for monitoring potentially problematic publications. The Science Council subsequently adopted a resolution recommending that the Academy Council arrange monitoring by the Pubpeer.com platform through the Library of the CAS.

The Science Council also supported an initiative by an international consortium led by the American Physical Society (APS) and the German Physical Society (DPG) to designate 2025 as the International Year of Quantum Science and Technology and recommended that the CAS join this initiative.

The Science Council decided to organise a multidisciplinary conference on Scientific Integrity and the Role of Science, which will take place on 24-26 September 2024 with the participation of prominent scientists from the Czech Academy of Sciences and universities. The Science Council also decided to prepare an informal networking event called ERC Day. The event is organised by the CAS, Charles University and the Expert Group for Supporting ERC Applicants in cooperation with the Technology Centre Prague. The purpose of the event, which will be held on 9-10 April 2024 in the Zámek Třešť conference centre, is to raise junior researchers' awareness of ERC grant projects. The event is intended as a precursor to the National Information Day on ERC Grants.

Evaluation of research and professional activities of CAS institutes

In 2023, the CAS continued preparing for the internal evaluation of the research and professional activities of CAS institutes for the period 2020-2024. By the end of 2023, the Academy Council approved further recommendations of the CAS Research Evaluation Committee regarding key elements for evaluation of institutes in regard to non-bibliometric outputs, bibliometric indicators, capacity aspects of evaluation committees, scientific team, process and criteria of Phase I evaluation and multiple affiliations.

Support for CAS knowledge and technology transfer

In March 2023, the Academy Council discussed and took note of the 2022 annual report of the CAS Technology Transfer Office (TTO), which provides a comprehensive overview and explanation of the activities provided or coordinated by the TTO in 2022.

In March 2023, the Academy Council also gave its consent to the signing of a Multilateral Memorandum of Cooperation between the Joint Research Centre of the European Commission and the European Technology Transfer Offices Circle (TTO Circle), of which the CAS is a member. It also discussed the planned establishment of a major new CAS initiative, the Programme for Application Development and Commercialisation (PRAK), whose primary objective is to accelerate the transfer of knowledge and technology into practice. In May 2023, Academy Council Guideline No. 6/2023 on the new programme was approved. The PRAK programme focuses on intellectual property protection with the goals of supporting activities leading to application of knowledge generated at the CAS, motivating researchers to apply it and increasing the commercial readiness of research results with a high TRL (technology readiness level). In May 2023, the Academy Council approved the establishment of the Programme for Application Development and Commercialisation (PRAK) Council as its new auxiliary body and appointed members to the PRAK Council for the term 2023-2025.

In October 2023, the Academy Council discussed and approved the draft budget of the TTO and the PRAK Programme for 2024 and 2025, including the TTO Activity Plan for 2024.The aim of this plan is to develop conditions for successful knowledge and technology transfer at CAS institutes with an emphasis on the early identification and valuation of CAS intellectual property and application potential, development of CAS knowledge and technologies for practical applications, and development and activities of a professional team for knowledge transfer of technologies and related infrastructure and transfer of knowledge and technologies from social sciences and humanities.

Supervision of the management of CAS institutes' assets

In 2023, the Academy Council, in accordance with the CAS Guideline on Procedure when Issuing Founder's Prior Consent and for Other Disposal of Assets, granted a number of prior approvals as defined by the Act on Public Research Institutions, particularly for purchase of scientific instruments and equipment serving the main purposes of CAS institutes. It discussed the conclusion of contracts to establish easements (especially for power and telecommunication networks) and approved the entry of several institutes into "association" legal entities and a joint application by several institutes for consent with the establishment of a new association, Prague.bio. The Academy Council approved the conclusion of contracts for the upcoming reconstruction of the Hybernská building (contract for work with the contractor, contract for technical supervision by the builder and for performance of OSH coordinator duties); subsequently, the consortium of construction companies initiated the reconstruction. In July 2023, on the basis of a contract concluded with the Office for Government Representation in Property Affairs, the Czech Language Institute definitively became the owner of the property in Washingtonova Street in Prague 1 and immediately after the registration of ownership in the Land Registry, it began taking steps to take over and reconstruct the property.

The Academy Council also discussed the Biology Centre's updated plan for a general reconstruction of its premises and the construction of a new building to meet the needs of the Centre. In preparation for the construction of a new building at the Institute of Plasma Physics' detached workplace in Turnov, the TOPTEC Research Centre for Special Optics and Optoelectronic Systems, approval was granted for legal negotiations with the City of Turnov and the Liberec Regional Authority to secure easements. After several years of searching for a suitable buyer and negotiating the terms and conditions of a set of transaction documents, approval was granted for the sale of 100% of the Institute of Nuclear Physics' commercial share in RadioMedic s.r.o., a company of ÚJV Řež, a. s. Founder's approval was also granted for the purchase of several properties for the Institute of Archaeology, Brno (in the Mušov - Římský vrch Pasohlávky cadastral area). The Astronomical Institute submitted for discussion a planned land exchange with the municipality of Ondřejov intended to consolidate land parcels on the Institute's grounds and preserve observation conditions in the vicinity with regard to possible future building development in the municipality.

Due to the overlap between activities of CAS institutes in research on the physical properties of rocks, approval was granted for a gratuitous transfer of a unique set of movable and immovable assets – equipment for studying the mechanical properties of materials – between the Institute of Geology and the Institute of Rock Structure and Mechanics. For the purpose of constructing new premises for the needs of the children's group of the Institute of Chemical Processes, the Centre of Administration and Operations of the CAS transferred part of the land at the Lysolaje site to the institute. The J. Heyrovsky Institute of Physical Chemistry prepared to found a spin-off company to commercialise research results on a patented method

that uses a new catalyst to convert methane to produce methanol. A record of change of jurisdiction to manage state property was drawn up with the State Land Office pertaining to a reversion of jurisdiction over land in the cadastral area of Dolní Mala Úpa.

Public procurement

In 2023, one small-scale public contract was awarded for the provision of professional tax and accounting advisory and consultancy services, and preparations have begun on a public contract for the provision, future development and maintenance of a filing service and related services. Preliminary market consultations as defined by S. 33 of Act No. 134/2016 Coll., on Public Procurement, took place, and the procurement procedure will be implemented in 2024.

Inter-ministerial commenting procedures and amendments to the founding charters of CAS institutes

In regard to inter-ministerial commenting procedures, in 2023 the CAS assessed and took positions on 172 government documents submitted by ministries or other state bodies via the eKLEP Legislative Process Electronic Library. The CAS submitted comments in 19 proceedings (11%), including essential and recommendation comments in 3 proceedings, essential comments in 12 proceedings and recommendation comments in 4 proceedings.
In 2023, three addenda to founding deeds of CAS institutes were issued (Addenda No. 4 and 5 - Centre of Administration and Operations of the CAS, and Addendum No. 1 - Institute of Hydrodynamics of the CAS).

Protection of personal data and processing of requests for information pursuant to Act No. 106/1999 Coll.

The CAS continued to pay close attention to thorough protection of personal data in accordance with the General Data Protection Regulation (GDPR) and Act No. 110/2019 Coll., on the Processing of Personal Data.

In 2023, the CAS received a total of ten requests for information under Act No. 106/1999 Coll., on Free Access to Information. The requests were processed in compliance with the law. In one case, a decision was taken to reject the application. Three requests did not fall within the jurisdiction of the CAS and were deferred under Section 14(5)(c) of the Act. The remaining requests were processed by providing information through communication pursuant to Section 4a(2)(a) of the Act, by providing a copy of the requested document pursuant to Section 4a(2)(b) of the Act or by providing a data file containing the requested information pursuant to Section 4a(2)(c) of the Act.

In 2023, one appeal against a decision to reject an application was submitted. The Office for Personal Data Protection rejected the applicant's appeal and upheld the procedure followed by the CAS.

Intellectual property protection

The CAS is the holder of 12 trademarks, which it maintains; there were no changes in 2023.

Litigation

No lawsuits were initiated in 2023.

Patronage of the CAS President

The President of the CAS bestowed patronage on nine science and research events.

Support of Open Science

In 2023, the Academy Council continued to pay heightened attention to the Open Access and European Open Access Cloud initiatives, which process information and existing activities related to open access to scientific data in both the Czech and European environments. In September 2023, the Academy Council supported the involvement of the CAS Centre of Administration and Operations in the development of the National Repository Platform in the European Open Science Cloud (EOSC-CZ) project (within the OP JAK), whose objective is to strengthen research and innovation capacities and introduce advanced technologies.

Increasing the CAS' institutional resilience against the influence of foreign powers

Following on Instruction of the Academy Council of the Czech Academy of Sciences No. 3/2022 on Increasing Institutional Resilience of the Czech Academy of Sciences, issued in October 2022, a training session for representatives of CAS institutes was held in January 2023 to set up internal CAS processes to increase the institutional resilience of the CAS against the influence of foreign powers. The training session included a detailing of threats and risks to which employees and CAS institutes may be exposed, explanation of related cybersecurity issues and discussion of compliance with international control regime rules.

Selected Results

All 54 research institutes of the CAS, which operate as public research institutions, contributed to the scientific results achieved in 2023. CAS institutes are grouped into three main research areas: the first area comprises physical sciences, the second area covers life and chemical sciences, and the third area focuses on the humanities and social sciences. CAS scientific research produced many outstanding results in 2023; nine of the most fascinating outcomes from the three areas are featured on the following pages.

SELECTED SCIENTIFIC RESULTS FROM RESEARCH AREA I INSTITUTES

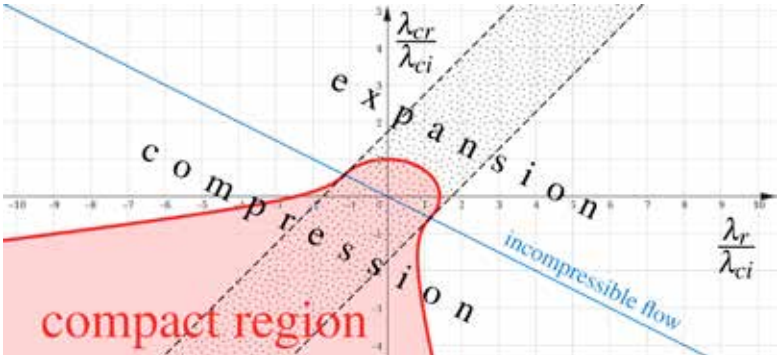
ORBITALLY COMPACT AND LOOSE VORTEX REGIONS

Institute of Mathematics

The paper, published in the journal *Physics of Fluids*, is the result of a long-term collaboration motivated by the desire to answer a seemingly simple question: "What is a vortex?". Although there are a number of methods to define vortices in fluids, their boundaries and local intensity, none are universally accepted or applicable. This paper introduces a novel idea to classify vortex regions into compact and loose regions based on a proposed measure of orbital compactness. With this new measure, the authors were able to demonstrate that some of the vortex regions identified by the methods in use are so loose that they should not be considered vortices. The results of the paper may find substantial application in engineering, e.g. in the analysis of flow around moving bodies such as vehicles in motion (cars, airplanes, etc.).

Bibliographic references:

Kolář, V., Šístek, J. Orbitally compact and loose vortex regions. Physics of Fluids. 2023, 35(12), 121708. ISSN 1070-6631. E-ISSN 1089-7666.



The parameters of the orbitally compact vortex region

Parametrization is based on velocity gradient eigenvalues, and the vortex is considered for gradients with a pair of complex conjugate eigenvalues. The red area corresponds to the compact vortex region. Compression strengthens the orbital compactness, while expansion weakens it.

LIGHTNING ON JUPITER PULSATES WITH A SIMILAR RHYTHM AS IN-CLOUD LIGHTNING ON EARTH

Institute of Atmospheric Physics

Storms in planetary atmospheres in our solar system conceal many secrets. One of them is the question of how lightning is generated on Jupiter. Scientists from the Institute of Atmospheric Physics examined measurements from the Juno interplanetary probe, which has been orbiting the giant gas planet since 2016 and measuring radio waves in close approaches to the planet. They found groups of short radio pulses at intervals one-thousandth of a second apart, which led them to the surprising conclusion that lightning on Jupiter is generated similarly to the intracloud lightning well-known on Earth.

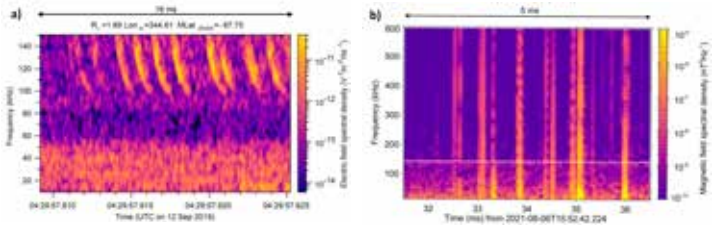
Bibliographic references:

Kolmašová, I., Santolík, O., Imai, M., Kurth, W. S., Hospodarsky, G. B., Connerney, J. E. P., Bolton, S. J., Lán, R. Lightning at Jupiter pulsates with a similar rhythm as in-cloud lightning at Earth. Nature Communications. 2023, 14(1), 2707. E-ISSN 2041-1723.

Comparison of spectrograms containing groups of pulses emitted by lightning processes on Jupiter and on Earth

Frequency-time spectrogram of power spectral density of electric field fluctuations of a group of dispersed pulses recorded by the Juno satellite on 12 September 2017 after 04:29:57 UTC at a radial distance of 1.89 RJ (Radius of the planet Jupiter).

b) Frequency-time spectrogram of power spectral density of magnetic field fluctuations showing the 5 ms long detail of the initiation of an intracloud flash that occurred on 6 August 2021 at 15:52:42 UTC. The measurement was conducted by a broadband magnetic field antenna (5 kHz to 90 MHz) installed at the Dlouhá Louka observatory in Czechia. For comparison with the dispersed pulses from panel a), the white dashed line indicates the upper frequency limit of the Juno radio system measurements.



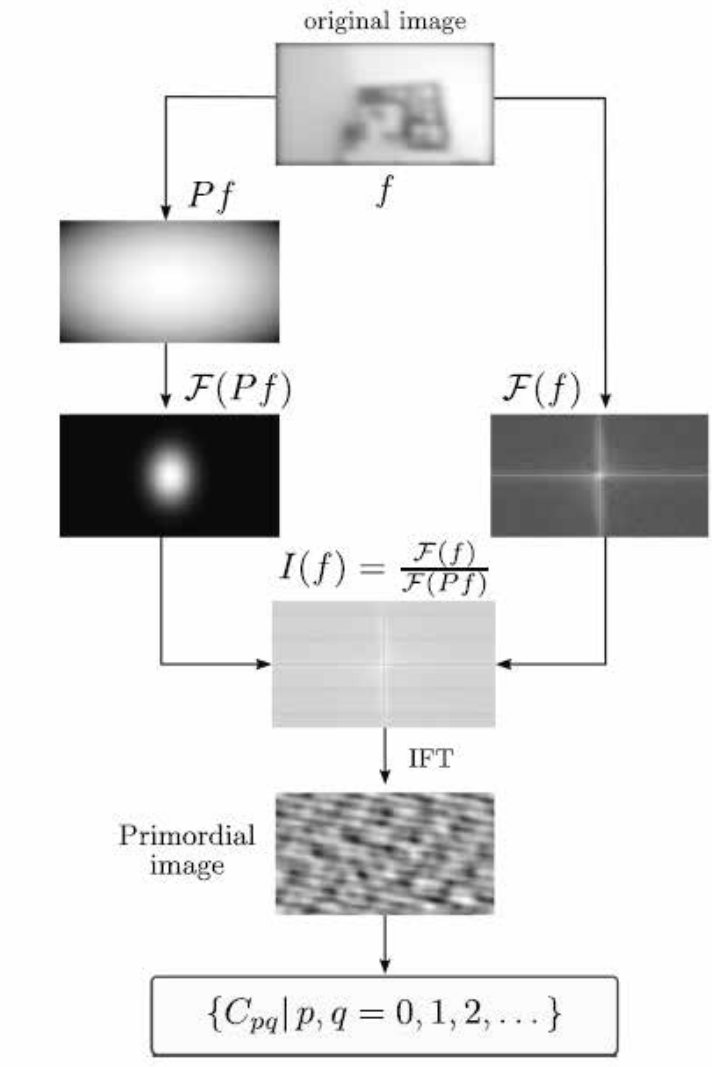
BLUR INVARIANTS FOR IMAGE RECOGNITION

Institute of Information Theory and Automation

The paper, published in the *International Journal of Computer Vision*, presents a novel approach to understanding blurred digital images. Instead of computationally demanding and rather unreliable image reconstruction, the authors proposed a direct method of object recognition. Blur is a frequent degradation of digital images caused by subject movement or incorrect focus. The method significantly improves their usability, which is particularly important for unique images. The IJCV journal is consistently ranked among the best computer science journals.

Bibliographic references:

Flusser, J., Lébl, M., Šroubek, F., Pedone, M., Kostková, J. Blur Invariants for Image Recognition, International Journal of Computer Vision vol.131, 9 (2023), p. 2298-2315.



Blur invariants design

Visual explanation of the core idea of the blur invariants design. A Fourier transform of the blurred image is divided by a Fourier transform of its projection onto a proper subspace. Then a moment expansion is used to obtain invariant and computationally efficient features.

Multifocal image fusion

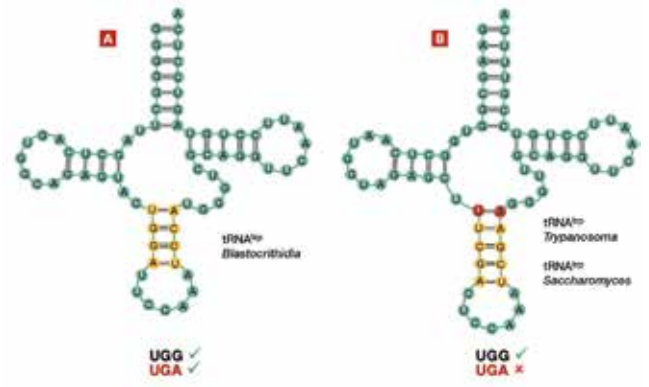
Multifocus image fusion is one of the areas where blur invariants can be applied. Two partially blurred input images (left and middle) are fused to produce a single all-in-focus image (right).

SELECTED SCIENTIFIC RESULTS FROM RESEARCH AREA II INSTITUTES

SHORT TRNA ANTICODON STEM AND MUTANT ERF1 ALLOW STOP CODON REASSIGNMENT

Biology Centre and Institute of Microbiology

In the protist Blastocrithidia nonstop, scientists from the Biology Centre and Institute of Microbiology discovered a massive departure from the canonical genetic code, consisting of reassignment of all three stop codons into sense codons, with only one stop codon being used universally. This extensive alteration of the genetic code is enabled by a novel alteration of the transfer (t)RNA and a mutation in the release factor, both of which are transferrable to trypanosome and yeast. The altered tRNA has the potential to correct disease-causing mutations in humans.



Secondary structure of tryptophanyl tRNA

A comparison of the shortened tryptophanyl tRNA (from Blastocrithidia) with the standard tryptophanyl tRNA (from trypanosome and yeast). The anticodon stem is labelled in yellow, while the critical base pair is highlighted in red to show the different functions. Codons read by the respective tRNA are also labelled.

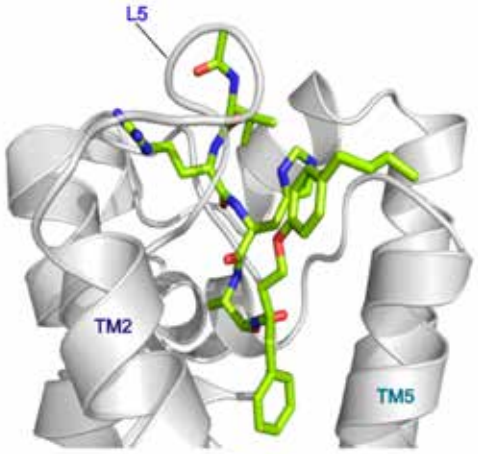
Bibliographic references:

Kachale, A., Pavlíková, Z., Nenarokova, A., Roithová, A., Durante, I. M., Miletínová, P., Záhonová, K., Nenarokov, S., Votýpka, J., Horáková, E., Ross, R. L., Yurchenko, V., Beznoskova, P., Paris, Z., Valášek, L. S., Lukeš, J. Short tRNA anticodon stem and mutant eRF1 allow stop codon reassignment. Nature. 2023, 613(7945), 751–758. ISSN 0028-0836. E-ISSN 1476-4687.

CHEMICAL BLOCKADE OF THE MITOCHONDRIAL RHOMBOID PROTEASE PARL BY NOVEL KETOAMIDE INHIBITORS REVEALS ITS ROLE IN PINK1 AND PARKIN PROTEIN-DEPENDENT MITOPHAGY

Institute of Organic Chemistry and Biochemistry

The mitochondrial rhomboid protease PARL regulates mitophagy by balancing intramembrane proteolysis of various substrates, including PINK1. It has been implicated in the pathogenesis of Parkinson's disease but investigating it as a possible therapeutic target has been challenging. Scientists at the Institute of Organic Chemistry and Biochemistry developed potent PARL-targeting ketoamide inhibitors and revealed that chemical inhibition of PARL leads to robust activation of the PINK1/Parkin pathway without major secondary effects on mitochondrial properties.



Ketoamide inhibitor developed at the CAS Institute of Organic Chemistry and Biochemistry bound to the active site of rhomboid protease

Chemical blockade of the mitochondrial rhomboid protease PARL by novel ketoamide inhibitors reveals its role in PINK1- and Parkin-dependent mitophagy.

Bibliographic references:

Poláchová, E., Bach, K., Heuten, E., Stanchev, S., Tichá, A., Lampe, P., Majer, P., Langer, T., Lemberg, M. K., Střížovský K. Chemical Blockade of the Mitochondrial Rhomboid Protease PARL by Novel Ketoamide Inhibitors Reveals Its Role in PINK1/Parkin-Dependent Mitophagy. Journal of Medicinal Chemistry. 2023, 66(1), 251–265. ISSN 0022-2623. E-ISSN 1520-4804.

CHROMOSOMAL INHERITANCE OF PLANT HYBRIDS THAT DOES NOT RESPECT MENDEL'S LAWS

Institute of Experimental Botany

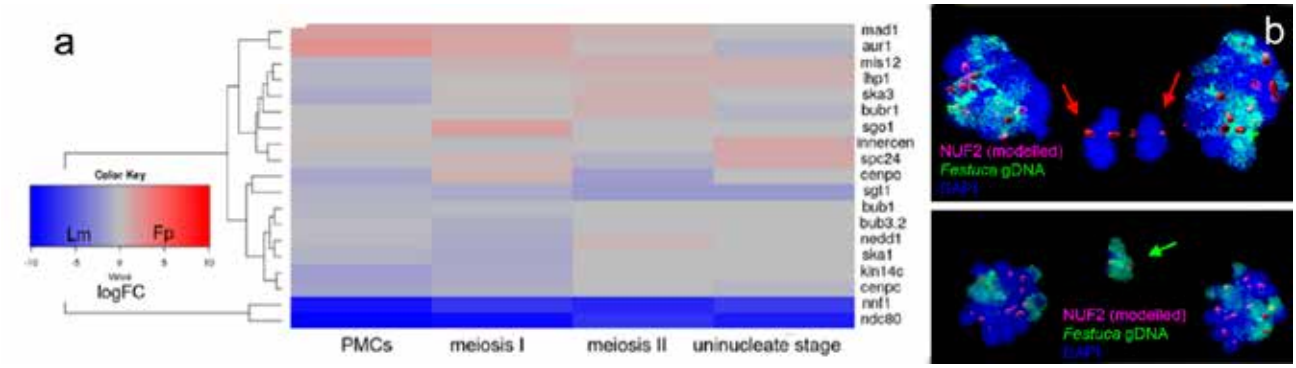
The crossing of two species involves the merging of two different genomes. Each hybrid thus contains two (or sometimes more) different sets of chromosomes originating from different parental species. In some hybrids, these chromosomes are not inherited evenly in the offspring, and chromosomes of one species are replaced by chromosomes of another species. Scientists from the Institute of Experimental Botany described the mechanism responsible for this biological phenomenon – namely differing behaviour of chromosomes during meiotic division – and identified key factors.

Bibliographic references:

Majka, J., Glombik, M., Doležalová, A., Kneřová, J., Ferreira, M. T. M., Zwierzykowski, Z., Duchoslav, M., Studer, B., Doležel, J., Bartoš, J., Kopecký, D. Both male and female meiosis contribute to non-Mendelian inheritance of parental chromosomes in interspecific plant hybrids (Lolium × Festuca). New Phytologist. 2023, 238(2), 624–636. ISSN 0028-646X. E-ISSN 1469-8137.

Mahelka, V., Kopecký, D., Majka, J., Krak, K. Uniparental expression of ribosomal RNA in ×Festulolium grasses: a link between the genome and nucleolar dominance. Frontiers in Plant Science. 2023, 14(18 September), 1276252. ISSN 1664-462X. E-ISSN 1664-462X.

Glombik, M., Copetti, D., Bartoš, J., Stočes, Š., Zwierzykowski, Z., Ruttink, T. et al. (2021). Reciprocal allopolyploid grasses (Festuca × Lolium) display stable patterns of genome dominance. Plant J. 107: 1166 – 1182.



Expression level of homeologs of kinetochore genes from fescue (Festuca; Fp) and ryegrass (Lolium; Lm) in hybrids of these species before, during and shortly after meiosis.

The colour range indicates the logarithmic change in expression (logFC) between the two homeologs; PMC: pollen mother cells (a). Immunolocalization of the kinetochore protein NUF2 in fescue and ryegrass hybrids. Note the different volume of NUF2 in ryegrass (red arrows) and fescue (green arrow) univalents.

SELECTED SCIENTIFIC RESULTS FROM RESEARCH AREA III INSTITUTES

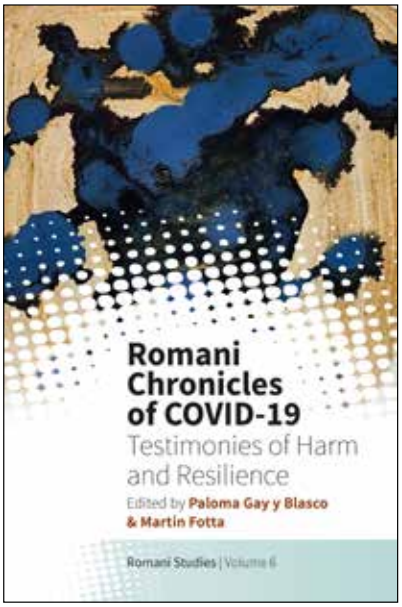
ROMANI CHRONICLES OF COVID-19: TESTIMONIES OF HARM AND RESILIENCE

Institute of Ethnology

A ground-breaking volume that gathers the testimonies of NGO workers, street vendors, activists, scholars, health professionals, and creative writers to chronicle the devastating impact of COVID-19 on Romani communities around the world. The contributors reveal how the pandemic exacerbated Romani disenfranchisement and document the resilience and creativity with which Romani responded to the crisis.

Bibliographic references:

Fotta, M., Gay y Blasco, P. (eds.) Romani Chronicles of COVID-19: Testimonies of Harm and Resilience. Oxford: Berghahn, 2023. ISBN 978-1-80073-891-1.



Book cover

P. Gay y Blasco and M. Fotta (eds.): Romani Chronicles of COVID-19: Testimonies of Harm and Resilience

INFORMED CONSENT IN HEALTHCARE: LEGAL AND ETHICAL ASPECTS

Institute of State and Law

This monograph discusses the issue of informed consent in legal and (bio) ethical discourse. The authors address the issue from various aspects, ranging from this institute's terminological definition, meaning and purpose to current legislation. This is the first publication in the Czech environment to deal with this topic in such a comprehensive manner. It provides a theoretical exploration of the concept of informed consent, an analysis of the concept in the context of philosophy, ethics and bioethics, details about current legislation and comparisons with cases from abroad.

Bibliographic references:

Doležal, T., Doležal, A. Informed consent in health care: Legal and ethical aspects Prague: CAS Institute of State and Law, 2023. ISBN 978-3-87439-59-3.

Book cover

T. Doležal and A. Doležal: Informed consent in health care: Legal and ethical aspects

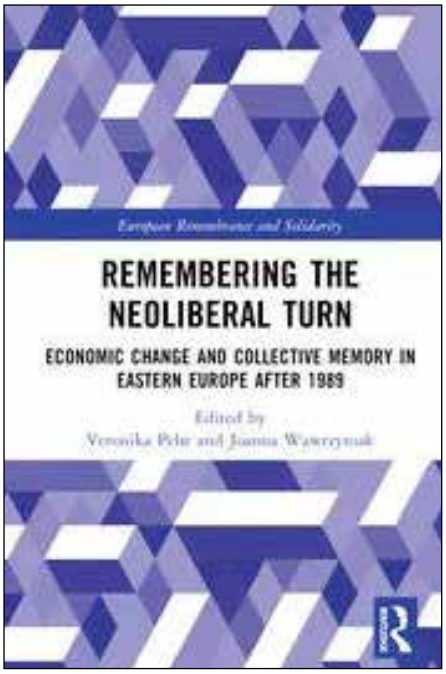
REMEMBERING THE NEOLIBERAL TURN. ECONOMIC CHANGE AND COLLECTIVE MEMORY IN EASTERN EUROPE AFTER 1989

Institute of Contemporary History

This book discusses how societies, groups and individuals remember and make sense of global neoliberal change in Eastern Europe. It shows how the key processes that impacted many lives across the social spectrum in Eastern Europe, such as deindustrialisation, privatisation, restitution and abrupt social restructuring, are collectively remembered across society today and how memory narratives of the 1990s contribute to current identities and political climate. The contributors investigate different levels of memory, from the national through the local to the cultural, analysing key myths of the transformation, giving special recognition to the social space and vernacular memories of the transformation period and reflecting on how the changes of the 1990s are mediated in cultural representations. This investigation is all the more timely as the 1990s are increasingly looked to for answers explaining the populist and nationalist turn across the globe.

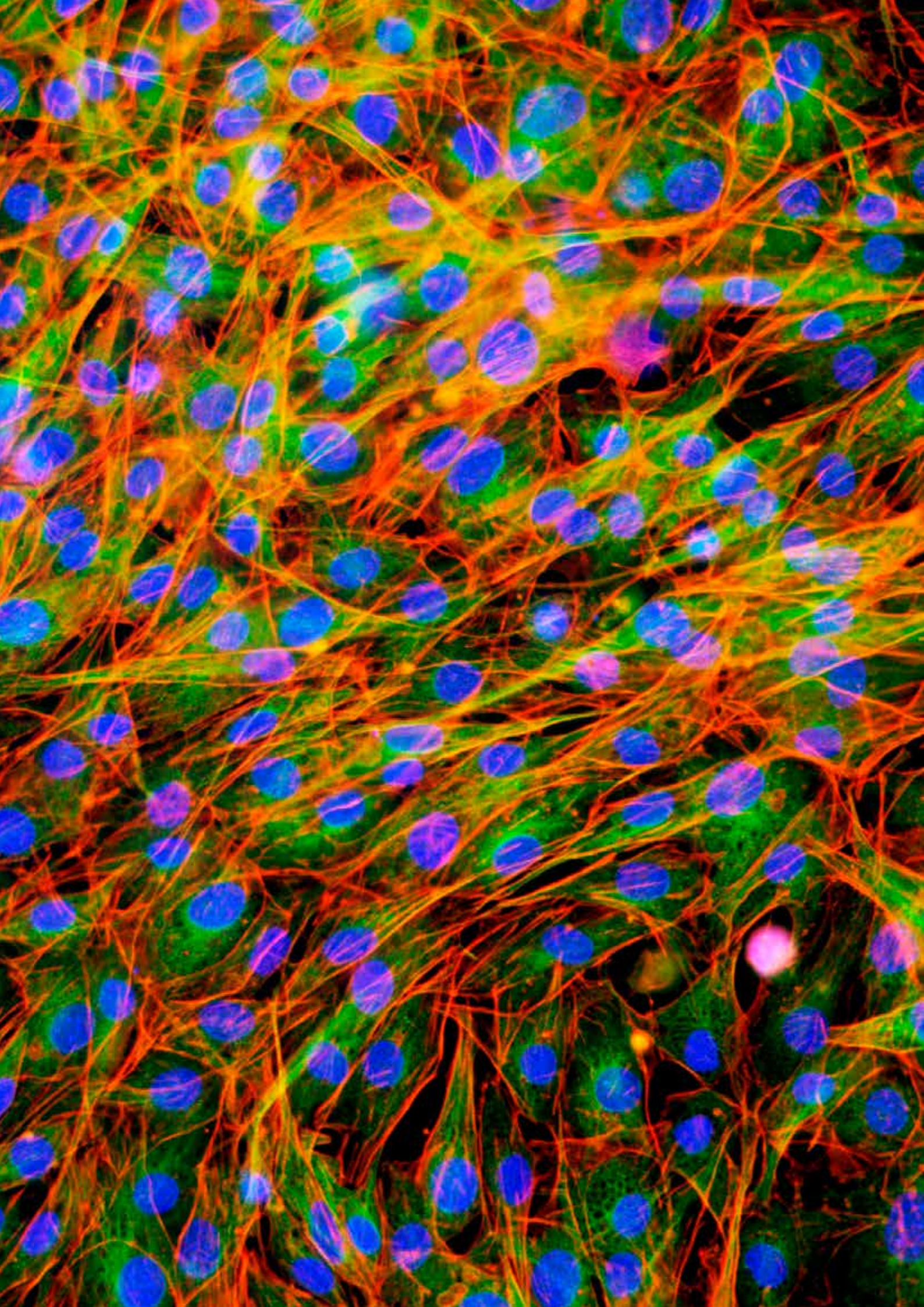
Bibliographic references:

Pehe, V., Wawrzyniak, J. (eds.) Remembering the Neoliberal Turn: Economic Change and Collective Memory in Eastern Europe after 1989. London: Routledge, 2023. ISBN 9781032553337.



Book cover

V. Pehe and J. Wawrzyniak (eds.): Remembering the Neoliberal Turn: Economic Change and Collective Memory in Eastern Europe after 1989



Strategy AV21

Top research in the public interest

Strategy AV21, approved by the CAS Academy Assembly in 2014, is the result of the CAS' ongoing efforts to help address issues in contemporary society. It is aptly characterised by the motto "Top research in the public interest", which was registered as a trademark of the CAS in 2021. Strategy AV21 research programmes focus on current issues that are crucially important to society. These issues require broad-based, interdisciplinary research and inter-institutional synergy, both between CAS institutes and with other relevant external partners. Strategy AV21 research programmes reap significant benefits from the wide range of research concentrated within the CAS, which gives them the opportunity to create exceptional connections between findings from the natural, technical and social sciences and humanities. Strategy AV21 goals are closely aligned with the goals of the National Research and Innovation Strategy for Intelligent Specialisation of the Czech Republic (RIS3).

> In the spirit of the motto "Top research in the public interest", Strategy AV21 seeks to respond to current societal demand through well thought-out collaboration of experts across scientific disciplines. In 2023, scientists worked on 15 Strategy AV21 research programmes.

In 2023, the two-year process of digitalising Strategy AV21 management administrative processes was successfully completed through the introduction of interactive annual and final report forms in the internal application of the CAS Head Office Information System (KIS). Subsequently, an environment for CAS infrastructure institutes' support activities was prepared in the same application, which significantly improved the tools for more efficient and transparent management of research programmes and support activities.

At the beginning of the year, an analysis of research programme consortia's engagement in national and international grant competitions was carried out. One-off data confirmed a significant success rate among topics addressed in Strategy AV21 for all types of providers.

STRATEGY AV21

Top research in public interest

Strategy AV21 research programmes were successfully presented at the CAS Science Fair in Prague-Letňany, where for the first time the "Small stage" was available in addition to the main programme. Here, interested members of the public had the chance to learn about Strategy AV21 results through popular science lectures. In a fun and easy-to-understand way, these lectures presented an array of topics, from housing under socialism to fires and their impact on the landscape, black holes and the search for exoplanets.

On 15 November 2023, the annual Strategy AV21 conference was held with the subtitle "Top research in the public interest". The conference includes presentations on one research programme (RP) from each of the research areas whose research has been completed or is close to completion. In 2023, research programmes No. 17 "Light in the Service of Society", No. 18 "Preclinical Testing of Potential Pharmaceuticals" and No. 23 "The City as a Laboratory for Change: Construction, Historical Heritage and Place for Safe and Quality Life" were presented. Videos of the lectures were posted on YouTube.

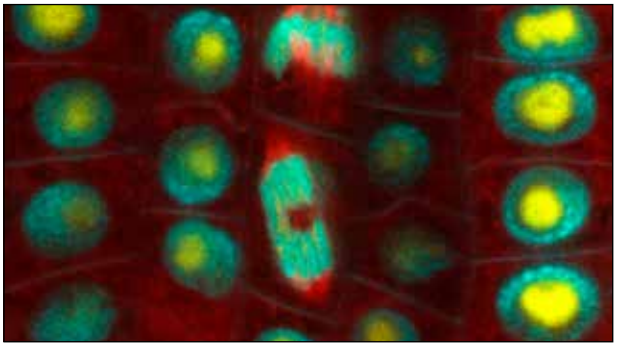
The outputs of RP No. 17 "Light in the Service of Society" are an example of successful collaboration with the industrial sector. In 2023, negotiations with the company ams-OSRAM AG were completed, marked by the signing of an initial purchase agreement for a sample of thin-film scintillators (materials that glow in the visible or UV region when hit by ionising radiation) based on InGaN/GaN quantum wells for commercial use. Three new hybrid welding methods investigated within the same research programme at the Institute of Scientific Instruments also have high application potential.

Additionally, in 2023, owing to the support of No. 27 "Sustainable Energy", Tomáš Němec from the Institute of Thermomechanics was able to file an international patent application to protect his technology for nanomaterial production through catalytic layer deposition for electrochemical devices (hydrogen fuel cells and electrolyzers) with the working title "Ignia". The technology was also assessed very positively in the national Transfer Technology Day 2023 competition. Preparations to establish a spin-off are currently underway.

The results of RP No. 18 "Preclinical Testing of Potential Pharmaceuticals" are another example of successfully applied research. The synergistic collaboration of the engaged CAS institutes saw the completion of the multi-year development of the agent MitoTam, including a successful clinical trial. MitoTam, which helps target the anti-cancer drug tamoxifen to cancer cell mitochondria, has already helped several Czech patients. Scientists from the Institute of Biotechnology discovered a new group of chemotherapy drugs which also show great potential in cancer treatment: these so-called mitochelators uptake iron from cancer cells. Iron has an irreplaceable cellular function and an iron deficiency can result in a loss of many enzymes and halt cellular respiration. The great potential of this discovery is also evinced by the fact that mitochelators prevent cancer cell metastasis.

Institute of Experimental Botany plant geneticists working on RP No. 19 "Food for the Future" achieved brilliant results. Their four-year collaborative research effort with scientists from Palacký University resulted in development of a tool enabling live monitoring of cell multiplication processes in barley. To make it possible to observe the division process, the scientists first had to modify the

plants so that parts of the cell nucleus would glow when examined with a microscope. Using genetic engineering techniques, they bound a green, red, blue or yellow glowing protein to selected cell structures. This achievement will enable more effective future study of the impact of various growth conditions on barley division, which may be crucial for ensuring food security for a growing global population in an era of climate change.

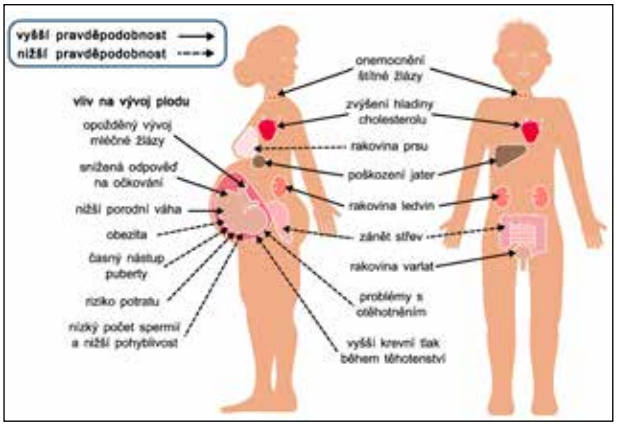


Barley

The image shows round blue-yellow cell nuclei in the living barley roots. Chromosomal division is captured in the middle of the image.

The results of a pilot analysis of raw and treated water in selected water sources carried out under RP No. 20 "Water for Life" may have a major societal impact. The study revealed that despite common water treatment practices, which monitor only a limited range of substances, hundreds to thousands of non-standardised substances were confirmed in all of the analysed samples. These included perfluorinated and polyfluorinated organic substances, which are human-made organic compounds with a strong bond between fluorine and carbon atoms that are not naturally degradable in nature. These substances are considered carcinogenic and have a negative impact on female fertility. An internet database titled *www.hydrometadata.cz* was also created within this research programme. The purpose of the web database is to enhance the possibilities of hydrological and environmental research, which is often limited by the time and cost of field measurements and the resulting lack of data. The database provides an overview of all relevant field monitoring data in conjunction with maps and allows all users to share measurement results with one another.

A study by the Economics Institute carried out in RP No. 22 "Society in Motion and Public Policy" clearly embodies the motto of Strategy AV21, "Top research in the public interest". In relation to the reform of secondary school admission rules and application processes, experts focused on mechanisms to match schools and students in order to evaluate which of the possible algorithms would be the most appropriate. A delayed acceptance algorithm proved to be the best for the Czech Republic. Using this algorithm, schools may admit students primarily on the basis of exam performance instead of on school preference ranking on student

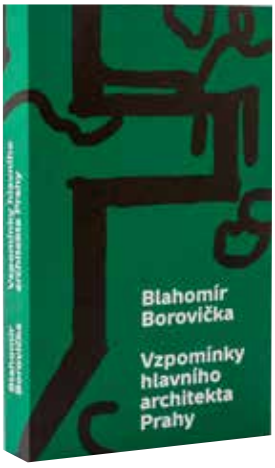


Effects of perfluorinated and polyfluorinated organic substances on human health

application forms. Owing to the detailed analysis of each algorithm and subsequent dissemination of the study results, during follow-up expert dialogue the Ministry of Education, Youth and Sports and Cermat, which are developing the new system, recognised the suitability of the recommended algorithm for the 2024 admission process.

An example of research in the public interest from another field is the development and testing of low-cost seismic stations to provide early warning of earthquakes. Thanks to financial support from RP No. 30 "Dynamic Planet Earth", low-cost seismic stations were deployed in additional locations in Nepal, effectively completing the network in the most seismically active region of the country.

In cooperation with the Institute of Contemporary History and the Prague Institute for Development and Planning, the book *Blahomír Borovička: Memories of the Chief Architect of Prague*, by architectural historian Martina Koukalová and historian Petr Roubal, was published as part of RP No. 23 "The City as a Laboratory for Change: Construction, Historical Heritage and Place for Safe and Quality Life". Blahomír Borovička served as chief architect during a period of unprecedented building development in Prague – with extensive construction of housing estates, the subway system and the reconstruction of old districts (Žižkov, Vinohrady, Karlín) – that rendered the city the largest 'construction site' in Czechoslovakia at the time. The book provides interesting insights into the institutional history of the Office of the Chief Architect and, above all, into the history of the development of Prague's built environment.



Book cover

Blahomír Borovička: Memories of the Chief Architect of Prague

Through RP No. 21 "Landscape Conservation and Restoration", a number of studies were published over the past year that compare the advantages and disadvantages of artificial landscape restoration and ecosystem self-renewal. Extensive research has shown that self-renewal processes often create a more sustainable and heterogeneous community in a given location than human interventions. These hypotheses were recently confirmed by the gradual recovery of forests in the Bohemian Switzerland area that had been afflicted by fire. The findings of the studies led to public debate about the suitability of existing legislative practice and the approach of key actors in restoration processes, which can help improve ecosystem resilience in the Czech landscape in the future.

With the support of RP No. 24 "Resilient Society for the 21st Century", an extensive publication titled *A Resilient Society. Between Helplessness and Tyranny* by philosopher Alice Koubová and literary documentary filmmaker Barbara Baronová was published. The authors held fourteen interviews with fifteen respondents exploring topics including crisis, social change, support systems, strategies for coping with emergencies, social ties, values and culture, all in relation to the theme of resilience.

Book cover
Alice Koubová, Barbora Baronová: A Resilient Society. Between Helplessness and Tyranny

Thanks to RP No. 25 "Virology and Antiviral Therapy", a Biology Centre research team was able to transfer monoclonal antibodies, derived from the blood of patients who have suffered tick-borne encephalitis, to clinical testing. These antibodies have great potential in the treatment of this disease. Subsequent research examined the response of tick-borne encephalitis virus to these antibodies, finding that when two different types of monoclonal antibodies are used, the virus is no longer able to mutate, and consequently cannot become resistant to the combination. The findings may have important implications for future clinical testing of therapeutic agents.

An example of successful popularisation of scientific results is the travelling exhibition "The Gene Age", which was prepared as part of RP No. 29 "Towards Precision Medicine and Gene Therapy - A New Hope in the Treatment of Human Diseases". Initially presented to the public in October 2023 on the Smíchov Embankment in Prague, the exhibition has been since held in two other locations. The exhibition is intended to raise awareness and outreach about the impact of genes and gene mutations on the development of human diseases, while also pointing out the need for inclusion and integration of people with rare diseases into society. The exhibition is also available online.

Exhibition
The Gene Age

Another exhibition was developed in RP No. 28 "Anatomy of European Society, History, Tradition, Culture, Identity", which was entitled "*... Then I saw a new heaven and a new earth...*" *The Apocalypse and Art in the Czech Lands*. The exhibition, which took place at the Gallery of West Bohemia in Pilsen, showcased an array of art works inspired by the Book of Revelation from the Middle Ages to the present. A book of the same name was published with CAS support (see p. 106).

Throughout 2023, reflections on the new opportunities and risks associated with the development of artificial intelligence resonated broadly in society and the media. In an effort to introduce a rational basis to the public discourse, researchers in RP No. 26 "Breakthrough Technologies for the Future - Sensing, Digitalisation, Artificial Intelligence and Quantum Technologies" collaborated with the Karel Čapek Centre to prepare a brochure titled *Should We Be Afraid of Artificial Intelligence?* The brochure presents the basic facts about artificial intelligence in an easy-to-understand way, refutes some entrenched myths and reviews the legislative and ethical challenges requiring attention in tandem with the development of artificial intelligence.

RP No. 16 "Space for Mankind" enabled significant media coverage of Czech participation in the Jupiter Icy Moon Explorer (JUICE) mission. On 14 April 2023, the JUICE interplanetary spacecraft successfully embarked on its odyssey to Jupiter. The spacecraft was equipped with an instrument for measuring electromagnetic waves at audible frequencies, developed by scientists and technicians from the Department of Space Physics at the Institute of Atmospheric Physics in collaboration with scientists from the Astronomical Institute. The new device will measure electromagnetic waves and also detect where they are propagating from.

Another important output of Strategy AV21 are expert opinions for legislative bodies, known as AVexes. In 2023, the following opinion papers were published: *Artificial intelligence*, *Fireworks: a toxic show with unbearable health risks*, and *Fusion energy within reach*. Seven expert brochures were published by Academia Publishing House in the Strategy AV21 series: *Lawson Criterion*, *Trees in the Landscape*, *Food from Prehistory to the Present - and Would We Like It?*, *Methodology for the Processing of Archival Material on the Historical Use of Forest Estates*, *Soil Life*, *Don't Give Up!*, *Quantum Technologies* and *Living Healthy Soil*.

Former railway bridge in Ralsko
The bridge was part of the railway siding connecting the Mimoň railway station with the Hradčany military airport. An activity of RP No. 24 "Resilient Society for the 21st Century" in Strategy AV21 - Resilient Ralsko (Photo Jitka Walterová, Photogenic Science 2023).

Czech Academy
of Sciences

STRATEGY AV21

List of Strategy AV21 research programmes

AND COORDINATORS

RP16
Space for Mankind
RNDr. Jiří Svoboda, Ph.D.
Astronomical Institute
01/01/2017 – 31/12/2023

RP17
Light at the Service of Society
Ing. Tomáš Mocek, Ph.D.
Institute of Physics
01/01/2017 – 31/12/2023

RP18
Preclinical Testing of Potential Pharmaceuticals
MUDr. Jan Kopecký, DrSc.
Institute of Physiology
01/01/2017 – 31/12/2023

RP19
Foods for the Future
Prof. Ing. Jaroslav Doležel, DrSc.
Institute of Experimental Botany
01/01/2020 – 31/12/2024

RP20
Water for Life
Doc. RNDr. Martin Pivokonský, Ph.D.
Institute of Hydrodynamics
01/01/2020 – 31/12/2024

RP21
Landscape Conservation and Restoration
Prof. Mgr. Ing. Jan Frouz, CSc.
Biology Centre
01/01/2020 – 31/12/2024

RP22
Society in Motion
Doc. Ing. Daniel Münich, Ph.D.
Economics Institute
01/01/2020 – 31/12/2024

RP23
The City as a Laboratory of Change and Safe Construction
PhDr. Adéla Gjuričová, Ph.D.
Institute of Contemporary History
01/ 01/ 2020 – 31/ 12/ 2024

RP24
Resilient Society for the 21st Century. The Potential of Crisis and Effective Transformation
Doc. RNDr. Mgr. Alice Koubová, Ph.D. et Ph.D.
Institute of Philosophy
09/02/2021 – 31/12/2025

RP25
Virology and Antiviral Therapy
Doc. RNDr. Daniel Růžek, Ph.D.
Biology Centre
09/02/2021 – 31/12/2025

RP26
Breakthrough Technologies of the Future – Sensing, Digitalisation, Artificial Intelligence and Quantum Technologies
Prof. Ing. Josef Lazar, Dr.
Institute of Scientific Instruments and Institute of Physics
01/01/2022 – 31/12/2026

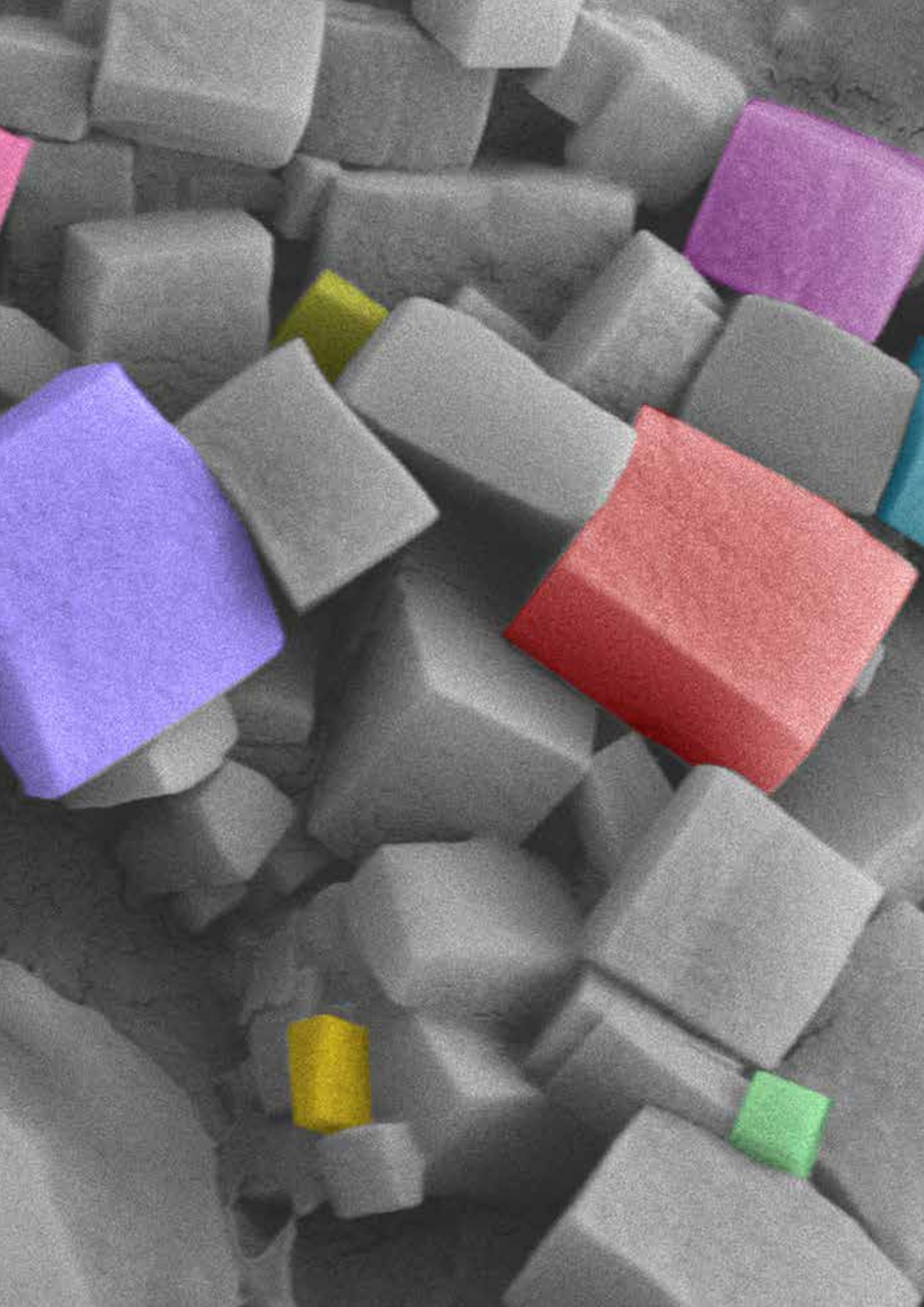
RP27
Sustainable Energy
Doc. Ing. Miroslav Chomát, CSc.
Institute of Thermomechanics and Institute of Plasma Physics
01/01/2022 – 31/12/2026

RP28
Anatomy of European Society, History, Tradition, Culture, Identity
Mgr. Jana Maříková-Kubková, Ph.D.
Institute of Archaeology, Prague
01/01/2022 – 31/12/2026

RP29
Towards Precision Medicine and Gene Therapy - A New Hope in the Treatment of Human Diseases
Doc. Dr. Radislav Sedláček, Ph.D.
Institute of Molecular Genetics
01/01/2022 – 31/12/2026

RP30
Dynamic Planet Earth
RNDr. Aleš Špičák, CSc.
Institute of Geophysics
01/01/2023 – 31/12/2027

Strategy AV21 Supporting Activities
Ing. Tomáš Wencel, MBA
Centre of Administration and Operations of the CAS
01/01/2023 – 31/12/2023



Projects from Operational Programmes

of EU structural Funds

In 2023, CAS institutes continued to work concurrently on projects under operational programmes co-financed by the European Structural and Investment Funds within the 2014-2020 programming period and the 2021-2027 programming period. In the 2021-2027 period, where grant programmes are divided into national operational programmes, cross-border cooperation programmes and supranational and interregional cooperation programmes, CAS institutes submitted applications in response to calls or started implementing projects under the Jan Amos Komenský Operational Programme (OP JAK) managed by the Ministry of Education, Youth and Sports and the Operational Programme Technology and Applications for Competitiveness (OP TAC) managed by the Ministry of Industry and Trade.

In 2023, CAS institutes were involved in 80 projects falling under EU Structural Funds operational programmes.

> “Operational programmes are a very effective tool for supporting high-quality research at CAS institutes that is focused on enhancing the Czech Republic’s competitive edge.

In 2023, CAS institutes worked projects under operational programmes co-financed from the European Structural and Investment Funds of two programming periods in parallel. Most of the projects falling under the 2014-2020 period were completed in 2023. In the new 2021-2027 programming period, CAS institutes began implementing new projects supported through OP JAK and participated in public competitions in successive OP JAK and OP TAK calls. Newly supported projects will be launched in upcoming years.

In 2023, CAS institutes were involved in 80 projects falling under EU Structural Funds operational programmes. CAS institutes served as coordinators or beneficiaries of 70 projects, of which 17 were launched in 2023 and 53 were completed during the course of the year. Table 1 provides an overview of CAS institutes’ participation in the projects, categorised by operational programme. More detailed information about projects launched in 2023 under the 2021-2027 period with a total approved funding allocation of CZK 1,890,588,000 is provided in **Table 2**.

Table 1: Participation of CAS institutes in coordination of operational programme projects in 2023

OPERATIONAL PROGRAMME	Projects launched	Projects ongoing	Projects completed	TOTAL
Integrated Regional Operational Programme	0	0	1	1
OP Jan Amos Komenský	17	0	0	17
OP Prague - Growth Pole of the Czech Republic	0	0	1	1
OP Research, Development and Education	0	0	44	44
OP Environment	0	0	4	4
Cross-border Cooperation Programme Interreg V-A Slovakia – Czech Republic	0	0	3	3
TOTAL	**17**	**0**	**53**	**70**

Table 2: Operational programme projects launched in 2023

Beneficiary/ coordinator	PROJECT	Total approved project support in thousands of CZK
OP Jan Amos Komenský		
Biology Centre	MSCA Fellowships - INTERFELLOWS	**16,614**
Biology Centre	SCIENCE FELLOWSHIPS	**12,509**
Institute of Physics	MSCA Fellowships CZ Institute of Physics I	**32,333**
Institute of Physics	MSCA Fellowships CZ Institute of Physics II	**15,022**
Institute of Microbiology	MSCA Fellowships CZ	**10,386**
Institute of Microbiology	MSCA Fellowships CZ No. 2	**10,775**
Institute of Experimental Botany	New insights for next generation crops	**435,679**
Institute of Experimental Medicine	Centre of Excellence in Regenerative Medicine	**481,225**
Institute of Photonics and Electronics	Development of optical components for fiber lasers and sensors for future applications in the mid-infrared	**3,356**
Institute of Plasma Physics	COMPASS-U: Tokamak for Top Fusion Research - Phase II	**357,988**
Institute of Plasma Physics	Institute of Plasma Physics - MSCA Fellowships CZ	**3,356**
Institute of Plasma Physics	Institute of Plasma Physics - MSCA Fellowships CZ 2	**5,086**
Institute of Organic Chemistry and Biochemistry	Institute of Organic Chemistry and Biochemistry MSCA PF Mobility	**3,356**
Institute of Contemporary History	The politics of memory and democratisation: the Czech Republic and Germany	**2,226**
Institute of State and Law	Suspended Sentences OP JAK MSCA	**4,536**
Global Change Research Institute	AdAgriF - Advanced methods for reducing emissions and sequestering greenhouse gases in agricultural and forest landscapes for climate change mitigation	**492,454**
Institute of Animal Physiology and Genetics	Ecological niche modelling to define the role of basal metabolic rate in local adaptation to climate change in Apodemus sylvaticus	**3,687**

Practical Application of Research

The CAS Knowledge and technology transfer strategy adopted at the end of the previous year was successfully implemented in 2023. The CAS Technology Transfer Office, which act as a transfer catalyst and guarantor and develops many activities and initiatives benefitting CAS institutes, played a significant role. Institute directors also dedicated considerable efforts to the application of their research results, with many expanding the institutes' work in targeted ways and making use of the CAS' new transfer initiative. An important activity was the new Programme for Application Development and Commercialisation (PADC), which facilitates funding of activities carried out by institutes and scientists to accelerate application of their inventions. In 2023, more than 40 projects applied to the programme and the best 10 were supported. Another set of projects has already been selected to receive support in the first half of 2024.

> The launch of the new Programme for Application Development and Commercialisation (PADC) has further motivated scientists to put their results into practice.

Implementation of the Strategy for knowledge and technology transfer in the CAS environment

In the context of the development of knowledge and technology transfer (hereinafter also referred to as "KTT") at the CAS, 2023 was marked by the implementation of the CAS Strategy for knowledge and technology transfer approved by the Academy Council as 2022 came to a close.

Knowledge and technology transfer at the CAS means the application of scientific research results that bring about social changes in the economy and society, especially in relation to the introduction of new technologies and services, efficient use of natural resources, creation of new jobs, support for legislation and the development of relevant public policies and other direct and indirect development of the social and cultural environment.

The CAS has created a comprehensive system of knowledge and technology transfer support that it is developing over the long-term. The main mission of this system is to enable and accelerate the use of scientific research results in practice. The key objective is to find and arrange funding for technology development and knowledge application, typically in close cooperation with an application partner.

The system is based on having a professional office under unified coordination and management, which implements clearly defined activities to support transfer activities at specific institutes and research teams. The priority focus areas of the Strategy for knowledge transfer in the CAS environment include early identification and valuation of intellectual property and application potential and development of related knowledge and technologies for practical application.

To support and coordinate knowledge and technology transfer activities, the CAS has established KTT advisory bodies - the Council for Cooperation of the CAS and the Business and Application Sphere and the Council for Use of Intellectual Property. Both bodies and their members actively engage in addressing current issues related to development of KTT within the CAS' scope of activity.

A significant achievement was the establishment of a new internal programme to support the commercialisation of research results. In June 2023, the Academy Council approved the Programme for Application Development and Commercialisation (PADC). This new concept of systematic support for scientists will greatly facilitate the translation of research results into practice. The main goal of the PADC programme is to directly support research teams that would like to focus on transfer of research results.

Another new activity launched in 2023 with great potential to generate positive impacts is a systematic focus on application of results from social science and humanities institutes. In 2023, comprehensive data collection and mapping of ongoing activities took place. In 2024, a concept for the application of knowledge from these scientific fields will be prepared. The concept is expected to enhance the expansion and visibility of CAS institutes' contributions and cooperation with decision-making bodies in the Czech Republic.

Practical aspects of transfer

During 2023, the range of KTT activities at CAS institutes expanded further. The long-term focus of virtually all CAS institutes is the implementation of joint research and development projects with private or public entities. These collaborations produce results that are clearly applicable in practice.

The trend of development and application of research results through business activities has continued. This is seen in the growing number of new spin-offs established by CAS institutes in conjunction with the given inventors and private investors. In 2023, several new spin-offs in fields such as petrochemistry and cardiology were approved and established. The quality of these spin-offs is demonstrated by their success in securing funding for further development.

In 2023, PADC programme support was extended to the first set of projects, numbering 10 in all, which received a total of CZK 4 million. These included, for example, the Institute of Biotechnology's research into new approaches to cancer treatment by targeting tumour metabolism, the Biology Centre's research into insecticidal agents for selective control of insect pests, development of nanostructured catalysts for the chemical industry at the

J. Heyrovsky Institute of Physical Chemistry, and development of biodegradable wires at the Institute of Physics. In November 2023, a selection process was launched for the second set of projects, which will be supported by the PADC programme in 2024.

CAS representatives are actively involved in laying the groundwork for the application of research results in the Czech Republic. CAS Vice-President Ilona Müllerová, as a member of the Research, Development and Innovation Council, leads many initiatives to improve the quality of transfer procedures in the Czech Republic. Under her leadership, a Transfer working group was established at the R&D&I Council and she is also working closely with the team of the Czech Minister for Science, Research and Innovation Helena Langšádlová to prepare transfer transformation activities.

Development of competences and advancement of expertise

The implementation of comprehensive educational activities for CAS institutes under the leadership of the CAS TTO has been a long-standing tradition. The proven programme for transfer specialists, TT Boost, was innovated to increase its focus on practical skills. In 2023, a number of educational and awareness-raising events were held on topical issues. These included, for example, intellectual property valuation, verification of market potential, an overview of sources of transfer financing in the Czech Republic and the EU, as well as current information on the PADC programme and the Technology Incubation programme from CzechInvest.

Intensive half-day courses focused on transfer issues, targeted at specific CAS institutes and attended by a wide range of staff (management, scientists, technical and administrative staff), have proven to be a successful and popular format.

Outlook for the upcoming period

The development of the transfer support system will remain a high priority and be afforded considerable attention. The main focus is the continued support and implementation of KTT at CAS institutes. For this reason, the PADC Programme will continue and increase the amount of funding it provides.

A targeted focus on verification of the quality of technology and knowledge based on proof of concept projects is envisaged.

In 2024, the systematic development of the CAS professional transfer team will continue, focusing in particular on the development of the necessary competences and also on strengthening capacities to handle a larger number of projects. An important initiative under the leadership of the TTO is the creation of a transfer knowledge base. It is anticipated that this base will become an important part of, and a catalyst for, further application of CAS institutes' research results.

Selected examples of research results for practical application

Institute of Physics

The Institute of Physics introduced a new method of forming a nanomaterial structure on a donor film receiver. The nanomaterial is transferred by laser, either forward transfer or blister-based laser. The method comprises scanning of the donor film or receiver using computer-driven means for moving the receiver, which enables the formation of a precise nanomaterial structure. The patent is registered under No. US11801704.

Institute of Physics

The Institute of Physics entered into a JANA2020 license agreement for a new version of a crystallographic computing system; the license partner is Shenzhen Jingtai Technology Co., Ltd., China. The contract is effective until 30 November 2026.

Institute of Photonics and Electronics

The Institute of Photonics and Electronics presented a method of extracting complex permittivity from transmission lines in the microwave frequency range. This technique is key to the development of wireless communications, radar and bio/sensor applications, particularly in the 5G and 6G technology bands. The patent is registered under No. CZ 309946.

Institute of Physics of Materials

The Institute of Physics of Materials introduced an innovative validated technology for precision casting of radial turbocharger wheels with increased thermomechanical resistance. This technology has already been operationally tested and introduced into serial production by the partner company, PBS Velká Bíteš, a. s. Project number: CZ.01.1.02/0.0/0.0/20_321/0024465.

Institute of Plasma Physics

The Institute of Plasma Physics has introduced a patent for a passive optical system for generating a structured laser beam. The beam has a unique cross section with concentric circles and reaches to infinite distance with a very small divergence. The system uses a combination of optical aberrations of conventional components and allows simple tuning of the beam parameters. The patent is registered under No. US 11,789,281 B2.

Institute of Geonics

The Institute of Geonics assessed the influence of EDZ (excavation disturbed zone – the interface between the rock and the excavated area) on the transport of radioactive substances and repository safety parameters. The project was implemented in 2019-2022 with the support of the Technology Agency of the CR (TA CR) (project no. TK02010118) and in cooperation with the Radioactive Waste Repository Authority (SÚRAO) and the Technical University of Liberec.

Nuclear Physics Institute

The Nuclear Physics Institute entered into a license agreement with Eckert & Ziegler Radiopharma GmbH to develop technology for cancer therapy, particularly terminal stage cancer, and to provide long-term service for the technology.

Institute of Hydrodynamics

Using remote sensing of the Earth and hydrological modelling, the Institute of Hydrodynamics created a specialised map based on a long-term SWAT hydrological model simulation in two catchment areas of interest: the Upper Úpa and Čistá river basins. The simulated period covers 1990-2019. The results are mainly used to analyse the causes of forest cover decline in selected areas of the Krkonoše National Park. The project was supported by the Technology Agency of the Czech Republic and was a collaboration with the Faculty of Science of Charles University, Czechglobe – Global Change Research Institute of the CAS and the Krkonoše National Park Administration.

Institute of Scientific Instruments

The Institute of Scientific Instruments obtained a patent for an innovative method of preparing an optically variable imaging device as a planar structure. This invention uses the function of optical primitives arranged in accordance with a graphical phyllotactic model. The patented invention will be applied to secure products, valuables and documents and will thus also help fight organised crime. Potential users include government, security forces and the commercial sector. The patent is registered under No. EP3497491.

Institute of Scientific Instruments

The Institute of Scientific Instruments improved the technical design of a directional fluorescence detector, which allows more efficient detection of the signal emitted by ions caught in a Paul trap in free space. The technical design will be used with an optical quantum clock based on cooled calcium ions. The design utility model is registered under No. 36751.

Institute of Scientific Instruments

The Institute of Scientific Instruments was engaged in the establishment of the spin-off VDI Technologies Inc. (US), which focuses on the US commercialisation and certification of the high-frequency ECG technology developed by the Institute.

Institute of Rock Structure and Mechanics

The Institute of Rock Structure and Mechanics introduced an innovative instrument that acts as a seismic beacon, measuring changes in rock massifs with high sensitivity. The instrument uses continuously generated harmonic seismic waves with stable frequency and amplitude. It was originally developed to detect pre-earthquake critical stress but can also be used to detect magma movements or changes in groundwater levels and hydrocarbon saturation. The generator patent is registered under No. CZ 309648 B6.

Institute of Theoretical and Applied Mechanics

The Institute of Theoretical and Applied Mechanics developed an X-ray profilometer that allows detailed inspection of layered structures deposited on a solid substrate with micrometric accuracy. The instrument uses a planar sharp X-ray beam that irradiates the object to be examined at a sharp angle. X-ray and XRF photons are detected by a semiconductor pixel detector. The instrument is primarily used for the investigation of medieval panel paintings but has wider applications in the examination of artworks and measurement of thicknesses in industrial sprays and coatings. The patent is registered under No. EP3828534.

Institute of Information Theory and Automation

The Institute of Information Theory and Automation developed a method of measuring fuel assembly deformation using digital image processing from fuel inspection videos. The licensing partner is Centrum výzkumu Řež s.r.o. The patent is registered under No. PV 2021-549.

Institute of Thermomechanics

The Institute of Thermomechanics developed certified methodologies for evaluation of the integrity of VVER-

1000 nuclear reactor pressure vessels at high temperatures caused by core melting due to a severe accident. The research included analyses modelling the response of a nuclear power plant to severe fuel damage with consideration of In-Vessel Melt Retention and Ex-Vessel Cooling strategies for accident scenarios with fuel loss and complete loss of AC power. The project was implemented with the support of the TA CR and in partnership with ÚJV Řež, a. s. and the Institute of Physics of Materials of the CAS.

Institute of Biophysics

The Institute of Biophysics, as part of the NanoHA project, demonstrated that molecular weight and gut microbiota influence the bioavailability of orally administered hyaluronic acid. A study in germ-free and conventional mice showed that orally administered hyaluronan labelled with the stable isotope 13C is extensively metabolised in the gastrointestinal tract depending on the specific microbiome. Furthermore, the absorption of specific hyaluronan metabolites into systemic circulation and their effect on physiological processes in the body was demonstrated. The project was supported by the Ministry of Industry and Trade (MIT) and implemented in cooperation with Contipro a.s.

Biology Centre

The Biology Centre developed a new method for protecting forest ecosystems against spruce bark beetle and northern spruce bark beetle using biopesticides with a specific fungus (CCM 9191 B. pseudobassiana) with high virulence against the target pests, which enabled optimisation of the biopesticide. The solution provides biotechnology for bark beetle control with low production costs and high efficacy. The project was financed by the TA CR and implemented in partnership with MycoTech s.r.o.

Institute of Biotechnology

The Institute of Biotechnology developed monoclonal antibodies that recognise human prostate-specific membrane antigen, a biomarker of prostate cancer. These antibodies have potential use in prostate cancer treatment and diagnostic imaging. The patent was registered under No. US11773182B2.

Institute of Physiology

The Institute of Physiology developed a modular 3D printer for direct bioprinting of hydrogels with cell suspension, which allows simultaneous printing of two or more matrices. The utility model is registered under No. 37203. The project was funded by the TA CR and implemented in collaboration with PrimeCell Bioscience, a.s., the Faculty of Biomedical Engineering of the Czech Technical University and Life Star International Ltd. from Taiwan.

Institute of Physiology

The Institute of Physiology demonstrated a significant anticonvulsant effect in a rat model of epilepsy as well as seizures induced by 6 Hz electrical stimulation for the 3α5β-steroid compounds which were studied. In another model of pentylenetetrazole-induced seizures, there was complete seizure blockage in pups and a significant reduction in the incidence and latency of generalised tonic-clonic seizures in adults. The solution is a new, safe and highly effective medicinal product for the treatment of epilepsy. The patent was registered in the Czech Republic, Canada and Japan under numbers 309617, CA3128921 and JP7248819.

Institute of Microbiology

The Institute of Microbiology focused on determining the effectiveness of two different drug application forms of TFI, which contains transfer factors as an active ingredient in the treatment of melanoma. AUMED, a.s. is the provider and project partner.

Institute of Microbiology

The Institute of Microbiology described a method of functionalising an aromatic amino acid or nucleobase through a process wherein the aromatic amino acid reacts in the presence of at least one reductant with at least one hypervalent iodine fluoroalkyl reagent carrying a fluoroalkyl moiety RF. The proposed method also provides novel hypervalent iodine fluoroalkyl reagents. The patent is registered under No. 396603.

Institute of Chemical Process Fundamentals

The Institute of Chemical Process Fundamentals developed a membrane technology for challenging separations mainly targeting the removal of carbon dioxide (CO2), sulphur dioxide (SO2) and nitrogen oxides (NOX) from flue and waste gases. This energy-efficient alternative to traditional separation processes is an economically competitive method for cleaning flue gases from small point sources of emissions such as waste incineration plants and steel or cement production units. The project was funded by the TA CR and MemBrain s.r.o. was the project partner.

Institute of Experimental Botany

The Institute of Experimental Botany received a certificate granting Community Plant Variety Rights in the European Union for a new apple tree variety designated UEB 6481. The right was registered under EU No. 63132.

J. Heyrovský Institute of Physical Chemistry

In Theta project TK04020069 funded by the Technology Agency, the J. Heyrovsky Institute of Physical Chemis-

try focused on the study of streamers and surface flashover discharges on insulators in alternative gases to SF6. One of the results concerns the optical properties of the Novec 5110 dielectric gas in the VUV spectral range. Specifically, the absolute effective cross sections for VUV photoabsorption of C5F10O gas were determined. This knowledge is used by Eaton Elektrotechnika, s.r.o.

Institute of Macromolecular Chemistry

The Institute of Macromolecular Chemistry developed the STEMDIFF software, which provides enhanced capabilities for the use of SEM microscopes with modern pixelated STEM detectors and enables simple use of electron diffractometers. STEMDIFF is a freely distributable module that users can download and easily integrate into their Python programming language software. The project was implemented through the programme "Centre for Advanced Electron and Photon Optics" (CAEPO; National Centre of Competence 2, project no. TN02000020). The provider is the TA CR and the partner is Thermo Fisher Scientific Brno s.r.o.

Institute of Macromolecular Chemistry

The Institute of Macromolecular Chemistry conducts research into treatment of cancer and skin diseases using light-activated micelles. These nanoparticles, based on polymeric amphiphiles containing ferrocene, allow precise spatial and temporal control of their activity with high specificity and reduced toxicity. The patent is registered under EP No. 23305409.7.

Institute of Organic Chemistry and Biochemistry

The Institute of Organic Chemistry and Biochemistry obtained patents for mebendazole prodrugs with enhanced solubility and oral bioavailability. Methods of using this drug in the treatment of various tumour diseases, including cancer, were described. The patent was registered in the US under No. 11,712,435 and in Australia under No. AU 2019216757.

Institute of Organic Chemistry and Biochemistry

The Institute of Organic Chemistry and Biochemistry obtained a patent for 3'3'-cyclic carbocyclic nucleotide-containing dinucleotides and their derivatives that can modulate the activity of the STING adaptor protein. It is used in the treatment of inflammation, allergic and autoimmune diseases, cancer and viral infections. The patent was registered in the US under No. US 11,766,447.

Global Change Research Institute

The Global Change Research Institute introduced Agrorisk.cz, a website providing early warnings of adverse weather effects in agriculture. It offers a daily updated description of abiotic and biotic risks at cadastral level including a 9-day forecast. The methodology was approved by the Central Institute for Supervising and Testing in Agriculture through certificate No. 169928/2023. The project entitled "Early Warning Agrometeorological System for Biotic and Abiotic Risks" is funded by the National Agency for Agricultural Research and the partner organisation is the Czech Hydrometeorological Institute.

Institute of Archaeology, Brno

In relation to preservation of the Czech Republic's archaeological cultural heritage, geophysical surveys were carried out e.g. at the construction site of the tangent connecting the D52 and D2 and at the construction site of the Kokory-Přerov motorway. On the basis of the surveys, rescue archaeological research was conducted. The institute's conservation and analytical laboratories began work on a comprehensive survey for the Museum of Kroměříž, along with conservation of the largest set of finds of medieval armour from the Czech Republic, which were obtained at the Cimburk Castle grounds.

Institute of Archaeology, Prague

Under the auspices of the Ministry of Regional Development, the virtual exhibition on the national cultural monument Závist was extended under the programme Development of basic and accompanying tourism infrastructure.

Institute of Ethnology

The study Towards Sustainable Food Consumption (Evidence Review Report) was prepared for SAPEA (Science Advice for Policy by European Academies) and as a basis for scientific recommendations of the European Commission's Group of Chief Scientific Advisors. The study responds to the European Commission's request for science-based recommendations on overcoming the barriers that prevent consumers from adopting sustainable and healthy diets and on fostering the necessary changes towards sustainability in the food environment.

Institute of Philosophy

The implementation phase of the TA CR project "Measures for developing an ethical culture in the Czech state administration" was prepared for the Ministry of Transport.

Economics Institute

Experts from the institute served on advisory bodies of various state institutions, such as the advisory body of the Deputy Prime Minister for Digitalisation at the Office of the Government of the Czech Republic; the Government Council for Gender Equality; the Council of External Advisors to the Prime Minister of the Czech Republic; the Ministry of Education, Youth and Sports; and the Ministry of Labour and Social Affairs.

Institute of Psychology

Experts from the institute were active, for example, in the Minister of the Interior's taskforce on promoting public mental health during emergencies. In cooperation with the Paediatric Clinic of Motol University Hospital, they developed a parent questionnaire as a child language screening tool. For Charles University, as part of the programme "Prevention of unethical behaviour on campus and support of competences in victim care" (SYRI project), they developed a professional guide focused on prevention of workplace bullying.

Oriental Institute

The institute's staff provided expert consultations to various state bodies and participated in public hearings in the Senate of the Parliament of the Czech Republic ("Forced labour and forced assimilation in the Uyghur region") and Parliament of the Czech Republic conferences (e.g. "Relations with China in the past decade"). Furthermore, training on Islam and Middle Eastern politics was held for the Czech Army and soldiers deployed to the Czech mission on the Sinai Peninsula in Egypt under the Multinational Observers programme.

Institute of Sociology

The institute's staff prepared a number of background studies for various Czech and European authorities. For example, the research reports "Key barriers, opportunities and good practices for entrepreneurship and innovation" and "White Paper. From policy to practice: The evidence base for ending gender-based violence in higher education and research" were prepared for the European Commission. The research report "Corruption in selected sectors in the Czech Republic and possibilities of its reduction" was prepared for the Ministry of Justice. A research report entitled "Factors in reoffense and the process of desistance in the context of conditional release from imprisonment" was also intended for state use.

Czech Language Institute

For the needs of the Prague Transport Authority, linguistic editing of the operational announcements in trams and PID was carried out. In addition, consultations were provided to the new voice of Prague Integrated Transport, pronunciation problems with tram stop names were identified, and a review of all recordings was made (approximately 1,250 items). The institute's experts also provided 486 expert opinions on personal names for public administration bodies (registry offices and ministries).

Institute of Contemporary History

The institute documented and created a subsequent exhibition of Slovak graves in Prague as a source for the study of the history of the Slovak minority for the Prague City Hall and the Slovak minority associations in Prague and Karlovy Vary.

Institute of State and Law

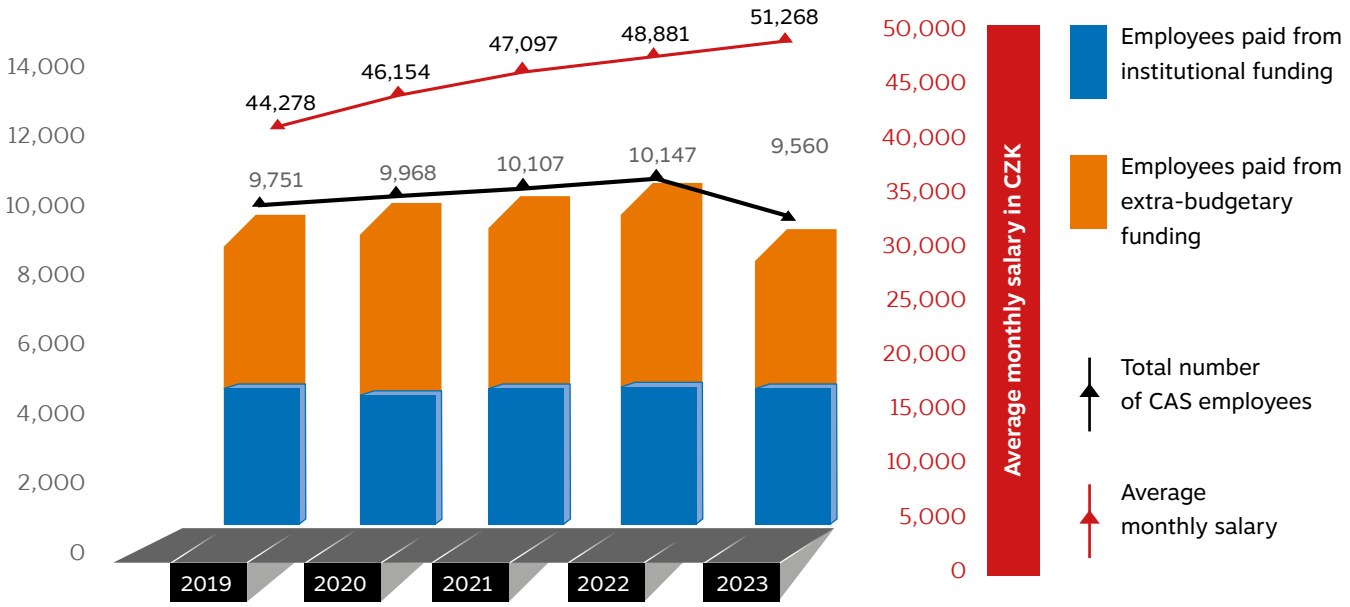
Experts from the institute provided legal opinions, statements and consultations on legislative bills for the needs of the CAS and its bodies. They also collaborated on proposals for legal regulation of artificial intelligence for the needs of the Ministry of Industry and Trade and the Office of the Czech Government. They provided expertise through advisory bodies of e.g. the Ministry of Labour and Social Affairs, the Ministry of the Interior and the Legislative Council of the Czech Government.

Employees and Salaries

The total number of CAS employees (listed as the average number of employees calculated in Full Time Equivalent – FTE) decreased year--on-year from 10,147 in 2022 to 9,560 in 2023. A total of 4,431 employees are paid through extra-budgetary allocations (which equalled 46.35% in 2023 compared to 49.94% in 2022). The number of research institute employees with university degrees who have passed arduous attestations pursuant to the Career Development Rules for CAS Employees with a University Degree and have been classified in the relevant qualification levels fell year-on-year from 6,230 to 5,913.

> The Czech Academy of Sciences and its institutes expended a total of CZK 5,881,180,000 on salaries and wages and CZK 187,533,000 for other payments for work (OON). The total average monthly salary at the CAS was CZK 51,268 with year-on-year growth of 4.88% from 2022.

Chart 1: Number of employees and average monthly salary at the CAS



The following table provides a more detailed look at the number of CAS employees categorised into employees of the CAS Head Office and employees of all CAS research institutes.

Table 3: Number of CAS employees

Year	2019	2020	2021	2022	2023
CAS public research institutions	9,672	9,893	10,037	10,080	9,494
CAS Head Office	79	75	70	67	66
CAS TOTAL	**9,751**	**9,968**	**10,107**	**10,147**	**9,560**

At the CAS Head Office, CZK 53,791,840 was expended (of which CZK 44,069,458 for salaries and CZK 9,722,382 for other payments for work performed) for 65.75 employees recalculated as average FTE. Unused funds equalling CZK 90,941 (of which CZK 27,736 for salaries and CZK 63,205 for other payments for work performed) were transferred to claims from unspent expenditures to 2024. The average monthly salary of CAS Head Office employees in 2023 was CZK 55,855.

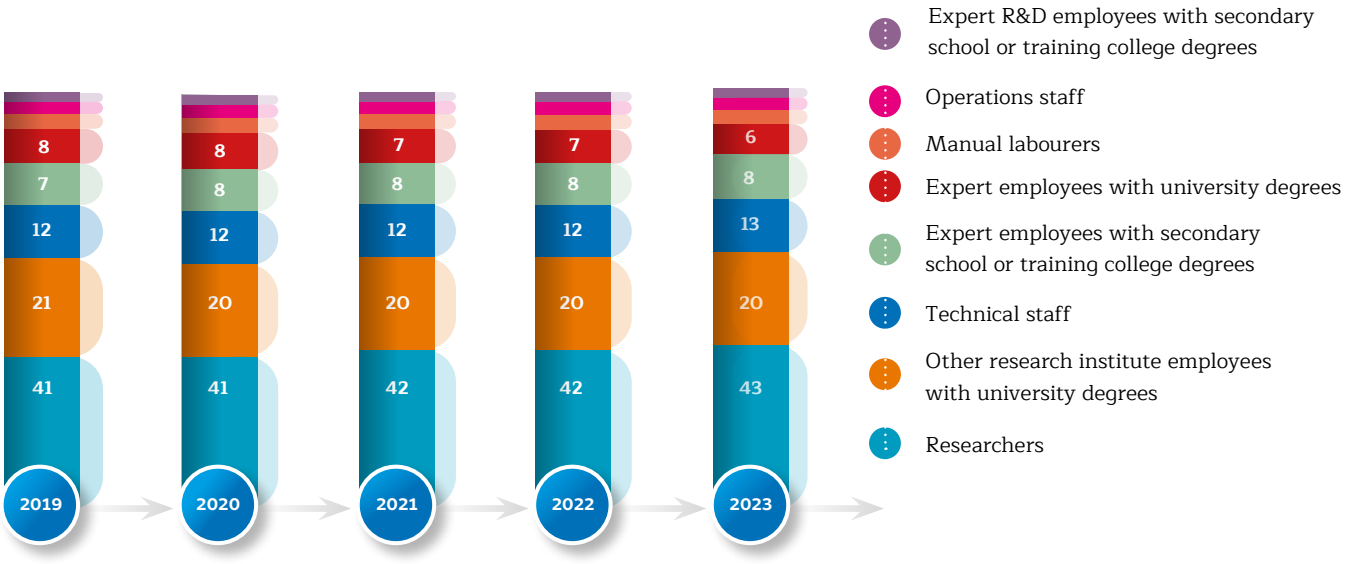
In 2023, CZK 5,837,110,000 was expended on salaries and CZK 177,810,000 for other payments for work performed for 9,494 employees across all CAS institutes (public research institutions). The average monthly salary of employees of CAS institutes equalled CZK 51,236.

The table below provides a more detailed look at average monthly salaries at public research institutions (including all funding sources – institutional and extra-budgetary) for each employee category.

Table 4: Number of employees and average monthly salary per category for 2023

Category	Average recalculated number of employees	Average monthly salary in CZK
Researchers	4,044	62,919
Other research institute employees with university degrees	1,869	40,348
Expert employees with university degrees	728	48,648
Expert employees with secondary school/ training college degrees	593	38,164
Expert R&D employees with secondary school/ training college degrees	205	39,832
Technical and administrative staff	1,208	52,912
Manual labourers	458	31,753
Operations staff	389	30,577
Total	**9,494**	**51,236**

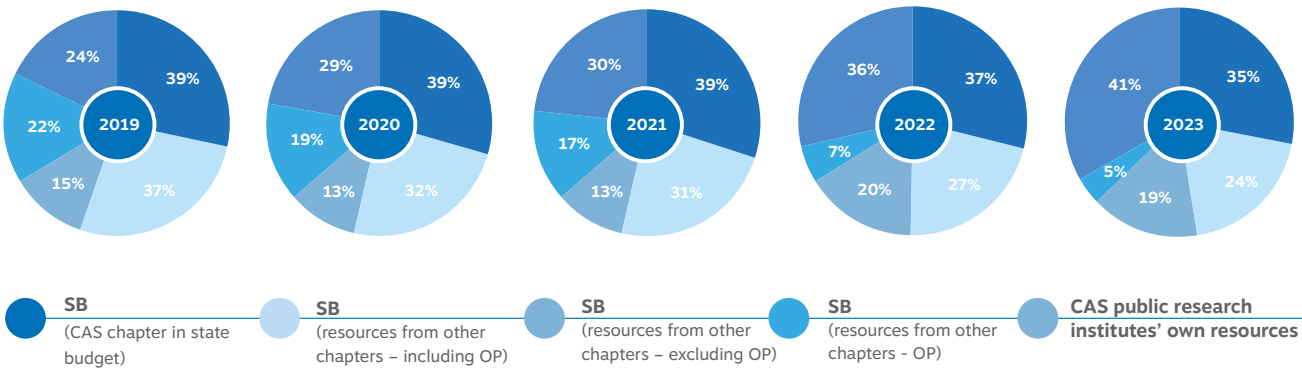
Chart 2: CAS research institute employee categories (in %)



Financial Resources and Their Use

In 2023, the Czech Academy of Sciences managed a total of CZK 19,835.74 million, of which CZK 6,993.61 million came from the CAS chapter in the state budget (SB). This state budget CAS chapter funding equalled 35% of the CAS' total financial resources in 2023.

Chart 3: CAS Financial resources (in %)



Financial resources (for the entire CAS) originating from the CAS budget chapter, grants from other budget chapters and the CAS' own resources are summarised in the following table.

Table 5: Structure of financial resources (actual) in mil. CZK

Type of expenditure		Non-investment resources	Investment resources	TOTAL
Resources from the CAS budget chapter		**5,987.88**	**1,005.72**	**6,993.61**
Grants from other budget chapters		**4,382.86**	**331.88**	**4,714.74**
GA CR projects		1,860.32	9.93	
TA CR projects		438.56	0.00	
Operational programmes		769.78	256.09	
Public research institutes' own resources		**8,127.39**		**8,127.39**
Commissions		**4,387.54**		
of which:	Publication sales	94.40		
	Conference fees	13.43		
	Licenses	3,572.53		
	Commissions related to main activity	386.41		
Other income		978.45		
	Other income (fines, penalties,	11,19		
	written-off receivables)	11.19		
	Interest	875.76		
	Exchange rate gains	91.51		
Settlement of funds		782.23		
	Reserve fund (RF)	4.74		
	Asset Replacement Fund (ARF)	163.36		
	Earmarked funds	508.77		
	of which: earmarked funds from abroad and monetary gifts	225.17		
	Social Fund (SF)	105.35		
Other income (excluding depreciation of assets acquired from grants)		**355.64**		
Proceeds from the sale of assets, securities, shares and materials		**1,622.86**		
Contributions received		**0.67**		
Total resources		**18,498.13**	**1,337.60**	**19,835.74**

Given that CAS institutes are managed as public research institutions in the system of non-governmental organisations and they are permitted to close their accounts by 30 June of the following year and that the institutes' financial statements must be verified by an auditor, the following expenditures statement should be taken as preliminary.

As of 31 December 2023, the Czech Academy of Sciences had a gain of CZK 2,390.06 million. Income of CAS institutes (public research institutions) totalled CZK 19,908.03 million (including depreciation of assets acquired from grants totalling CZK 1,526.52 million). The total expenditures of CAS institutes amounted to CZK 17,517.97 million. A detailed breakdown of the expenditures of CAS institutes is provided in the following table.

Table 6: Structure of non-investment expenditures of CAS institutes (in mil. CZK)

TYPE OF EXPENDITURE	2022	2023	Coefficient
Purchase of materials (small tangible assets, purchase of other materials)	1,336.65	1,103.39	0.83
Purchase of power and water	677.32	574.40	0.85
Goods sold	43.89	47.33	1.08
Repairs and maintenance	243.61	324.13	1.33
Travel expenses	207.75	243.49	1.17
Purchase of services (representation costs, technical evaluation of intangible assets, postage, telephone and internet services, purchase of intangible assets, rent, IT services, guest staff living expenses, conference fees and training, other services)	2,338.79	2,226.17	0.95
Personnel costs	8,158.14	8,048.91	0.99
Statutory social costs	292.69	301.58	1.03
Other social costs	26.48	39.45	1.49
Taxes and fees	8.35	9.58	1.15
Other costs (insurance, other operating costs, earmarked funds, fines, losses, damages, interest, write-off of receivables, donations, etc.)	427.88	726.66	1.70
Exchange rate losses	199.14	200.00	1.00
Depreciation and amortised cost of fixed assets sold	2,228.27	1,778.94	0.80
Securities and shares (sale of)	870.52	1,422.68	1.63
Material sold	0.00	0.05	15.93
Creation and use of provisions and allowances	5.00	20.00	4.00
Inventory change - own performance	-21.78	-21.21	0.97
Activation of material, goods, services and property	-72.44	-69.21	0.96
Grants provided	6.47	2.74	0.42
Corporate income tax	475.72	538.91	1.13
CAS institutes expended a total of	**17,452.44**	**17,517.97**	**1.00**

The main sources of investment funding are institutional and targeted grants from the state budget and foreign grants. They serve primarily for the acquisition or improvement of buildings and equipment, or for maintenance and repair of buildings and equipment.

Table 7: Investment resources of CAS institutes (in mil. CZK)

Type of expenditure	2022	2023	Coefficient
Resources from the CAS chapter of the state budget	**1,192.2**	**1005.3**	**0.84**
Resources from other ministries, including operational programmes	**375.5**	**331.9**	**0.88**
Depreciation	**262.1**	**255.3**	**0.97**
Income from sale of fixed assets	**45.0**	**34.6**	**0.77**
Other	**46.8**	**205.4**	**4.39**
Total	**1,921.6**	**1,832.5**	**0.95**

Table 8: Use of investment resources by CAS institutes (in mil. CZK)

Type of expenditure	2022	2023	Coeficient
Funding of construction	813.3	891.5	1.10
Acquisition of instruments and equipment	1,171.2	943.3	0.81
Maintenance and repairs	38.5	7.2	0.19
Other	240.2	80.0	0.33
Total	**2,263.2**	**1,922.0**	**0.85**

Resource generation equalled CZK 1,832.5 million in 2023 and CAS institutes used a total of CZK 1,922.0 million. The asset replacement fund was reduced by CZK 89.5 million.

Controlling

The CAS controlling system is based on the applicable legislation and on requirements related to decision-making and management processes of CAS bodies. Until 1 December 2023, the CAS Control Section consisted of the Division of Public Administration Control and the Internal Audit Department, where:

- the Division of Public Administration Control carries out public administration control of grant recipients and above all controls the management of public funds and assets of CAS institutes. In particular, compliance of the controlled entities' management with the relevant legal regulation is examined, including verification of the functionality and effectiveness of the internal control system set up at each CAS institute,
- the Internal Audit Department examines in particular the functionality and effectiveness of the internal control system for the management of the organisational unit of the CAS.

The CAS Control Section was abolished through an organisational change made on 1 December 2023. Both the Division of Public Administration Control and the CAS Internal Audit Department now once again fulfil the purpose and meaning of the applicable legislation in the implementation of controlling in the CAS sector by performing separate and independent activities in their designated areas.

Division of Public Administration Control

The Division of Public Administration Control prepares and carries out its controlling tasks in a manner fulfilling the requirements set forth for the given public administration area, which arise in particular from the Act on Financial Control and other regulations governing the performance of public administration control and financial control.

Controls are carried out on the basis of an approved annual plan and specific controls are carried out in accordance with the thematic foci that have been set for the given control. Primary attention is always paid to the fulfilment of the duty within the defined scope and structure, with the aim of verifying due management of state budget funds disbursed by the CAS as the administrator of the science and research budget chapter. Appropriate attention is paid to compliance with budgetary rules and to management of assets acquired with public funds.

Accordingly, in 2023, the controlled entities were, as usual, subjected to verification of compliance with the statutory conditions for the use of budgetary funds and conditions set by the provider for the use of grants and maintenance of proper accounting records. When controlling compliance with budgetary rules and other legal regulations governing the management of public entities, the control teams focused on adherence to the procedures set out in the applicable legislation and internal rules for the preparation, implementation and funding of investments, and compliance with the legal provisions for tenders, including compliance with the terms of the register of contracts. They also assessed whether there had been any violations of rules governing due diligence in asset management.

In the case of asset management, the control teams focused on the proper exercise of property rights in relation to intangible assets and responsible management of tangible assets. In 2023, the Division of Public Administration Control primarily verified whether asset records were properly maintained and whether the principles of economy, efficiency and effectiveness were followed in the use of funds and assets of the controlled entities.

In the case of supplier-customer relations, attention was focused on the fulfilment of the conditions of economic and non-economic activities according to the EU Guideline, as well as on controlling whether there had been any violations of the conditions of the Act on Public Research Institutions through financial or asset transactions carried out without adequate prior written consent from the competent bodies (i.e. whether the management of the relevant entities was affected by the consequences of absolutely invalid legal acts).

Labour relations were also examined as a standard focus area, in particular the fulfilment of the conditions set out in the Labour Code, including the handling of employee liability for loss events at the workplace, and whether all related transactions were properly recorded in the accounts.

Increased attention was also paid to the functionality of the internal control system established at the controlled CAS institutes, the effectiveness of which was assessed both in terms of the setting of the system and the result of controlling in all controlled areas.

Cases of non-compliance with applicable legal regulations detected by a control were subsequently analysed in more detail so that the problems identified by the control could be generalised and processed appropriately for the benefit of all CAS institutes to prevent the recurrence of the detected irregularities in the future.

Public administration and financial controls were carried out at five CAS institutes, in the following public research institutions:

- Institute of History,
- Institute of Theoretical and Applied Mechanics,
- Institute of Ethnology,
- Institute of Molecular Genetics,
- Institute of Geology.

The control results were discussed with the management of the given institute. The directors of the controlled entities subsequently adopted appropriate measures to remedy the identified deficiencies. The Division of Public Administration Control will continue to monitor the implementation of these measures. All of the control reports and conclusions were also submitted to the President of the CAS and other members of the Academy Council Presidium for discussion of public administration control results at Academy Council sessions. Each control report was also forwarded to the chair of the supervisory board of the controlled institute.

In 2023, the Division of Public Administration Control also examined in greater detail the use and accounting of grants provided in 2022 for research, education and similar activities through the CAS budget chapter to five scientific societies associated within the Council of Scientific Societies of the Czech Republic:

- Czech Oral History Association,
- Czech Society for Slavonic, Balkan and Byzantine Studies,
- Cartographic Society of the Czech Republic,
- Czech Association for African Studies,
- Union of Czech Mathematicians and Physicists.

In 2023, the Division of Public Administration Control controlled the allocation, use and accounting of grants provided from the state budget through Chapter 361 by the Czech Academy of Sciences to CAS institutes and scientific societies associated in the Council of Scientific Societies of the Czech Republic in the total amount of CZK 550,374,483. Of these, the public administration control carried out at CAS institutes examined funds totalling CZK 549,910,483 and the control of scientific societies examined grants totalling CZK 464,000.

The OVK is also responsible for processing complaints and suggestions sent to CAS bodies and the CAS Head Office. The Division of Public Administration Control handles some of the cases directly and also keeps records of complaints processed by other departments, continuously monitors their processing and in some cases participates in their subsequent resolution. In 2023, the Division of Public Administration Control dealt with or recorded 17 complaints and suggestions for investigation. Due care was taken to verify every case and to provide adequate supporting documentation. After review, five of the submitted cases were dismissed and four represented legitimate concerns. These cases can be considered closed. Eight cases are still in the process of resolution and related communication.

In addition to public administration and financial control, audit verification of accounting of funds for EU Framework Programme projects, record-keeping and resolution of complaints, one of the Division of Public Administration Control staff members is appointed as secretary of the Supervisory Committee of the Academy Assembly to handle the administrative and organisational aspects of the Committee's sessions.

Internal auditing

The internal auditor carried out tasks in accordance with the approved annual plan, which identifies the audit areas and the objectives of each audit assignment. In addition to the auditor's verification and assurance role, the auditor also provided consultancy services to the CAS management, CAS bodies and organisational units of the CAS Head Office.

The internal audit plan for 2023 was developed on the basis of a risk analysis. During the year, one internal audit was carried out, namely on 2022 CAS financial statements. Following a change in personnel in the internal auditor position, an audit of the effectiveness of the internal control system was initiated at the end of 2023, which is expected to be completed in the first quarter of 2024.

In connection with the internal audit of the 2022 CAS financial statements, the auditor identified some deficiencies and weaknesses and proposed recommendations to improve the internal control system's functionality and effectiveness and prevent potential risks. The conclusions of the internal audit, including the auditor's recommendations, were not formally discussed with the President of the CAS and the audited entity, and thus the audit was not formally closed. The auditor forwarded the results to the Ministry of Finance of the Czech Republic for review.

On the basis of the auditor's findings and recommendations, the CAS adopted a set of corrective measures and designated individuals responsible for their implementation. The measures are directed towards more effective setting and provision of preliminary, intermittent and subsequent management controls by modifying the internal documentation related to the CAS internal control system and launching a new grant proceedings management information system. Further measures included initiation of an extraordinary public administration control of the CAS Centre of Administration and Operations and ensuring the correct accounting of selected types of accounting transactions in the CAS Head Office. A review of the procurement system in the CAS Head Office and an analysis of the method of recording CAS internal regulations are planned.

Support of Excellence

The scientific policy of the Czech Academy of Sciences includes support of excellent research at its institutes. The CAS provides this support through various avenues. One of the most significant is the Academic Premium (Praemium Academiae), intended for scientists working on excellent research in any scientific field. The Otto Wichterle Award for selected promising young researchers is another means of support. The Czech Academy of Sciences supports exceptional young scientists, including researchers from abroad who are invited to collaborate with the CAS, through the Lumina Quaeruntur Research Fellowship and the Jan Evangelista Purkyně Fellowship. The CAS also provides targeted support to early career researchers through three other programmes: the Programme to Support Prospective Human Resources – post doctoral fellows, Programme for Research and Mobility Support of Starting Researchers and the Josef Dobrovský Fellowship. Each year, the prestigious Czech Academy of Sciences Awards recognise outstanding scientists for their extraordinary research results.

PRAEMIUM ACADEMIAE – ACADEMIC PREMIUM

The Academic Premium is the Czech Academy of Sciences' most illustrious support for scientific excellence. It is awarded to brilliant scientists who excel in their fields, providing them with funding at a globally comparable level and moral support for further scientific work. The Academic Premium award money of up to CZK 5 million per year helps recipients cover their research costs for a period of six years and, in the longer term, to develop their research both by building their own research teams and by acquiring needed new instruments or laboratory materials.

THE 2023 ACADEMIC PREMIUM AWARD-WINNERS INCLUDE:

Mgr. Martin Friák, Ph.D.

Institute of Physics of Materials

Martin Friák is one of the founders of the theory-guided materials design method. He has successfully applied this method in the design of lighter materials for cars, superalloys, magnets, nanoparticles and microparticles.

The Academic Premium Award will allow Martin Friák to develop a new project called "The Science of Hybrid Computational Materials: Quantum Computers and Artificial Intelligence", which focuses on the use of "hybrid" algorithms that link classical computers with quantum computers, in addition to artificial intelligence. He plans on combining quantum computing with machine learning methods. Given the great importance of materials to the development and running of our society, the implementation of quantum computing and AI in materials science will help address a number of challenges. Quantum computers are very promising and while they will undoubtably play a major role in the future, their development is still in its infancy and there is, for example, a very limited amount of software for them at present.

RNDr. Martin Srnec, Ph.D.

J. Heyrovský Institute of Physical Chemistry

The tools of Martin Srnec's trade are computers and the laws of quantum and statistical mechanics, for he is a computational chemist. In his field, computer modelling and the latest machine learning methods can be used effectively in practice.

Martin Srnec's research goal is to develop an efficient tool for understanding and theoretically forecasting selectively controlled chemical reactions with proton and electron transfer (H+, e-). These reactions are common in living organisms (they form new carbon molecular skeletons by splitting the bonds between carbon and hydrogen) and for energy conversion and storage. Martin Srnec will base his work on an original theory he developed several years ago, which evoked extraordinary interest from the global scientific community. Martin Srnec has introduced two completely new thermodynamic quantities into chemistry and physics: asynchronicity and frustration. A key aspect is that these quantities can be determined independently, both experimentally and computationally. Asynchronicity and frustration, along with reaction energy, comprise a complete base - a triad that controls reaction rate and selectivity.

In his project Martin Srnec will therefore investigate e.g. the variability of the relationships between members of the thermodynamic triad and different sets of reactions. He will also develop algorithms for obtaining optimal values of the thermodynamic triad for the desired selectivity of chemical reactions. Another line of research will be the continued development of his concept of asynchronicity and the study of the mechanisms that might govern asynchronicity and frustration, as well as the possibility of using these variables to pair spontaneous reactions with nonspontaneous ones.

Assoc. Prof. RNDr. Petr Jehlička, Ph.D.
Institute of Ethnology

Petr Jehlička works in the Department of Ecological Anthropology at the Institute of Ethnology. His research focuses on sustainable food consumption, the informal food economy (home food production, collection and sharing) and its interconnection with mainstream food provisioning in a market environment, as well as the geopolitics of knowledge production. His new research project, RESOURCE, will focus on the water and food consumption strategies of Czech households. This area has received little attention to date. The research results have great potential to serve as a roadmap for the management of these resources in other EU Member States as well. Such efforts to transfer local knowledge to a pan-European level upend the perspective of existing scientific approaches. For comparative research purposes, the project will also follow households in the Netherlands, where food and water are managed less economically than in the Czech Republic.

The RESOURCE project thus addresses key issues around how to ensure sufficient food and water in contemporary drought-ridden Europe. Instead of focusing on sustainability and resource efficiency innovations and new discoveries, however, the project focuses on practices that are already known and embedded in society but which have received little research attention to date.

Petr Jehlička and his team will combine several methods in their research, from participant observation and interviews with household members to data collection and questionnaire surveys. The project also aims to shift international academic discourse on households and approaches to sustainability.

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The purpose of programmes supporting excellence at the Czech Academy of Sciences is to support top research of CAS institutes both morally and financially.

LUMINA Quaeruntur Fellowship

The Lumina Quaeruntur Fellowship provides financial aid to promising researchers, enabling them to compose their own research teams and fund their work for up to five years. To be eligible, the fellow must submit a project proposal to the European Research Council (ERC) or a similar international grant agency during the fellowship. Both Czech and foreign researchers are eligible for the fellowship.

IN 2023, FIVE SCIENTISTS FROM A RANGE OF CAS INSTITUTE DISCIPLINES WERE RECOGNISED AS LUMINA QUAERUNTUR FELLOWS:

Ing. Jakub Vícha, Ph.D.
Institute of Physics

Cosmic rays are streams of fast-moving particles that hit the Earth's atmosphere. In his research, Jakub Vícha will focus mainly on high-energy radiation and attempt to deepen understanding of its origin and composition. He will also use experimental data to ascertain better ways of modelling interactions between hadrons, which are particles much smaller than an atom.

Dr. rer. nat. Gerrit Angst, Ph.D.
Biology Centre

Gerrit Angst plans on establishing a Soil biochemistry research group working at the interface between soil biology and chemistry. The study of the dynamics of soil organic matter, including the influence of soil fauna, is one of the fundamental issues in contemporary ecological research. It plays a key role in the adaptation of society to climate change and in preservation of soil fertility. His research focuses on the role of earthworms and other soil fauna in soil stabilisation and carbon storage processes.

Davide Crippa, Ph.D.
Institute of Philosophy

Davide Crippa and his team will trace the roots of modern mathematics education through historical and sociological digital research data processing methods.

RNDr. Karel Škoch, Ph.D.
Institute of Inorganic Chemistry

Karel Škoch's new research group will aim to find alternative transition metal processes that use elements closer to nature, such as boron, silicon or phosphorus, in the form of Lewis superacids. In addition, the team will try to make the superacids even more efficient by preparing them as positively charged particles that have even greater electron-withdrawing capabilities.

Kateřina Chládková, M.A.
Institute of Psychology

Kateřina Chládková's new research team will investigate the relationship between brain and body dynamics on the one hand and human communication capabilities on the other. The main objective of her research is to uncover the role of rhythm in spoken interaction and determine whether brain and body rhythms can serve as markers of speech cognition.

J. E. PURKYNĚ **FELLOWSHIP**

The aim of this fellowship is to bring outstanding scientists from other countries to CAS institutes, including scientists of Czech origin who have been working abroad long-term as well as leading foreign scientists, generally younger than 40 years old, and to provide them with adequate funding at CAS institutes for a period of up to five years. These scientists are expected to become leaders of innovative teams at their respective institutes. In 2023, the last J. E. Purkyně fellow was supported with funding of CZK 175,000. New proposals have not been accepted since 2018. Project support concluded in 2023.

OTTO WICHTERLE **AWARD**

This award is intended for selected extraordinarily talented, promising CAS scientists up to 35 years of age. The award bears the name of Professor Otto Wichterle, an outstanding world-class Czech chemist, who was appointed President of the Czechoslovak Academy of Sciences after November 1989. The aim of the Otto Wichterle Award is to encourage young CAS scientists whose excellent results contribute to the development of their scientific disciplines. In 2023, CAS President Eva Zažímalová bestowed the Otto Wichterle Award on the following 24 young scientists:

I. MATHEMATICS, PHYSICS AND EARTH SCIENCES

Ing. Petr Hauschwitz, Ph.D., MBA
Institute of Physics
Ing. Filip Křížek, Ph.D.
Institute of Physics
Ing. Tomáš Neuman, Ph.D.
Institute of Physics
Ing. Andrea Školáková, Ph.D.
Institute of Physics
Gwladys Steciuk, Ph.D.
Institute of Physics
Ing. Veronika Brychová, Ph.D.
Nuclear Physics Institute
Giovanni Ceccio, Ph.D.
Nuclear Physics Institute
Ing. Michal Kamrádek, Ph.D.
Institute of Photonics and Electronics
RNDr. Kateřina Novotná, Ph.D.
Institute of Hydrodynamics
Mgr. Kamila Hrubanová, Ph.D.
Institute of Scientific Instruments
RNDr. Jana Popová, Ph.D.
Institute of Atmospheric Physics

II. LIFE SCIENCES AND CHEMICAL SCIENCES

Mgr. Jan Hynek, Ph.D.
Institute of Inorganic Chemistry
Pamir Nag, Ph.D.
J. Heyrovský Institute of Physical Chemistry
PharmDr. Eva Randárová, Ph.D.
Institute of Macromolecular Chemistry
Mgr. Dominika Luptáková, Ph.D.
Institute of Microbiology
RNDr. Jaroslav Semerád, Ph.D.
Institute of Microbiology
Mgr. Kristýna Kárová, Ph.D.
Institute of Experimental Medicine
RNDr. Marek Šmejkal, Ph.D.
Biology Centre
Ing. Stanislav Juráň, Ph.D.
Global Change Research Institute

III. HUMANITIES AND SOCIAL SCIENCES

Mgr. Aleš Kudrnáč, Ph.D.
Institute of Sociology
PhDr. Tomáš Gecko, Ph.D.
Masaryk Institute and Archives
Mgr. Pavel Horák, Ph.D.
Institute of Ethnology
Mgr. Lukáš Lička, Ph.D.
Institute of Philosophy
Mgr. Jiří Dynda, Ph.D.
Institute of Slavonic Studies

PROGRAMME TO SUPPORT PROSPECTIVE HUMAN RESOURCES – POSTDOCTORAL FELLOWS

at CAS institutes (the "PPLZ programme") is intended for starting post-doctoral students (within two years of the defence of their Ph.D. dissertation or equivalent, or four years in the case of long--term study abroad or parental leave).

Under the 2023 PPLZ Programme call, 27 candidates were supported in the 20th call and 26 candidates in the 21st call (with funding commencing on 1 January 2023, or 1 July 2023).

JOSEF DOBROVSKÝ FELLOWSHIP PROGRAMME

This programme helps young foreign researchers who need to study the historical, cultural, artistic, linguistic, geographical or natural context in the Czech Republic for their scientific research. In 2023, total funding of CZK 673,000 was provided for 18 study visits at eight CAS institutes. The following researchers received support:

Dr. Irena Vladimirsky, Ph.D. (Institute of History)
Giovanni Patriarca, Ph.D. (Masaryk Institute and Archives)
Dr. Luisa del Rosario Aguilar Ruz (Institute of Art History)
Magdalena Eriksröd-Burger, M.A., MSc. (Institute of Art History)
Dr. Ksenija Tschetschik-Hammerl (Institute of Art History)
Dr. Paulina Gulińska-Jurgiel (Institute of Contemporary History)
Dominika Czarnecka, Ph.D. (Institute of Ethnology)
Jonathan Lahey Dronsfield, Ph.D. (Institute of Philosophy)
Dr. Marlene Meuer, Ph.D. (Institute of Czech Literature)
Mphil. Jana Hunter (Institute of Czech Literature)
Mag. Lena-Marie Franke (Institute of Czech Literature)
Mgr. Natalia Palich, Ph.D. (Institute of Czech Literature)
Mgr. Kamil Wrzeszcz (Institute of Czech Literature)
Mgr. Magdalena Joanna Krzyżanowska (Institute of Czech Literature)
BA Noam Baram (Institute of Czech Literature)
Mag. Martina Schmidinger (Institute of Czech Literature)
Siniša Habijanec, Ph.D., dr.sc. (Czech Language Institute)
Assoc. Prof. Milen Petrov Tomov, Ph.D. (Czech Language Institute)

PROGRAMME FOR RESEARCH AND MOBILITY SUPPORT OF STARTING RESEARCHERS

This programme, initiated in 2016, was created to support the development of collaboration between CAS institutes and prominent international scientific research institutions and enable starting researchers to independently take part in active international collaboration. From 2021 onwards, no new research proposals have been accepted and the programme is being phased out. In 2023, the final four projects were supported with total funding of CZK 1,062,000.

ERC-CZ/AV PROGRAMME

This programme supports projects of researchers whitch have received an A in the second round of the European Research Council expert panel evaluation (i.e., not supported due to a lack of funding) or a B. In 2023, the CAS continued to support the final project with funding of CZK 6,800,000. The project investigator is

Mgr. Iva Mozgová, Ph.D.
Biology Centre

CZECH ACADEMY OF SCIENCES AWARDS

Each year, the Czech Academy of Sciences bestows these awards on outstanding researchers for exceptional research results focused on societal priorities, which have strengthened the competitiveness of Czech science internationally and whose initial publication or implementation occurred within the last five years.

IN 2023, THE ACADEMY OF SCIENCES AWARD FOR OUTSTANDING RESULTS OF GREAT SCIENTIFIC SIGNIFICANCE WAS BESTOWED BY CAS PRESIDENT EVA ZAŽÍMALOVÁ UPON THE FOLLOWING RESEARCHERS:

- **Ing. Mgr. Jaroslav Hlinka, Ph.D.**, nominated by the Institute of Computer Science, for the scientific work *Modelling the dynamics underlying epileptic seizures*
- **Prof. RNDr. Daniel Růžek, Ph.D.**, nominated by the Biology Centre, for the scientific work *Emergent viral infections: from molecular pathogenesis to the development of new therapeutic options*
- **Assoc. Prof. Dr. phil. Rudolf Kučera, Ph.D.,** **and Prof. PhDr. Ota Konrád, Ph.D.,** nominated by the Masaryk Institute and Archives, for the scientific work *Paths out of the Apocalypse. Physical Violence in the Fall and Renewal of Central Europe, 1914-1922*

Scientific “Research Professor” Degrees

The scientific title “Research Professor” was established by Decision XXI of the CAS Academy Assembly on 18 December 2002 and has been repeatedly confirmed by resolutions of the Government of the Czech Republic on the Statutes of the Czech Academy of Sciences, most recently in Resolution No. 614 of 24 May 2006. The awarding of the scientific degree is governed by the provisions of Art. 62 of the Statutes of the Czech Academy of Sciences. In order to implement this provision, the Academy Council has adopted the Rules for Granting the “Research Professor” Degree by the Czech Academy of Sciences.

> The Czech Academy of Sciences awards the scientific degree of "Research Professor" in recognition of outstanding, far-reaching and original scientific work that contributes to the advancement of research in a specific scientific field and characterises the awardee as a scientist of distinguished stature. Degrees are decided upon by the Science Council of the CAS.

At its 10th session on 30 January 2003, the CAS Science Council established a Committee for the Research Professor Degree as an auxiliary and advisory body for matters related to the awarding of the "Research Professor" scientific degree. The Science Council decides on the awarding of scientific degrees solely on the basis of nominations made by the Committee for the Research Professor Degree and the results of scientific degree award proceedings, which take place in one of the standing committees for the scientific fields in Research areas I, II and III. There are 36 dissertation defence committees which currently have a total of 378 members, including 171 from CAS institutes, 169 from universities, 13 from foreign universities, 12 from other Czech research institutions and 13 from foreign research institutions.

The new Vice-Chairman of the Committee for the Research Professor Degree is Prof. Mgr. Lubomír Rulíšek, CSc., Res. Prof. of the Institute of Organic Chemistry and Biochemistry. He replaces the late member Prof. PhDr. Petr Sommer, CSc., Res. Prof. A new member, PhDr. Robert Šimůnek, Ph.D., Res. Prof. of the Institute of History, was elected to the Committee for the Research Professor Degree.

In 2023, the following 13 researchers were awarded the degree of "Research Professor":

PhDr. Ľubor Králik, CSc., Res. Prof.
Ľ. Štúr Institute of Linguistics SAS, v. v. i.
Dissertation: *Etymology and Dialectal Lexicography (on the Material of the Dictionary of Slovak Dialects)*
Committee: Bohemian Studies
Scientific degree awarded: "Doctor of Philological Sciences"

RNDr. Lenka Maletínská, CSc., Res. Prof.
Institute of Organic Chemistry and Biochemistry
Dissertation: *Lipized Prolactin-Releasing Peptide as a New Potential Tool to Treat Obesity and Neurodegeneration: Preclinical Studies in Rodent Models*
Committee: Biomedicine
Scientific degree awarded: "Doctor of Molecular Biological and Medical Sciences"

Mgr. Matyáš Havrda, Ph.D., Res. Prof.
Institute of Philosophy
Dissertation: *Galen's Method of Inquiry and Proof: Studies on Ancient Foundations of Rational Medicine*
Committee: Classical Studies
Scientific degree awarded: "Doctor of Philological Sciences"

Ing. Vít Jakubský, Ph.D., Res. Prof.
Nuclear Physics Institute
Dissertation: *Analysis of Dirac materials with the methods of mathematical physics*
Committee: Nuclear, subnuclear and mathematical physics
Scientific degree awarded: "Doctor of Physical and Mathematical Sciences"

Photos from the "Research Professor" degree ceremony held on 4 October 2023 at the CAS Library.

Assoc. Prof. PhDr. Mgr. Petr Šída, Ph.D., Res. Prof.
Department of Archaeology, Faculty of Archaeology, University of Hradec Králové
Dissertation: *Mesolithic of North Bohemia III. Evolution of the prehistoric landscape in Bohemian Paradise: Vegetation, fauna, humans*
Committee: Archaeology
Scientific degree awarded: "Doctor of Historical Sciences"

Assoc. Prof. PhDr. Lucie Storchová, Ph.D., Res. Prof.
Institute of Philosophy
Dissertation: *Bohemian school humanism and its editorial practices (ca. 1550–1600)*
Committee: Classical Studies
Scientific degree awarded: "Doctor of Philological Sciences"

Vladimir Lotoreichik, Ph.D., Res. Prof.
Nuclear Physics Institute
Dissertation: *Optimization and asymptotics of eigenvalues for differential operators with surface interactions*
Committee: Nuclear, subnuclear and mathematical physics
Scientific degree awarded: "Doctor of Physical and Mathematical Sciences"

Prof. RNDr. Oldřich Fatka, Ph.D., Res. Prof.
Faculty of Science of Charles University, Institute of Geology and Palaeontology
Dissertation: *Exceptionally preserved Cambrian and Ordovician fossils in the Barrandian area*
Committee: Geological Sciences
Scientific degree awarded: "Doctor of Geophysical and Geological Sciences"

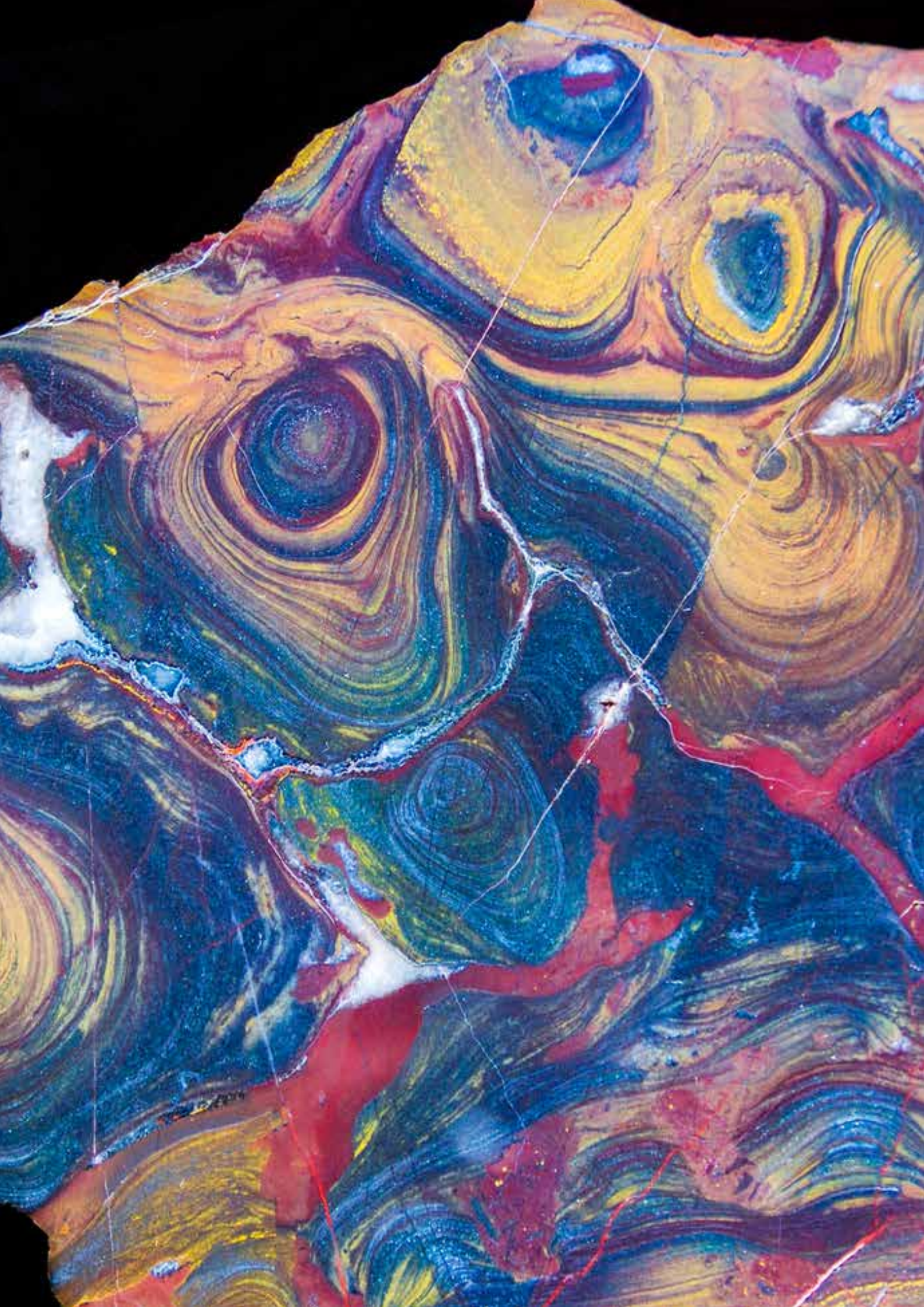
Mgr. Magdaléna Jacková, Ph.D., Res. Prof.
Institute of Czech Literature
Dissertation: *New and spiritual comedy: early modern biblical drama in the Czech lands*
Committee: Bohemian Studies
Scientific degree awarded: "Doctor of Philology"

Mgr. Petr Plecháč, Ph.D. et Ph.D., Res. Prof.
Institute of Czech Literature
Dissertation: *Quantitative Analyses of Poetic Texts*
Committee: Bohemian Studies
Scientific degree awarded: "Doctor of Philological Sciences"

RNDr. Štěpán Sklenák, Ph.D., Res. Prof.
J. Heyrovský Institute of Physical Chemistry
Dissertation: *Active sites in zeolite catalysts. A DFT approach*
Committee: Physical Chemistry
Scientific degree awarded: "Doctor of Chemical Sciences"

Assoc. Prof. Mgr. Tomáš Vítek, Dr., Res. Prof.
Institute of Philosophy
Dissertation: *The Soul, Body, and Death. From Homer to Plato*
Committee: Philosophy
Scientific degree awarded: "Doctor of Social Sciences and Humanities"

Assoc. Prof. Ing. Petr Cintula, Ph.D., Res. Prof.
Institute of Computer Science
Dissertation: *Logic and Implication: An Introduction to the General Algebraic Study of Non-classical Logics*
Committee: Mathematical Structures
Scientific degree awarded: "Doctor of Physical and Mathematical Sciences"



International Cooperation

Through its existing programmes of international bilateral and multilateral cooperation, the CAS continued to strengthen the integration of CAS institutes into European and global research organisation networks. CAS programmes primarily support researcher mobility and target early career researchers. Directing support for international cooperation in this way is one of the essential tools for reinforcing these scientists' level of excellence and research quality, while enabling them to acquire expertise and build lasting scientific contacts. Another key area of international cooperation were activities to support increased CAS engagement in the Horizon Europe EU framework programme, particularly in ERC grants.

> The CAS also consistently engaged in activities to counter the influence of foreign powers and in membership in relevant international non-governmental organisations.

In 2023, a number of international activities were implemented in which CAS representatives took part. In April, the management teams of the CAS and the Slovak Academy of Sciences (SAS) held their traditional annual meeting in Smolenice, Slovakia. Topics of discussion included, for example, the role of security in development of international cooperation with "sensitive countries", the position of the CAS and SAS in international scientific institutions, the issue of equal opportunities and gender, and knowledge transfer experience. The annual Academic Prague event, where the CAS meets with representatives of foreign embassies in Prague, ministries and major Czech universities, was held in June. A total of 72 guests attended the event at Villa Lanna, including representatives of embassies from 33 countries. In October, the traditional meeting of representatives of the academies of science of the V4 countries and Slovenia took place in Warsaw. The group discussed issues such as strategies to develop successful ERC grant applications and the role of scientific expertise in society and politics. The Young Researcher Awards ceremony was part of the event. The 2023 awards focused on global and polar climate change research. The CAS award was presented to Eva Balounová from the Institute of State and Law. In October, the conference Thirty Years of Independence of the Slovak and Czech Republics (1993-2023) was held in Bratislava on the occasion of the 70th anniversary of the Slovak Academy of Sciences and the 30th anniversary of the founding of the Slovak and Czech Republics. The CAS took part in preparation of the conference.

The CAS received a number of prominent foreign visitors in 2023. During the year the CAS was visited by representatives of several foreign embassies in Prague. Courtesy meetings were held e.g. with the Ambassadors of the Republic of France, the Republic of India, the Republic of South Africa, the Republic of Cuba, the Kingdom of Thailand and the United Kingdom of Great Britain and Northern Ireland, as well as with the Space Attaché of the Italian Embassy. In April, the President and Vice-President of the Lithuanian Academy of Sciences visited the CAS leadership, the ELI Beamlines Centre, HiLASE and the Institute of Physics. In May, the CAS leadership and representatives of the Mongolian Academy of Sciences met and signed a memorandum on scientific cooperation. A delegation from the Academia Sinica of Taiwan met with the CAS leadership and toured the Institute of Organic Chemistry and Biochemistry and the BIOCEV joint research centre during its visit to the Czech Republic in July. In October, representatives of the University of Toyama, Japan, visited the CAS. A scientific cooperation agreement was signed and the new University of Toyama liaison office was inaugurated in the CAS building in Národní street. In December, the CAS management discussed cooperation opportunities with representatives of the Saxon Academy of Sciences and the Leibniz Institute for the History and Culture of Eastern Europe.

To deepen scientific collaboration and initiate new contacts, CAS representatives made several trips abroad. In April, a CAS delegation visited Finland, where the members discussed possibilities for cooperation with several research

and educational institutions in the cities of Helsinki, Vaasa and Espoo. In May, at the invitation of the Ministry of Foreign Affairs of the Czech Republic, CAS staff took part in a nuclear energy mission to Israel, where they served as the science section representatives.

In relation to countering the influence of foreign powers, the CAS was invited to a roundtable on international research security, which was held in London at the beginning of the year. Furthermore, a paper on the CAS' approach to cooperation with foreign partners and the prevention of unwanted transfer of sensitive knowledge or technology was presented at the international meeting of secretaries of European advisory bodies for science, technology and innovation, which was organised by Minister Helena Langšádlová and held in May in Prague.

In regard to membership in international non-governmental organisations, the CAS continued its membership in, in particular, the European Academies Science Advisory Council (EASAC), All European Academies (ALLEA) and the InterAcademy Partnership (IAP). In 2023, CAS representatives participated in important events such as the ALLEA constituent general assembly in London and the general assemblies of the European Network of Research Integrity Offices (ENRIO) in Paris and of the Union Academique Internationale (UAI) in Philadelphia. In these organisations, CAS representatives actively engaged in panels, working groups and conferences in person or online and took part in preparation of scientific articles. The General Assembly of the European Network of Research Integrity Offices (ENRIO) in Paris was attended by PhDr. Oldřich Tůma, Ph.D., Chairman of the Commission for the Scientific Integrity of the CAS, who has served as the President of ENRIO on behalf of the CAS since 2022. The Czech Academy of Sciences also sent representatives to the 14th session of the International Human Rights Network of Academies and Scholarly Societies (IHRN) in Pretoria. The CAS responded to human rights violations around the world by sending an appeal to Iranian leaders in relation to the adverse security conditions endured by health care workers in the country. Through a letter from the President of the CAS, the CAS also called on the Chinese President to release Uighur ethnographer Rahile Dawut. The CAS and the V4 Academies issued a joint statement on the situation in the Middle East condemning the terrorist attacks on Israel on 7 October and expressing their full support for Israel. At the end of June, the annual meeting of young scientists with Nobel Prize winners took place in Lindau. The CAS, as the guarantor for the Czech Republic, nominated six candidates to attend the meeting. The Lindau Committee selected four of them, including two from CAS institutes (the Biology Centre and Institute of Microbiology).

BILATERAL AND MULTILATERAL COLLABORATION

In 2023, the CAS continued to collaborate with both European and non-European partners on bilateral and multilateral international projects through joint research programmes. It continued to update contractual documents, extended existing collaborative ties and entered into several new bilateral agreements on scientific collaboration. New agreements were arranged with the Goethe University Frankfurt, Germany; University of Toyama, Japan; Kyungpook National University, Korea; the Mongolian Academy of Sciences and the Saxon Academy of Sciences. The framework agreement with the German Max Planck Society was updated. The CAS' third year of fruitful collaboration with the prestigious American university Massachusetts Institute of Technology (MIT) got underway. The project was open to scientists from research institutions from across the Czech Republic.

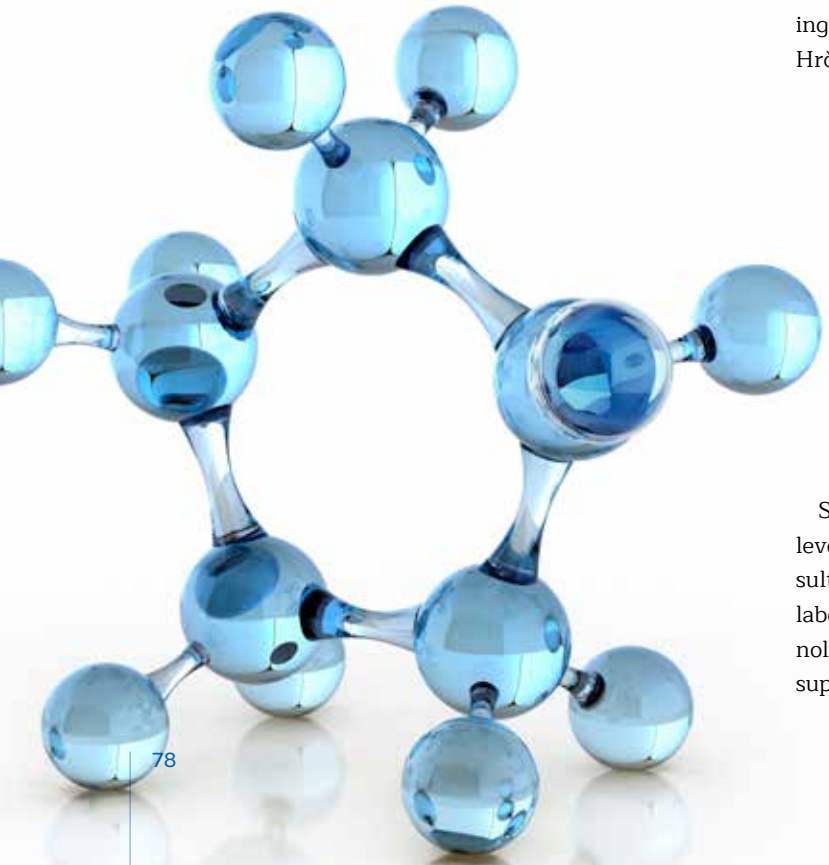
Overall, the CAS supported bilateral projects with total funding of CZK 16.7 million in 2023. In a new tender for projects supporting researcher mobility, 51 projects from 13 countries were supported out of a total of 135 submitted proposals.

The international Researchers at Risk Fellowship programme to support researchers in distress continued in 2023, once again focusing exclusively on supporting Ukrainian researchers in the context of ongoing Russian aggression in Ukraine. In 2023, researchers were supported with funding of CZK 27.6 million through this programme. Dur-

ing 2023, preparations were also made for the launch of the second phase of the Researchers at Risk Fellowship in the upcoming period.

In 2023, through its multilateral cooperation efforts, the CAS supported two three-year projects co-funded by the European Commission, which were awarded funding in the CHANSE tender launched by the HERA and NORFACE partnership. These include the SMARTUP project, in which the Institute of Sociology is engaged, and the TIMED project of the Institute of Philosophy. The CAS provided funding of CZK 3 million for the two projects in 2023. In parallel, two new CHANSE calls were launched in 2023. The first is the "Crisis" call (a collaboration between CHANSE and HERA) and the second is the "Enhancing well-being for the future" call (a collaboration between CHANSE and NORFACE). During October, the first round of project evaluations took place. Twenty-two projects from CAS institutes proceeded to the second round of the selection procedure, which will take place at the end of March 2024. Successful projects will now be fully funded by partner organisations without funding from the European Commission. The CAS also expressed interest in continuing the existing collaboration within the international HERA and NORFACE partnership.

In addition to the abovementioned projects, four SEA-Europe JFS projects ran successfully in 2023 with the engagement of teams from the J. Heyrovsky Institute of Physical Chemistry, Institute of Inorganic Chemistry, Biology Centre and Institute of Microbiology. A total of CZK 2.6 million was expended for the projects in 2023. Within this platform, the CAS joined another call focused on the "Circular Economy" and "Clean, Accessible and Secure Energy Supply", which was announced in December 2023.



The CAS continued to collaborate with Japan and selected European countries, specifically through participation in the next EIG CONCERT-Japan call for projects with the overarching theme "Solutions for Carbon-Neutral Cities". Two projects from CAS institutes submitted applications, for which they are seeking financial support from the MEYS.

ERA Cooperation

The CAS continuously strives to engage in activities supporting the European Research Area (ERA) and takes advantage of the opportunities offered by Horizon Europe, the EU framework programme supporting research and innovation. In addition to direct involvement in research initiatives at EU level, CAS representatives also participate in the development of European science policies.

In 2023, CAS institutes worked on 42 ongoing projects funded by the Horizon 2020 framework programme, with total funding of EUR 8.8 million. In the subsequent Horizon Europe framework programme, CAS scientists are working on a total of 78 projects, for which they received EUR 6.2 million from the European Commission in 2023.

One of the greatest achievements in a scientist's career is winning a prestigious European Research Council (ERC) grant, awarded to excellent, original and ground-breaking projects. Three researchers from CAS institutes were awarded ERC grants in the enormously competitive international selection process. Two scientists obtained Advanced Grants for internationally recognised experts who have already established themselves in the field and demonstrably influenced it. They are Tomáš Jungwirth from the Institute of Physics and Pavel Jungwirth from the Institute of Organic Chemistry and Biochemistry. A Consolidator grant, which is designed to reinforce the career development of excellent young scientists at the stage of creating or consolidating their own existing scientific teams, was awarded to Jan Hrček from the Biology Centre.

Systematic support for ERC grant applicants at national level continued in 2023 through various training and consultation activities conducted by an expert group run collaboratively by Charles University, the CAS and the Technology Centre Prague. The CAS also continued to financially support ERC project applicants through its own incentive

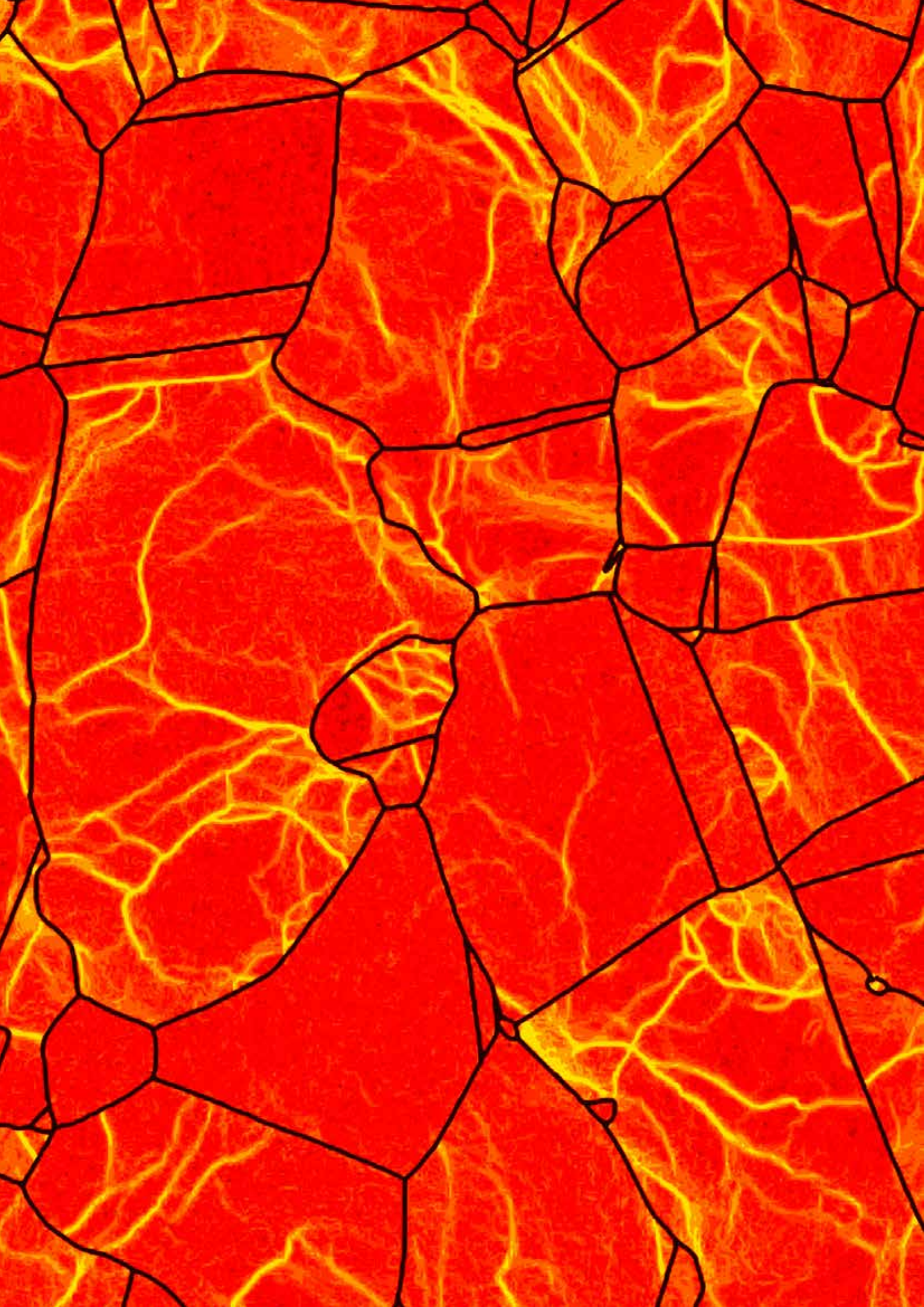
grants (PERC), through which total funding of CZK 1.1 million was awarded to eleven applicants in 2023.

The CAS also continued to support project section staff in 2023. With the goal of improving support and services for researchers, the fifth meeting of project managers working at CAS research institutes was held in December 2023. The overarching theme was support for ERC grant applicants at the CAS.

In addition, the CAS also focused on strengthening participation in European Research Area activities and regularly informed its institutes about the wide array of research opportunities offered by the EU Horizon Europe framework programme and other European initiatives.

CEFRES platform cooperation

Within French-Czech CEFRES Platform cooperation between the CAS, the French National Centre for Scientific Research (CNRS), Charles University and the French Embassy in the Czech Republic, a selection process for projects, which are to be implemented from February 2024 to January 2026, was completed in September 2023. The Committee for Support of Researchers of CAS Institutes Involved in CEFRES Platform Research Activities proposed supporting a project by Martin Ďurďovič (Institute of Sociology) and Gilles Lepesant (CNRS) entitled "Contested energy transitions. Conflicts and social innovations in the Czech Republic, Slovakia, Germany, and France", which will be supported with funding of CZK 1.2 million.



Regional Cooperation

The Czech Academy of Sciences helps Czech regions and microregions improve their quality of life through jointly funded research project implementation and application. 19 new projects, funded according to agreements between CAS institutes and their regional partners, proceeded in 2023.

> Collaboration between CAS institutes and regional partners such as regions and microregions of the Czech Republic focuses on addressing social, economic, ecological, natural and cultural issues through basic research and application projects.

In 2023, institutes from the sections of Earth Sciences, Chemical Sciences, Biological and Medical Sciences, Biological-Environmental Sciences, Historical Sciences, Humanities and Philological Sciences of the CAS engaged in regional cooperation. Projects focused on issues such as the detection of surface quality (study of surface properties of profiles and application to existing and new engineering production processes), obtaining information on air pollution (characterisation of air pollution by atmospheric aerosols in the vicinity of a children's sanatorium), mapping of invasive insectivorous species to prevent biodiversity loss (monitoring of the occurrence of the greater white-toothed shrew), archaeological findings (preservation and presentation of archaeological heritage), organising the archival collections of institutions (development of a catalogue of an Eastern European art collection, inventory of archival printed materials in Ukrainian) and communicating the post-war development of a selected border region (description of the relations between minorities and the political system with regard to the plurality of cultural traditions).

These collaborative efforts are rooted in agreements concluded successively with the Association of Municipalities of Orlicko (2003), South Moravian Region (2008), City of Brno (2008), Prague 1 Municipal District (2009), Pardubice Region (2013), Hradec Králové Region (2013), Vysočina Region (2014), Zlín Region (2015), Ústí nad Labem Region (2015), Central Bohemian Region (2016), Karlovy Vary Region (2016), Olomouc Region (2017), South Bohemian Region (2018), Pilsen Region (2019), Šumava National Park Administration (2019), Liberec Region (2020), Moravian-Silesian Region (2020) and the Capital City of Prague (2022). Implementation of 19 new projects, funded according to agreements between CAS institutes and their regional partners, proceeded in 2023.

Work on these joint projects includes a regular annual meeting, held alternately in Prague and Brno, and attended by representatives of the CAS and of the regions of the Czech Republic. These meetings provide a platform where researchers and representatives of regional and local governments can exchange information, glean inspiration and engage in discussion. The Regional Cooperation Committee selected six joint projects to take part in a presentation and evaluation of the results of projects funded by 2022 regional cooperation grants, which took place in Brno on 12 June 2023:

1. Drainage and 3D laser scanning of the St. Antonín Paduánský mine in Horní Město to identify its real layout and volume, including identification of mine water courses for possible future use for the municipality of Horní Město, Institute of Geonics, Municipality of Horní Město,

2. Calculation of evaporation in the Elbe Lowland in the cadastre of the municipality of Velký Osek, Institute for Hydrodynamics, Municipality of Velký Osek,

3. Mapping the occurrence of the critically endangered crucian carp in the South Bohemian Region and preparation of a regional crucian carp conservation action plan, Biology Centre, South Bohemian Region,

4. Transport access to secondary schools in the Karlovy Vary Region, Institute of Sociology, Karlovy Vary Region,

5. Havlíček, Havel! Conference on the occasion of the 200th anniversary of Karel Havlíček Borovský's birth, Masaryk Institute and Archives, Museum of the Highlands of Havlíčkův Brod, p. o.,

6. Celts and Germans in the Dalešice Dam region, Institute of Archaeology, Brno, Bohemian-Moravian Highlands Museum in Jihlava, p. o.

Section of Biological and Medical Sciences

- Study of permeation of pharmaceuticals in alternative waste water treatment systems (Pardubice).

Section of Earth Sciences

- Documentation and long-term monitoring of selected mine workings and surface phenomena in Horní Město and its surroundings with regard to modern and historical mining of ore in the inner city (Horní Město)
- Study of surface properties of profiles measured by contact and non-contact methods and their application to existing and new production processes (Ostrava)

Section of Chemical Sciences

- Study of the ionosphere: research, education and science popularisation (Karlovy Vary).
- Characterisation of atmospheric aerosols in the air in the vicinity of a children's sanatorium with speleotherapy in Ostrov u Macochy (Ostrov u Macochy).

Section of Biological-Ecological Sciences

- Mapping and monitoring of the dispersal of the greater white-toothed shrew (Crocidura russula) in the Karlovy Vary Region (Karlovy Vary).

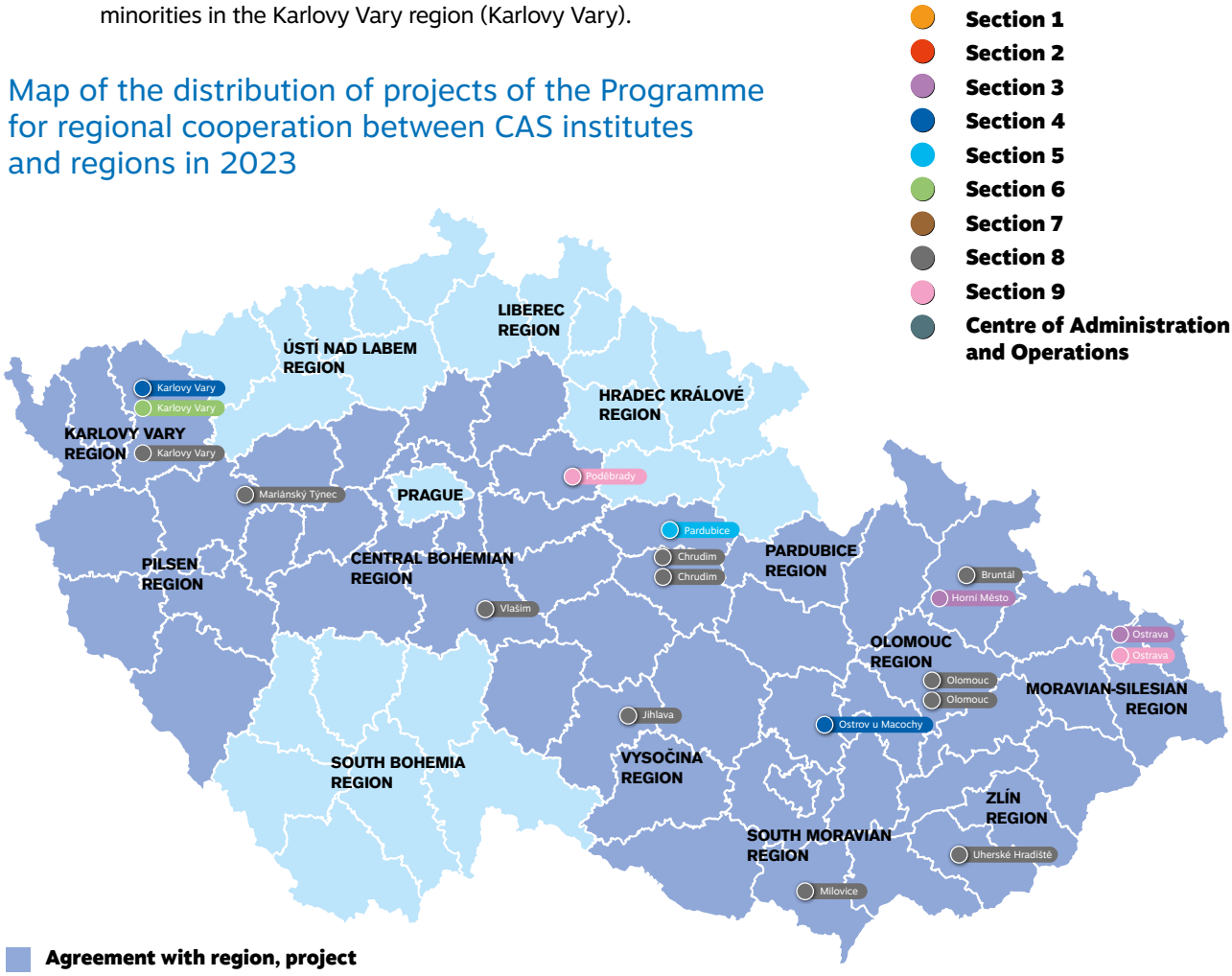
Section of Humanities and Philological Sciences

- Ukrainian Economic Academy in Poděbrady (1922-1932). Compilation of a unique archival collection and linguistic evaluation of publications (Poděbrady).
- Publication: "Paths of Art. 19th-20th century East European painting, drawing and graphic design from the collection of the Gallery of Fine Arts in Ostrava" (Ostrava)

Historical Sciences

- The legacy of traditions and cultural pluralism in the life of the majority society and national and ethnic minorities in the Karlovy Vary region (Karlovy Vary).
- Celts and Germans in the Dalešice Dam region (Jihlava).
- Tangible culture of medieval castles in the Chrudim region (Lichnice, Rychmburk, Zkamenělý Castle) (Chrudim).
- Exposition of medieval art at Rychmburk Castle in Skutče (Chrudim).
- Between the municipality and the state. The phenomenon of district self-government in the Czech lands 1848-2002 (Vlašim).
- Prehistory of the Uherské Hradiště region in absolute and paleoenvironmental data (Uherské Hradiště).
- Mammoth hunters in Milovice - processing finds from the Milovice IV site for presentation and popularisation of the village's archaeological heritage (Milovice).
- Gold from Opava (Bruntál).
- Celts in the northern Pilsen region, preventive protection of archaeological heritage (Mariánský Týnec).
- Reconservation and review of archaeological finds from the Mohelnice - Za Cukrovarem site for presentation of the cultural heritage of the Olomouc region (Olomouc).
- Medieval and early Renaissance books from Olomouc: new views and findings (Olomouc).

Map of the distribution of projects of the Programme for regional cooperation between CAS institutes and regions in 2023



Environment and Sustainable Operations

in Scientific Research and Research Infrastructure

In 2023, the Czech Academy of Sciences continued to focus on socially crucial topics related to sustainability and environmental protection. The permanent advisory bodies to the Academy Council in this area are the Commission for the Environment and the Committee for Energy Research. These committees are composed of leading experts in the relevant fields. Through Strategy AV21 research programmes, research at CAS institutes delves into current issues such as: “Landscape Conservation and Restoration”, “Foods for the Future”, “Water for Life”, “Sustainable Energy” and “Resilient Society for the 21st Century. The Potential of Crisis and Effective Transformation”.

> Investigations of the interaction between human activities and natural phenomena, including risk analysis and preventive measures, carried out by CAS institutes in collaboration with their partners, demonstrate that ecosystem changes, caused by both natural factors and human intervention, significantly impact the population of some species and landscape biodiversity.

Biology Centre

Soil restoration after large-scale fires

Based on long-term monitoring of research plots in the Bohemian Switzerland National Park, Biology Centre staff published outputs about the impact of forest fires on soil, soil carbon storage and overall post-fire soil regeneration. In close cooperation with the Bohemian Switzerland National Park, which was the site of a large-scale, destructive fire in 2022, they proposed management measures for the affected areas to support restoration of ecosystem balance. They evaluated the influence of different types of pre-fire vegetation on soil properties and soil community composition, described the consequences of fire on precipitation-runoff relationships, and assessed soil and watershed solute mobility and transport as a function of soil organic matter composition and burn rates in the affected watersheds. With their knowledge, the scientists are able to propose very practical measures to reduce the risk of forest fires or decrease the risk of high intensity fires to prevent serious economic, natural and social damage. The research results may be applied widely to inform decision-making processes by state administration authorities, especially national parks and other protected areas, as well as the general forestry and natural science public, local governments and tourism and private forest owners. In regard to post-fire recovery of natural areas, researchers are finding that ecosystems have a considerable capacity for self-renewal, even after fires as extensive as the one that affected Bohemian Switzerland.

Institute of Botany

High-resolution microclimatic maps for the Šumava, Bohemian Switzerland and Saxon Switzerland national parks

A team at the Institute of Botany developed a set of microclimatic maps that open new possibilities for targeted biodiversity conservation, e.g. spatial modelling of the occurrence of protected species or for targeted adaptation of forest management to climate change. The maps have a spatial resolution of 5 m and were created by synthesising data from a new network of microclimatic stations. Microclimatic maps with such granular spatial resolution, based on laser scanning data and in-situ measurements in forest stands, are unique, even globally. Compared to the climate data used to date, the new maps contain information on important local effects. This provides park authorities with a much more accurate basis for the protection of endangered species and forest ecosystems, as site-specific temperature and humidity conditions have a major influence on the prosperity of plants in the habitat.

Soil restoration after large-scale fires

Microclimate monitoring area near Jelení hora (Šumava National Park). *A datalogger for measuring the air temperature at two metres is mounted on the tree trunk, and a datalogger that measures ground and underground temperatures and soil moisture is placed in a cage to protect it against damage by animals. Author: Josef Brůna, CAS Institute of Botany.*

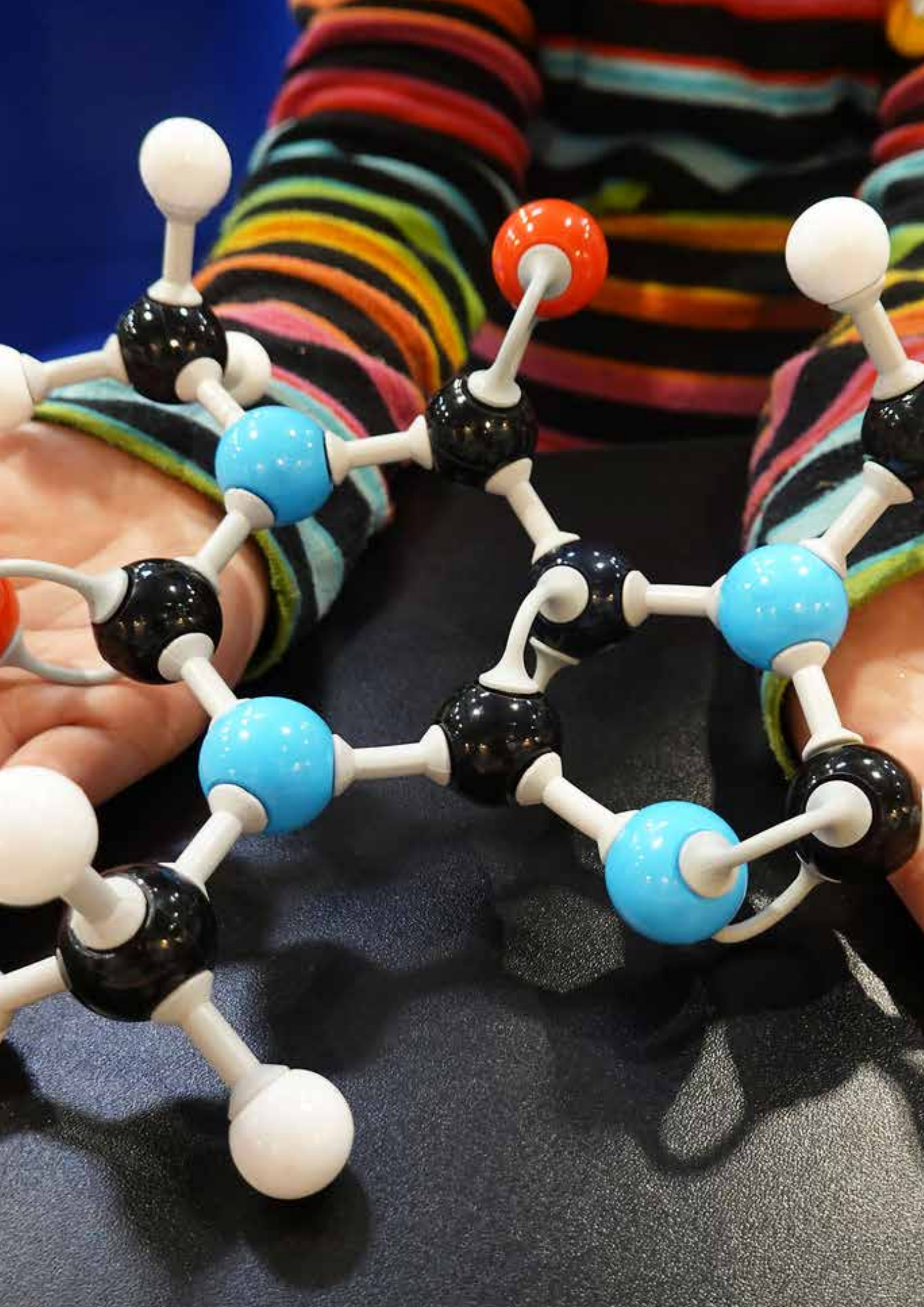
Institute of Vertebrate Biology

Protection of the little owl - communication with farmers
The little owl is a critically endangered species in the Czech Republic. With only about 100 pairs, it is on the verge of extinction. This is primarily a consequence of large-scale intensive farming that results in landscape diversity loss and large fields where owls have nowhere to nest and nothing to hunt. The only part of the Czech Republic where there is still a stable population is north-western Bohemia, which has many family farms and farmsteads. According to scientists, farmers make it possible to install safe nesting boxes, remove technical traps in which owls die unnecessarily, or adjust their farming practices to protect owls. Farmers thus play an important role in owl conservation.

Research conducted among farmers showed that they are interested in working with ornithologists to save this critically endangered owl. They consider personal consultations with ornithologists key. They would also welcome simpler communication with the authorities, which is overly bureaucratic and often incomprehensible in farmers' view. This is often the reason they abandon attempts to apply for subsidies. The Institute of Vertebrate Biology cooperated with the Czech Ornithological Society on the research.

As part of the Strategy AV21 research programme "Landscape Conservation and Restoration", scientists evaluated various measures and their impact on the biodiversity of agricultural landscapes. Their work focused on applied conservation of the critically endangered owl, including communication with farmers. They also worked on several projects assessing the impact of certain landscape features on agricultural landscape biodiversity. Scientists also worked on nature-based ecosystem restoration through natural grazing by large ungulates.

Farmer Jarda and an owl (photo Martin Šálek, winning photo of the 2019 Photogenic Science competition)



Educational Activities

Educating young scientists and improving the quality of the national education system at all levels are crucial elements of the CAS' mission in society and an integral part of research at the Czech Academy of Sciences. CAS' educational efforts are grounded in cooperation with universities, with particular attention on educating students in doctoral programmes. CAS employees are also directly and extensively involved in teaching and supervising university students, while also taking part in a variety of educational and training programmes for secondary school students and teachers.

COOPERATION WITH UNIVERSITIES

The current version of Act No. 111/1998 Coll., on Higher Education Institutions requires that doctoral programmes implemented by institutes in cooperation with universities be accredited by the National Accreditation Bureau. A mandatory part of the accreditation application is an agreement between the Czech Academy of Sciences and the relevant university on cooperation on implementation of the given doctoral programme. The Academy Council has drawn up a model agreement and works individually with the management of each relevant university on the specific wording of each given agreement, including points such as representation of CAS institutes in subject area boards of specific study programmes and listing affiliations on papers published by students. Agreements have already been signed with 16 universities and negotiations with others are continuing in an atmosphere defined by trust and due procedure. The CAS continues to pro-actively seek out other opportunities to expand collaboration with universities throughout the Central European region.

Relations between the CAS and universities are monitored and coordinated by the Council for Cooperation with Higher Education Institutions and the Preparation of Scientific Employees of the CAS, which is an advisory body to the CAS management. The Council convened at two meetings during 2023. At a session on 19 May 2023, discussion focused on the forthcoming reform of doctoral studies, namely the strategic plan of the Ministry for Higher Education for the period from 2021, and the results of a questionnaire survey at CAS institutes conducted in 2022, which showed the need for further CAS staff involvement in the activities of the subject area boards and in development of doctoral study programmes. The questionnaire survey results were also presented to the management of CAS institutes and the CAS Science Council. The members of the Academy Council were also actively and repeatedly involved in the commenting procedure of the amendment to the Higher Education Act, which is connected with the legal regulation of the status and financing of doctoral students, as well as in public discourse about the future development of universities and doctoral studies. The second meeting of the Council was held online on 21 November 2023, when, in addition to the aforementioned reform of doctoral studies, the Council members were acquainted with a new programme, created in cooperation with the Czexpats in Science association, which aims to enable short-term internships (mainly during the summer) for Czech university students who are currently working at foreign universities. The goal is to support development of contacts between talented students with a keen interest in scientific research and CAS institutes.

> “The Academy of Sciences constantly strengthens collaborative ties with universities, secondary and primary schools. The education of students in doctoral programmes is a particular area of emphasis.

CAS institutes and employees participate extensively in student education at both public and private universities. In 2023, CAS employees provided more than 5,000 semestral series of lectures, practicals or seminars with a total scope of more than 74,000 hours. CAS institutes thus contribute significantly to student education and supervision of students’ qualification work. In 2023, employees of CAS institutes trained 2,117 doctoral students and also participated in the supervision of many bachelor and master programme students. A total of 220 doctoral students trained at CAS institutes successfully completed their studies in 2023.

Table 9: Overview of the most significant forms of cooperation with universities

	2018	2019	2020	2021	2022	2023
Doctoral students trained at CAS institutes	1,995	2,046	2,161	2,312	2,259	2,117
Newly admitted doctoral students	376	384	427	395	344	318
Number of completed doctoral dissertations	264	242	181	228	199	220
Number of semestral series of lectures, seminars and practicals	5,247	6,909	6,479	6,101	4,556	5,036
Number of hours lectured	71,335	73,086	69,518	68,176	71,903	74,635

The CAS has supported the general education of doctoral students for many years through its successful and sought-after week-long Course on scientific research basics. The course is intended for doctoral students in various disciplines and aims to cultivate the skills students need to thrive in the fiercely competitive international environment. Courses are held in Prague and in Brno. In 2023, 83 students took part in three combined courses in Prague, and 243 students participated in five in-person courses in Brno. Students from other institutions also seek out the courses. The lecturers include renowned and experienced experts, mainly CAS employees, and lecture content is chosen to be useful for doctoral students across all disciplines. The main subjects include scientific methodology, ethical principles in scientific work and bioethics, evaluation of scientific work, scientific communication and its written genres, suitable presentation of research results, editorial aspects of publishing in journals, scientific writing techniques, rhetoric and the culture of speech, lecturing skills, current information resources for science, research and education, research funding options, targeted funding, grant proposal development, intellectual property rights and commercialisation, technology and knowledge transfer, writing scientific papers in English, and more. The import and significance of these courses is evidenced by student feedback, which is collected and evaluated on an ongoing basis.

ENGAGEMENT AT SECONDARY AND PRIMARY SCHOOLS

CAS' engagement in secondary and primary school education centres around teaching and a diverse array of lectures. Through the Open Science project, the CAS also offers summer science camps for secondary and primary school natural science teachers and science popularisation courses.

Students of the Course on scientific research basics, which took place on 9-13 October 2023 at the CAS building in Národní street in Prague.

Media Communications and Promotion

Communicating with the public, particularly through the media, has always been a key component of the Czech Academy of Sciences' activities. CAS media communications are grounded in continuous, regular and systematic popularisation of science and research results. Scientists and science promoters strive to spark public interest in scientific work. CAS employees do their utmost to bring science closer to non-scientists, attract their interest in research findings across disciplines and present their institutes and themselves at work on specific research projects.

The significant scientific results produced by the CAS have the potential to leave an indelible imprint on the Czech media landscape and beyond. Scientists' expert statements on current events or issues have the power to set the public agenda and highlight socially crucial topics.

THE CZECH ACADEMY OF SCIENCES AS A MEDIA PARTNER

An essential part of CAS media communications involves working with public service media, namely Czech Television (CT), Czech Radio (CR) and the Czech Press Agency. Throughout 2023, CAS scientists were regularly invited to take part in Czech Television and Czech Radio broadcasting and asked for interviews to clarify various current topics. For both journalists and the public, their statements served as assurance of verified knowledge across scientific disciplines.

In 2023, there were 33,728 media outputs mentioning the CAS and variations of its name in monitored media, 63.9% of which were on the internet, 17.2% in printed media, 3.3% in Czech Press Agency news desks which other media use as a source, 4.7% in television news and 10.1% in radio. The remaining 0.7% relates to podcasts, social networks and YouTube broadcasts. According to Newton Media, the keyword Academy of Sciences appeared in the monitored media an average of 2,810 times per month. The vast majority of media reporting about the CAS had a positive connotation.

The work of the CAS, across all of its scientific disciplines, figured prominently in the media in 2023. Accordingly, only a few brief examples of the emphatic impact of CAS media communications can be shared below.

CAS research topics

The two sessions of the Academy Assembly, which took place at the National House Vinohrady in Prague, were of chief importance for the CAS and were presented in the media, particularly in relation to the forthcoming amendment to the Act on Support for Research, Experimental Development and Innovation (Act No. 130/2002 Coll.).

> “Communicating with the public, particularly through the media, has always been a key component of the Czech Academy of Sciences’ activities. In 2023, there were 33,728 media outputs about the CAS in monitored media.

The announcement of European Research Council grant recipients heralded very positive media attention for the CAS as a whole and the **Institute of Physics** and the **Institute of Organic Chemistry and Biochemistry**: brothers Tomáš and Pavel Jungwirth were both awarded ERC Advanced grants. Moreover, Tomáš Jungwirth is the first Czech scientist to receive an ERC Advanced grant twice.

Events organised by the **Centre of Administration and Operations** for the CAS were also covered by the media: firstly, the CAS’ traditional Brain Week in March, and secondly exhibitions at the Science and Art Gallery in Národní street: *Great Moravian Mikulčice virtually*, *Democratic events through the lens of Czech National Council MP Dagmar Hochová*, *Czechoslovakia*, *The New Homeland* and *the jubilee Photogenic Science competition*.

The 7th annual *Science Fair*, which took place from 8 to 10 June at the PVA EXPO Letňany and was visited by a record 46,000 people, had a considerable media imprint. The fair received slight media attention several weeks in advance, but about a week before the opening and especially on Friday and Saturday, the event was covered by most national and regional media. The most important coverage included reports by CT and CR; information on the servers Novinky.

cz and Blesk.cz; in the dailies Metro, Pražský deník and Hospodářské noviny; and the weeklies Vlasta, Květy, etc.

At the end of the year, the CAS attracted media attention with two powerful topics: the danger of "eternal chemicals", first broached in a CR report and followed by a published video interview with Jaroslav Semerád from the **Institute of Microbiology**, which was supported by a visually appealing short informational video; and the heavily discussed topic of fireworks toxicity, with e.g. a video interview with Táňa Závodná from the **Institute of Experimental Medicine** and a short, massively shared shot on social networks. The topic of fireworks toxicity was linked to the CAS brand, making it clear that the Czech Academy of Sciences has a number of experts who are knowledgeable about the issue.

CAS in current news

In 2023, the strong voice of CAS scientists also resounded in the public discourse in relation to the proposed budget allocation for science, research and innovation. CAS President Eva Zažímalová commented in the media on the impact of the consolidation package on the budget of scientific institutions, including the CAS. CAS Vice-President Martin Bilej also spoke to journalists about investments in science, and CAS Vice- President Jan Řídký explained the impact of the reduction in the science and research budget. Daniel Münich, Filip Pertold, Klára Kališková and Jan Švejnar from **CERGE-EI** assessed the proposed cuts through the lens of economics. The CAS Academy Council Presidium also reacted with two critical statements, one on the draft proposal of budget cuts and the second on the proposed changes to European funds co-financing rules.

A number of scientists also opposed the proposed deep cuts to science funding through e.g. petitions by the Science Lives! association. Over 3,800 people (not only academicians) signed the first petition called *Don't Cut Science!*, while the second petition, which responded to the draft law on RDI, was called *Defend Czech Science* and was supported by 1,800 petitioners.

The CAS was also featured in the media in connection with President Petr Pavel's travels around the Czech Republic: his May visit to the **Masaryk Institute and Archives**, where he and CAS President Eva Zažímalová inaugurated the TGM Library, was eagerly covered by the media. At the end of September, the Czech President toured the South Moravian Region, including the Hradisko u Mušova archaeological site. The Mušov - Gateway to the Roman Empire visitor centre was built and is operated by the **Institute of Archaeology, Brno** with the support of the CAS.

CAS scientists also regularly explained, analysed and commented on current events and the context of important historical anniversaries, etc.

Focus on research: media topics put forth by CAS institutes

CAS public communications were also carried out through press releases, with an average of four releases published every week.

A press release about the City of Prague's new marketing strategy, which aims to attract more sophisticated and affluent clients to the metropolis, evoked great media interest. The new concept is based on research by scientists from 11 CAS institutes.

Another topic that resonated with journalists was the opening of a new, state-of-the-art BSL-3 laboratory for research on highly infectious viruses and bacteria at the Czech Centre for Phenogenomics, which is part of the **Institute of Molecular Genetics** at the BIOCEV Centre.

The unique findings uncovered in Oman by an international team led by the **Institute of Archaeology, Prague** attracted considerable media attention.

The launch of the Jupiter Icy Moon Explorer (JUICE), a giant interplanetary probe with ten scientific instruments on board, also captured journalists' interest. Experts from the **Institute of Atmospheric Physics** and the **Astronomical Institute** made key contributions to the instrumentation.

The media were also intrigued by one of the brightest gamma-ray bursts observed by Czech telescopes on the night of 19 June - the optical light emission was so bright that it was seen by the relatively small optical telescopes of research teams from the **Institute of Physics** and the **Astronomical Institute**.

The media also readily reported a press release from the IDEA think-tank at the **Economics Institute** concerning a new study, *What the data says about generations X and Y: when our parents were as young as we are*, which presents a unique comparison of the lives of Generation Y (millennials), and those of Generation X (their parents).

Media also covered CAS awards which recognise scientists for research results that enhance the stature of Czech science, including the Otto Wichterle Prize; the *Academic Premium - Praemium Academiae*; the highest award, the *Lumina Quaeruntur Fellowship*; and the Award of the President of the CAS for the promotion or popularisation of research, experimental development and innovations, etc.

The popular summer event *Archaeological Summer* once again drew media attention, as did other archaeologist stories: the graves of the Langobard elite discovered at the base of the Pálava Hills by **Institute of Archaeology, Brno** staff, and the "Bánov Treasure" collaborative research project of the **Institute of Archaeology, Brno**, Palacký University in Olomouc and Charles University in Prague.

News from the **Institute of Theoretical and Applied Mechanics** about the deciphering of a text, in which Daniel Vavřík participated in an international team of scientists, elicited unusually broad media promotion. The text was located inside a tablet consisting of one folded rectangle of lead

foil, which had lain for thousands of years buried in rocks on Mount Ebal in the West Bank of the Jordan River. Daniel Vavřík was able to scan the inside of the tablet - without mechanically opening it - using x-ray tomography, so that epigraphers could read it.

Information about the **Institute of Experimental Medicine's** gene therapy work resulting in axon growth in the injured spinal cords of laboratory rats aroused enormous media interest.

Czech and international media keenly covered a report by **CzechGlobe - Global Change Research Institute** detailing changes in hop production and quality caused by climate change: rising temperatures and increasingly frequent droughts will lead to reduced production and will also affect the taste of beer.

Information about an opportunity for schools to participate in building a database of Czech language dialects by recording the speech of older people also resonated in the media. **The Czech Language Institute** launched the *Become a superdialectologist!* call for secondary and upper primary school students.

Videos as a new communication format

Short videos featuring a scientist speaking on a current issue or about a new press release were once again used in 2023 to introduce CAS themes. The videos, which are approximately 10 to 15 minutes long, are produced by the Division of External Relations Press Section, which posts them on social media (in their shortened 2-3 minute versions) and sends them to journalists as material for reporting. Media offices then either use the videos directly in their broadcasts or news reports or prepare their own news stories with the help of the respondent.

In 2023, the Division of External Relations Press Section produced 30 of these videos. Roughly one-third accompanied and supported CAS press releases (e.g. a video for the press release on the deciphering of the curse tablet harvested an unprecedented 100,000 views for the CAS), one-third introduced CAS institute topics (e.g. videos clarifying how LED lighting technology works, the harmful effects of fireworks, corporate and public interest in sustainable fashion) and one-third responded to events in society such as Russia's war in Ukraine (four video interviews), Israel and the Gaza Strip (two videos), the presidential elections (two videos), etc.

Strategy AV21 and AVex expert opinions

AVex expert opinions, which are developed in response to requests from the Parliament of the Czech Republic, were issued for the fifth year in a row. They provide lawmakers, selected ambassadors and Members of the European Parliament with independent and apolitical expert information about concrete, current societal problems and potential solutions.

Three expert opinions were published in 2023: the first covered *Artificial Intelligence* and was developed by the **Institute of Computer Science** and the **Institute of State and Law**; *Fireworks: a toxic show with unbearable health risks* was prepared jointly by scientists from the **Institute of Hydrodynamics**, the **Institute of Chemical Processes** and the **Institute of Experimental Medicine**; and *Use of energy from nuclear fusion is within reach* was compiled by scientists at the **Institute of Plasma Physics**.

Ilustration: *AVex covers*

SCIENCE POPULARISATION

through the Centre of Administration and Operations of the CAS

> The Czech Academy of Sciences considers the popularisation of research results and the dissemination of scientific knowledge to the general public to be an integral part of its mission.

The CAS service office, the Centre of Administration and Operations, has always played an important role in systematic popular promotion of CAS research results. It manages a diverse spectrum of popularisation activities through the Division of External Relations.

Science Fair

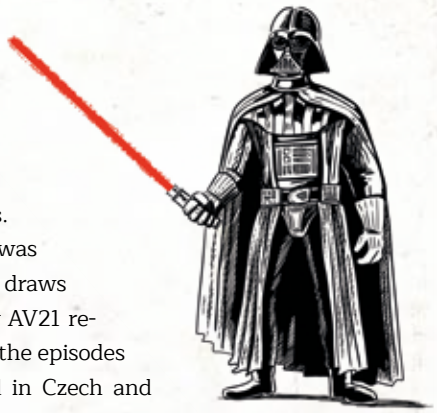
Attractions such as a photovoltaic tent, a robotic dog, a journey to the Ice Age, observations through a microscope and the production of medieval paints and many others drew thousands of visitors to the 2023 Science Fair. It was the largest science event in the Czech Republic and was organised by the CAS on 8-10 June at the PVA EXPO PRAHA site in Letňany. More than 100 scientific institutions, companies and science centres presented their work. The accompanying programme included lectures, workshops, panel discussions and a live podcast. Attendance set a new record: some 46,000 people visited the Science Fair over the course of three days.

The Prague Public Transport Company, Memory of Nations and the National Institute of Mental Health presented for the first time. Another new feature were two discussion programmes with young scientists: *Science Stop* and *Ask a Scientist Live!* The *CAS Podcast* was recorded live at the Science Fair for the first time. There was also a "Small Stage" at the fair, where people could learn about the results of Strategy AV21 research programmes. Lectures, which were held in mostly one-hour intervals throughout the three days, presented a broad array of topics - from housing under socialism to fires and their impact on the landscape and to black holes and the search for exoplanets - in a fun and easy-to-understand way.

Open Science Project

In 2023, the Open Science project, which has been running since 2005 and is fully funded by the CAS, enabled another round of secondary school students from all over the country to take part in student science internships. As in 2022, a total of 901 secondary school students sent in 1,657 applications. Students applied most often for internships in biology, physics, psychology and the medical sciences. Altogether, 223 students were given the opportunity to become researchers for a number of months through 129 science internships led by 118 instructors from 39 CAS institutes. The range of internship topics was drawn from all three research areas. The internships culminated in the *2023 Open Science Student Science Conference*, which took place on 22 - 24 November 2023 at the Institute of Physics in Prague. Over 150 secondary school students gathered to present the results of their year-long research during the three-day event in November. During the conference, nearly a hundred papers were presented in the research areas life and chemical sciences; mathematics, physics and earth sciences; and the humanities and social sciences. The secondary school students presented to the jury the topics of research they had investigated during the year-long internships and their research results.

UNdistorted science



The first 10-episode UNdistorted Science series was launched in 2014. Numerous positive responses from teachers, secondary school students and the general public provided motivation for the creation of subsequent series. The latest (ninth) series was completed in 2023 and draws on the themes of Strategy AV21 research programmes. All of the episodes were once again subtitled in Czech and English, making the UNdistorted Science series fully accessible to hearing impaired and international audiences. The episode topics of the ninth series were drawn from e.g. biology, physics, philosophy, medicine and linguistics. Scientists from CAS institutes served as expert guarantors for the episodes. The successful UNdistorted Science book, whose first volume was published by Academia in 2021, saw the completion of a draft of the second volume in 2023. The CAS continued to provide access to teacher guidance papers which contain accompanying questions, quizzes

and riddles on selected episodes of the series. Teachers use the series and guidance papers as supplementary teaching material in primary or secondary school classes. The series is very popular, with 62,000 subscribers and over 10 million views on YouTube.

Summer Science Camp

During the CAS' traditional Summer Science Camp, teachers expanded their pedagogical knowledge and skills through workshops, lectures and discussions geared towards enhancing lessons. Experiments were selected with a view to keeping costs low for schools and to their inclusion in the Framework educational programmes for the relevant school level. Along with gaining new knowledge, teachers had the opportunity to establish contacts with CAS staff and learn about activities that the CAS offers for teachers and students. The synergistic effect of the practical course is to reinforce teachers' motivation, which increases students' interest in studying science and engineering fields. Teachers also learn about current topics and trends in the field. The 2023 camp was held from 7 to 19 August in Olomouc. The programme encompassed 31 interactive workshops and practical exercises and was attended by 36 teachers. Lectures were provided by scientists from the Czech Academy of Sciences and teaching staff from universities.

School of Czech Language and Literature for Teachers

Another teacher training course was the three-day School of Czech Language and Literature, which took place from 2-4 October 2023 in Prague. It was organised by three CAS bodies: the Czech Language Institute, Institute for Czech Literature and CAS Centre of Administration and Operations, for a group of 45 teachers of Czech language, mainly from the upper primary level, secondary schools and grammar schools. Participants of the 2023 (11th) edition learned about topics such as how electronic dictionaries are currently being created, the secrets of dialect lexicography and samizdat literature. They visited the language advisory office and the lexicology department of the Czech Language Institute, had a guided tour of the Old Masters exhibition in the Schwarzenberg Palace, etc.

Wichterle Camp

The Wichterle Camp is designed as a three-day convening of the Otto Wichterle Prize winners, which gives these award-winning scientists an opportunity to share their experience, knowledge and research results in an informal setting. The fourth year of the camp was held from 30 August to 1 September 2023 at the Nové Hrady Castle Conference Centre. The programme included presentations of the award-winners' research as well as other workshops and meetings (e.g. a workshop on human resources management, a lecture on grant calls). The award-winning scientists also participated in an informal discussion with the CAS leadership about

the structure and management of the CAS and about various aspects of careers in science. As in 2022, they took part in a two-day practical training course on media presentation. It was held before the awards ceremony so that the award-winners could use their skills to respond to heightened media interest in their work.

CAS Week

From 6 to 12 November, the third annual CAS Week Festival took place, building on the 20-year tradition of the largest science festival, the CAS Week of Science and Technology. The festival once again presented the latest research and discoveries of scientists directly in CAS institutes, in the building in Národní street, at university research partners' premises, etc. Like every year, CAS institutes opened their doors to introduce visitors to their research through lectures, workshops, exhibitions, excursions, escape games, etc. The programme in the CAS building in Národní street comprised a lecture series based on the themes of Strategy AV21 research programmes. The "*Science Stop*", which is always very popular with visitors, was once again part of the event in 2023. At the "*Science Stop*", the Otto Wichterle Prize recipients presented their award-winning work to the public. Once again a series of panel discussions and moderated talks was held at the Přítomnost cinema in Prague's Žižkov district, focusing on current events and issues of interest to the public today. The 2023 topics were energy and artificial intelligence.

Photogenic Science

The main idea behind the CAS Photogenic Science photo competition is to connect science and art. The tenth anniversary year of the Photogenic Science Photo competition was once again a success endeavor with the engagement of CAS employees. The jury selected the best of their science - art photographs. In addition to the main category, Photogenic Science, a secondary category called Practical and Impractical Science was announced. Another highlight was the Drawing and Illustration category. The best images from research areas I, II and III were also acknowledged. Altogether, 102 employees from 31 CAS institutes participated, submitting a total of 245 photographs and 32 drawings and illustrations.

The winning photographs were exhibited from 27 November 2023 to 14 February 2024 in the Science and Art Gallery in the CAS building. As in previous years, a wall calendar was created from selected science - art photographs. The exhibition began with a gala opening that included the 2023 awards ceremony and the unveiling of a publication/photo book, *The Journey of Science in Photographs*, which chronicles the competition's 10 year history.

On Board with Science

In 2023, the popularisation project On Board with Science followed on its successful series of popularisation lectures from the previous year. Through the project, successful young scientists from all scientific fields make in-person visits and give online lectures to secondary school and grammar schools across the country. The participating scientists and science popularisers, in particular the Otto Wichterle Prize recipients, offer secondary school students a new perspective on what they are learning through unconventional lectures. The scientists also share the professional journeys which led them to their current scientific research and their employer, the Czech Academy of Sciences. The aim of the project is to render the world of contemporary science and research accessible to young people, as a way of inspiring them to consider a career in science themselves.

In 2023, a total of 24 lectures were held through the On Board with Science project, of which 14 were delivered in-person and 10 online. Grammar and secondary schools from all over the Czech Republic are involved in the project and some schools have expressed interest repeatedly.

Exhibitions at the Science and Art Gallery

Exhibitions at the Science and Art Gallery in the CAS building at Národní 3 constitute an inimitable presentation of scientific research and projects. The gallery's exhibition programme embraces the tradition of scientific exhibitions that introduce the public to the research topics of CAS institutes, interdisciplinary teams and their Czech and international partners through professionally prepared installations. In 2023, the gallery hosted 4 exhibitions.

The exposition *Great Moravian Mikulčice* virtually (10 March - 9 June 2023, Institute of Archaeology, Brno) presented virtual models of archaeological objects and artefacts from the Mikulčice hillfort through animations, holographic displays, augmented reality, etc. New 3D documentation, visualisation and analytical display methods were demonstrated on selected results of almost 70 years of archaeological research in Mikulčice.

2023
the best corporate magazine
for customers category

The photographic exhibition *Democratic events through the lens of MP Dagmar Hochová* (21 June - 18 August 2023, Institute for Contemporary History in cooperation with the Office of the Chamber of Deputies of the Parliament of the Czech Republic) provided a unique testimony of the events in the Czech National Council in 1990-1992, as captured by this renowned photographer. The photographs provided a glimpse into the proceedings of the Czech National Council as well as informal moments in the chamber and behind the scenes, thus bringing to light entirely new material for the analysis of the processes of parliamentary and national emancipation, as well as linkages between the spheres of politics and art.

The exhibition *Czechoslovakia, the New Homeland* (6 September - 12 November 2023, Institute of Slavonic Studies) focused on prominent immigrants who played key roles in the development of science in Czechoslovakia. The exhibition presented selected scientists who emigrated to interwar Czechoslovakia from the former Russian Empire, their life stories, and, above all, the results of their work, all through period photographs, documents and exhibits.

During the CAS Week in November, the Photogenic Science exhibition opened in the gallery (27 November 2023 – 14 February 2024, Centre of Administration and Operations), where the public could view selected images from the 10th annual CAS photo competition.

CAS Media

In 2023, four issues of the official magazine of the Czech Academy of Sciences, renamed *A/Magazine* (formerly *A/Science and Research*) were published. The main topic of the March issue was fear (*A 1/2023*), the June issue focused on crystals (*A 2/2023*), the September issue dealt with artificial intelligence (*A 3/2023*) and the December issue reported on fairy tales (*A 4/2023*). In addition, two issues of the popular science magazine *A/Easy* (formerly *AΩ/Science for Everyone*) were published. The spring issue focused on war, while the main theme of the autumn issue was life.

In 2023, *A/Magazín* scored a historic success in the 30th edition of the prestigious Czech Top 100 corporate communication competition, winning the best corporate magazine for customers category. CAS media was also recognised in the 21st edition of the largest communication competition in the Czech Republic, the Zlatý středník. The *AΩ / Science for Everyone* magazine and the *Czech Academy of Sciences podcast* (formerly *Science within Reach*) were both acknowledged with a "top rated" award. In addition, in the 2022 Journalism Award competition organised by the OSF Prague, the Czech Academy of Sciences podcast was nominated as one of the top three projects in the audiovisual journalism category (best interview, discussion or debate).

In 2023, there were also 6 issues of the internal electronic newsletter *AB / Academic Bulletin*, which is intended for CAS institute employees. A new e-mail newsletter, *A / Z Akademie*, was launched in autumn 2023 to highlight news from the internal life of our institution every two to three weeks. It contains links to selected news published on the CAS website in the section "About us" under the tab "*A / Z Akademie*". A total of 5 newsletters were published in 2023.

News from the CAS and its institutes is consistently popularised through the main website, avcr.cz, and social networks, where the number of fans is also growing. Facebook remains the most followed social network (59,353 followers), followed by Instagram (21,910), X a.k.a. Twitter (13,601) and LinkedIn (5,101). The Twitter account of the CAS in English already has a following of 1,372 users.

Audiovisual Production of the CAS

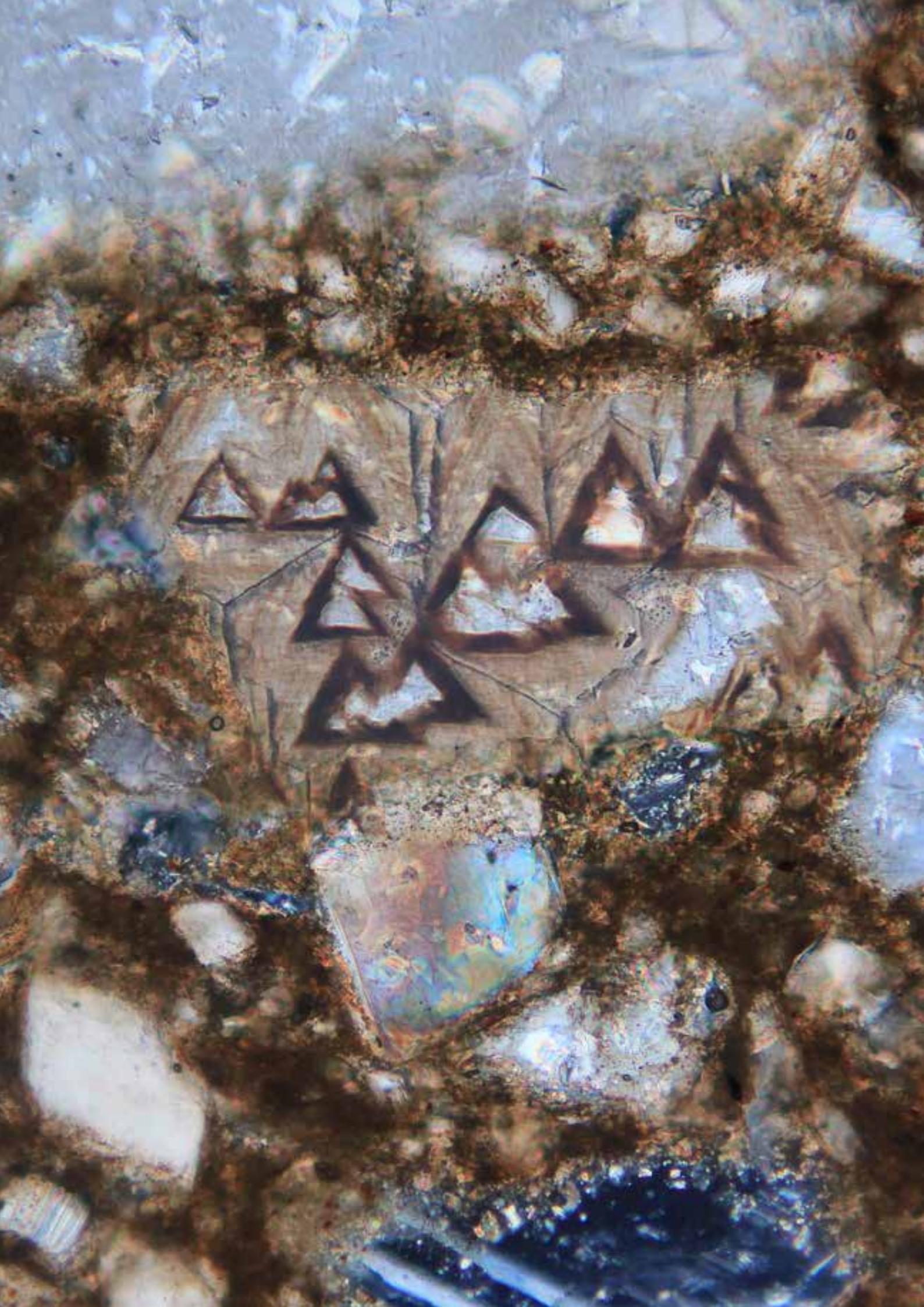
The Czech Academy of Sciences continuously popularises science through its audiovisual works, from making videos for social networks to production of vignettes, news stories and documentaries. During 2023, the Audiovisual Technology Division of the Centre of Administration and Operations regularly provided streaming and technical support for important events (lectures, conferences, Brain Week, CAS Week, etc.).

In 2023, staff focused on creating promotional videos, ranging from vignettes of prominent scientists, especially the Academic Premium and *Lumina Quaeruntur* recipients, to videos presenting specific institutes, such as the Institute of State and Law. There were also videos sharing news from Academia Publishing House and presenting the Academia Publishing House Award nominees.

Collaboration with the Institute of Hydrodynamics continued on the documentary series *Water for Life*, which covers drinking water and water resources, and on the filming of time-lapse material about the natural restoration of the fire-damaged Bohemian Switzerland National Park and related research involving scientists from various CAS institutes. *The City as a Laboratory of Change* is a new project, prepared with the Institute for Contemporary History. As part of Strategy AV21, it will highlight the resilience of cities during crises (floods, fires, etc.).

In April, the documentary *Finding the Man of Sorrows* was selected for the Academia Film Olomouc 2023 International Festival of Popular Science Films from a large pool of documentaries. In October, the film was one of the finalists at the Černá věž festival in České Budějovice. The documentary series *Silent Threats* (with discussions) and the older documentary Movements can still be viewed on Czech Television's iBroadcast. *Silent Threats* is being broadcast again on TV Noe.

The production of the video series Scout, a popular science programme targeting young people, continued for the YT channel. For example, videos about Czech archaeologists' discoveries were made from footage shot in Oman with scientists from the Institute of Archaeology, Prague. Scout won the main prize, Černého Janka, at the MUSAION film festival in June, as well as one category of the Zlatý středník competition in September. In cooperation with CT :D, the third series of the TV show *Scout for Children* was produced, and aired in September and October. All series are available on iBroadcast.



Publications

The Czech Academy of Sciences supports the publication of selected scientific and popular science publications from all of the scientific disciplines through the Academia publishing house, which is part of the Centre of Administration and Operations, and other CAS institutes. Books by CAS authors are also published by other Czech and prominent international publishing houses.

> The Czech Academy of Sciences supports the publication of high-quality publicly accessible scientific and popular science publications, by which it helps disseminate scientific research results and advance knowledge.

In compliance with CAS Guideline No. 13/2018 on Support of Publication Activities, the CAS supports proposals for publication of original scientific work, critical editions of important sources and significant commemorations, translations of important scientific or popular science works, and popular science works encompassing original research results as a major component.

In 2023, through the Publishing Support Programme, and based on recommendations from the Committee for the Support of CAS Publishing Activities, the Czech Academy of Sciences supported publishing at the following 10 CAS institutes: the Institute of Archaeology in Brno, Institute of Archaeology in Prague, Institute of Philosophy (Filosofia and Oikoymenh publishing houses), Institute of History, Masaryk Institute and Archives, Institute of Art History (Artefactum Publishing House), Institute of Czech Literature, Institute of Contemporary History, Institute of State and Law and Centre of Administration and Operations (Academia Publishing House).

This support of CZK 17.9 million enabled the publication of 97 books, 45 of which were published by Academia Publishing House and 52 by CAS institutes - and another +113 books are being prepared for publication.

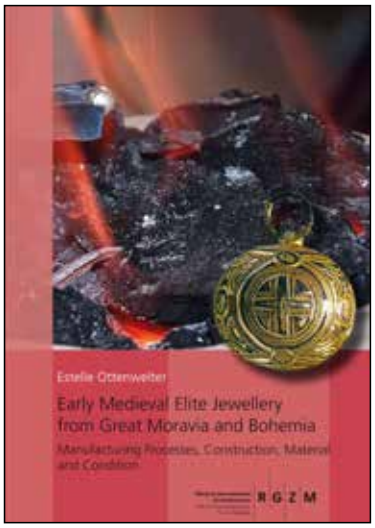
The Academia Publishing House is the largest CAS publishing house and a leader among Czech publishers. In its editions programme it publishes works from all scientific disciplines - original scientific monographs and works by Czech scientists, classic scientific works, translations of foreign books, popular-educational literature, non-fiction literature, encyclopaedias, dictionaries, language textbooks, manuals and university textbooks, the popular-educational magazine Živa and high-quality Czech and translated foreign fiction.

In 2023, the Academia Publishing House published a total of 92 books, nine new brochures in the Science Around Us series and seven new brochures in the Strategy AV21 series. Seven Strategy AV21 programme monographs were published with programme support.

The following publications, for example, were supported by the Publishing Support Programme:

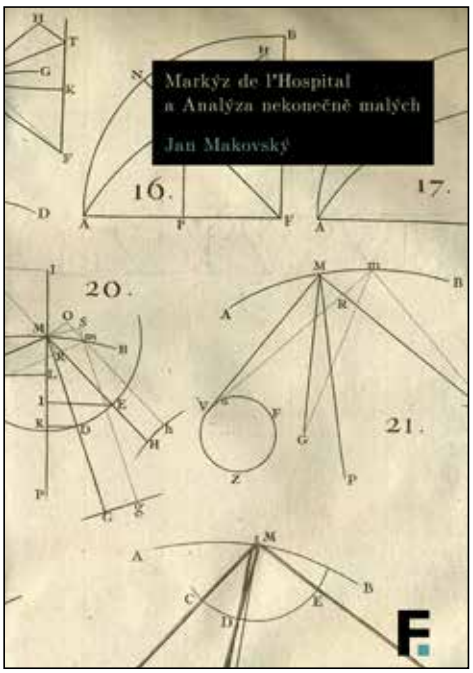
Institute of Archaeology in Brno

P. Žákovský, P. Bárta, J. Hošek:
Medieval swords in the Czech lands. The sword as a technological, cultural, historical and archaeological phenomenon.
Institute of Archaeology, Brno, 2023.



Institute of Archaeology in Prague

E. Ottenwelter: *Early Medieval Elite Jewellery from Great Moravia and Bohemia. Manufacturing Processes, Construction, Material and Condition*. Römisch-Germanisches Zentralmuseum, Leibniz-Forschungsinstitut für Archäologie, Mainz 2022 (published in 2023).

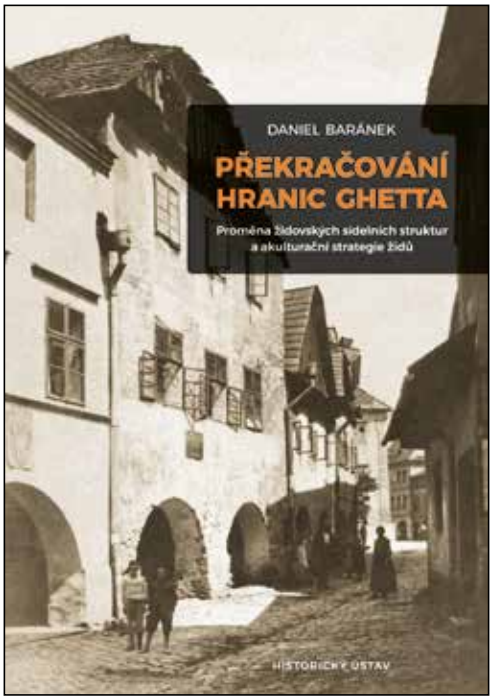


Institute of Philosophy

Jan Makovsky: *The Marquis de l'Hospital and Analysis of the Infinitesimal*.
Filosofia, Prague 2022 (published in 2023).

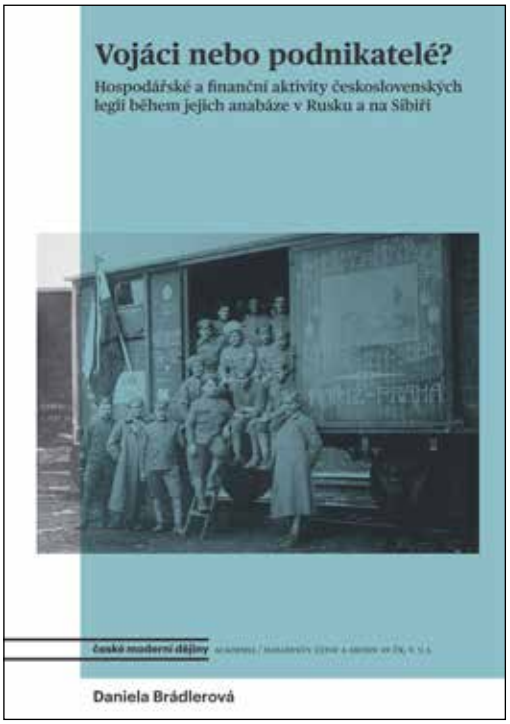
Institute of Philosophy

Tertullianus: *About the soul.* Oikoumené publishing house, Prague 2023, translation by Petr Kitzler.



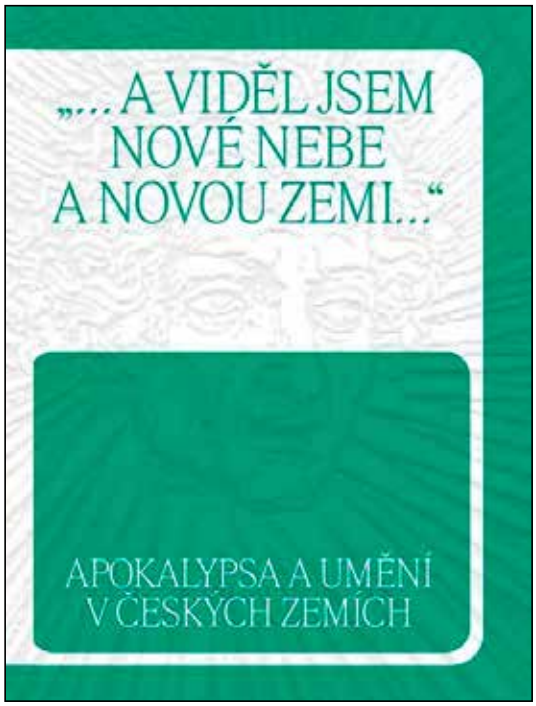
Institute of History

D. Baranek: *Crossing ghetto borders: The transformation of Jewish settlement structures and Jewish acculturation strategies.*
Institute of History, Prague 2023.



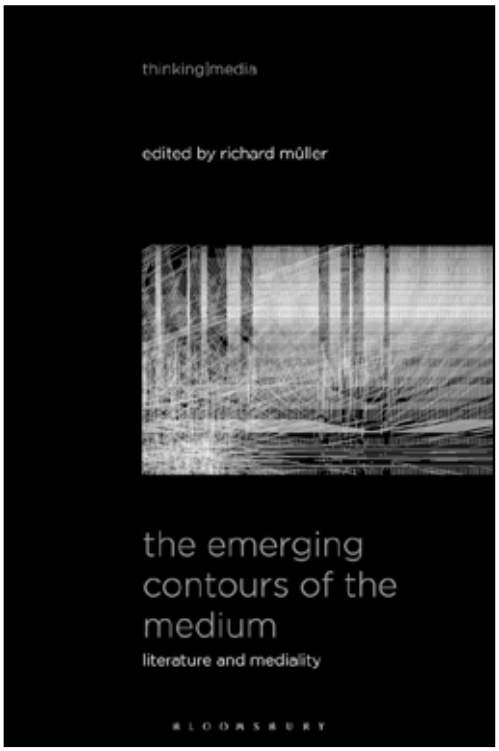
Masaryk Institute and Archives

D. Brádlerová: *Soldiers or businessmen? Economic and financial activities of the Czechoslovak legions during their anabasis in Russia and Siberia.* 2. ed., Academia / Masaryk Institute and Archives, Prague 2023 and Academia, Praha 2023.



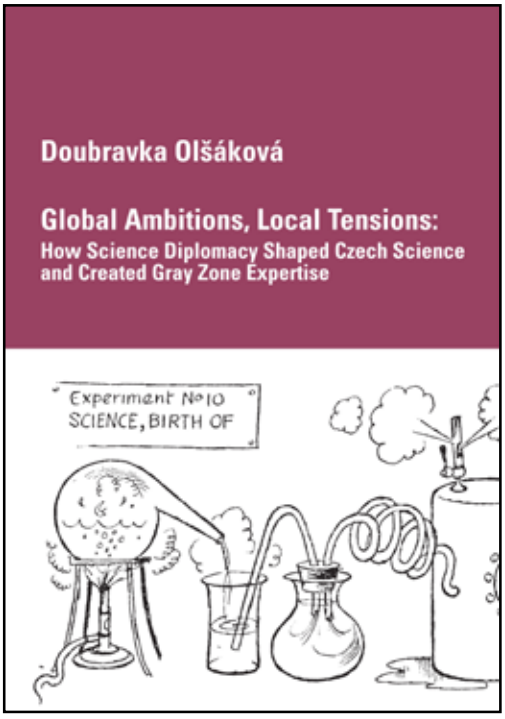
Institute of Art History

K. Kubínová, P. Machalíková, T. Winter (eds.) *"... Then I saw a new heaven and a new earth..." The Apocalypse and Art in the Czech Lands*. Artefactum and the West Bohemian Gallery in Pilsen, Prague 2023.



Institute of Czech Literature

R. Müller (ed.): *The Emerging Contours of the Medium: Literature and Mediality.* Bloomsbury Publishing, Thinking Media edition, New York - London 2024.



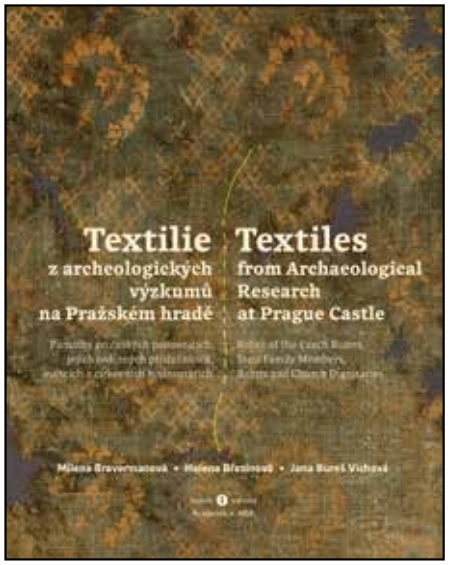
Institute of Contemporary History

D. Olšáková: *Global Ambitions, Local Tensions: How Science Diplomacy Shaped Czech Science and Created Gray Zone Expertise*. Institute of Contemporary History, Prague 2023.

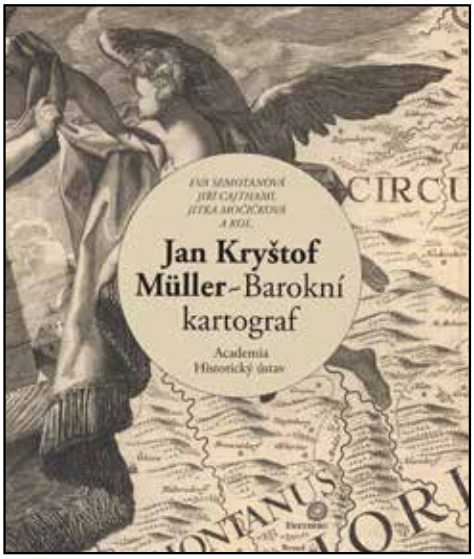
Institute of State and Law

M. Kramář - L. Hálová: *Financial Control Act. Problems of legislative processing.* Institute of State and Law, Prague 2023.

Centre of Administration and Operations - Academia

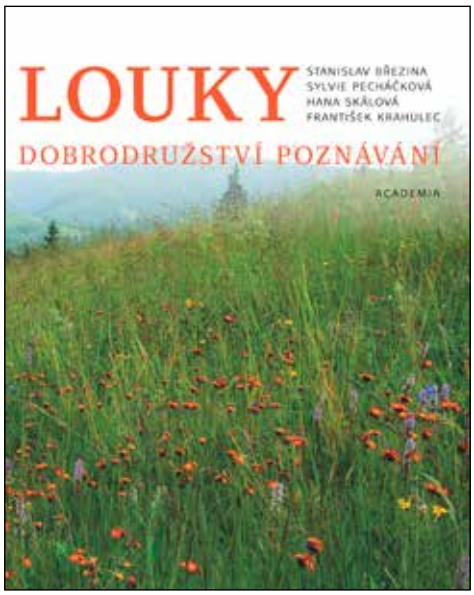


M. Bravermanová - H. Březinová - J. Bureš Víchová: *Textilie z archeologických výzkumů na Pražském hradě / Textiles from archaeological research at Prag.* Academia and Institute of Archaeology, Prague 2023.



E. Semotanová - J. Cajthaml - J. Močičková: *Jan Kryštof Müller - Baroque cartographer.* Academia and the Institute of History, Prague 2023

J. Moravec: *In Search of the Unknown Creatures of the Amazon Forest.* Academia, Prague 2023



S. Březina et al.: *Meadows. The Adventures of Exploration*. Academia, Prague 2023

Živa magazine

Cooperation with Scientific Organisations

The Czech Academy of Sciences is a long-standing supporter of the activities of scientific societies in the Czech Republic. Scientific societies link renowned experts from universities, the Czech Academy of Sciences and ministerial research institutes, as well as students and other individuals interested in the given scientific disciplines. Many scientific societies are interdisciplinary in nature and some focus on specific disciplines that are not represented in academic or other scientific institutions. Most of the societies are members of international associations in their field that operate on a global or European level. In 2023, the CAS supported 133 projects in collaboration with the Council of Scientific Societies.

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The Czech Academy of Sciences is a long-standing supporter of the activities of scientific societies, including the Learned Society of the Czech Republic and scientific societies associated in the Council of Scientific Societies of the Czech Republic. In 2023, the CAS supported 133 projects in collaboration with the Council of Scientific Societies.

The CAS provides systematic, long-term support to scientific societies associated in the **Council of Scientific Societies of the Czech Republic** (hereinafter the Council of Scientific Societies). Since 2019, the Council of Scientific Societies has operated as an independently registered association, affiliated with the CAS Academy Council through the Committee for Cooperation with Scientific Societies. The Council of Scientific Societies currently associates 91 scientific societies with more than 31,568 members. The largest society is the Czech Ornithological Society (7,266 members). Two new societies were admitted at the plenary session on 12 April 2023: the Czech Biophysical Association and the Czech Society for Catholic Theology.

In 2023, the societies published a total of 31 internationally noted journals, six of which had an impact factor, e.g. *Preslia* (Czech Botanical Society – IF 3.4), *Fottea* (Czech Phycological Society – IF 2.2), *Journal of Geosciences* (Czech Geological Society – IF 1.4), *Plant Protection Science* (Czech Society for Plant Pathology – IF 1.3) and *Geography* (Czech Geographical Society - IF 0.9). The societies also published 36 national professional journals, 12 web-based journals (many of the previously mentioned journals have web-based versions), and 38 newsletters or bulletins reporting mainly on news from the societies and the field. An interesting publication, released as a supplement to the journal *Acta societatis zoologicae bohemicae* (Czech Zoological Society), is a commemorative publication by M. Skuhrava titled *90 years of the Czech Zoological Society*.

Scientific societies published a total of 75 book monographs and proceedings in 2023. They include, for example, the following notable books: I. Kraus: *Technically talented women and their inventions* (Union of Czech Mathematicians and Physicists), M. Šepták: *Edvard Beneš and the Austrian Question 1931-1934* (Edvard Beneš Society), E. Kubů et al.: *In the Sign of Self-help and Solidarity. Cooperatives, Cooperative Elites, and Politics in Central Europe in the Second Half of the 19th Century and the First Half of the 20th Century* (Society for Economic and Social History). A new 544-page edition of the book *Prague Birds 1800-2020* by V. Wahl and colleagues offers a comprehensive view of the evolution of birds in the Prague region over two centuries (Czech Ornithological Society). Interesting popular science books published in 2023 include *The Big Book - The Solar System* by J. Martínek (Czech Astronomical Society) and an unusual “cookbook” of geographical atlases by editors R. Sieber and V. Voženílek called *The Atlas Cookbook: Ten Ingredients How to Edit an Atlas* (Cartographic Society of the Czech Republic). In the genre of professional memoir literature, I. Hlaváček’s book *Life among Papers and Books* was published (Czech Archive Society).

Scientific meetings and conferences are the most frequent “showcase” for the societies’ activities at both international and national level. In 2023, societies carried out nearly 363 of these activities. Among the largest were *Europacat 2023* (Czech Chemical Society, 1,800 participants) and the *Joint Congress of EACA and ISCAA (The 17th Congress of the European Association of Clinical Anatomy and the XIV. Symposium of Clinical and Applied Anatomy)* (Czech Anatomical Society, 850 participants). Innovative convenings included the week-long 5th WASWAC World Conference on “Adaptation Strategies for Soil and Water Conservation in a Changing World” (Czech Society of Soil Science), the new international conference *Methods in Plant Sciences 2023* (Czech Society of Experimental Plant Biology), and an interdisciplinary meeting titled *XIX. Discussions in Structural Molecular Biology and the 6th User Meeting of CIISB* (Czech Society for Structural Biology). Regular conferences included the *52nd Jírovec’s Protozoological Days* (Czech Society for Parasitology) and the *XXVII. Biochemical Congress* (Czech Society for Biochemistry and Molecular Biology), held in Slovakia. Other interesting scientific meetings included the *30th European Society for Philosophy and Psychology Conference* (ESPP) *(Czech Committee for Logic, Methodology and Philosophy of Science), Balkan Express. Between Orientalism and Occidentalism. The 7th International Balkan Studies Conference* (Czech Society for Slavonic, Balkan and Byzantine Studies) and *ICA Spring Olomouc - Atlases: Their Design and Use* (Cartographic Society of the Czech Republic).

Scientific societies actively supported elementary, secondary and university education through more than 200 events such as mathematics, chemistry, geography, natural science and astronomy knowledge competitions and specialised field courses for secondary school and university students and teachers, which often also included members of the public. There is a steadily increasing number of events for doctoral students that blend teaching and practical science, e.g. the *32nd Annual Student Conference Week of Doctoral Students* (Czech Astronomical Society, 120 students). Didactic and publishing activities are growing; the Union of Czech Mathematicians and Physicists is a leader with its traditional journals *Maths Teacher*, *Mathematics-Physics Perspectives* and *Advancements in Math-*

ematics, Physics and Astronomy. There has also been an increase in visitor numbers at large popularisation events for the general public, such as *Chemistry at the Silesian Ostrava Castle* (Czech Chemical Society), the *Physics Teachers' Invention Fair* (Union of Czech Mathematicians and Physicists) and *Science Fest* (Society for Biochemistry and Molecular Biology). Exhibitions, which are less common, include the *Great Invertebrate Exhibition* (Czech Entomological Society), which was visited by 6,300 visitors over 9 days. There is a noticeable predominance of natural science disciplines, but there are also events featuring practical disciplines, e.g. the *Experts to Schools* event (Czech Economic Society) focused on economic and legal topics. Almost half of the scientific societies honour both teachers and students for their publications or teaching.

Most scientific societies usually focus on lecture and popularisation activities for the public. In 2023, nearly 500 of these activities took place. The Czech Society for Ornithology stands out for its wide range of popularisation and consulting activities, especially the ongoing "post-covid" *Ornithologist on the Line* videos and management of the *Pan-European Common Bird Monitoring Scheme*. The website with the most traffic was once again www.astro.cz (Czech Astronomical Society).

Records of all activities of the scientific societies associated in the Council of Scientific Societies can be found in the database rvs.paleontologie.cz. In 2023, 1,959 records of separate events were entered into this database.

The Learned Society of the Czech Republic (hereinafter the "Society') connects prominent scientists from all disciplines. Its goals are to encourage freedom in the cultivation of science in all its manifestations, foster a drive for knowledge and joy from the quest for knowledge, disseminate scientific findings among the public, help improve educational quality and support development of a creative, rational and humanely responsible environment in Czech society. At the end of 2023, the Society had 104 regular fellows, 49 international fellows and 15 emeritus fellows.

The Society organised a number of lectures on current scientific and educational issues, including seven lectures and three discussions (with 13 speakers) at plenary sessions open to the public, a panel discussion "Open access - benefits and risks" with seven speakers, a panel discussion "Beautiful social machines II: the horizons of artificial intelligence in a discussion with four global experts" in cooperation with Masaryk University in Brno and the RECETOX Research Centre during an extraordinary fellows' retreat. Four lectures were given at the XXIX General Assembly, as well as two by international speakers. The Society held eight working sessions. At the June session, Prof. Jean-Marie Lehn, Nobel Prize winner in Chemistry, presented a lecture titled "Steps Towards Life: Chemistry!". During the "Bernard Bolzano Lectures" series, Prof. Reinhard Genzel, Nobel Prize winner in Physics, gave a lecture called "A Forty Year Journey: Evidence of the Supermassive Black Hole in the Centre of the Milky Way".

The Society awarded one Learned Society award in the scientific researcher category and two prizes in the junior scientific researcher category. It also recognised two teachers for promoting interest in science and research in secondary schools, creating an enabling environment for individual student work and outstanding student work in competitions. It also awarded 11 prizes to secondary school students, one university student prize and one "Via Chimica" Award, which is a joint prize of the Learned Society of the Czech Republic and the Experientia Foundation. The awards are funded by the Science Support Foundation of the Learned Society of the Czech Republic. The most significant prizes that the Society awarded in 2023 were 11 medals of the Learned Society of the Czech Republic, *Societas Scientarium Bohemica, Ad Laudem et Honorem*, for merit in the development of science.

The Society and the United Nations Information Centre in Prague jointly awarded the Climate Change Communication Prize; several presentations on environmental topics were made at the awards ceremony. The Learned Society organised a professional excursion of its fellows to the Moravian-Silesian Region, during which two experts gave lectures. Chairman Libor Grubhoffer reached out to the members of the government to draw attention to the inadvisability of intended budget cuts in science and higher education and subsequently held personal discussions with individual politicians about this issue.

The Learned Society published several statements on current public affairs. It endorsed a statement by the Czech Rectors Conference on the state of funding for public education and expressed its concern about the long-standing situation, and also joined a statement by the Czech Rectors Conference in support of the Israeli people in their fight against terrorist attacks by Hamas, Hezbollah and Palestinian Islamic Jihad. The Society also joined the call to combat the growing manifestations of anti-Semitism in Czech society. The Council of the Learned Society of the Czech Republic published a call for continued material and military aid to Ukraine, supported a statement by the Czech Rectors Conference on the planned cuts in higher education, issued a statement in support of the ratification of the Istanbul Convention, and supported the position of the Czech Academy of Sciences on the planned 10% reduction of the R&D&I budget. The Learned Society joined an open letter by Prof. Zdeněk Hel concerning the organisation of a conference of the SMIS-Lab association, known for spreading misinformation related to covid-19, on the floor of the Chamber of Deputies of the Parliament of the Czech Republic and asked the Speaker of the Chamber of Deputies, Ms. Markéta Pekarova Adamová, to reconsider the decision to permit this conference.

The Society's website at *www.learned.cz* and its Facebook, Twitter and YouTube accounts provide information about the Society's activities and its fellows. Lectures or presentations from lectures are also published on the website. The Learned Society cooperated with the Czech Academy of Sciences, Charles University, Masaryk University, the Institute of Chemical Technology in Prague, Experientia Foundation, UN Information Centre in Prague and other organisations.

CAS Awards

Each year the Czech Academy of Sciences recognises outstanding scientists for excellent research results that focus on societal priorities, which have strengthened the international prestige of Czech science and were first published or implemented during the past five years. In 2023, the results of the scientific and popularisation work of CAS researchers were recognised with many specific prizes, medals, honours and other awards. CAS scientists received prizes not only from the CAS but also from other Czech and international organisations and institutions. The following pages provide an overview of the most important awards.

AWARDS OF THE CZECH ACADEMY OF SCIENCES

The CAS President presented the following awards in 2023:

The Award of the Czech Academy of Sciences for outstanding results of research, experimental development and innovations, achieved in the following research projects:

- **Ing. Mgr. Jaroslav Hlinka, Ph.D.**, Institute of Computer Science, for the research result *Modelling the dynamics of epileptic seizures*
- **Prof. RNDr. Daniel Růžek, Ph.D.**, Biology Centre, for the research result *Emergent viral infections: from molecular pathogenesis to the development of new therapeutic options*
- **Assoc. Prof. Dr. phil. Rudolf Kučera, Ph.D.**, and **Prof. PhDr. Ota Konrád, Ph.D.,** Masaryk Institute and Archives, for the scientific work *Paths out of the Apocalypse. Physical Violence in the Fall and Renewal of Central Europe, 1914-1922.*

The Award of the Czech Academy of Sciences for young researchers for outstanding results of research, experimental development and innovations achieved in research tasks supported by the CAS until the age of 35 years:

- **Mgr. Adéla Hladká, Ph.D.**, Institute of Computer Science, for the research result *Detection of intergroup differences at the item level in multi-item measurements*
- **Ing. Nikola Holubová, Ph.D.**, Biology Centre, for the research result *Biology and diversity of avian Cryptosporidia spp.*
- **Mgr. Martin Zach, Ph.D.**, Institute of Philosophy, for the research result *Complementary theory of scientific modelling: Modelling mechanisms in tumour immunology.*

The Award of the President of the Czech Academy of Sciences for promotion or popularisation of research, experimental development and innovations

- **Prof. Ing. Miloslav Šimek, CSc.**, Biology Centre
- **Dr. Ing. Jiří Kotek, FEng., dr. h. c.,** Institute of Macromolecular Chemistry
- **Assoc. Prof. PhDr. Martin Jemelka, Ph.D.,** Masaryk Institute and Archives

HONORARY MEDALS AWARDED TO CZECH AND FOREIGN RESEARCHERS IN 2023

The Honorary Medal of the Czech Academy of Sciences "De scientia et humanitate optime meritis"

- **Prof. Ing. Martin Fusek, CSc.**, Institute of Organic Chemistry and Biochemistry
- **Mgr. Jiří Holba, Ph.D.**, Oriental Institute

The Ernst Mach Honorary Medal for Merit in the Physical Sciences

- **Ing. Jiří Kamarád, CSc.**, Institute of Physics
- **Prof. Ing. Jindřich Musil, DrSc.**, Institute of Physics
- **RNDr. Antonín Šimůnek, CSc.**, Institute of Physics

The František Pošepný Honorary Medal for Merit in the Geological Sciences

- **Prof. RNDr. Ivan Horáček, CSc.**, Faculty of Science, Charles University

The Gregor Johann Mendel Honorary Medal for Merit in the Biological Sciences

- **RNDr. Lubomír Adamec, CSc., DSc.**, Institute of Botany
- **Pascal Boireau, PhD, DVM**, Animal Health Laboratory, Maisons-Alfort, ANSES, France
- **RNDr. Jiří Nedoma, CSc.**, Biology Centre
- **Prof. RNDr. Jaroslav Vrba, CSc.**, Biology Centre

The František Palacký Honorary Medal for Merit in the Historical Sciences

- **Prof. i.R. Dr. Christian Lübke**, Leibniz-Institut für Geschichte und Kultur des östlichen Europa, Leipzig, Germany
- **Assoc. Prof. PhDr. Jan Němeček, DrSc.,** Institute of History
- **Prof. Dr. Philipp Ther, M.A.**, Universität Wien, Vienna, Austria

The Vojtěch Náprstek Medal of Honour for Merit in the Popularisation of Science

- **Mgr. Jan Mařík, Ph.D.**, Institute of Archaeology, Prague

The Honorary Medal for Merit for the Czech Academy of Sciences

- **Assoc. Prof. RNDr. Jana Pěknicová, CSc.,** Institute of Biotechnology
- **Prof. PhDr. Eva Semotanová, DrSc.**, Institute of History

SIGNIFICANT AWARDS GIVEN TO CAS RESEARCHERS BY OTHER INSTITUTIONS

The State Award of the President of the Republic - the Medal of Merit 1st class for services to the state in the field of science

- **RNDr. Jiří Grygar, CSc.**, Institute of Physics

- **Prof. MUDr. Helena Tlaskalová-Hogenová, DrSc.,** Institute of Microbiology

The Award of the Minister of Education, Youth and Sports for outstanding results in research, experimental development and innovation

- **Prof. RNDr. Julius Lukeš, CSc.,** Biology Centre
- **RNDr. Ondřej Kuda, Ph.D.,** Institute of Physiology

The Award of the Minister of Agriculture for the best result of research and experimental development and innovation

- **Ing. Jana Fránová, Ph.D.,** Biology Centre

The Medal of the Ministry of Education, Youth and Sports for work in the field of education

- **Mgr. Maksym Buryi, Ph.D.,** Institute of Physics

The Order of the British Empire for services to the promotion of science and Anglo-Czech scientific relations

- **Dr. Michael Londesborough, Ph.D.,** Department of Inorganic Chemistry

The Appleton Prize for outstanding achievement in experimental studies, awarded by the International Union of Radio Science (URSI)

- **Prof. RNDr. Ondřej Santolík, Dr.,** Institute of Atmospheric Physics

The Beno Gutenberg Medal for significant lifetime contributions to seismology awarded by the European Geosciences Union (EGU)

- **RNDr. Jaroslava Plomerová, DrSc.,** Institute of Geophysics

The Gold Medal of the Polish Minister of Education and Science for outstanding contributions to higher education and science

- **Doc. PhDr. Jan Němeček, DrSc.,** Institute of History

The Visegrad Group Academies Young Researcher Award

- **JUDr. Eva Balounová, Ph.D., LL.M.,** Institute of State and Law

The L'Oréal UNESCO Award for women in science

- **Ing. Veronika Vymetálková, Ph.D.,** Institute of Experimental Medicine

The Award of the President of the Research, Development and Innovation Council for popularisation

- **Prof. RNDr. Jan Konvalinka, CSc.,** Institute of Organic Chemistry and Biochemistry

The Josef Hlávka Medal, intended for prominent figures, founders and other important personalities of Czech public universities, Czech science and art in recognition of their lifetime work for the benefit of Czech science, art and education

- **Prof. PhDr. Eva Semotanová, DrSc.,** Institute of History

The Josef Hlávka Special Prize

- **Mgr. Eva Havlová, prof. PhDr. Adolf Erhart, DrSc., (in memoriam)** and **PhDr. Ilona Janyšková, CSc.,** Czech Language Institute

The Medal of the Learned Society of the Czech Republic for meritorious contributions to the advancement of science

- **Ing. Květoslava Stejskalová, CSc.,** J. Heyrovsky Institute of Physical Chemistry
- **RNDr. Zdeněk Lánský, Ph.D.,** Institute of Biotechnology

The Gold Medal of Charles University for significant work in the field of organic chemistry and biochemistry, long-term scientific and pedagogical activity

- **Prof. Ing. Martin Fusek, CSc.,** Institute of Organic Chemistry and Biochemistry

The Silver Commemorative Medal of Charles University

- **MUDr. Pavel Vodička, CSc., DSc.,** Institute of Experimental Medicine

The Neuron Foundation Award for Promising Scientists

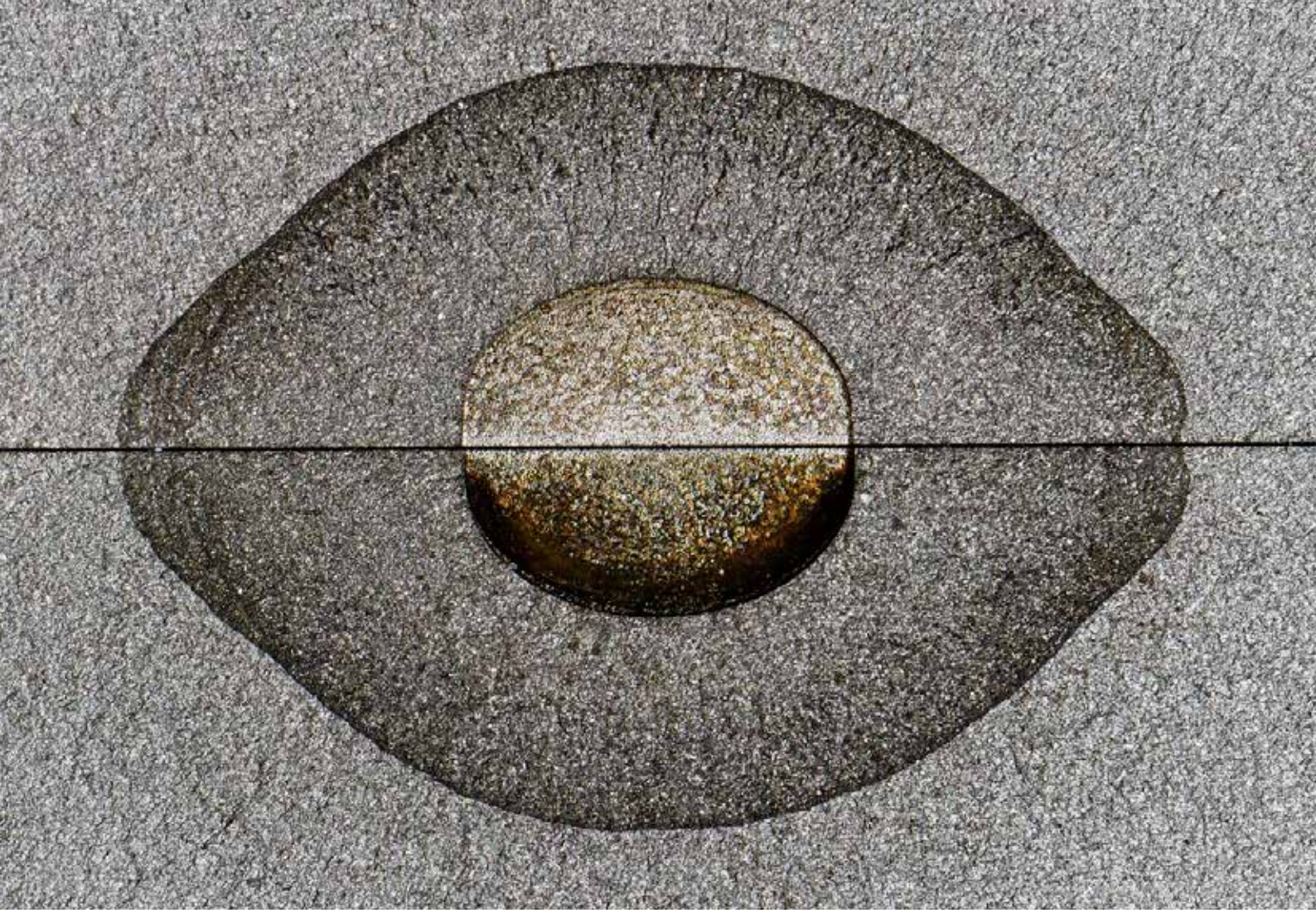
- **Mgr. Kateřina Rohlenová, Ph.D.,** Institute of Biotechnology, in the field of medicine
- **Mgr. Martin Schwarzer, Ph.D.,** Institute of Microbiology, in the field of biology
- **Doc. Mgr. Sylvie Graf, Ph.D.,** Institute of Psychology, in the field of social sciences

The Award of the President of the Czech Science Foundation for exceptional basic research results in grant projects

- **Mgr. Jakub Rohlena, Ph.D.,** Institute of Biotechnology

The Award of the Technology Agency of the Czech Republic

- **RNDr. Karel Tajovský, CSc.,** and his research team, Biology Centre, in the Governance category
- **Ing. Olga Šolcová, DrSc.,** Institute of Chemical Processes, in the Partnership category



List of photos used on pages in between chapters: Photogenic Science 2023

p. 6 Natália Luptáková (Institute of Physics of Materials): Winter garden
p. 10 Lukáš Synek (Institute of Experimental Botany): Dragon's blood trees at risk
p. 16 Hana Sehadová (Biology Centre): Tangled pathways
p. 22 Alexej Bubnov (Institute of Physics): Liquid crystals
p. 30 Barbora Veselá (Institute of Animal Physiology and Genetics): Interactions
p. 38 Šárka Podlahová (Biology Centre): Sweet cubes
p.42 Marta García Rivas (Astronomical Institute): A mirror that changes everything
p. 50 Martin Braun (Institute of Rock Structure and Mechanics): Going hand in hand makes work easier
p. 54 Pavel Lisý (Institute of Geology): At right angles (almost)
p. 62 Lukáš Krmíček (Institute of Geology): Lava beasts
p. 74 Radek Mikuláš (Institute of Geology): Blood of the Earth
p. 80 Štěpán Gamanov (Institute of Physics of Materials): Hot dislocation
p. 84 Martin Braun (Institute of Rock Structure and Mechanics): Memento mori
p. 88 Z. Sochorová (J. Heyrovský Institute of Physical Chemistry): Chemistry in one's hand
p. 103 Karel Slavíček (Institute of Archaeology, Brno): Mayan ceramics
p. 108 Jan Ponert (Institute of Botany): Furry flowers
p. 116 Dušan Tichoň (Institute of Physics of Materials): Living form of iron

Annex:

The Annual Report of the Czech Academy of Sciences for the provision of information pursuant to Act No. 106/1999 Coll., on Free Access to Information, as amended, for the period from 1 January until 31 December 2023

a)	Number of submitted requests for information	10
	Number of decisions issued rejecting an application	1
b)	Number of appeals lodged against a decision rejecting an application	1
c)	Number of court judgments on review of legality of a decision rejecting an application	0
d)	Number of exclusive licences granted	0
e)	Number of complaints filed under Section 16a of the Act	0

List of abbreviations used

CAS	Czech Academy of Sciences
CTU	Czech Technical University in Prague
ERC	European Research Council
EU	European Union
GA CR	Czech Science Foundation
LCV	Legislative Council of the Government
MEYS	Ministry of Education, Youth and Sports of the Czech Republic
OP JAK	Jan Amos Komenský Operational Programme
OP TAC	Operational Programme Technology and Applications for Competitiveness
R&D&I Council	Research, Experimental Development and Innovation Council
TA CR	Technology Agency of the Czech Republic
R&D	Research and Development
R&D&I	Research, Experimental Development and Innovation

The names of the institutes of the CAS appear in abbreviated form and do not contain the letters “CAS, v. v. i.”.

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