



**XLIVth Academic Assembly of the Academy of Sciences of the Czech Republic
Prague, April 24, 2014**

Item on the agenda: 2a

**A PROPOSAL
OF THE ANNUAL REPORT
ON THE ACTIVITY OF THE ACADEMY OF SCIENCES
OF THE CZECH REPUBLIC
2013**

CONTENTS

THE ASCR	5
PROFILES OF RESEARCH AREAS	7
MATHEMATICS, PHYSICS AND EARTH SCIENCES	7
LIFE AND CHEMICAL SCIENCES	8
HUMANITIES AND SOCIAL SCIENCES	9
SELECTED RESULTS.....	10
PUBLICATIONS.....	13
FOSTERING RESEARCH, DEVELOPMENT AND INNOVATION	15
Forms of the Support of the ASCR from the State Budget of the CR.....	15
THE ACADEMY OF SCIENCES CR – PROVIDER OF SPECIAL-PURPOSE SUBSIDY	16
PROJECTS OF THE OPERATIONAL PROGRAMMES OF THE EU STRUCTURAL FUNDS	17
CENTRES OF EXCELLENCE FUNDED FROM THE OPERATIONAL PROGRAMME RESEARCH AND DEVELOPMENT FOR INNOVATIONS .	17
CENTRES OF EXCELLENCE FUNDED FROM OPERATIONAL PROGRAMME PRAGUE – COMPETITIVENESS.....	19
INTERNATIONAL COOPERATION.....	19
ORGANIZATIONAL ACTIVITIES	19
COOPERATION WITH INTERNATIONAL SCIENTIFIC ORGANIZATIONS	21
COOPERATION WITH INTERNATIONAL NON-GOVERNMENTAL ORGANISATIONS.....	22
COOPERATION WITHIN INTERNATIONAL BILATERAL AGREEMENTS	22

PARTICIPATION OF THE ASCR IN THE EUROPEAN UNION FRAMEWORK PROGRAMMES.....	23
REGIONAL COOPERATION	24
EDUCATIONAL ACTIVITY	24
COOPERATION WITH UNIVERSITIES AND OTHER HIGHER EDUCATION INSTITUTIONS	25
TEACHING	25
EDUCATION OF STUDENTS.....	26
COURSE IN THE FUNDAMENTALS OF RESEARCH WORK.....	26
PROVIDING EDUCATION AT SECONDARY AND ELEMENTARY SCHOOLS.....	27
TOWARDS SOCIETY	29
EDITORIAL ACTIVITIES.....	29
POPULARIZATION OF SCIENCE	30
REFLECTED BY THE MEDIA	32
SCIENCE FOR PRACTICE.....	33
AWARDS AND MEDALS.....	37
SIGNIFICANT AWARDS TO THE RESEARCHERS OF THE ASCR	37
AWARDS GRANTED BY THE ASCR	38
FINANCIAL MANAGEMENT	44
EMPLOYMENT AND DRAWING ON WAGE RESOURCES	53
CONTROLLING AND AUDITING	56
STRUCTURE OF THE ACADEMY OF SCIENCES 2013	57
APPENDICES	59
LIST OF ACRONYMS.....	111

THE ASCR

The Academy of Sciences of the Czech Republic (ASCR) was established by Act No. 283/1992 Coll. as the successor of the former Czechoslovak Academy of Sciences. The ASCR promotes and carries out research through 54 public research institutions and employs over 8,000 workers, more than half of whom are researchers with university degrees.

The primary mission of the ASCR and its institutes is to conduct basic research in a broad spectrum of natural, technical and social sciences and humanities. This research, whether highly specialised by nature or interdisciplinary, aims to advance scientific knowledge at the international level while taking into account the specific needs of both Czech society and national culture.

Institutes of the Academy participate in education, particularly by training young researchers in doctoral study programmes and by teaching at universities or other higher education institutions.

The Academy also fosters collaboration with applied research and industry. The integration of Czech science into the international context has been promoted through numerous international joint research projects and through the exchange of scientists with counterpart institutions abroad.

THE ASCR PRESIDENT'S ADDRESS

Dear Reader,

Hereby we present to you the Annual Report of the Academy of Sciences of the Czech Republic, a body associating more than fifty institutes residing in Prague, Brno, České Budějovice and in a number of other places in the Czech Republic. All of the institutes together represent a unique conjunction of scientific research in a wide scope of disciplines ranging from technical and natural sciences to humanities and life sciences.

Year 2013 was not the easiest year for the Academy, particularly because it was the year of a continuing decrease in the institutional component of the Academy's financing, the component that creates operational stability in any scientific institution and forms prerequisites for all its units to perform the given research tasks successfully. For the Academy, the institutional financing dropped down dramatically

from 63 percent in 2007 to mere 35 percent of its total budget in 2013, which substantially complicates long-term and conceptual research work.

Despite these economic obstacles, in 2013 the Academy of Sciences successfully defended its position of the most efficient Czech scientific research institution and presented itself with the research of a high standard. Its individual institutes across all branches of science were successful in achieving significant scientific results. The latest ones will be mentioned inside the current Annual Report. The report is designed to help the reader get easily a fast overview of our activities, results and important achievements. At the same time, we have decided to present our work by means of a single yet bilingual report, which can serve as a symbolic expression of a close connection between Czech science and the international context.

From among the topics generally included in our annual reports, let me draw your attention to the chapter dealing with the cooperation of the Academy of Sciences with the business sector. Implementation of the results of basic research in practice together with the ASCR's own applied research have always been constant features of our mission. Personally, I am convinced that a meaningful cooperation between academic and business sectors is a prerequisite for the development of a society based both on knowledge and on efficient process of innovation.

Such aim, however, collides with the fact that over a long period of time the area of science and research in the Czech Republic has been underfunded and tied down by a number of bureaucratic mechanisms. If we are supposed to acquire steady results comparable with those of the developed European countries, necessarily, our funding should also be comparable. The increase in institutional funding of science and research in mid-term horizon not only creates an essential and indispensable ground for the stabilization of the Academy of Sciences and its institutes, but also provides a vital condition for the utilization of the existing potential of the entire system of science and research for the benefit of the Czech Republic and its citizens. Therefore, we believe that it is important now and in the future to keep addressing the government authorities and together with them try to find the solution that would be more consonant with the interests of the Czech society.

Jiří Drahoš, President of the ASCR

PROFILES OF RESEARCH AREAS

MATHEMATICS, PHYSICS AND EARTH SCIENCES

In the *Section of Mathematics, Physics and Computer Science*, methods of mathematics and informatics have been developed also for other branches of science. The research in Physics gains knowledge of basic natural laws in micro and macro world, the behaviour of physical systems at extreme conditions and the possibilities of practical utilization of new discoveries and phenomena. Among the investigated topics, we can find the research on condensed matter systems with unique physical properties (including nanostructure systems), exploration of properties, structure and interactions of matter at a subatomic level, and study of classical, particle, quantum and nonlinear optics. Astrophysical and astronomical laboratories investigate the nature and behaviour of matter and radiation from the upper parts of the Earth's atmosphere to the farthest corners of the Universe; their research focuses on the issues of galaxies, star systems, stars, Sun, Earth-Sun relations, interplanetary bodies and artificial satellites of the Earth.

The focal point of the *Section of Applied Physics* is the research on the properties of ionic environments and laser plasma, photonics, generation and diagnosing of high- and low-temperature plasma, transmission phenomena in liquid systems and hydrosphere, mechanics of ductile objects and biomechanics, dynamics of liquids, thermodynamics, research into properties of high voltage electromagnetic systems, new concepts of energy conversion, sensors, transmission and processing of signals, material research and exploration of the properties of advanced materials in the relation to their microstructure. Encouragement is also given to the development of new physical methods, special technologies and instrumentation principles, as well as to the development of basic interdisciplinary research and applied research focused on fundamental knowledge exceeding the disciplinary borders. Typical are the applications in bioengineering, medicine and ecology, including the protection of human health and safety and preservation of natural and cultural heritage of humankind.

The institutes integrated in the *Section of Earth Sciences* investigate the planet Earth with its immediate and distant vicinity. The priority here belongs to the study of inner structure of the Earth, study of the development of lithosphere, biosphere and environment from the oldest geological eras to the present, including human-induced processes in lithosphere. For the area of industrial applications, important parts are exploration of geodynamic processes in the upper layer of the Earth's crust and investigation of hydrological processes influencing the environment and ecologically responsible management of raw materials.

LIFE AND CHEMICAL SCIENCES

The research in the *Section of Chemical Sciences* is directed towards the targeted synthesis and the structural and functional characterisation of new inorganic and organic compounds with a special focus on crystalline, composite, glass and polymeric materials and supramolecular or nanostructured systems. Another priority, rendering a theoretical basis for applications, is the research of the relations between the structure, properties and reactivity of materials associated with the clarification of temporally and spatially distinguished mechanism of their reactions. A substantial part of the research activities belongs to the study of the chemical principles for biological effects in biomedicine and ecology, and to the development of new chemotherapeutics, biologically active substances and polymeric biomaterials for targeted therapeutic applications. Advanced technologies are the objective of the research focusing on the processes in multiphase reactive systems, molecular engineering, new methods for initiating chemical reactions and processes important for environmental decontamination and protection. An integral part of chemical research is the development of instrumental, analytical and bioanalytical methods.

The Section of Biological and Medical Sciences focuses on the research into the processes in living systems at various levels of their organisation. Special attention is paid to the development of genomics, proteomics and system biology as bases for future biomedicine and biotechnologies. Biomedical research focuses on the knowledge of the biophysical properties of living systems, the mechanisms of functioning and disorders of the nervous, immune, cardiovascular and reproductive systems, including the external factors influencing them; on the study of gene expression and its signal path, the genetic bases of diseases and human evolution; on the research of tumour and stem cells; on the development of new pharmaceuticals; on the influence of lifestyle factors on the health of the population; and on the biology of microorganisms and microbe biotechnologies. Biomedical research studies the function and disorders of the nervous, immune, cardiovascular and reproductive systems, gene expression and its signal path, the genetic bases of diseases and human evolution and focuses on the development of new pharmaceuticals. The emphasis is placed on obtaining knowledge applicable in the prevention, diagnostics and therapy of serious diseases and in modern biotechnologies. Research in the biology of animals includes physiology and the pathologic processes in animals, the genetic bases of the development of plants, the interaction of the plant genome with the environment and on the biodegradation of xenobiotics in water and soil.

The institutes and centres belonging to the *Section of Biological-Ecological Sciences* concentrate on mutual relations between organisms and between organisms and the environment, as well as on the functional mechanisms in ecosystems with respect to the anthropogenic effects. The objective is to apply the knowledge into medicinal, biotechnological, veterinary and agricultural practice the same as into rational management of the landscape. The research is also focused on animal biodiversity, evolutionary ecology of the vertebrates and adaptations of their behaviour, on the

investigation of the evolution, structure and ecological role of plant biodiversity (from the genetic level through the level of organisms and communities to ecosystems) and on the study of the insect as both a biological model and pest. Another area of interest includes the interactions of parasitic and symbiotic organisms, organism communities in the soil ecosystems, the functioning of the ecosystems of valley dams and lakes, the study of the global cycle of carbon, energy and material flows through ecosystems, and the ecology of the landscape influenced by man. An important component of the research is the use of advanced methodologies in ecology, particularly the methods of molecular biology, remote research of the Earth and mathematic modelling with an emphasis on a systemic approach.

HUMANITIES AND SOCIAL SCIENCES

A common ground of work for the institutes associated within the *Section of Social-Economic Sciences* is the interest in the topical societal issues. For psychology, the central topic is the study of the conditions for the optimal development of human beings in a variety life situations. Research in economics reflects the contemporary shifts in the changing world. It focuses, for instance, on the study of so-called dynamic global games, which can be a helpful tool for analysing various economic processes. The key subject matter for the sociological research is to examine long-term social processes forming the society in the Czech Republic and its human and socio-cultural heritage. At the same time, sociology focuses on short-term social, political, economic and value trends (for example shifts in voter turnout). Research in the field of law takes in several focal points. Apart from selected issues of philosophy of law (e. g. epistemology of law), it concentrates on legal aspects of societal problems, such as biomedicine or protection of personal data in the fast-changing digitized world. At the same time, it does not marginalize traditional areas (international and private law) that have always held great social importance.

For the *Section of Historical Sciences* the linchpin is the research of topics that significantly contribute to forming the cultural, national and state identity, the issues of the formation of the Czech historical region from the Early Middle Ages until the present. Archaeological part of the research emphasises the development of methodology, particularly in cooperation with the methods of the natural-science disciplines and protection of archaeological monuments. The Section also covers the research of history of art and music in the Czech lands. This research takes into account Central-European and European contexts (from the points of view of continuity, diversity and integration) as well as challenges and threats in the contemporary global world. Considerable importance is attached to information infrastructure: the development and implementation of modern ways in source basis processing and its availability.

The topics of the Section of Humanities and Philology show a broad variety from philosophical issues to the areas of ethnology or languages and literature of a particular nation. Research in the field of philosophy concentrates primarily on philosophical aspects of democracy and plurality of cultures and on exploration of sources and traditions of European thinking. The issues of logics, theory of science, classical and medieval studies are also covered. Ethology and social anthropology analyse the ways of life of diverse social and ethnic groups not only in the Czech lands, but also abroad, and pursue the matters of migration. There is a wide range of Bohemistic projects in linguistics and literary science that ameliorate the knowledge of the national language and its literary culture thus forming national identity and formulating its attitude towards the European context. A similar perspective gives grounds for Czech Slavonic studies and Oriental studies, branches that investigate “other” languages, histories and cultures. An important part of the work in humanities besides publishing critical lexicographic editions, encyclopaedic and musical works that promote national cultural heritage is producing electronic data and information resources.

SELECTED RESULTS

- *The trajectory, structure and origin of the Chelyabinsk asteroidal impactor*

Researchers of the Astronomical Institute computed the trajectory and velocity of the asteroid that collided with the Earth on February 15, 2013 – the largest collision with a cosmic body since 1908. More than 1,000 people were injured in Chelyabinsk. The researchers used videos freely available on the internet, modelled the disruption of the asteroid on its way through the atmosphere and found out that the asteroid was relatively fragile and mostly fragmented at the heights above 30 km. Similarity of orbits suggests that the asteroid may once have been part of a larger asteroid no. 86039.

- *Friction on the micro-scale depends on surface orientation*

Researchers at the Institute of Physics achieved to measure friction forces with atomic resolution using atomic force microscope. Their measurements proved that the friction between two macroscopic objects is dependent on the relative orientation of the atomic structure of surfaces in contact. The performed theoretical calculations provided a deeper understanding of the origin of directional dependence of friction forces resulting from different excitation of vibrational degrees of freedom on the surface.

- *Experimental demonstration of optical “tractor” beam*

Optical “tractor” beam transports microparticles over the distance of one hundred micrometers against photons flow. The direction of the resulting force depends on the size of a particle; as a result, uneven particles can be separated. Several illuminated objects interact via force effect of scattered light and self-arrange into optically bound microstructures transported by the beam in different directions. By this demonstration, the Institute of Scientific Instruments paved the way to assembling and transport of functional microstructures by mere illumination of a microparticle suspension.

- *Determination of the exact chemical composition of the valves affected by biomineralization*

Aortic stenosis is the most frequently operated cardiac defect in developed countries. One of the causes of the aortic valve loss of elasticity is biomineralization, manifested by the formation of hydroxyapatite in the valvular tissue. A new methodological approach based on a broad utilization of a range of analytical methods was used in the research in which the Institute of Theoretical and Applied Mechanics collaborated with several research organizations. A detailed description of the mineralized valves composition serves to further study the mechanism of biomineralization.

- *Heavy convective precipitation forecasting*

Researchers at the Institute of Atmospheric Physics compared forecasts of strong convective precipitation calculated by two numerical weather prediction models and studied the ability of the models to forecast hail. It was found that the assimilation of radar reflectivity into the model considerably improved forecasting of precipitation and hail. For hail forecast, it is necessary to use a finer horizontal and vertical resolution of the model. For the comparison and evaluation of the model results, to use several verification methods, including spatial techniques proved as advantageous.

- *A novel method designed to synthesize zeolites makes it possible to hydrolyze a zeolite in a chemically selective way and change it into individual layers, which are then reassembled into a new zeolite structure*

Researchers at J. Heyrovsky Institute of Physical Chemistry designed a new way to synthesize zeolites stemming from a pre-formed parent UTL zeolite hydrolysis that results in selective removal of pillars and in formation of 2-dimensional zeolitic layers. Subsequently, the individual layers are organized by means of proper organic templates and reassembled by a chemical bond. New zeolites were not prepared by direct synthesis before. The new procedure will enable a synthesis of novel materials with a broad application (e.g. in separation of gases and vapours or in catalysis).

- *Bio-specific surfaces for affinity separations, biosensors and tissue-engineering biomaterials*

At the Institute of Macromolecular Chemistry, a new technique of preparation of organized layers of polymer chains on material surfaces was developed based on controlled polymerization initiated by a polydopamine surface layer. The method, applicable to various types of materials, can be used for preparation of bio-specific surfaces for affinity-based separations, biosensors and tissue-engineering biomaterials. Combined with photo-click reactions and using optical mask, patterned surfaces were prepared that selectively either promote or inhibit adhesion and growth of cells.

- *Analysis of the exocyst complex dynamics at the cytoplasmic membrane using advanced TIRF microscopy*

At the Institute of Experimental Botany, the researchers succeeded in visualizing the dynamics of exocyst tethering complex at the cytoplasmic membrane. The complex plays an essential role in the tethering of secretory vesicles at the growing domains of cytoplasmic membrane of eukaryotic cells. It was the first time it had been possible to study its spatio-temporal dynamics. A comparison between the number complexes and exocytotic vesicles indicated a new model of exocyst function as a complex that can also independently dock to the membrane (and undock) and catch the secretory vesicles.

- *Regeneration of severely damaged ocular surface by stem cells*

Researchers at the Institute of Experimental Medicine expanded limbal and mesenchymal stem cells *in vitro* and by means of nanofiber scaffolds transferred them on the damaged ocular surface in experimental animal models (mouse, rabbit). The therapeutic effect of stem cells was evaluated by histology and by stem cells ability to inhibit gene expression of proinflammatory molecules, such as IL-2, IFN-gama, IL-17 and iNOS. The results demonstrated applicability of stem cells and nanofiber scaffolds in the treatment of severely damaged ocular surface.

- *Tracking colonization events and processes using genetic approaches*

When changing its habitat, each individual carries over its genetic information from which the place of origin of the source population can be traced. The scientists at the Institute of Vertebrate Biology reconstructed the source populations and described colonization processes in some rodent species. The acquired results may be helpful in conservation of endangered species, in eliminating negative consequences of biological invasions or may give information on human history through the study of species introduced by man.

PUBLICATIONS

- *History of the 20th century – the Society between Democracy and Totalitarianism: Czechoslovak Diplomacy*

The book by a team of authors at the Historical Institute is the second part of second part of the account of the development of Czechoslovak diplomacy from its post-World War I emergence to the early 1990s. A similar dictionary on Czechoslovak diplomacy was not available before and the facts about the communist period in particular have been inaccessible in common encyclopaedias, apart from a few exceptions. The dictionary includes all key persons of the Czechoslovak Foreign Service. The book was awarded the Dictionary of 2013 prize by the Union of Interpreters and Translators.

Dejmek, J. – Němeček, J. – Michálek, S.: *Diplomacie Československa*. Academia, Praha 2013, 802 s.

- *Politics as Absurdist Drama, Václav Havel in the Years 1975–1989*

The book deals with Václav Havel as a playwright, political thinker, representative of the Charter 77 movement, organizer of parallel culture, and leader of the Civic Forum at the time of the “Velvet Revolution”. The selected segment of history is bordered by two events – Havel’s open letter to Gustáv Husák in April 1975 and the moment when Havel replaced the politician symbolizing “stagnation” and “oblivion” in the position of the President of the Republic in December 1989.

Suk, J. (Ústav pro soudobé dějiny): *Politika jako absurdní drama. Václav Havel v letech 1975–1989*. Paseka, Praha 2013, 447 s.

- *Philosophy and Probability*

The material of the book is approached as an introductory text to the basics of probability. It offers an explanation of various interpretations of probability – frequentist, propensity, classical, Bayesian, and objective Bayesian – and their reflection in the contemporary literature.

Childers, T. (Filosofický ústav): *Philosophy and Probability*. Oxford University Press, Oxford 2013, 216 s.

- *Václav Hájek from Libočany. Czech Chronicle*

A new edition of one of the most important works of the Czech literature and historiography published for the first time before the year 1543 and for centuries

belonging among the most popular and widely read books written in Czech. Despite a severe criticism received in the second half of the 18th century from Gelasius Dobner, the book has served as a source of ideas to many Czech authors and artists. Most old Czech legends have been alive in general awareness in the very form that was imprinted on them by Hájek's Czech Chronicle. Jan Linka's is the most complete edition of the book to that point missing in the Czech culture. It includes a complete transcription of the text and its transliteration on the attached CD, indexes (of people and places) and a differential glossary, together with an erudite editorial note and afterword by Petr Voit.

Václav Hájek z Libočan. Kronika česká. ed. Linka, J. (Ústav pro českou literaturu), Academia, Praha 2013, 1448 s.

- *Academic Grammar of Standard Czech*

This extensive publication by the Institute of the Czech Language is based on analyses of contemporary written texts included in the Czech National Corpus. It reveals many new insights into formal morphology, word formation, nonlinear syntax, word order, structure of complex sentences, and text construction.

Štícha, F. – Vondráček, M. – Kolářová, I. – Hoffmannová, J. – Bílková, J. – Svobodová, I. Akademická gramatika spisovné češtiny. Academia, Praha 2013, 974 s.

- *Cyril and Methodius between Constantinople and Rome*

Taking advantage of the latest historical, archaeological and philological findings, the author sets the history of Cyril and Methodius mission in the context of European history. He depicts the Byzantine environment, explains the motives behind the mission to Great Moravia and the role it played in the formation of society there. The author explains the connection the mission had with the fight of Moravian rulers for independence from the Frankish Empire and with the struggle between the patriarchate of Constantinople and Roman Curia. In this way, the author also elucidates the meaning and value of the emergence of Old Church Slavonic literature.

Vavřínek, V. (Slovanský ústav): Cyril a Metoděj mezi Konstantinopolí a Římem. Vyšehrad, Praha 2013, 375 s.

FOSTERING RESEARCH, DEVELOPMENT AND INNOVATION

FORMS OF THE SUPPORT OF THE ASCR FROM THE STATE BUDGET OF THE CR

The basis of financing of the ASCR's institutes consists in **institutional support** from the state budget expenditures on research, development and innovation. It is provided in the structure of the outlay on research plans (until 2013), on the development of Research Organizations, on Organizing Public Competitions, on the Assessment of Projects and Research Plans, on Material or Financial Rewards of Outstanding Achievements and on Operating Costs.

In 2013, the last research plans of the following four institutes were accomplished: Centre for Administration and Operations of the ASCR (Implementation of the infrastructure of research and development at the ASCR), Institute of Biophysics (Genome and epigenome: 1D and 3D structure, dynamics, interactions with proteins and functions), Institute of Experimental Medicine (New biotechnologies, nanomaterials and stem cells for usage in regenerative medicine) and Institute of Biotechnology (Building the Institute of Biotechnology of the ASCR).

As far as **special-purpose support** is concerned, in 2013 the institutes of the ASCR were engaged in the resolution of 1,779 grant projects and RDI projects financed from the state budget. In 1,417 projects, the institutes of the ASCR were recipients of the support, and in 362 projects, they were participants (co-recipients). The overview of the participation of the ASCR's institutes in resolving the projects divided by the individual provider is given in Table 1.

Table 1: Participation of the institutes of the ASCR in RDI projects in 2013.

	ASCR's institute as a recipient	ASCR's institute as a participant	TOTAL
Provider	Number of projects	Number of projects	Number of projects
GA ASCR	30	0	30
GACR	900	179	1,079
MC	28	4	32
MIT	3	46	49

MEYS	373	21	394
MI	11	2	13
MH	14	34	48
MA	19	1	20
TACR	39	75	114
TOTAL	1,417	362	1,779

Details concerning financing and economic management of the ASCR are provided in the part called “Financials”.

THE ACADEMY OF SCIENCES CR – PROVIDER OF SPECIAL-PURPOSE SUBSIDY

Grant Agency of the ASCR in 2013 financially supported only the ending grant projects (started in the year 2009). For these projects, total sum of CZK 37,333 000,000 was used from the budget of the ASCR. Special-purpose resources were provided for the resolution of 35 standard grant projects (30 of which were projects of the ASCR and 5 were projects of universities and other higher education institutions).

The Academy of Sciences CR was a provider of special-purpose subsidy in the programme called **Nanotechnology for Society** in 2007–2012. In February 2013, the Council of the Programme Nanotechnology for Society evaluated the fulfilment of the aims and the quality of the results achieved in the completed projects as of December 31, 2012. All of the projects were assessed as fulfilled, with six of them evaluated as “fulfilled with outstanding results” mainly on the ground of the high number of superior outcomes produced. Contracts on the utilisation of research and development results were concluded with the recipients of all the programme projects completed. The fulfilment of the contacts will be monitored each year for a period of three years upon the date on which the programme was concluded.

The final evaluation of the results concluded that in 6.5 years of its existence the programme had brought a considerable amount of new knowledge in the area of nanotechnologies. Projects within the programme contributed to 37 patents, 14 utility models, 78 prototypes, 52 functional samples, 47 verified technologies, 9 software products, 1 pilot plant and also 1,769 treatises published in specialised periodicals, 647 papers in anthologies, 52 chapters in a specialised book and 4 specialised

books. The results given here correspond with the number of the applied results given in RIV as of September 27, 2013.

In the course of 6.5 years of the programme's existence, a considerable amount of new knowledge was achieved in the area of nanotechnologies. To acquaint wider public with the best results achieved within the programme, a semidiurnal specialized seminar was held at the headquarters of the ASCR on October 21, 2013, where the researchers of four selected most successful projects presented their high achievements.

PROJECTS OF THE OPERATIONAL PROGRAMMES OF THE EU STRUCTURAL FUNDS

In 2013, the institutes of the ASCR participated in solving 130 projects of the operational programmes funded from EU structural funds. They were significantly represented especially in Operational Programmes Education for Competitiveness (ECOP), Research and Development for Innovations (RDIOP), and Prague – Competitiveness (OPPC).

Institutes of the ASCR were recipients or coordinators in 78 projects, 9 of which started in 2013; 55 projects continued along the whole year of 2013 and 14 were completed in the course of the year.

Building and modernization of research infrastructures funded from operational programmes Research and Development for Innovations (RDIOP) and Prague – Competitiveness (OPPC) belong among the most important and expensive projects of operational programmes of the structural funds resolved at the institutes of the ASCR.

CENTRES OF EXCELLENCE FUNDED FROM THE OPERATIONAL PROGRAMME RESEARCH AND DEVELOPMENT FOR INNOVATIONS

Among the outstanding projects subsidized in the period 2007–2013 whose implementation proceeded in 2013, we can introduce *Extreme Light Infrastructure (ELI)* project. A unique laser infrastructure for interdisciplinary applications is being built in Dolní Břežany by the Institute of Physics, which coordinates a national consortium ELI-CZ comprising 14 Czech universities or other higher education institutions and research institutes. Total amount of the subsidy for the preparation and construction of the world's most intense laser and the related costs will require CZK 6.8 billion. The infrastructure of ELI with its research aims is the most prominent project in the history of building research infrastructures in the CR.

In spring 2013, the main stage of construction works was started. In September 2013, an agreement with American company Lawrence Livermore National Security was signed on a unique laser system as one of the main parts of ELI Beamlines facility. Signing of the agreement was ushered in by a press conference in May 2013 attended among others by Norman Eisen, U.S. Ambassador to the Czech Republic, Constantin Haefner, Lawrence Livermore National Laboratory representative, and other important guests.

Another outstanding scientific project is *Biotechnology and Biomedicine Center (BIOCEV)* that is being constructed in Vestec near Prague. The researcher of the project is the Institute of Molecular Genetics in cooperation with another five institutes of the ASCR (Institute of Biotechnology, Institute of Microbiology, Institute of Physiology, Institute of Experimental Medicine, Institute of Macromolecular Chemistry) and two faculties of Charles University Prague (Faculty of Science and First Faculty of Medicine). The goal of the project is to create a scientific Centre of Excellence in the fields of biotechnology and biomedicine.

The research part of the BIOCEV project was launched at the existing laboratories of Charles University and the ASCR. Attended by Czech Prime Minister Jiří Rusnok, Minister of Education Dalibor Štys and other important guests, the BIOCEV centre's foundation stone ceremony was held on October 7, 2013 to mark the official start of construction works of the new scientific centre in Vestec. According to the current plan, the building of the centre is scheduled to be finished at the beginning of 2015, when first research teams and apparatuses are expected to move in. Total expenditures planned for the BIOCEV project from subsidy funds are roughly CZK 2.3 billion.

The goal of the ALISI project is to build and run in Brno a regional centre of research and development with up-to-date equipment where diagnostic methods and technologies focused on micro and macro worlds will be developed. The implementation of the project is managed by the Institute of Scientific Instruments. The inauguration of ALISI laboratories was held in May 2013. The total budget covering the infrastructure and ALISI launch in 2014 is expected to be CZK 513 million.

CENTRES OF EXCELLENCE FUNDED FROM OPERATIONAL PROGRAMME PRAGUE – COMPETITIVENESS

At the Institute of Experimental Medicine, *Research Centre for Cell Therapy and Tissue Repair (CBTTN)* was launched. The common denominator of the newly established centre's research tasks is basic biomedical research focused on the study of stem cells and their use in repair and regeneration of damaged organs or tissues.

A special ceremony was held at the premises of the ASCR at Prague-Krč to initiate the project called *Prague Infrastructure for Structural Biology and Metabolomics (PISBM)* implemented by the Institute of Microbiology. The PISBM project opens new opportunities for structural analysis of medically important biochemical processes and biomolecular structure.

A new unit was also established and open in a ceremony at the Institute of Molecular Genetics for the project called *CZ – OPENSCREEN: National Infrastructure for Chemical Biology*. The new unit will conduct basic research in the areas of chemical biology and genetics.

INTERNATIONAL COOPERATION

ORGANIZATIONAL ACTIVITIES

In 2013, the ASCR organized or co-organized about 300 international scientific conferences. Among the most important belong SPIE Optics and Optoelectronics 2013 in Prague (International Society for Optics and Photonics in cooperation with the Institute of Physics), FENS Featured Regional Meeting (Institute of Experimental Medicine) and New Emigration from the Czech Republic after 1989 and Return Policies (The Senate of the Parliament of the Czech Republic together with the Institute of Ethnology). A more detailed overview of selected significant scientific events can be found in Appendix 5.

The 25th *EUCYS* (European Union Contest for Young Scientists) was a significant international event organized by the Centre for Administration and Operations. This contest has been organized annually since 1989 by the European Commission as part of the European Union's wider Science and Society Programme with the goal to increase awareness among Europeans about science and scientific community. The main objective is to get young people interested in science and attract them into careers in science. The contest is open to young student researchers aged between 14 and 21 from across Europe and from many countries outside Europe. In the 25th *EUCYS*, 83 finest student research projects contested in nine categories covering science, technology and humanities.

New European Structural and Investment Funds Regulations (ESIF) became effective in December 2013 establishing regulatory framework for drawing on the funds. On the national level, key strategic documents were prepared. The ASCR participated in preparation of the *Agreement on Partnership for the Programme Period 2014–2020* and has been involved in creating a new *Operational Programme Research, Development and Education (OPRDE)*. One of the basic conditions for the approval of the new operational programmes and drawing on ESIF in the period 2014–2020 is the preparation of the so-called *Smart Specialization Strategy (S3)* or Research and Innovation Strategies for Smart Specialisations (RIS3) for the CR. With the aim of the preparation of this document, RIS3 Coordination Council has been established, where the representatives of the ASCR also participate. Another cardinal document created in cooperation with the ASCR is *National Reform Programme 2014*, which introduces the strategy of the government of the CR oriented towards the support of competitiveness and economic welfare of the country.

In cooperation with Max-Planck-Gesellschaft, the ASCR participated in preparation of the expert programme of the conference *The EU HORIZON 2020 Programme and Teaming for Excellence in the European Research Area (H2020-TEERA 2013)*. The conference, which was organized by the Technology Centre ASCR and MEYS, took place in Prague in October 2013. The event, attended by Máire Geoghegan-Quinn, European commissioner for research, innovation and science, was held on the occasion of Horizon 2020 launch in the CR. The upcoming S3 was presented there. The conference gave a platform to the European Commission, European Parliament and international scientific community to discuss the optimum utilization of tools provided by Horizon 2020 programme.

Representatives of the ASCR strove, through the mediation of MEYS, for the specialists from the institutes of the ASCR to become involved in configurations of the Programme Committee of Horizon 2020 and its advisory thematic groups.

In the context of the preparation of programming period 2014–2020, the ASCR initiated an *international meeting focused on the issue of sustainability and development of research infrastructures*. At the ASCR's premises, a Round Table Meeting took place on November 28, 2013 with the intent to open a discussion on the particular questions and issues related to the international dimension of research infrastructures and to suggest steps that would facilitate a better utilization of ESIF

potential in their support. Big research infrastructures ELI and CERIC (Central European Research Infrastructure Consortium) served as examples for a discussion concerning building, management and sustainability of similar facilities. The Round Table was attended by leading foreign experts and representatives of several Czech ministries. The conclusions drawn from the discussion will contribute to further development and sustainability of the existing as well as the newly built research centres.

EURAXESS Czech Republic at the Centre for Administration and Operations continued with its task of providing visiting foreign research scientists with information and help. The Centre assisted them in legal and administrative issues related to their working stay in the CR. In this way, the Centre significantly contributed to easier and stronger cooperation with foreign scientists at the institutes of the ASCR.

COOPERATION WITH INTERNATIONAL SCIENTIFIC ORGANIZATIONS

The ASCR kept developing its cooperation with European and world organisations with the aim of supporting the integration of Czech scientists into leading international projects thus facilitating their long-term access to unique research infrastructures, devices, platforms, databases and scientific data. The development of international relations was certainly boosted by a traditional meeting called “Academic Prague” where the ASCR’s leaders met the members of Diplomatic Corps and leaders of universities and other institutions in higher education. Exchange of experience from the area of strategy of science and integration into ERA was a topic of the annual meeting of representatives of the ASCR with leaders of Slovak Academy. Topical issues were also discussed at a regular conference of the representatives of the Visegrád Group Academies.

Great attention was paid to the involvement of Czech scientists in the ATLAS experiment carried out at CERN’s LHC accelerator. The researchers at the Institute of Physics became actively involved in the part of the experiment that contributed to the discovery of the long-sought Higgs boson. In 2013, Peter Higgs and François Englert were awarded the Nobel Prize in Physics for their work and boson prediction.

A more detailed overview of the participation of the ASCR’s institutes in leading international projects can be found in Appendix 4.2.

COOPERATION WITH INTERNATIONAL NON-GOVERNMENTAL ORGANISATIONS

In 2013, the representatives of the ASCR significantly contributed to European integration and further development of European research area through their activities in many important European organizations, namely European Science Advisory Council – EASAC, All European Academies – ALLEA, European Academies, European Science Foundation – ESF. A considerable importance can be attached to the participation of the ASCR's representatives in organizations active in Europe and worldwide, such as International Council for Science – ICSU or Union Académique International – UAI. Besides, the researchers of the ASCR were actively involved in the work of many other scientific societies and committees. In 2013, they also continued in their activities in the International Human Rights Network of Academies and Scholarly Societies.

Among the most significant examples of the active share of representatives of the ASCR in creating European science strategy belongs their participation in preparation of EASAC expertise in carbon dioxide capture and storing, on biofuels and on direct-to-consumer genetic testing contributing to resolution of current problems and to creating Europe-wide strategy in application of scientific knowledge.

In December 2013, the ASCR submitted an application for the association Science Europe.

The ASCR kept endorsing the activity of national committees by means of which the representatives of Czech scientific community became involved primarily in ICSU activities. In autumn 2013, the ASCR hosted the session of the Management Group of European members of ICSU.

COOPERATION WITHIN INTERNATIONAL BILATERAL AGREEMENTS

International scientific relations were developed with partners from 45 countries and based on 66 bilateral inter-institutional academic agreements. The cooperation was implemented in the form of exchanges within joint projects, cooperation in thematic areas, study stays and participation in conferences. Total number of 7 calls was launched for submission of new projects. The institutes of the ASCR admitted total number of 438 foreign researchers who spent there in total 3,875 days; 417 Czech researchers were sent to foreign partner organizations and spent there in total 3,653 days. Other bilateral cooperation of the ASCR's institutes with foreign institutions was carried out on the basis of the concluded inter-institutional agreements.

Targeted support for long-term stays of researchers from the institutes of the ASCR at reputable institutes abroad and for stays of top foreign experts at the institutes of the ASCR went on through the Programme of the Internal Support of Projects of International Cooperation of the ASCR. In addition, the support of up to three-year-long research projects resolved by researchers of the ASCR in cooperation with important scientific institutions continued. A total of CZK 34.4 million was allocated for the resolution of 83 research projects and for 10 long-term stays in 2013.

PARTICIPATION OF THE ASCR IN THE EUROPEAN UNION FRAMEWORK PROGRAMMES

In 2013, the institutes of the ASCR participated in solving 134 projects of the EU's framework programmes with the amount of EUR 8.7 million of contractually negotiated financial resources. The highest number of projects was evenly resolved, 12 each, by the Institute of Physics and Biology Centre.

One of the two prestigious grants of the European Research Council (ERC) given to research workers from the CR in 2013 was obtained by Pavel Pudlák at the Institute of Mathematics for the project Feasibility, logic and randomness in computational complexity. It is the sixth ERC project given to researchers at the institutes of the ASCR. (Financial support from ERC CZ MEYS was also obtained by Martin Kalbáč at J. Heyrovsky Institute of Physical Chemistry, which implies that 3 of total 8 projects of ERC programme in the CR were solved at the ASCR's institutes.)

A summarizing overview of the main tools of framework programmes in 2013 is given in the table below. A selection of significant projects is given in Appendix 4.2.

Table 2: Participation of the institutes of the ASCR in the main tools of framework programmes in the year 2013

Tool type	Total number of projects
CP (Projects of research cooperation)	46
MCA (Marie Curie Actions – support for training courses and career development)	40
CSA (Coordination and support actions)	15
CP-CSA-INFRA (Support for research infrastructures)	24
ERC Grants	6
Joint Technology Initiatives	3

REGIONAL COOPERATION

In 2013, the 10th anniversary of cooperation was commemorated with the Pardubice Region, namely with the Association of the Municipalities of Orlicko. This research programme is meant to help the particular regions to solve tasks of social, economic, ecological, environmental and cultural nature. Last year, subsidies from this programme were directed to four sectors in the areas of the environment (emergency events in the atmosphere, negative impact on soil, ecosystem contamination), sociology and history (migration of population, integration of foreigners). The following institutes cooperated in resolving these tasks: the Institute of Thermomechanics, the Institute of Hydrodynamics, J. Heyrovský Institute of Physical Chemistry, the Institute of Analytical Chemistry, the Institute of Microbiology, the Institute of Experimental Botany, the Institute of Vertebrate Biology, the Institute of Geonics, Economics Institute, the Institute of Sociology and the Institute for Contemporary History. A similar programme of regional cooperation was carried out in the South Moravian Region with the Institute of Analytical Chemistry, the Institute of Geonics, the Institute of History and the Institute of Ethnology as participants.

EDUCATIONAL ACTIVITY

Active participation in the development of the quality of education and its perfecting belongs among the substantial factors constituting the mission of the Academy of Sciences. For that reason, the ASCR has always seen as essential its educational activities on a variety of levels.

Educational activities concentrated especially on the cooperation with universities or other institutions in higher education and on doctoral training performed as part of the broadened accreditation of doctoral study programmes at the individual institutes. At the same time, the ASCR's institutes also widely participated in the education and training of secondary school youth through direct instruction, by increasing the expertise of their teachers or by assisting in organising specialised competitions, Olympiads and specialised secondary school events.

COOPERATION WITH UNIVERSITIES AND OTHER HIGHER EDUCATION INSTITUTIONS

On the national level, the cooperation with universities and other higher education institutions is a fundamental component the ASCR's relations with other institutions involved in education, research and development. Besides scientific research, cooperation is performed in the area of education. This form of cooperation is coordinated by the Council for Cooperation with Universities and Graduate Study Programmes of the ASCR that is a consultative body of the ASCR's authorities. In 2013, after the elections held at the spring session of the Academic Assembly, the composition of the Council was partly renewed. Its foundation meeting was held with the attendance of Jiří Zlatuška, Vice-Chairman of the Council of Higher Education Institutions, whose presence was used for a discussion on the current issues of the relations between the institutions in higher education and the ASCR.

TEACHING

The direct participation of the ASCR and its employees in higher education instruction is extensive and significant. Last year, researchers of the ASCR ensured a total of 4,034 individual semestral cycles of lectures, exercises or seminars in a total amount of 74,198 hours. To a considerable extent, the employees of the ASCR also participated in the academic life of institutions in higher education through the participation in the sessions of the scientific councils, the councils for doctoral study programmes or in the examination and appointment commissions. The ASCR contributed to the quality of higher education instruction through the membership of several of its employees in the Accreditation Commission and through regular guest participation at sessions of the Council of Higher Education Institutions. An important platform for cooperation with universities and other higher education institutions in research and education was provided by joint units, of which there is a total of 55. In 2013, the Nečas Center for Mathematical Modelling was established as a joint research unit at the Institute of Mathematics, Charles University, Prague and the Institute of Computer Science. The particular results of the cooperation with universities in the research area are summarised in another section of the report.

EDUCATION OF STUDENTS

The institutes and researchers of the ASCR participate significantly in the supervision of students; the qualification theses are often created in laboratories and institutes of the ASCR. Last year, the employees of the institutes of the ASCR supervised 1,362 students of Bachelor and Master study programmes and 2,063 students of Doctoral Degree programmes. In 2013, 224 postgraduate students trained in doctoral programmes at the institutes of the ASCR completed their studies. The ASCR concluded 22 framework contracts with universities and other higher education institutions on cooperation in the implementation of doctoral study programmes. In a wide range of disciplines, the institutes of the ASCR hold joint accreditation for the implementation of the programmes. The data on the participation of the ASCR in higher education and on the recent development of certain indicators are presented in Table 3. A more detailed statistics is provided in Appendix 6.

Table 3: Overview of the most important activities of cooperation with higher education institutions

	2008	2009	2010	2011	2012	2013
Doctoral students supervised at institutes	2,162	2,157	2,153	2,182	2,064	2,063
MA/MS students supervised at institutes	1,419	1,540	1,454	1,342	1,356	1,362
Newly accepted doctoral students	411	412	338	381	386	397
The number of completed doctoral dissertations	266	279	249	254	258	224
The number of semestral cycles of lectures, seminars and exercises led at HEIs by the employees of the ASCR	3,571	3,487	4,360	3,853	3,722	4,034
The number of hours lectured	78,306	76,744	77,379	80,600	76,939	74,198

In the area higher of education, the institutes of the ASCR have been preparing many other specialized courses, seminars and lecture cycles.

COURSE IN THE FUNDAMENTALS OF RESEARCH WORK

A successful and sought-after Course in the Fundamentals of Research Work administered by the ASCR has become an established contribution to general training of students in doctoral study programmes. The course, which has been offered in Prague and in Brno since the year 2004, is meant for students in doctoral study programmes, but is also attended by students completing their MA/MS programmes. In 2013, the course took place in Prague four times with a total of 133 students enrolled. The successful cooperation was proceeded with Petr Svoboda from the Institute of Molecular Genetics, who arranged the organizational and specialized part of a course reserved for students specialized in biomedicine. The programme of this course was again implemented in cooperation with lecturers from European Molecular Biology Organization (EMBO). The targeted content of the course received a very favourable response from the students. A highly specialised course is also prepared for 2014.

In Brno, four courses were organized in 2013; a total of 173 students from higher education institutions in Brno, Ostrava, Olomouc, Opava a Zlín were enrolled.

Likewise, the courses in Brno have been continually brought up to date. The Course in the Fundamentals of Research Work has regularly been discussed at sessions of Council for Cooperation with Universities and Graduate Study Programmes of the ASCR.

PROVIDING EDUCATION AT SECONDARY AND ELEMENTARY SCHOOLS

The ASCR, its institutes and researchers participated in the education at secondary and elementary schools through direct instruction and a variety of lectures. They also shared considerably in creating and publishing secondary school textbooks or e-learning courses. Significant attention was paid to the utilisation of the financial resources from the EU funds; individual institutes of the ASCR cooperated according to the content of the projects targeted on several groups of interest. Special attention was devoted to elementary and secondary school pedagogues.

The following mentioned activities are only examples of a large number of events organized. The aim of project called *Open Science III* is to offer secondary school students outside Prague a unique chance to become involved in real scientific activities. By means of scientific internships, they can directly participate in scientific and research work at the Institutes of the ASCR where the internships are provided. Under the supervision of Czech scientists, the students work on scientific issues from the areas of natural and technical sciences. In 2013, the total number of internships for secondary school students was 174, and for students from higher education institutions the number was 28.

Besides that, courses for secondary school teachers of chemistry, physics and biology were organized in autumn 2013. The theoretical part of the courses included lectures and suggestions for the work with talented young people, information on the possibilities of further education for secondary school students, research activities, methodological preparation of students for Olympiads in various subjects, and information given by leading Czech scientists on the latest development in their particular specializations. The content of the practical part focused on work in laboratories, suggestions for workshops within school instruction, and visits to the institutes of the ASCR and departments at universities or other institutions in higher education. The goal of the education of pedagogues in the individual specializations was to enrich their own instructing activities with attractive experiments well liked by the young generation, which are often a decisive factor that motivates their future interest in the study of natural sciences and subsequent choice of careers in science. Among other important educational events, we can place *Water Day* in Ostrava, international *Earth Day* or a joint science popularization exhibition *Science and Water*. The aim of the project called *Open Science Prague* was to involve talented secondary school students from Prague in scientific work at the institutes of the ASCR, give them further training and encourage them in the study of natural sciences and a future career in science.

Spring educational excursions to the world of science for secondary school students are regularly organized in May and June at selected institutes of the ASCR. In 2013, they were attended by 2,252 visitors from the ranks of secondary school students and wider public. Nine institutes of the ASCR in Prague, Brno and Dolní Dunajovice offered spring excursions for all those interested in science. In the course of five days, the 15th Annual *European Brain Awareness Week* organized by the Institute of Experimental Medicine and Centre for Administration and Operations was attended by 1,488 people ranking of secondary school students and wider public.

The institutes of the ASCR contributed in a substantial way to the quality of Olympiads in Mathematics, Chemistry and Biology or the Olympiad in the Czech Language. The institutes mainly offered expert and information assistance in the contests, supervision of laboratory exercises, lectures and organization of summer schools.

TOWARDS SOCIETY

“The objective of communication of the Academy of Sciences CR is to inform society in a professional way about scientific achievements and to promote the picture of science as public service.”

From the point of view of communication with the public, 2013 was also a demanding year for the ASCR. In the atmosphere of increasing pressure on the reduction of the budget, one of the top priorities was to find new efficient ways of communicating the results of scientific activities. The objective was to inform the public in a professional way about scientific achievements and at the same time to present science as public service that is essential for economic and cultural development of society. A successful effect of this can be seen in a growing tide of general public's view of science and research as prerequisites for economic growth of the country and understanding the ASCR as its warrant on the national level.

Every year, the ASCR subsidises publishing of selected scientific and science-popularisation publications. In 2013, the subsidy for the issuance of scientific and science-popularisation literature amounted to almost CZK 12 million supporting 63 book titles. Within the ASCR's Policy of Open Access, 49 authors were given the opportunity to publish their scientific achievements and were supported by a sum of CZK 1.1 million.

The attention of the ASCR was focused on science popularisation events that offer immediate contact with the public and with interested individuals. Among the most significant occasions, it was Science and Technology Week in November 2013 with more than 500 events organized all over the Czech Republic.

In 2013, about 12,646 reports were published in selected printed or electronic media with the headword associated with the Academy of Sciences.

EDITORIAL ACTIVITIES

The ASCR encourages and supports issuing selected scientific and science popularizing publications. In 2013, this support reached almost CZK 12 million and helped to publish 63 titles. The publishing house Academia received 45 subsidies and other units of the ASCR received 18 subsidies. The Open Access policy of the ASCR helped 49 applicants to publish their scientific findings subsidizing them by CZK 1.1 million.

POPULARIZATION OF SCIENCE

One of the ASCR's primary goals dwells in popularisation of science, scientific fields, individual institutes, particular research results, as well as outstanding scientific figures. The goal is to use a range of communication tools and to convince society about the need of science for its development and about the implied fact that it is imperative to take care of a constant increase of the standard of education across all strata of the population.

For this reason, the Centre for Administration and Operations of the ASCR organized the third *SCIAP Competition Show of the Popularisation of Science*, where the most successful popularisation activities implemented in the Czech Republic or in the Czech language are presented. There were 15 awards given to the competitors in the categories of Exposition, Periodicals, Audio or Audio-visual Programme, Internet, and Other. Moreover, the Academy of Sciences supported *FameLab 2013*, international competition for science popularisers introduced in the Czech Republic by the British Council Czech Republic.

Great attention was devoted to popularisation events that offer direct contact with the audience and with interested individuals. The most remarkable was scientific festival *Science and Technology Week of the ASCR* held on November 1–15, 2013, which offered more than 500 events organized all over the Czech Republic. This festival, organized by the Centre for Administration and Operations of the ASCR, is meant for wider public, but primarily it is aimed at students of secondary schools. Every year, it gives them the opportunity to visit scientific departments and laboratories and learn more about the world of science.

Also the October visit of NASA's geologist James Rice attracted a great deal of attention. Dr. Rice's visit was organized at the invitation of the Academy of Sciences CR and the Embassy of the United States in Prague within the project *Mars: The Next Step*. With the organizational assistance provided by the American Center and the Astronomical Institute, the American scientist delivered lectures for wider public in five cities of the CR accompanied by a unique exhibition of photographs from the research of Mars. Altogether six lectures for expert and lay public were attended by 1,200 individuals interested in science.

A vast majority of institutes endeavour to bring the results of their work to the wider public, above all to younger generations. Among the most noticeable belongs J. Hejrovský Institute of Physical Chemistry with a series of 70 popularizing and educating events subtitled *Try science with us* attended by 4,610 visitors, mostly from among pupils of 42 secondary or elementary schools and kindergartens from all over the Czech Republic. In addition, the Astronomical Institute was very active in organizing regular astronomical observations at the observatory in Ondřejov, visits to the institute and lectures. The total attendance rate to the Astronomical Institute's events in 2013 reached 5,000 people.

The Institute of Geonics also follows the idea of popularization of natural sciences and organized an event called *Chemistry and other natural sciences* held at Silesian Ostrava Castle. The Institute of Experimental Botany held *Fascination of Plants Day*. The Astronomical Institute organized an event called *Water in the Universe*, and the Institute of Organic Chemistry and Biochemistry participated in organizing *Science Fair* directed towards pupils and students of elementary and secondary schools. Science Fair was followed by *Library of Dreams or Nightmares of the Humankind at the Library of the ASCR*.

In the area of social sciences and humanities, popularizing activities of the Institute of State and Law held in 2013 were focused, besides other things, on codification of private law in connection with the new Civil Code. The Institute of Sociology prepared an interesting event – inventory check of the development of the Czech Republic in previous two years; it was a part of the project called *12 Hours of the Future: Marathon of Thoughts, Ideas and Propositions*. The Economics Institute organized regular meetings with the press and presentations of the EI's project IDEA named *IDEA for breakfast*.

Media event of the year was Otto Wichterle 100th birth anniversary. The Institute of Macromolecular Chemistry organized ceremonial Recollections meeting where leading Czech and foreign scientists contributed with speeches. Moreover, in the cooperation with the British Council, the Institute prepared an event where the public could meet members of Prof. Wichterle's family.

Exhibitions are another important form of popularization and the ASCR uses it abundantly: in the building of the ASCR in Národní street alone, 23 exhibitions took place. It was also through exhibitions that the ASCR participated in one of the most significant cultural events of the year 2013 – the 1150th anniversary of the arrival of the apostles Cyril and Methodius to Moravia. Their mission was commemorated by an exhibition subtitled *CM 863 – Saints Cyril and Methodius. History – Tradition – Veneration*, which was created with the assistance and consulting of the Institute of Slavonic Studies. The Institute of History was a co-organizer of an exhibition called *Dictatorship vs. Hope* held in Velehrad and later in Prague.

The importance of new media has been growing. At the international competition *The European Science TV and New Media Festival* in Dublin organized by EuroScience, EuroPAWS a Ciencia Viva, the ASCR was successful with an interactive presentation of the Institute of Physiology created by the Production studio of Centre of Administration and Operations. In a wide competition of reputable European studios, such as British BBC, German WDR and ZDF, Swiss RSI and Swedish STV, the presentation belonged among four best-rated multimedia programmes in the category of New Media.

Academic Bulletin, the official monthly of the ASCR, informs about events inside the ASCR and its institutes. In 2013, eleven issues were published, five thematic supplementary issues and a separate supplement – a specialized monograph on Villa Lana in Prague. As a magazine for specialists and wider public, *Academic Bulletin* presents the activities of the institutes in its paper version and on web pages containing a large photo gallery. All over the year 2013, the magazine kept commemorating the 20th anniversary of the existence of the ASCR and informed about the events connected with the anniversary of Ss. Cyril and Methodius. As a part of publicity of the ASCR in foreign media, the editorial board organized a study visit at the institutes of the ASCR for science journalists from 24 European countries.

REFLECTED BY THE MEDIA

The success of the Academy of Sciences in addressing the wide public is reflected in the reactions of the media to the Academy's work.

In 2013, selected printed, internet and other media published 12,646 reports with the headword ASCR or its forms, and with other selected key words associated with the Academy of Sciences CR; that is about 1,053 reports in a month, roughly 35 articles each day. Vast majority of the articles gave a positive account of the ASCR; they also reacted relatively univocally to the statements of the then Prime Minister Jiří Rusnok, who in October 2013 challenged not only the functioning of the ASCR, but entire basic research in the CR.

A number of workers of the ASCR actively appeared in the media with their comments concerning the current issues of scientific policy or with the information on the matters in their research areas. They were often invited to one-hour broadcasts of CT24 programme Hyde Park Civilizace (Hyde Park Civilization).

The attention of journalists was logically attracted by such key events as Science and Technology Week, September visit of James Rice or the international competition EUCYS. Wide attention of the media also accompanied newly launched infrastructures, such as the new research centres in Mikulčice presented to the public and the media by the Archaeological Institute in Brno or the *atmospheric tower at Křešín near Pacov* and experimental unit in *Domamínek* launched by Global Change research Centre.

SCIENCE FOR PRACTICE

To utilize scientific knowledge fully in practice belongs among constant tasks of the Academy of Sciences with the goal of creating direct contacts of the ASCR's institutes with partner organizations from the industrial sphere. These contacts may come in the form of contract research or joint projects supported by Czech or foreign agencies. Partner organizations of the ASCR for cooperation with the user sphere are the Technology Agency CR, the Engineering Academy CR, the Association of Research Organizations, the Association of Innovative Entrepreneurship CR, Confederation of Industry CR, and CzechInvest, on the regional level, then Regions themselves and regional innovation centres.

Research in the ASCR's institutes is characterized by long-term well-planned work on selected topics and is combined with accumulation of knowledge, experience and technology. Such approach creates good conditions for cooperation, joint projects, and for the transfer of technologies to the user sphere and often gives rise to long-term ties between research teams of the ASCR and partner firms or institutions.

A new impulse for the application-oriented research at the ASCR institutes was given by the participation of a number of institutes in projects of Operational Programme Research and Development for Innovation, especially in the support of Regional R & D Centres. Through their orientation, they bring important encouragement to broaden cooperation with Czech and foreign partners in industry, higher education, health care and other research institutions.

Support and coordination of the ASCR's activities in practical application is provided by the *Council for Cooperation of the ASCR with Business and Application Sphere*. The Council associates persons entrusted with the subject of technology transfer at the ASCR's institutes and researchers skilled in cooperation with industry and other areas where the results of research are applied. Newly established Council started a dialogue in 2013 with the Technology Agency of the Czech Republic (TACR), the main provider of special-purpose resources for the applied research. A Memorandum was signed on cooperation between the Council and TACR.

Besides collaboration with partners from the industrial sphere, application-oriented activities of the ASCR include cooperation with the Chamber of Deputies and the Senate of the Parliament CR, state administration and its bodies and organs (Radioactive Waste Repository Authority, Land Fund of the Czech Republic, Czech Statistical Office), local administration offices (municipalities, town districts, towns, regions), other subjects and non-governmental organizations. A cycle of specialized seminars called "Scientific Knowledge – Foundation of a Better, Competitive Society" organized by the ASCR together with the Chamber of Deputies of the Parliament CR started in May 2013. The goal of this cycle is to create a platform for a dialogue

between politics and science. In seminars, leading experts from the institutes of the ASCR and other cooperating institutions will present selected topics referring to sustainability and development of standard of economy and living, provision and protection of health, security, environment, social and cultural challenges arising from the issues of social cohesion and national identity.

The following are examples of significant cooperation with partners from the sphere of industry:

- Method of sample imaging by means of slow electrons in the Scanning Electron Microscope. Scanning Electron Microscope working on the principle of imaging by the so-called slow electrons was first constructed in the CR at the Institute of Scientific Instruments of the ASCR. The microscope utilizes a new type of the objective lens that enables a much better detection of the optical signal. The method is now applied in electron microscopes commercially produced by world leading producers such as FEI and TESCAN in Brno. In 2013, Ilona Müllerová, Director of the Institute of Scientific Instruments, received the award of Czech Head for Invention (Česká hlava – Invence).
- A project called “*Utilization of the new satellite navigation system generation for comparison of time scales*” was successfully implemented and the production was started. In 2013, the system was supplied to about 15 laboratories in the whole world. The system is produced by a partner organization DICOM, spol. s r. o.
- A project called “*Industrial microfluidization of liposomal and hydrophobic drug formulations*” carried out at the Institute of Physiology and supported by TACR was completed by the patented method of preparation and treatment for dosage form of liposomal gel that contains hydrophobic photosensitizer for photodynamic therapy. The preparation effective for 10 minutes disintegrated human colorectal carcinoma, breast carcinoma, melanoma and basalioma, implanted to nu/nu mice, with the increasing effect at increasing doses and with 100 percent effectiveness at higher doses. Canadian patent was granted based on the existing Czech patent and on the world-valid patent application, which is now registered at the European Patent Office (EPO). Cooperating partners were WAKE spol. s r. o. and RCD, spol. s r. o.
- New promising *nanocomposite materials* based on transition metal chalcogenides for photovoltaic paints were developed at the Institute of Inorganic Chemistry of the ASCR within a project supported by MPO and directed to the application sphere. The outcome is a method of preparing materials based on Cu, Zn, Ag and In sulphides. This industrially applicable method was found useful by our partner firms Rokospol a. s., and Nanogies s. r. o.

An important form of the transfer of research results into practice is a spin-off-type company established by a research organization.

In 2013, a spin-off company called *Innovative Bioimaging, LLC* was established by the Global Change Research Centre with the goal to utilize commercially the method of two-photon polarization microscopy. Its activity will consist of selling the device and services connected with two-photon polarization microscopy. (Find more at www.innovativebioimaging.com)

Research results important for practical applications deserve legal protection, which is mostly provided by patents.

Table 4: Overview of industrial patents granted to the institutes of the ASCR in 2013

	Number	Licence
Invention applications submitted in the CR	55	
• Patents granted in the CR	41	1
• Utility models submitted in the CR	25	
• Utility models registered in the CR	27	1
• Protected trademarks submitted in the CR	1	
• Protected trademarks registered in the CR	2	
• Industrial designs submitted in the CR	1	
• Industrial designs registered in the CR		
Invention applications submitted abroad		
• International application – PCT'	14	
National or regional phase of 'PCT'	10	
• National or Regional route	6	
Patents granted abroad		
• Regional (at EPO, EAPO, OAPI, ARIPO)	17	1
of which patents	42	
• National	11	
Applications for Community plant variety right filed in the CR	4	
• Cultivation certificates in the CR	2	2

Legal protection granted to a scientific result by a patent is a significant success. The following are examples of the results of this demanding process:

- The Institute of Organic Chemistry and Biochemistry. Patent name: *“Estrogen receptor alpha and beta ligands, methods for their preparation, and pharmaceutical compositions containing them”*. The compounds are useful as an active substance of pharmaceuticals for hormone replacement

therapy, as well as for the treatment of tumours and inflammatory diseases. The European patent has been granted and validated in Great Britain, France, Germany and the Czech Republic. The substances are being intensively tested on animals for the treatment of certain illnesses of central nervous system especially for ischemic damage to the CNS, neurodegenerative changes and disorders, affective disorder and post-traumatic stress disorder, with an expected use for the treatment of Alzheimer's disease. The project is closely monitored by a foreign investor who is ready to get involved once the results are sufficiently verified.

- The Institute of Organic Chemistry and Biochemistry. Patent name: "*Novel antimicrobial peptides and their synthetic analogues*". The compounds are being tested as promising in breaking common resistance of bacterial pathogens (to antibiotics) and as exhibiting a potent activity against resistant stems of yeast. The testing has been carried out in cooperation with physicians in connection with the future utilization in sanitary and cosmetic products. The European patent has been granted and validated in Germany.
- The Institute of Experimental Botany. Patent name: "*6, 9-disubstituted purine derivatives and their use as cosmetics and cosmetic compositions*" and patent "*6, 9-disubstituted purine derivatives and their use for treating skin*". American and Japanese patents were granted in 2013. The key substance, cytokinin derivative, rejuvenates complexion and helps in the treatment of skin diseases. The inventions were licensed to American company Pyratine Plc, California, which covers the patent fees. The product containing pyratine, a substance derived from cytokinins, was introduced to the US market two years ago. It is not only a product for dermatology improving rough skin, wrinkles and treats pigmentation problems; it is also an effective agent in the treatment of erysipelas and acne.
- The Institute of Physiology. Patent name: "*Liposomal phthalocyanine gel preparation for photodynamic therapy of tumours and its procedure of preparation*" was granted in Canada. The preparation has as yet the shortest drug-to-light time interval of most commercially available prepares for photodynamic therapy of tumours. This motivates its pilot production, which is being successfully conducted in applied and industrial research in cooperation with companies WAKE, spol. s r. o. and RCD, spol. s r. o.

AWARDS AND MEDALS

SIGNIFICANT AWARDS TO THE RESEARCHERS OF THE ASCR

The relevance of the ASCR's work for society is manifested in a number of awards and prizes granted to researchers of the ASCR's institutes by Czech and foreign institutions and state bodies. In the year 2013, the following awards belonged among the most significant:

The Tomas Garrigue Masaryk Order, First Class (awarded by the President of the Republic)

- Erazim Kohák (Institute of Philosophy) for lifetime great merit in the Czech culture and identity

The Medal of Merit in service to the Republic in the field of science (awarded by the President of the Republic)

- Eva Syková (Institute of Experimental Medicine)

The Silver Commemorative Medal of the Senate of the Parliament of the Czech Republic

- Václav Hořejší (Institute of Molecular Genetics) for lifetime scientific work

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

- Petr Sommer (Institute of Archaeology, Prague)
- Petr Pyšek (Institute of Botany) for outstanding results in research, experimental development and innovations
- Jan Kopecký (Institute of Physiology) for the research into omega-3 fatty acids in preventive and curative use for obesity and insulin resistance

The František Běhounek Prize (granted by MEYS)

- Jiří Bartek for the research in the area focusing on molecular genetics and malignant diseases

The Prize of the Ministry of Culture.

- Rostislav Švácha (Institute of Art History) for an outstanding contribution to knowledge and popularization of modern and contemporary architecture and for keen protection of cultural heritage.

The Honorary Medal of the Prime Minister of the Government of the Czech Republic for Merit in Czech Identity

- Erazim Kohák (Institute of Philosophy) especially for books Heart and Horizon: Cultural Identity and Global Humanity in Czech Philosophy, and In Quest of Czech Philosophy

The National Prize of the Government of the Czech Republic “Česká hlava” (Czech Head)

- František Šmahel (Institute of Philosophy) for lifetime achievements

The Czech Head Award (granted by The Czech Head, Ltd. and the Government of the Czech Republic)

- Ilona Müllerová (Institute of Scientific Instruments) for long-term and systematic research in the area of electron microscopy

AWARDS GRANTED BY THE ASCR

Awards granted by the Academy of Sciences are a part of the Academy's scientific policy. The aim of the awards is to support bearers of excellence in research (Praemium Academiae), promising young researchers (The Otto Wichterle Premium), and also to invite eminent researchers from abroad to collaborate (The J. E. Purkyně Fellowship). There are also other important awards granted for scientific and popularizing work.

Praemium Academiae in 2013 was awarded to Martin Nikl (Institute of Physics).

Martin Nikl (born 1957) is one of the world leading specialists in physics of scintillation materials, which he introduced in the early 1990s in the Institute of Physics, where he created a team and a laboratory to study scintillation. Nikl contributed significantly to the explanation of basic physical mechanisms and development of new material concepts for heavy single-crystal scintillators with their progressive utilization in the areas of high energy physics, medicine, industrial hi-tech applications or systems for security and national defence. In the 1990s, Martin Nikl won recognition as an architect of material concept of radiation-resistant scintillator based on lead tungstate (1997); working on the development of the concept, Nikl established a large international consortium. In recent decade, Martin Nikl has been involved in the study and development of other scintillation materials based on complex oxides, namely aluminium perovskites, garnets, silicates and hafnium oxides, which possess a high potential for practical use. In this area, Martin Nikl is a co-author of several new material approaches, first of all Pr-doped Lu₃Al₅O₁₂ (2005) and Ce-doped multicomponent garnets (2011), which currently belong to world most

attractive and intensively studied systems. The range and intensity of Nikl's cooperation with home and foreign industry is exceptional: since the 1990s, he has been collaborating with Czech company CRYTUR Ltd., successor of Monokrystaly Turnov, on the development of scintillation and laser materials. Together, they have published over 30 treatises; since the year 2000, they have participated in two international projects (NATO Science for Peace, EC-INTAS) and one large national project of GA AV; since 2011, they have secured a joint project at the newly created Technology Agency CR.

The Otto Wichterle Premium to promising young scientists at the ASCR

I. Mathematics, Physics and Earth Sciences

- | | |
|---------------------|--|
| • Veronica Goian | Institute of Physics |
| • Jaroslav Hlinka | Institute of Computer Science |
| • Jaromír Chalupský | Institute of Physics |
| • Martin Ledinský | Institute of Physics |
| • Babak Mahdian | Institute of Information Theory and Automation |
| • Jakub Šístek | Institute of Mathematics |
| • Jiří Štěpán | Astronomical Institute |

II. Life and Chemical Sciences

- | | |
|-----------------------------|---|
| • Petr Cígler | Institute of Organic Chemistry and Biochemistry |
| • Martin Dračinský | Institute of Organic Chemistry and Biochemistry |
| • Martin Hrubý | Institute of Macromolecular Chemistry |
| • Jana Humpolíčková | J. Heyrovský Institute of Physical Chemistry |
| • Lukáš Choleva | Institute of Animal Physiology and Genetics |
| • Petr Chytil | Institute of Macromolecular Chemistry |
| • Miroslav Kolařík | Institute of Microbiology |
| • Roman Kuchta | Biology Centre |
| • Helena Kupcová Skalníková | Institute of Animal Physiology and Genetics |

III. Humanities and Social Sciences

- | | |
|-----------------------|------------------------------------|
| • Josef Bernard | Institute of Sociology |
| • Kateřina Čapková | Institute for Contemporary History |
| • Alžběta Danielisová | Institute of Archaeology |
| • Vendula Hnídková | Institute of Art History |
| • Jakub Hrubý | Oriental Institute |
| • Vojtěch Kyncl | Institute of History |

- Ondřej Ševeček

Institute of Philosophy

The J. E. Purkyně Fellowship to outstanding and promising researchers was awarded to the following scientists:

- Oleg Lunov, nominated by the Institute of Physics, for scientific activity focused on the research and development in a new interdisciplinary direction of the application of prospective physical methods in cell biology
- Martin Danišík, nominated by the Institute of Rock Structure and Mechanics, for scientific activity focused on the research, development, control and application of low-temperature thermochronology and modern methods of determining the age of minerals and rocks
- Miloslav Polášek, nominated by the Institute of Organic Chemistry and Biochemistry, for scientific activity focused on the area of molecular imaging
- Martin Srnec, nominated by the J. Heyrovský Institute of Physical Chemistry, for scientific activity focused on bioinorganic complex systems
- Alexander Höllwerth, nominated by the Institute of Slavonic Studies, for scientific activity focused on interdisciplinary work extending beyond the boundaries of literary science, theory of law and philosophical thinking
- Vincent Mortet, nominated by the Institute of Physics, for scientific activity focused on the research into nanodiamond
- Sergej Hloch, nominated by the Institute of Geonics, for scientific activity focused on the research into high-speed water jet
- Oliver Weingarten, nominated by the Oriental Institute for scientific activity focused on multi-disciplinary study of Chinese text culture

Awards of the Academy of Sciences CR for excellent results of great scientific significance were obtained by the following teams of authors:

- The team nominated by the Grant Agency of the AS CR, consisting of Marian Karlický and Miroslav Bárta (Astronomical Institute), for the scientific outcome **“New model of magnetic reconnection in solar flares”**
- The team nominated by the Institute of Macromolecular Chemistry, consisting of Daniel Horák, Michal Babič, Hana Macková, Petr Šálek, Zdeněk Plichta, for the scientific outcome **“Functional magnetic polymer nano- and microspheres for minimally invasive diagnostics”**

- The team nominated by the Institute of Philosophy, consisting of František Šmahel, Robert Novotný, Pavlína Mašková and Lenka Bobková, for the scientific outcome **“The Luxembourgs, the Czech Crown in the Centre of Europe”**

Awards of the Academy of Sciences CR to young scientists for outstanding results in scientific work were obtained by the following scientists:

- Vít Latzel, 1978 (Institute of Botany), for the scientific outcome **“Unsuspected evolutionary power of parents”**
- Daniel Sojka, 1978 (Biology Centre), for the scientific outcome **“Blood digestion in ticks – insight into the multi-enzyme hemoglobinolytic machinery”**
- Vojtěch Kyncl, 1983 (Historický ústav), for the scientific outcome **“Without remorse. Genocide of the Czechs after the assassination of Reinhard Heydrich”**

The Award of the President of the ASCR for the promotion or popularization of research, experimental development and innovation in 2013 was obtained by the following scientists:

- Michal Křížek (Institute of Mathematics)
- Miroslav Raab (Institute of Macromolecular Chemistry)
- Erazim Kohák (Institute of Philosophy)

Awards granted by the ASCR to Czech and foreign researchers in 2013:

The Honorary Medal "De Scientia et Humanitate Optime Meritis"

- Roger Balian (Institut de Physique Théorique, Saclay, France)
- Zdeněk Havlas (Institute of Organic Chemistry and Biochemistry)

The Bernard Bolzano Honorary Medal for Merit in the Mathematical Sciences

- Pavel Drábek (Department of Mathematics, Faculty of Applied Sciences, UWB)
- Jaroslav Kautský (Flinders University of South Australia, Australia)
- Vladimír Souček (Faculty of Mathematics and Physics, Charles University)
- Zdeněk Strakoš (Institute of Computer Science)

The Ernst Mach Honorary Medal for Merit in the Physical Sciences

- Gunther Friedrich Eggeler (Institut für Materials – Chair for Materials Science and Engineering, Ruhr-Universität Bochum, Germany)
- Martin Černohorský (Masaryk University, Brno)

The František Pošepný Honorary Medal for Merit in Geological Sciences

- Ove Steptansoon (Helmholtz-Centre Potsdam – GFZ German Research Centre for Geosciences, Potsdam, Deutschland)

The František Křižík Honorary Medal for Merit in Technical Sciences and for Implementation of Results of Scientific Research

- Zdeněk Bittnar (Department of Mechanics, Faculty of Civil Engineering, Czech Technical University in Prague)
- František Maršík (Institute of Thermomechanics)

The Jaroslav Heyrovský Honorary Medal for Merit in Chemical Sciences

- Nobuyosh Koga (Chemistry Laboratory, Graduate School of Education, Hiroshima University, Japan)
- Rudolf Zahradník (J. Heyrovský Institute of Physical Chemistry)

The Gregor Johann Mendel Honorary Medal for Merit in Biological Sciences

- Jan Květ (Institute of Botany)
- František Sehnal (Biology Centre)

The Jan Evangelista Purkyně Honorary Medal for Merit in Biomedical Sciences

- Pavel Mareš (Institute of Physiology)
- Radim Šrám (Institute of Experimental Medicine)
- Barbara Cannon (Stockholm University, The Royal Swedish Academy of Sciences, Stockholm, Sweden)

The Josef Dobrovský Honorary Medal for Merit in Philologic and Philosophical Sciences

- Emilie Bláhová (Institute of Slavonic Studies)

The František Palacký Honorary Medal for Merit in Historical Sciences

- Jaroslav Pánek (Institute of History)

The Jan Patočka Memorial Medal

- Václav Konzal (Institute of Slavonic Studies)

The Vojtěch Náprstek Honorary Medal for Merit in Science Popularisation

- Marcel Grün (Observatory and the Planetarium Prague)
- Martin Hilský (Faculty of Arts, Charles University Prague)
- Jana Olivová (Czech Radio)

The Honorary Medal for Merit in the Academy of Sciences of the Czech Republic

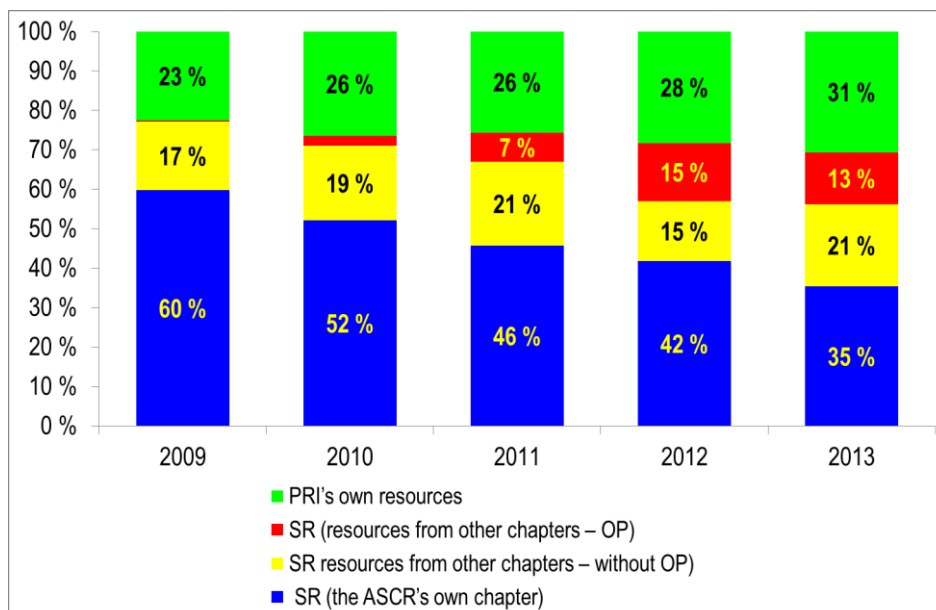
- Vít Našinec (Biology Centre)
- Božena Petschová (Institute of Organic Chemistry and Biochemistry)
- Pavel Chráska (Institute of Plasma Physics)

FINANCIAL MANAGEMENT

In 2013, the ASCR managed a total of CZK 12,623,000,000, of which CZK 4,467,000,000 came from its own budget. From 2009, there was a gradual growth of the total financial resources of the ASCR by CZK 2.7 billion; this was true despite the decrease of the resources of its own state budget chapter by approximately CZK 1.4 billion. This development was allowed by an increase by CZK 2.5 billion of the resources from the state budget coming from other budget chapters and by an increase by CZK 1.6 billion of the resources belonging to public research institutions.

The percentage of resources from ASCR's own budget chapter to the total financial resources of the ASCR dropped from 60 % in 2009 to mere 35 % in 2013. In the near future, this reduction could unfavourably influence or impede production of Academy's own resources.

Graph 1: Financial Resources of the Academy of Sciences of the CR
(in percent)



Financial resources (as for the whole ASCR) coming from the budget of the chapter, subsidies from other budget chapters and from extrabudgetary resources are summarised in the following overview:

The Structure of the Financial Resources (in millions of CZK):

	Non-investment resources	Investment resources	Total
Approved budget of the chapter	3,816.2	633.0	4,449.2
Transfer of non-investment resources into investment	-184.6	184.6	0.0
Transfer outside the chapter of the ASCR	0.0	0.0	0.0
Subsidies from other budget chapters	5.9	0.0	5.9
<hr/>			
Amended budget of the chapter of the ASCR	3,637.5	817.6	4,455.1
of which subsidies to public research institutions	3,532.4	817.6	
to Head Office of the ASC	105.1	0.8	
Use of claims from unused expenses	0.8	0.0	0.8
of which grants of the Grant Agency of the ASCR	0.0	0.0	
Financial Mechanisms of EEA/Norway	0.0	0.0	
Projects of the European Union	0.0	0.0	
material costs of the OSS	0.0	0.0	
Resources of the reserve fund of ASCR chapter	11.6	0.0	11.6
Transfer to files of claims from unused expenses	-0.2	0.0	-0.2
Total resources from the ASCR budget chapter	3,649.7	817.6	4467.3
<hr/>			
Subsidies from other budget chapters			
(pursuant to Act No. 130/2002 Coll.)	2,974.6	1320.0	4,294.6
of which grants of the GACR	1453.0	22.2	
of which grants of the TACR	172.2	0.0	
other projects	1346.4	1297.8	

Own resources of PRI		3,860.7	3,860.7
of which main activity orders		189.9	
sales of publications		105.8	
sales of goods and services		133.2	
sales of material and securities		529.8	
licences		1,961.1	
conference fees		17.5	
foreign grants and donations		310.7	
rental		85.7	
interest, exchange-rate profits		156.8	
own fund resources		157.4	
other		212.8	
Total resources	10,485.0	2,137.6	12,622.6

The institutional resources comprised 99.2 % of the total amount of the budgetary resources of the chapter and 35 % of all the resources of the ASCR. The amount of **special-purpose resources** intended for the resolution of the grant projects that are provided from the chapter of the ASCR based on the results of public tenders was reduced by 22.8 % as compared to 2012. The special-purpose resources formed 0.8 % of the total amount of budgetary resources and 0.3 % of all of the resources of the ASCR. From **other budget chapters** pursuant to Act No. 130/2002 Coll., a total of CZK 4,294.6 million, i.e. by 28.3 % more than in 2012, was transferred directly without budget measures to the institutes of the ASCR. This figure includes the resources in the amount of CZK 1,475.2 million acquired for the resolution of projects from the GACR, CZK 175.2 million from the TACR, and 2,644.2 million from other providers (e.g. MEYS, MA). The total amount of the resources acquired meant 34.1% of all of the resources of the ASCR. The total sum of CZK 3,860.7 million belonging to **own-source financial resources of Public Research Institutions of the ASCR** was comprised by CZK 3,643 million from the institutes, and CZK 217.7 million from the Centre for Administration and Operations of the ASCR. These resources comprised 30.6 % of all the resources of the ASCR.

The **non-investment resources** of the ASCR were comprised by 34.8 % of the resources of its own chapter, 28,4 % of transfers from other chapters of the state budget, and by 36.8 % from its own revenue and extrabudgetary resources. The percentage of non-investment resources acquired by transfer from the other chapters of the state budget increased as against the previous year by 23.3 %. The

investment resources of the ASCR were comprised by 38.2% of its own chapter of the state budget and 61.8% of transfers from the other chapters of the state budget.

The joint expenditures, intended particularly for foreign contacts, computer networks, membership fees to international scientific organisations, and the subsidies to scientific societies associated at the Council of Scientific Societies of the CR were covered from the budget of the Head Office of the ASCR. The budget of the Head Office also served to all of the special-purpose resources intended for extra-academic entities for the resolution of the grant projects of the Grant Agency ASCR.

From their total revenues of CZK 10,380 million, the institutes of the ASCR (Public Research Institutions) used CZK 9,125.1 million to cover their expenses. The total amount of CZK 1,254.9 of the improved economic results were primarily intended for the supplementation of the resources for construction and for renewal of instruments and equipment essential for the actual scientific work at the institutes.

Considering that the institutes of the ASCR are managed as public research institutions in the setting of non-state organisations, they do not conclude the accounting until June 30 of the following year and the final account must be verified by an auditor. It is therefore necessary to understand the following analysis as preliminary.

As against 2012, the total expenditures of the institutes of the ASCR increased by 12.2 %. Year-on-year rise appeared in the costs for the purchase of material (by 7.9%), purchase of energy, water and fuel (by 6.5 %), purchase of services (by 4.7 %), for repairs and maintenance (by 4.6%), travel costs (by 7.9 %), and personnel costs (by 8 %). The rise of the fund of special-purpose resources increased in comparison with the previous year by 11%.

The Structure of the Expenses of the institutes of the ASCR (in millions of CZK):

Personnel costs (labour costs, mandatory insurance paid by the employer, health-insurance benefit compensation)	52,08 %	4 752,5
Purchase of material	9,64 %	879,6
of which books, journals		65,5
small material property		183,5
use of material, protective aids		553,4
other material costs		28,8
work of a production character (press)		48,4
Purchase of energy, water and fuels	3,18 %	290,1

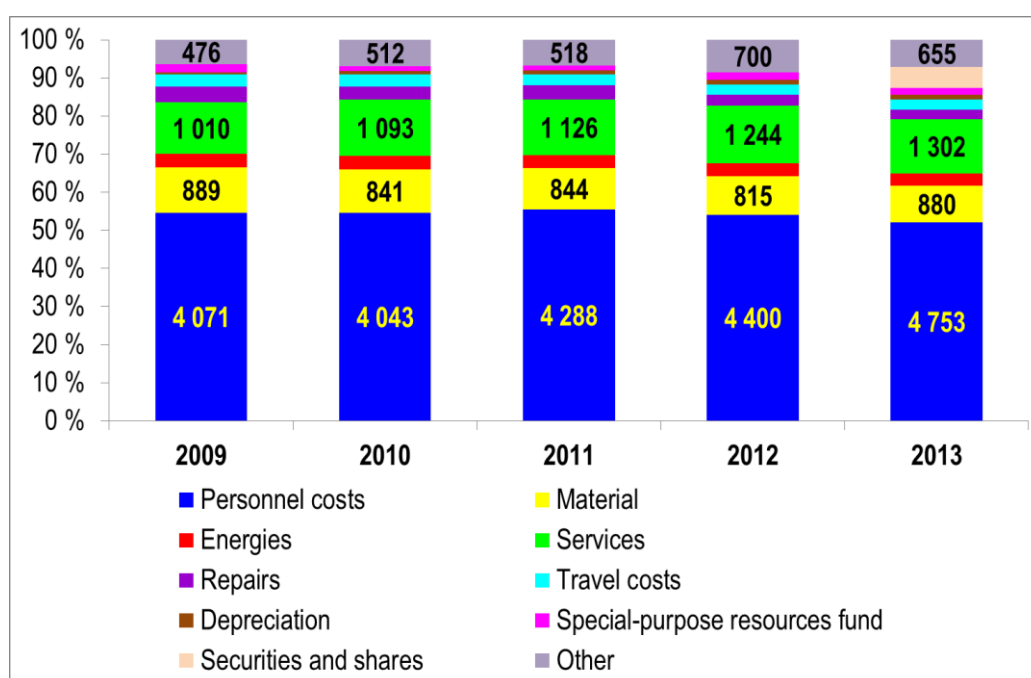
of which electrical energy		165,6
water, steam, gas		106,2
fuels, fuel substances		18,3
Purchase of services	14,27 %	1 302,3
of which services of the post, telecommunication and radiocommunication		38,6
purchase of small non-material property		16,8
rent		57,2
computer technology performances		29,2
representation costs		11,2
preliminaries		9,8
conference fees		43,2
sewage fees		9,1
other service		1 087,2
Repairs and maintenance	2,56 %	233,3
of which repair and maintenance of real property		165,0
repair and maintenance of moveable assets		68,3
Total travel costs	2,62 %	238,6
of which foreign travel expenditures		219,2
domestic travel expenditures		19,4
Creation of a fund of special-purpose resources	1,82 %	166,0
of which special-purpose resources from the chapter of the ASCR		0
institutional resources		95,3
special-purpose resources from other providers		70,7
securities and shares sold	5,48 %	500,3

Depreciation of fixed assets	1,18 %	107,5
Total other costs	7,17 %	654,9
of which transfers to the SF and other social costs		147,2
taxes and fees		289,4
exchange-rate loss	31,7	
injury insurance, fines, penalties, shortfalls, damages		186,6
The institutes of the ASCR used a total of	100,00 %	9 125,1

Of the resources spent on 'purchase of services', (CZK 1,302.3 million), the item 'other services' comprised CZK 1,087.2 million. The expenditures on other services are specific for each institute of the ASCR. They are contributions abroad within international cooperation, scientific measurements and analyses for projects, publication costs, training, seminars, payments for the professional preparation of grant requests, legal and tax consultation, payments for electronic access into the databases of foreign journals and similar.

The analysis given here does not include the accounting depreciation of property acquired from subsidies of the total amount of CZK 1,073,038, which create an expenditure item only from an accounting perspective; pursuant to Decree No. 504/2002 Coll., as amended, they do not comprise a resource of the property reproduction fund and do not influence the economic result.

Graph 2: The Use of Non-Investment Resources (in millions of CZK)



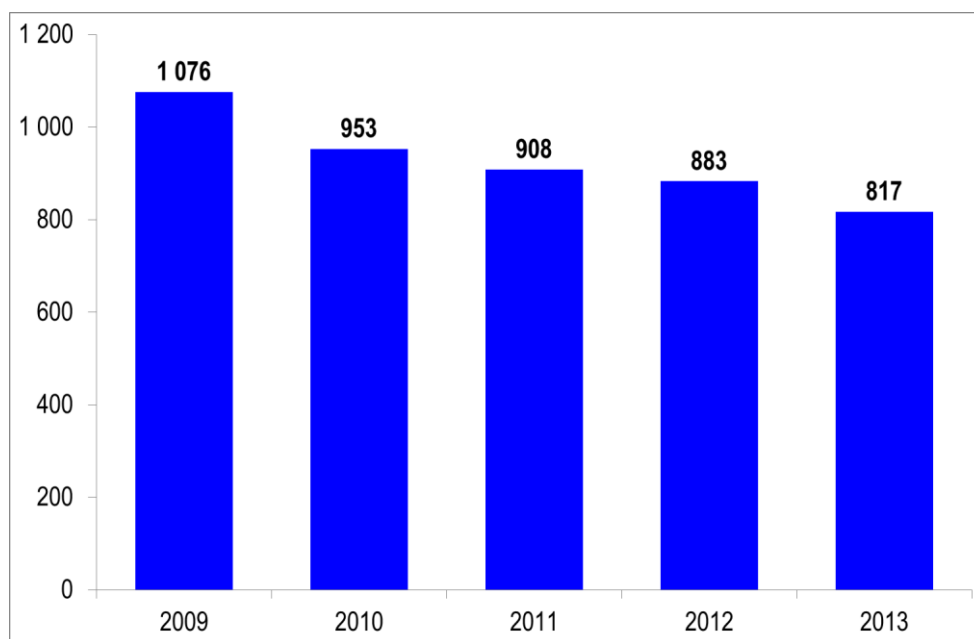
The comparison of the ratios of the non-investment resources of the institutes of the ASCR spent during the observed period from 2009 to 2013 clearly shows that the percentage of the items to the total amount of the resources spent does not change very much.

The sources of investment resources are comprised predominantly of the institutional and special-purpose subsidies from the state budget and from foreign grants. They serve particularly for the purchase or appreciation of buildings and instruments, or for their maintenance and repairs. The data for the entire ASCR can be summarised as follows:

Total Investment Resources (in millions of CZK)	2,520.6
of which depreciation	114.9
transfer from improved outcome from operations recipients; joint recipients (pursuant to Act No. 130/2002 Coll.)	19.4
foreign grants and donations	1,320.0
revenues from fixed assets sales	202.0
combining funds for fixed assets acquisition	35.9
subsidies from the state budget	11.5
institutional	816.9
	0.0
These resources were used to fund	
building	1,763.1
acquisition of instruments and equipment	1,525.3

maintenance and repairs	29.1
other	44.5
Total used on the acquisition of fixed assets	3,362.0
Property Reproduction Fund Outflow	-841.4
Returned to the state budget	0,0

**Graph 3: The Investment Resources of the Budget of the ASCR
(in millions of CZK)**



The following is a selection of major construction events that were provided with an investment subsidy (in thousands of CZK) in 2013:

Reconstruction and completion of the complex of the Institute of Organic Chemistry and Biochemistry	126,829
The research base Mikulčice-Trapíkov of the Archaeological Institute Brno	34,000
Reconstruction of a building in Brno, Čechyňská 19, the Archaeological Institute	29,165
The annex construction and adaptation of Building 231 VdG	

at the Nuclear Physics Institute	20,000
Reconstruction of the complex at Prosek– 1. stage at the Institute of Theoretical and Applied Mechanics	19,350
Construction of clean rooms on 6th floor at J. Heyrovský Institute of Physical Chemistry	10,835

The pressure on saving more than CZK 95 million (year-on-year decrease in the budget of the ASCR) necessitated a substantial reduction of investment in the instrumental equipment of the institutes in 2013. Financial resources were (to a limited extent) only provided for expensive instruments (over CZK 5 million). The budget of the ASCR only allowed the sum of CZK 70 million to be allocated for this purpose, and that entirely for expensive instruments over CZK 5 million. The institutes of the ASCR considerably contributed from their own resources to these subsidies.

The following is a list of important instruments acquired for the investment resources in 2013:

Versatile analytical platform based on SEM+XE-FIB (Institute of Physics)	15,112
Liquid chromatograph coupled to a mass spectrometer in tandem (Institute of Botany)	7,017
MALDI TOF-TOF mass spectrometer for the characterization of polymers (Institute of Macromolecular Chemistry)	7,000
Scanning electron microscope with integrated ion beam (Institute of Physics of Materials)	6,580
LTQ XL Linear Ion Trap Mass Spectrometer including UHPLC (Institute of Chemical Process Fundamentals)	5,800

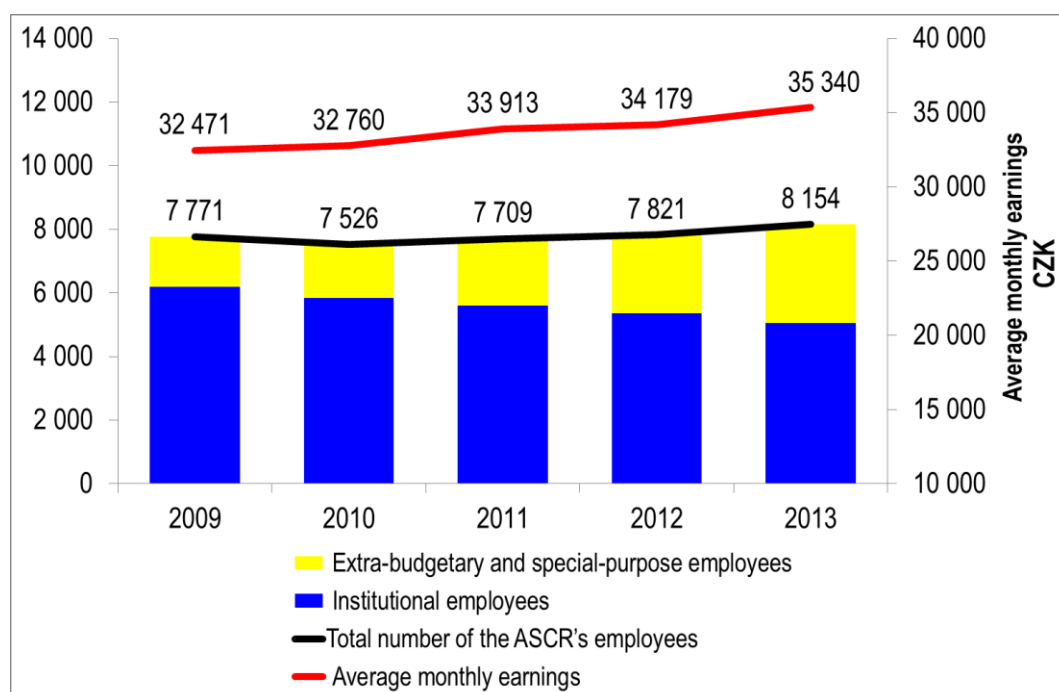
Investment resources used by individual institutes of the ASCR in 2013 are listed in Appendix 8.

EMPLOYMENT AND DRAWING ON WAGE RESOURCES

The total number of employees of the ASCR¹ increased in 2013 from 7,821 to 8,154, of which 3,096 employees (which is 37.92 % against 31.49 % in 2012) are paid from special-purpose and extrabudgetary resources. The number of university-educated employees of research units who passed the certification following the Career Rules for University Educated Employees of the ASCR and were put in the relevant qualification grade rose from 4,489 to 4,679.

In total, the ASCR spent CZK 3,458,115,000 on salaries and wages and CZK 148,280,000 on other payments for work performed. The total average monthly income at the ASCR was CZK 35,340 with a year-on-year increase of 3.4 % compared with 2012.

Graph 4: The Number of Employees (FTE) and Average Earnings (of the ASCR as a whole)



A more detailed overview of total number of employees of the ASCR is provided by the following categorisation into employees of the Head Office of the ASCR and the employees of all of the research units of the ASCR.

¹ Always given as an average number of employees per Full Time Equivalent – FTE.

Table 5: The Number of Employees (FTE) at the ASCR

YEAR	2009	2010	2011	2012	2013
At the research institutes of the ASCR	7,683	7,466	7,645	7,752	8,080
At the Head Office of the ASC	88	60	64	70	74
Total of the ASCR	7,771	7,526	7,709	7,821 ^{*)}	8,154

^{*)} In 2012, the total sum of the ASCR of 7,821 resulted from the count of the following numbers without rounding: at the research units of the ASCR 7,751.70 employees; at the Head Office of the ASCR 69.51 employees.

At the Head Office of the ASCR, CZK 36,713,000 was spent for the wages of 74 employees, and CZK 1,127,000 for the other payments for work performed, which thus makes a total of CZK 38,345,00.

The total average monthly earnings of the employees of the Head Office of the ASCR without the elected officials of the ASCR in 2013 were CZK 37,340. With the elected officials of the ASCR included among the employees of the Head Office of the ASCR, we get average earnings of CZK 44,551.

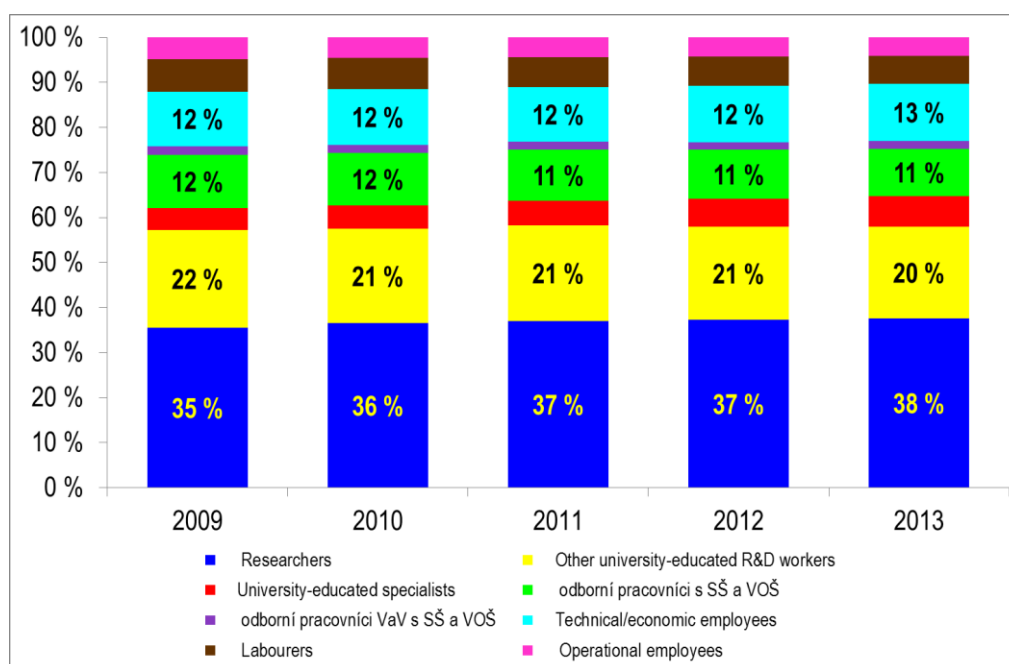
In comparison with the previous year, the average earnings dropped. The elected representatives of the ASCR (president, vice-presidents and members of the Academic Council) are paid by the government regulation no. 564/2006 Coll. of salaries in public services and administration, therefore they are included in mandatory indicators – wage expense limits and number of employees of the Head Office ASCR. This induces distortion (upwards) in the data reported for the ASCR as an organizational body of the state.

At all of the institutes of the ASCR (public research institutions), CZK 3,421,402,000 was spent on 8,080 employees in 2013 and CZK 147,153,000 for the other payments for work performed; a total labour cost thus reaching CZK 3,568,555,000. The total average monthly earnings were CZK 35,283 with a year-on-year increase of 3.5 % compared to the year 2012.

A more detailed overview of the average monthly earnings at the public research institutions (including all resources – institutional, special-purpose and extrabudgetary) divided by the categories of employees is provided in the following table:

Category	Average adjusted number of employees	Average monthly earnings in CZK
Researchers	3,037	47,381
Other university-educated employees of research units	1,642	28,871
University-educated specialists	551	33,547
Secondary school or college-educated specialists	852	23,432
Secondary school or college-educated R&D Specialists	138	26,963
Technical-economic employees	1,027	35,628
Labourers	498	18,763
Operational employees	335	16,927
Total	8,080	35,283

Graph 5: Categories of Employees (FTE) at the research units of the ASCR



The numbers of employees, paid wage resources categorized by resources, and average gross monthly earnings for the individual institutes of the ASCR are given in Appendix 9.1 of the electronic version of the Annual Report. Appendix 9.2 gives the numbers of institutes and employees of the ASCR categorized by sections.

CONTROLLING AND AUDITING

Public audit oversight of the ASCR is ensured by an independent audit department directly subject to the President of the ASCR. Its activity is performed pursuant to the Act on Financial Control in Public Administration.

In 2013, seven planned audits of units of the ASCR were conducted. Subsidies provided to 12 projects were audited in 6 scientific societies. The amount of these subsidies was CZK 744,000 of the total sum of CZK 5,600,000 provided. One research plan was verified in a total audited amount of CZK 21,397,000, and thirteen grant projects in a total of CZK 47,046,000 of the amount audited. The financial controls in the course of 2013 verified the drawing of the special-purpose supports provided in the period of the duration of selected grant projects until December 31, 2012.

At institutes of the ASCR, six subsequent audits were conducted to inspect fulfilling the measures to remove insufficiencies discovered by audits of the economic management in 2012. Repeating insufficiencies were not found.

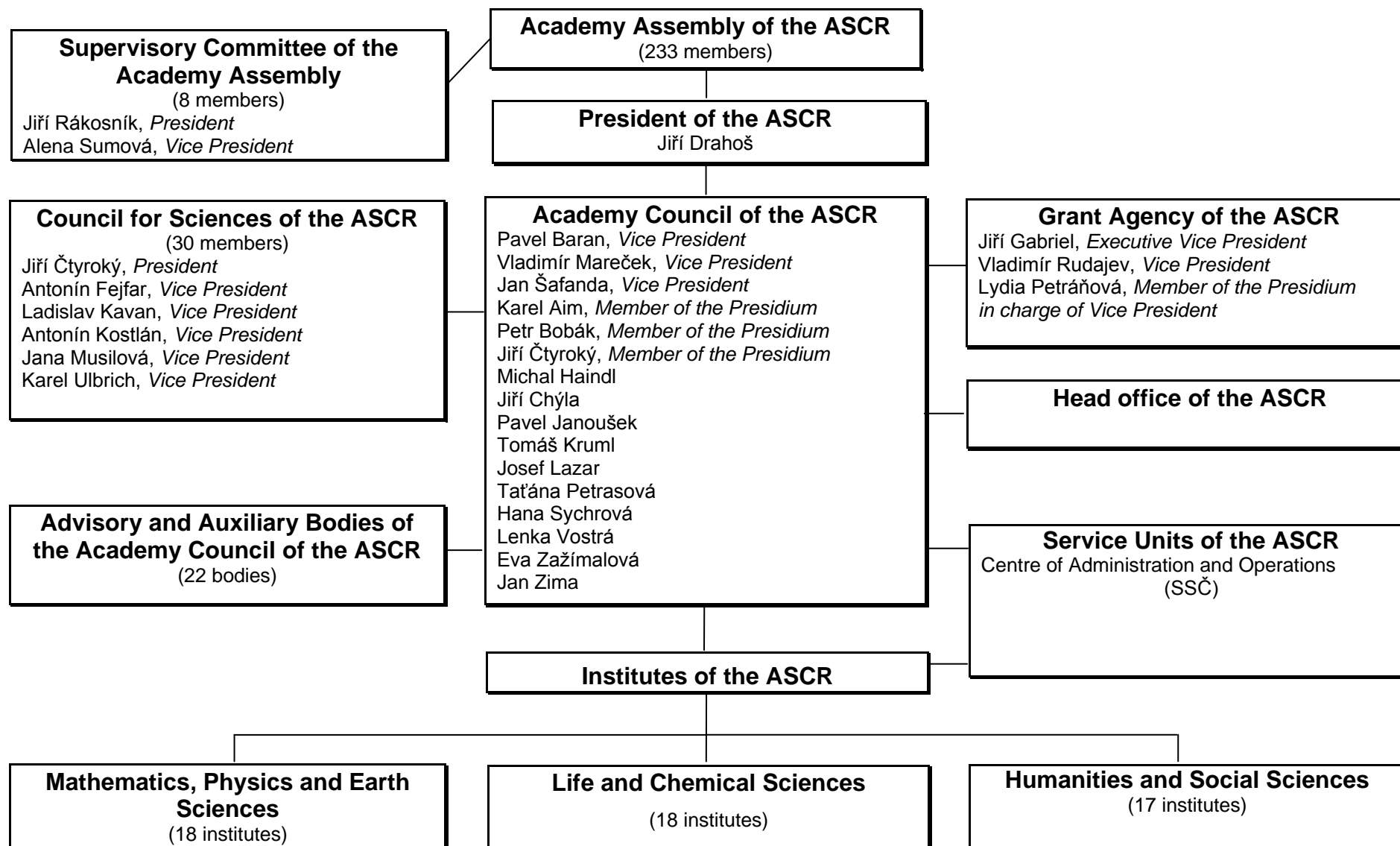
Based on the approval by the competent body of the EU, the Audit Department of the Head Office of the ASCR conducts internal audits of the accounting of projects of the EU Framework Programmes. In 2013, the volume of financial resources verified was CZK 82,273,691.

In the period from February 11, 2013 until August 15, 2013, the Supreme Audit Office audited the ASCR – audit no.13/06 “Financial resources allocated to the investments under the authority of the ASCR and public research institutions established by the ASCR.”

The audit was carried out at the ASCR (an organisational body of the state), at the Institute of Physics, the Institute of Physiology, the Institute Microbiology and the Centre for Administration and Operations. The controlled period were years 2008–2012; in material statements also the preceding periods and periods until the end of the audit fell under the controlled period.

The ASCR prepared Standpoint on Audit Conclusion of the Supreme Audit Office (SAO) with comments and explanations concerning the individual findings of the SAO and the measures taken.

STRUCTURE OF THE ACADEMY OF SCIENCES 2013



1. Section of Mathematics, Physics and Computer Sciences	
Astronomical Institute	(ASÚ)
Institute of Physics	(FZÚ)
Institute of Mathematics	(MÚ)
Institute of Computer Science	(ÚI)
Nuclear Physics Institute	(ÚJF)
Institute of Information Theory and Automation	(ÚTIA)

2. Section of Applied Physics	
Institute of Photonics and Electronics	(ÚFE)
Institute of Physics of Materials	(ÚFM)
Institute of Plasma Physics	(ÚFP)
Institute of Hydrodynamics	(ÚH)
Institute of Scientific Instruments	(ÚPT)
Institute of Theoretical and Applied Mechanics	(ÚTAM)
Institute of Thermomechanics	(ÚT)

3. Section of Earth Sciences	
Institute of Geophysics	(GFÚ)
Institute of Geology	(GLÚ)
Institute of Atmospheric Physics	(ÚFA)
Institute of Geonics	(ÚGN)
Institute of Rock Structure and Mechanics	(ÚSMH)

4. Section of Chemical Sciences	
Institute of Analytical Chemistry	(ÚIACH)
Institute of Inorganic Chemistry	(ÚACH)
J. Heyrovsky Institute of Physical Chemistry	(ÚFCH JH)
Institute of Chemical Process Fundamentals	(ÚCHP)
Institute of Macromolecular Chemistry	(ÚMCH)
Institute of Organic Chemistry and Biochemistry	(ÚOCHB)

5. Section of Biological and Medical Sciences	
Institute of Biophysics	(BFÚ)
Institute of Biotechnology	(BTÚ)
Institute of Physiology	(FGÚ)
Institute of Microbiology	(MBÚ)
Institute of Experimental Botany	(ÚEB)
Institute of Experimental Medicine	(ÚEM)
Institute of Molecular Genetics	(ÚMG)
Institute of Animal Physiology and Genetics	(ÚŽFG)

6. Section of Bio-Ecological Sciences	
Biology Centre	(BC)
Institute of Botany	(BÚ)
Institute of Vertebrate Biology	(ÚBO)
Global Change Research Centre	(CVGZ)

7. Section of Social and Economic Sciences	
Library	(KNAV)
Economics Institute	(NHÚ)
Institute of Psychology	(PSÚ)
Institute of Sociology	(SOÚ)
Institute of State and Law	(ÚSP)

8. Section of Historical Sciences	
Institute of Archaeology Brno	(ARÚB)
Institute of Archaeology Prague	(ARÚ)
Institute of Art History	(HÚ)
Masaryk Institute and Archives	(MÚA)
Institute of Art History	(ÚDU)
Institute of Contemporary History	(ÚSD)

9. Section of Humanities and Philology	
Institute of Ethnology	(EÚ)
Institute of Philosophy	(FLÚ)
Oriental Institute	(OÚ)
Institute of Slavonic Studies	(SLÚ)
Institute of Czech Literature	(ÚČL)
Institute of the Czech Language	(ÚJČ)

MAP OF REGIONAL DISTRIBUTION OF THE INSTITUTES OF THE ASCR

Map

APPENDICES

LIST OF APPENDICES

- 1.1 Overall publication results
- 1.2 Publication results in research areas
2. Other results
3. Examples of the cooperation with user sphere within joint projects based on economic agreements
- 4.1 Overview of international scientific cooperation of the institutes of the ASCR
- 4.2 Selected international projects resolved by the institutes of the ASCR
5. Overview of important internationally attended conferences organized by the institutes of the ASCR
6. Overview of the most important events of cooperation between the ASCR and universities or other higher education institutions
7. Projects of operational programmes started in 2013
- 8.1 Economic Management of Public Research Institutions in 2013
- 8.2 Investment resources and their management in 2013
- 9.1 Number of employees, wage resources and earnings in 2013
- 9.2 Number of the units and employees of the ASCR by Sections
10. Annual Report of the Learned Society of the Czech Republic
11. Activities of the Council of Scientific Societies of Czech Republic and associated societies
12. Annual Report of the ASCR on the provision of information pursuant to Act No. 106/1999 Coll.

Note: Printed version of the Annual Report does not comprise Appendices; these will only be published on web pages of the ASCR. Printed version, however, will be extended by supplemental documentary images.

APPENDIX 1.1: TOTAL PUBLISHING RESULTS OF THE ASCR

Publication type	Publishing Results			
	Year of issue 2012		Year of issue 2013*)	
	Czech language	Foreign language	Czech language	Foreign language
Books	161	58	155	67
Treatises in books	588	479	309	341
Articles in scientific journals	1,054	4,346	861	4,061
Conference Collections	16	26	17	23
Papers in anthologies	352	1,259	274	1,173
Translations	30		24	
Reviews	335		266	
Specialised articles in the daily press	134		163	
Research reports	404		444	

*) The data for 2013 are incomplete, because the publications are also published in the year following the year dated.

Note: The aggregate data for the ASCR do not represent a sum of the data by science branches owing to the fact that staff from more than one institute can participate in a single task. Such work is included only once for each institute and in the total.

1. 2: PUBLICATION RESULTS IN RESEARCH AREAS

Publication type	Sections 1-3				Sections 4-6				Sections 7-9			
	Year of issue 2012		Year of issue 2013*)		Year of issue 2012		Year of issue 2013*)		Year of issue 2012		Year of issue 2013*)	
	Czech lang.	Foreign lang.	Czech lang.	Foreign lang.	Czech lang.	Foreign lang.	Czech lang.	Foreign lang.	Czech lang.	Foreign lang.	Czech lang.	Foreign lang.
Books	15	11	17	16	10	12	9	13	137	35	130	37
Treatises in books	20	87	5	58	38	116	22	96	533	278	282	186
Articles in scientific journals	154	1861	129	1671	146	2239	110	2,227	757	265	629	202
Conference collections	7	14	6	13	1	8	2	7	8	4	9	3
Papers in anthologies	121	860	100	826	60	306	84	281	174	102	91	72
Translations	0		0		1		0		29		24	
Reviews	0		2		4		4		331		260	
Specialised articles in the daily press	26		40		31		53		77		70	
Research reports	123		139		25		32		223		229	

*) The data for 2013 are incomplete, because the publications are also published in the year following the year dated.

APPENDIX 2: OTHER RESULTS

- *Logical foundations of mathematics and computational complexity: a gentle introduction*

This weighty monograph treats logical foundations of mathematics from a perspective not applied before in the literature. Most existing publications on this topic focus on philosophical questions, set theory or the incompleteness of formal systems. The new element that the author (researcher at the Institute of Mathematics) connects with the foundations of mathematics is complexity theory. According to the author, complexity is at least as important for the foundations of mathematics as are the traditional concepts of computability and probability.

- *Energy Complexity of Recurrent Neural Networks*

Besides computation time and memory demands, research was carried out into alternative complexity measures, such as the energy consumption of (acyclic) logic (threshold) circuits inspired by information processing in the brain. Research workers at the Institute of Computer Science introduced the energy complexity of recurrent (cyclic) neural nets and derived the tradeoff between the time demands and the energy consumption when simulating finite automata by optimal-size networks including energy lower bounds.

- *Visual Texture, Accurate Material Appearance Measurement, Representation and Modelling*

The book coming from the Institute of Information Theory and Automation provides the first exhaustive survey of the contemporary sum of knowledge in a new branch of science – physically correct visual texture modelling, which is the appropriate paradigm for the representation of material visual properties. The book comprehensively covers the whole process of study and modelling representation, measurement, from material appearance representation, measurement, analysis, and compression, to modelling, editing, visualization, and perceptual evaluation.

- *Surface plasmon resonance biosensor for analysis of complex biological samples*

Researchers at the Institute of Photonics and Electronics developed a surface plasmon resonance (SPR) biosensor employing a new referencing method that allows to suppress the effect of non-specific adsorption, which is the main limitation for the application of label-free biosensors in the analysis of bodily fluids. Experiments demonstrated that the developed SPR biosensor enables the detection of the carcinoembryonic antigen (cancer biomarker) with a higher accuracy and lower biological variability in contrast to conventional detection approaches.

- *Mechanisms of surface relief formation leading to crack initiation in fatigued crystalline materials*

A model of extrusion and intrusion formation based on the thorough analysis of migration of point defects produced during localized cyclic plastic straining and identification of the principal source of cyclic slip irreversibility was proposed at the Institute of Physics of Materials. The present model for the first time and contrary to previous physically-based models offers a comprehensive quantitative description of processes leading to the initiation of fatigue cracks; the predictions of the model comply with the major part of experimental observations.

- *Development of Hall sensors for fusion reactors*

Researchers at the Institute of Plasma Physics studied properties of Hall sensors with metallic sensitive layers (Cu and Bi) applicable to magnetic field measurement in future fusion reactors. The main attention was focused on changes in their properties due to neutron irradiation and due to temperature cycling. One of the major results was identification of a potent technology for manufacturing of these sensors. The promising results achieved allowed to open negotiations on possible implementation of the sensors at the currently constructed large international thermonuclear experimental reactor ITER in France.

- *Mechanical properties of microstructures in 'smart' magnetic alloys*

So-called smart alloys are materials that can change the shape in response to external influences; for smart magnetic alloys, it is under the influence of external magnetic field. Researchers at the Institute of Thermomechanics analyzed the microstructures in crystals of several selected alloys of that kind (e.g. the magnetic shape memory alloy Co-Ni-Al), and determined the influence of the microstructures on mechanical and thermomechanical properties of the material.

- *Seismic detection of active submarine volcanic complexes*

Volcanic activity is usually accompanied by seismic activity in the form of series of earthquakes called earthquake swarms, striking in short intervals of time in a fixed cavity under the volcano. Series of such earthquakes beneath the seafloor were found to correspond with the occurrence of distinct seamounts. Researchers at the Institute of Geophysics interpret the seamounts as hitherto unknown submarine volcanoes and the observed earthquake swarms as a consequence of magma ascent in respective magma conduits.

- *Volcanic dust from Iceland volcano Eyjafjallajökull 2010 eruption deposited in Prague*

Researchers at the Institute of Geology found dust from 2010 Eyjafjallajökull eruption deposited also in Prague and the surroundings. The geochemical signature of volcanic material in the total dust sample was low due to the low content of volcanic material in the total dust volume (ca 12 %). Grain-size of volcanic particles was mostly from 2.5 to 25 μm , but surprisingly, relatively large grains ($>50 \mu\text{m}$) were also

found. The best method of dust study was morphological observation of individual dust grains and x-ray diffraction.

- *Generation of pulsating water jets*

Research at the Institute of Geonics focused on generating pulsating water jets was crowned with patents and an exclusive licence provided to a German producer of high-pressure equipment. Subsequent research in this field resulted in the numerical model of a hydrodynamic nozzle where self-excited pulsation of pressure and flow causes a forced break-up of the jet exiting the nozzle. The generation of a pulsating jet by the hydrodynamic nozzle was verified experimentally and patented.

- *Targeted selection of working electrolyte systems for effective analyses by capillary electrophoresis with mass-spectrometric detection.*

Researchers at the Institute of Analytical Chemistry developed an effective procedure for the selection of working conditions of analytical capillary electrophoresis with mass-spectrometric detection. The procedure is theoretically founded, uses new electrophoretic principles and allows high selectivity and sensitivity in the analyses performed. High sensitivity of the method (down to 20-30 ng/L) was demonstrated on analyses of the fungicide thiabendazole in beverages and residues of ibuprofen and diclofenac in waters.

- *Biomass Gasification*

The Institute of Chemical Process Fundamentals introduced a method of converting solid or liquid biomass into a calorific gas in the fluidized-bed gasification reactor. The following are the most important conclusions: (1) 50 vol. % of dolomitic limestone in fluidized bed improved the conversion of char and lowered the level of tar in generator gas; (2) the optimal temperature for biomass gasification with limestone in fluidized bed was 850 °C; (3) the use of CO₂, H₂O and O₂ mixture resulted in the most efficient gasification in terms of high char conversion and low tar yield.

- *Demonstration of the interaction of insulin with insulin receptor*

Disorders in the action of insulin cause a serious disease called diabetes mellitus. The action of insulin is mediated by its binding to a specific cell receptor. The collaboration of four international teams resulted in the preparation and analysis of crystals of a complex of insulin with insulin receptor and in gaining a detailed view of the interaction of both molecules. Scientists at the Institute of Organic Chemistry and Biochemistry contributed with developing highly active insulin analogs.

- *Negative impact of environmental pollutants on the reproduction of mammals*

Environmental pollutants, flame retardant (tetrabromobisphenol A), antibiotics (tetracycline and doxycycline) and mycotoxin (zearalenone) affect male reproductive parameters, changes in the expression of selected genes and sperm quality, and have an impact on reproduction. Biological, biochemical and genetic methods were used at the Institute of Biotechnology, to detect the changes. In view of the increase

of infertility in human population, the study of the effect of pollutants on reproduction organs and the quality of sperm is in the interest of global reproductive laboratories.

- *Modulation of synaptic transmission in suprachiasmatic nucleus by extracellular ATP and molecular determinants of function of receptors for ATP*

The hypothalamic suprachiasmatic nuclei (SCN), the circadian master clock in mammals, rhythmically release ATP, but the role of ATP in the SCN was unknown. A study carried out at the Institute of Physiology showed that ATP-gated P2X receptors are located on nerve terminals and their activation modulates the release of classical neurotransmitters, which can regulate the activity of circadian pacemaker neurons. It was demonstrated that the binding of ATP to P2X receptors causes an opening of the cation-selective channels.

- *Boron clusters-based carbonic anhydrase inhibitors*

Carbonic anhydrases are vitally important enzymes that play crucial roles in many physiological and pathophysiological processes. For example, carbonic anhydrase IX (CA IX) can be found on the surface of many tumours and therefore it can serve as a marker in cancer diagnostics and as a target in cancer therapy. On the basis of structural analysis researches at the Institute of Molecular Genetics designed and synthesized new types of CA IX inhibitors with high selectivity toward the CA IX without negative influence on physiologically important enzymes, e.g. CAII.

- *Juvenile hormone (JH) signalling in insect reproduction and development*

Scientists at the Biology Centre found that insects need the JH receptor (Met) and circadian clock proteins to switch between diapause and reproduction in response to seasonal changes. Under long-day conditions, JH acting via Met and circadian clock proteins activates reproduction-specific genes. JH also requires Met but not the circadian clock proteins to stimulate oogenesis and to control metamorphosis in larvae. Therefore, the diverse effects of JH depend on interactions of the same receptor Met with distinct partners.

- *Invasive plants and animals show on average enhanced performance in the new distribution range, but not universally*

Researchers at the Institute of Botany verified that biogeographic approach is crucial for understanding biological invasions and their impacts. A quantitative comparison of the performance of invasive plants and animals in invaded regions with the performance in their native ranges showed that invasive individuals were on average bigger, more fecund and more abundant. However, for about a half of 26 plant and 27 animal species analysed, the differences were not significant. Some species thus may become invasive by simply behaving in the same way as at home.

- *A method for obtaining structural and functional information on proteins, based on polarization fluorescence microscopy, US patent*

A US patent was issued covering two-photon polarization microscopy (2PPM), a microscopy technique developed by the Laboratory of Cell Biology at the Global Change Research Centre. The method allows observations of a number of molecular processes taking place in living cells, for example optical observations of electrical signals in neurons, monitoring molecular processes involved in cell signalling, but also obtaining information on the structure of protein molecules in living cells. Currently the Laboratory seeks to encourage commercial utilization of the method.

- *Annual killifish – novel system to study ageing*

Annual killifish have become an important model system for the research on ageing. All data on biology, population genetics and life history of natural populations of Annual killifish come from field and laboratory research of the IVB team at the Institute of Vertebrate Biology. The research characterized genetic structure of wild populations of the fish, demonstrated that they are vertebrates with the shortest generation time and showed that species from different regions across gradient of aridity differ in genetically determined lifespan.

Publications

- *Tractable Dynamic Global Games and Applications*

The authors of the Economics Institute present in their article a family of tractable dynamic global games and their applications. Agents privately learn about a fixed fundamental and repeatedly adjust their investments while facing frictions. The game exhibits many externalities: payoffs may depend on the volume, volatility and concentration of investment. The authors examine how frictions, for example the Tobin tax, affect equilibrium and identify conditions when frictions discourage harmful behaviour without compromising investment volume.

Mathevet, L. – Steiner, J.: Tractable dynamic global games and applications. Journal of Economic Theory, 2013, Roč. 148, č. 6, s. 2583-2619.

- *Superior Temporal Sulcus and Social Cognition in Dangerous Drivers*

An article by scientists at the Institute of Psychology deals with the ways the superior temporal sulcus/gyrus (STS/STG) in the temporal lobe relates to the processing of social stimuli. A larger difference in the activation of the STS/STG was found in safe drivers compared to dangerous drivers while they were watching short videos (six videos of safe driving campaign “Nemyslíš, zaplatíš“ have tragic endings, and six show safe driving). A similar difference was also found in drivers who in their descriptions of the video mentioned the actors’ emotions, compared to those who did not speak about the emotions.

Zelinková, J. – Shaw, D. J. – Mareček, R. – Mikl, M. – Urbánek, T. – Peterková, L. – Zámečník, P. – Brázdil, M.: Superior temporal sulcus and social cognition in dangerous drivers. Neuroimage, 2013, Roč. 83, December, s. 1024-1030.

- *Where Have Voters Gone? The Explanation of the Development of Electoral Participation in the Czech Republic, 1990–2010*

The book focuses on voter participation in parliamentary elections in the Czech Republic. Since the early 1990s, voter participation in elections to the Chamber of Deputies has been on the decline to the extent that since 2002 no more than one-third of eligible voters have turned out for the elections. Compared to Western democracies, this is a low level of participation, yet slightly above average, compared to other post-communist states in Central Europe. What is alarming, however, is the steady decline over time in participation from the level of turnout in the early 1990s. Voting in an election is one of the most important political actions of citizens in democracies and it serves to legitimise not just those in power, but the entire political regime. The book represents the first systematic study of voter participation and the reasons for its decline in the Czech Republic.

Linek, L. (Institute of Sociology): Kam se ztratili voliči? Vysvětlení vývoje volební účasti v České republice v letech 1990–2010. Centrum pro studium demokracie a kultury, Praha 2013, 334 s.

- *The Internet as the Subject of Law: Searching for Balance between Autonomy and Privacy*

The book aims at the issues of the relationship between personal freedom and privacy in the Internet environment. It is difficult to give a priority to one of the abovementioned issues as they are basically of the same meaning and complement each other. The book is intended for everyone who deals with these frequently conflicting issues; it will be particularly appreciated by specialists in data protection in the Internet environment. In his work, the author exhaustively describes the current decision-making practice, but what is more, offers possible solutions for an area that is considered complicated and in places too chaotic for an unspecialised lawyer.

Matejka, J. (Institute of State and Law): Internet jako objekt práva: hledání rovnováhy autonomie a soukromí. CZ.NIC, Praha 2013, 256 s.

- *Historians from Home and Abroad*

The book contains studies on representatives of Czech historiography and Czech studies in European countries and the USA in the 19th and 20th centuries, especially interpreting the development from traditional regional history to modern cultural history and micro-history, the assessment of early modern Czech history in the classical historiography and the attitude of different scholars towards historical sciences. The other part of the book is devoted to interviews with selected historians from Europe, America and Asia.

Pánek, J. (Institute of History): Historici mezi domovem a světem. Univerzita Pardubice, Pardubice 2013, 797 s.

- *Tumulus Site in Stěbořice and the Influence of Great Moravia in the Peripheral Regions*

The book by authors at the Institute of Archaeology Brno deals with the Early Medieval tumulus site in Stěbořice near Opava. It is the very first publication to summarise the facts about Slavic tumulus sites in Moravia and Bohemian Silesia. The burial method and the gifts found buried with the deceased clearly reflect the expansion of culture and apparently also the expansion of power from the central regions of Great Moravia further towards the north in the second half of the 9th century.

Kouřil, J. – Tymonová, M.: Slovanský kostrový mohylník ve Stěbořicích. Archeologický ústav AV ČR, Brno, v. v. i., Brno 2013, 278 s.

- *Touchstones in Archaeology*

European archaeological collections record numerous stone artefacts from the Early Middle Ages described as whetstones. Researchers at the Institute of Archaeology Prague have found that many of them were in fact touchstones – tools to test the quality of a particular metal. These artefacts are concentrated mainly in Viking-Age and Slavic coastal settlements in the Baltic Sea basin and in trade centres of Central and Eastern Europe. In graves, the touchstones together with balance scales or weights appear as signs of the buried individual's access to precious metals thus symbolizing the social position.

Ježek, M. – Zavřel, J.: Touchstones in graves from the Avar and Great Moravian periods. Archäologisches Korrespondenzblatt, 2013, Roč. 43, č. 1, s. 117-129.

Ježek, M.: Touchstones of archaeology. Journal of Anthropological Archaeology, 2013, Roč 32, č. 4, s. 713-731.

Ježek, M.: Touchstones from early medieval burials in the collection of The State Archaeological Museum in Warsaw. Wiadomości Archeologiczne, 2013, Roč. 64, s. 160-169.

- *Monographs: Development of the Institute of Organic Chemistry and Biochemistry of the Czech Academy of Sciences in Historical Context*

The series of publications presents the historical context of this renowned non-university scientific institution, and outlines how political and economic pressure influenced the Institute's performance. Researchers at the Masaryk Institute and researchers at the Archives of the ASCR utilized previously little-used archival sources and to some extent also the outcomes of oral history research method. The result helps considerably to understand the mechanisms affecting the notable academic institution in the past and factors influencing the efficiency of scientific research.

- *Crematorium in the Process of Secularization in the Czech lands in the 20th Century. Ideological, Construction and Typological Changes*

The book deals with secularization in a context that brings clarification of how and when certain traditional building types became detached from the influence of religious institutions, authorities or symbols. Crematorium is one of the modern building types the formation of which is closely connected with the promotion of

secular civil rights. The publication concentrates on the development of this construction type in the Czech lands in the 20th century.

Svobodová, M. (Institute of Art History): *Krematorium v procesu sekularizace českých zemí 20. století. Ideové, stavební a typologické proměny.* Artefactum, Praha 2013, 182 s.

- *Jan Amos Comenius's Works*

The new volume of the critical edition created by scientists of the Department for Comenius Studies at the Institute of Philosophy includes the works of Comenius related to the past and present of the Unity of Brethren. Above all, it includes Comenius' edition of the Latin text and Czech translation of the eighth book of History of the Unitas Fratrum written by a Polish noble Jan Łasicki. It is the first issue of the Latin version in modern times. Other two Latin treatises published, *Lesnae excidium* and *Acclamatio votiva*, relate to the Second Northern War in 1656-1658.

Steiner, M. – Havelka, T. – Just, J. – Petráčková, V. – Sousedík, S. – Bečková, M. – Kyrálová, M. – Beneš, J. – Řezníková, L. – Urbánek, V. (eds.) (Institute of Philosophy): Johannis Amos Comenii Opera omnia. Academia, Praha 2013, 444 s.

- *Logic for Masters, Slaves and Kibitzers. Philosophical Guide to Deontic Logic*

The book provides a comprehensive account of philosophical problems associated with the development of tools for the logical analysis of prescriptive discourse and building systems of deontic logic. It presents a historical survey of investigations in the given area and focuses on the key question related to the fact that prescriptive sentences or utterances – commands, regulations, instructions, permissions, etc. – are not truth bearers and hence seem to fall outside of the traditionally conceived domain of logical studies. The central chapters show how important it is to clarify whether we wish to analyze the language means suitable for the description of normative situations or the language means used to issue prescriptions of various kinds. The author suggests that Lewisian language games, in which the Master, the Slave and the Kibitzer take part, can provide a suitable framework for the exploration. The book also focuses on conceptual problems of prescriptive discourse, puts forward an original ontological foundation for the studies that is based on a specific answer to the question of what constitutes the existence (or validity) of a rule or a norm, and addresses problems of the 'kinematics' of commanding and permitting. The readers who will work their way through the book should get a vivid picture of the development of deontic logic and a good insight into the main logico-philosophical problems in the area. This insight should also help them toward a better understanding of some interesting problems concerning the foundations of logic.

Svoboda, V. (Institute of Philosophy): Logika pro Pány, Otroky a Kibice. Filosofický průvodce světem deontické logiky. Filosofía, Praha 2013, 320 s.

- *Morphology and Syntax of Old Hindī*

Based on an early Rājasthānī manuscript from the 17th century, the volume includes a detailed description of morphological structure and case syntax of Old Hindi in the

form preserved in a collection of religious texts recorded in East Rajasthan. The publication also contains a partial edition of the oldest preserved manuscript holding this script. The monograph also contributes to the study of historical development of new Indo-Arian languages.

Strnad, J. (Oriental Institute): Morphology and Syntax of Old Hindī: Edition and Analysis of One Hundred Kabīr vānī Poems from Rājasthān. Brill, Leiden/Boston 2013, 573 s.

- *“I Had a Wonderful Childhood”. Childhood Memories of Ethnic German Inhabitants of Brno in the 1920s-1940s.*

This Czech-German bilingual book has been created by means of the oral history method. The topic chosen focuses on everyday life in the multiethnic Brno of the 1920s up until 1945/1946. The partners for the interviews, recorded in 2009–2012, were people born in the years 1919–1935 who today live in Germany, Switzerland, or Brno. The book begins with a theoretical study of the history of Brno, the theme of childhood and youth in ethnological and historical literature, oral history method and the context of the book's appearance. The publication represents a unique endeavour to map memories of everyday life of children in a Czechoslovak city between the wars and during WWII. The book includes biographical vignettes of respondents, a glossary, street, geographic and name index, and black and white photographs.

Cooperating institutions: Statutory City of Brno, Brno City Archives

Nosková, J. – Čermáková, J. (Etnologický ústav): „Měla jsem moc krásné dětství”. Vzpomínky německých obyvatel Brna na dětství a mládí ve 20.–40. letech 20. století. Archiv města Brna, Brno 2013, 705 s.

APPENDIX 3: EXAMPLES OF COOPERATION WITH THE USER SPHERE WITHIN JOINT PROJECTS OR BASED ON ECONOMIC CONTRACTS

- Development of a low-voltage source for RPW experiment on Solar Orbiter, a probe for the research of the Sun, Astronomical Institute, Czech Space Research Centre, s. r. o.
- Development and operation of a supercomputing facility Amálka used for the development of satellite experiments and interpretation of the data acquired, Astronomical Institute, Sprinx Systems, a. s.
- Development of low-voltage source for RPWI-JUICE experiment on a probe for the research of the planet Jupiter, Astronomical Institute, Sprinx Systems, a. s.
- A proposal and design of a L-DEPP experiment for measuring plasma parameters on the Moon's surface, Astronomical Institute, Czech Space Research Centre, s. r. o.
- Design and development of a data Emanuel gateway for visualization on simulated data, Astronomical Institute, Sprinx Systems, a. s.
- Completion of phase B of mirrors for a cosmic coronagrapher Astronomical Institute, ESA
- Development of a unique technology for growing large Yb:YAG crystals with suppression of spontaneous emission, Institute of Physics, CRYTUR, spol. s r. o.
- Recuperation and thermoelectric conversion of waste heat in combustion engine, Institute of Physics, Sobriety s. r. o., ŠKODA AUTO a. s.
- Sulphid compounds as/like phosphors for solid mass sources of white light, Institute of Physics, CRYTUR, spol. s r. o.
- Utilization of the new satellite navigation system generation for comparison of time scales, Institute of Photonics and Electronics, Dicom, spol. s r. o.
- Research and development of precision casting technologies of new Ni-based superalloys for turbofans and turbines rotor casts, Institute of Physics of Materials, První brněnská strojírna Velká Bíteš, a. s., UJP Praha a. s.
- Protective diffusion coating for high-temperature application at cast Ni-based superalloys, Institute of Physics of Materials, Faculty of Mechanical Engineering, Brno University of Technology
- Creep and oxidation characteristics of E110 claddings under LOCA temperature, Institute of Physics of Materials, UJP Praha a. s.
- Development of hybrid torch pilot plant with plasmatrone for plasma spraying technologies and plasmatrone for pyrolysis and gasification of organic substances and waste, Institute of Plasma Physics, ProjectSoft HK a. s.

- Optical transmission of energy, digital and analogue data including optical information in extreme environments, Institute of Plasma Physics, FOTON, s. r. o.
- Set of safe management regulations and operation of the mine workings at great depths, Institute of Geonics, OKD, a. s., HBZS a. s.
- Analysis of violation in granite rocks occurring in underground storage of spent nuclear fuel, Institute of Geonics, Radioactive Waste Repository Authority
- Development of tools for the support of applied research and experimental ALFA development in the field of energy sources, in environment protection and creation, in reducing negative anthropogenic impacts on the environment and reducing negative consequences of natural disasters and their prevention, Institute of Hydrodynamics of the, Ing. Jindřich Fiedler – Electronics for ecology
- Microfluidic chip for generation of droplets composed of two fluids and their mixing, Institute of Scientific Instruments, PSI (Photon Systems Instruments), spol. s r. o.
- Precise high-voltage power supply with integrated low-voltage DC floating power supply, Institute of Scientific Instruments, TESCAN, a. s.
- New replica of sputtering equipment with improved functionality for depositing B-DLC layers, Institute of Scientific Instruments, BVT Technologies, a. s.
- Microfluidic chip for generation of droplets by flow-focusing. Institute of Scientific Instruments, PSI (Photon Systems Instruments), spol. s r. o.
- New generation of electrochemical sensors and biosensors using thin modified by DLC layers. Institute of Scientific Instruments, BVT Technologies, a. s.
- Electron gun with high voltage power supply for a particle beam optics. Institute of Scientific Instruments, TESCAN, a. s.
- Temperature controlled specimen holder for cathodoluminescence measurements, Institute of Scientific Instruments, FEI Czech Republic, s. r. o.
- Device for casting microfluidic chips, Institute of Scientific Instruments, PSI (Photon Systems Instruments), spol. s r. o.
- CAN bus splitter with USB and Ethernet Interface, Institute of Scientific Instruments, MESING, spol. s r. o.
- New method of the measurement of construction response of containment of nuclear power station to guarantee safety in case of hard accidents, , Institute of Scientific Instruments, Nuclear Physics Institute
- Microfluidic chip for double droplet generation. Institute of Scientific Instruments, PSI (Photon Systems Instruments) spol. s r. o.
- Experimental differential interferometric system for e-beam writer X-Y table measurements. Institute of Scientific Instruments, TESCAN Brno, s. r. o.

- Technique of a defined reduction of optical fibre diameter for vibration sensors, Institute of Scientific Instruments, PROFcomms s. r. o.
- Implementation of effective technology for depositing of thin passivation and ant reflexive coatings into the production of crystalline solar cells, Institute of Scientific Instruments, Solartec s. r. o.
- Development of instrumentation and methodology for the selection of photoautotrophic microorganisms for production of higher-generation biofuels, Institute of Scientific Instruments, PSI (Photon Systems Instruments) spol. s r. o.
- Bioimpedance monitor for pulse wave measurements. Institute of Scientific Instruments, St. Anne's University Hospital Brno.
-
- The use of ashes from biomass combustion and its conversion to the easily applicable fertilizer - the complex study of advantages and risks, Institute of Rock Structure and Mechanics, REAL ECO Technik, spol. s r. o., CZ Biom – The Czech Biomass Association, c. a., Česká rozvojová agentura, o.p.s., Czech University of Life Sciences
- Research and development of new abrasive tools fixed with hybrid bond based on inorganic polymers, Institute of Rock Structure and Mechanics, Česká rozvojová agentura, o.p.s.
- Advanced methods in design, monitoring and assessment of slender dynamically loaded structures, Institute of Theoretical and Applied Mechanics, EXCON, a. s.
- Research on possibilities of earth InSAR for assessment of deformations in risk objects and locations (Verified technology of vertical deflections determination of concrete bridge constructions by means of terrestrial interferometric radar), Institute of Information Theory and Automation, Geodézie Ledec nad Sázavou s. r. o.
- Application of advanced statistical assimilation techniques of model predictions with observations from terrain in the form of modern software tool for emergency management support, Institute of Information Theory and Automation, National Radiation Protection Institute
- Probabilistic distributed industrial system monitor / 7D – Eurostar, Institute of Information Theory and Automation, COMPUREG Plzeň, s. r. o.
- Verified technology of horizontal movement determination of brick factory chimneys by means of terrestrial interferometric radar, Institute of Information Theory and Automation, Geodézie Ledec nad Sázavou s. r. o.
- Ecology of driving, modelling, cluster models, classification, decision making, Institute of Information Theory and Automation, Škoda Auto a. s.
- Interactive power devices for automotive application with increased reliability and safety, Institute of Information Theory and Automation, IMA, spol. s r. o.

- Verified technology of horizontal transversal movements determination of floodgate sides by means of terrestrial interferometric radar, Institute of Information Theory and Automation, Geodézie Ledec nad Sázavou s. r. o.
- GenEx – System for support of the FISH method evaluation, Institute of Information Theory and Automation, UK VÚT Brno, CAMEA, spol. s r. o.
- Design and implementation of traffic exchange and communication interface with module point management traffic logger, Institute of Information Theory and Automation, ELTODO DS
- Implementation of a new principle of fluidic oscillation in the new type of equipments for biogas enrichment and for water treatment, Institute of Thermomechanics, IPRA.CZ spol. s r. o.
- Control system for high power electric converters, Institute of Thermomechanics, ČKD ELEKTROTECHNIKA, a. s.
- Automated diagnostics of extremely loaded structures (engineering constructions), Institute of Thermomechanics, Unica Technologies a. s., Faculty of Civil Engineering, CTU
- Monitoring of fatigue crack growth in fatigue loaded aircraft structures, Institute of Thermomechanics, Honeywell CZ s. r. o., Aircraft Industries, a. s., Kunovice, LÚ FSI VUT Brno
- Monitoring the condition of helicopter gearbox using acoustic emission method, Institute of Thermomechanics, AURA a. s., LOM (VTUL) Praha s. p.
- Control system for high power electric converters, Institute of Thermomechanics, ČKD ELEKTROTECHNIKA, a. s.
- Dispersal strategies of *Ips typographus* (L.) for sustainable development of forest covers in Lower Austria – South Bohemia, Biology Centre, Universität für Bodenkultur, Wien, VetMed Universität, Wien, NP Šumava
- Development of vaccine for protect transmission of ticks transmitted infections based on Ferritin-2 for veterinary and human use, Biology Centre, Bioveta, a. s.
- Development of testing system for determining the effectiveness of materials and biological samples intended to prevent tick-borne diseases (borreliosis, tick-borne encephalitis) intended for the cosmetics industry, human and veterinary medicine, Biology Centre, Bioveta, a. s.
- Patent proposal of a method for multiple immunolocalization in HR SEM, Biology Centre, FEI Czech Republic s. r. o., Delong Instruments a. s., CRYTUR spol. s r. o., Research and Testing Institute Plzeň, Institute of Scientific Instruments, Institute of Macromolecular Chemistry Institute of Molecular Genetics
- Development of molecular-genetic markers for modern breeding and gene engineering of hop (*Humulus lupulus*) based on the system of genomic and expression libraries, Biology Centre, Hop Research Institute, Co., Ltd., Saaz
- Optimization of cultivation conditions for culturing of commercially important alga *Haematococcus* for the production of astaxanthin (pigment with

antioxidant effects), Global Change Research Centre, PSI (Photon Systems Instruments), spol. s r. o.

- SANMOD - The development of a remedial module for variable applications of remediation technology, Global Change Research Centre, MikroChem LKT spol. s r. o.
- Comprehensive research on joint replacements, with improved functional characteristics, based on beta titanium alloys, Institute of Physiology, Company Beznoska, s. r. o., Faculty of Mathematics and Physics, Charles University
- Development of implants, tools and fixators with antibacterial coating on the basis of nanostructured surfaces, Institute of Physiology, Prospan, spol. s r. o., Mikropur, s. r. o.
- Alternative use of antioxidant properties of modified lignin, Institute of Physiology, VIDIA spol. s r. o.
- Development of new transgenic technologies for biomedical research and pharmaceutical industry, Institute of Physiology, Velaz, s. r. o.
- Industrial microfluidization of liposomal and hydrophobic dosage forms, Institute of Physiology, WAKE spol. s r. o., RCD, spol. s r. o.
- Suspension cultivation of spirochetes of leptospirosis and Lyme borreliosis in bioreactor with the aim of production of human and veterinary immunological preparations. Institute of Microbiology, Bioveta Ltd.
- Development of an integrated biorefinery for processing chitin rich biowaste to speciality and fine chemicals (CHIBIO), Mikrobiologický ústav, Apronex s. r. o.
- Optimization of the production of haloalkane dehalogenases in mixed bioreactor, Institute of Microbiology, Enantis Inc.
- Validation of oCellaris software allowing semi-automatic analysis of cell granularity and pH, Institute of Microbiology, Del a. s., Institute of Physiology
- Optimized Lentikats Biocatalysts with immobilized yeasts *Saccharomyces* sp. for biotechnology applications, Institute of Microbiology, LentiKat's a. s., Faculty of Science, Charles University, Prague, Institute of Physiology, Institute of Organic Chemistry and Biochemistry
- IMPULS (Innovation in microbiology – Postdoctoral laboratory and educational centre) , Institute of Microbiology, ENVISAN-GEM, a. s.
- New innovative nano-composite materials based on transition metal chalcogenides for solar coatings, Institute of Inorganic Chemistry, Rokospol a. s., Nanogies s. r. o.
- Progressive technology of multifunctional nanoparticles of zinc oxide, , Institute of Inorganic Chemistry, Synpo, a. s., Rokospol a. s., Nanogies s. r. o.
- Research for the production of multifunctional photoactive nanocomposites for use in the construction industry and for paints, Institute of Inorganic Chemistry, DENAS COLOR a. s., J. Heyrovský Institute of Physical

Chemistry, BARVY A LAKY TELURIA, s. r. o., Technical University of Liberec

- The use of photoactive nanosurfaces, Institute of Inorganic Chemistry, Technical University of Liberec, ATG s. r. o., Isolit-Bravo, spol. s r. o., Retap, spol. s r. o., J. Heyrovský Institute of Physical Chemistry
- Examination of medically important species of mosquitoes to selected arboviruses, Institute of Vertebrate Biology, Regional Hygiene Station in Ostrava
- Microreactor for sulphonation reactions at pilot plant conditions, Institute of Chemical Process Fundamentals, Procter&Gamble, Brussels Innovation Center, Belgium
- Ion Color – ionic liquid based additives, Institute of Chemical Process Fundamentals, BARVY A LAKY TELURIA, s. r. o.
- Removal of endocrine disruptors from wastewater and drinking water using photocatalytic and biological processes, Institute of Chemical Process Fundamentals, Dekonta, a. s.
- New varieties prepared through cross breeding with transgenic potato, Institute of Experimental Botany, Vesa, a. s.
- Study of factors influencing the development of "water bloom" in the water reservoir of Seč, Institute of Experimental Botany, Povodí Labe, s. p.
- Center for Development of Original Drugs, Institute of Experimental Medicine, Institute of Organic Chemistry and Biochemistry UPOL, Institute of Chemical Technology, Prague (ICT), Institute of Physiology MediTox s. r. o., APIGENEX s. r. o., QUINTA-ANALYTICA s. r. o., IOCB TTO s. r. o.
- Development of the business environment in the field of clinical trials for advanced therapies, Institute of Experimental Medicine, EastHorn Clinical Services in CEE s. r. o.
- Development of a process for the abatement of nitrogen oxides for industrial applications for especially demanding conditions, J. Heyrovský Institute of Physical Chemistry Euro Support Manufacturing Czechia s. r. o., CHEMOPROJEKT CHEMICALS s. r. o.
- New materials and technologies for the conservation of the materials of historical monuments and the preventive care, J. Heyrovský Institute of Physical Chemistry, Euro Support Manufacturing Czechia s. r. o., CHEMOPROJEKT CHEMICALS s. r. o.
- The use of photoactive nanosurfaces to solve current problems of air and water cleaning, J. Heyrovský Institute of Physical Chemistry, Retap, spol. s r. o.
- Research for the production of multifunctional photoactive nanocomposites for use in the construction industry and for paints, J. Heyrovský Institute of Physical Chemistry, BARVY A LAKY TELURIA, s. r. o., Denas Color a. s.
- Hemagel - further improvement of healing properties of commercially viable product, Institute of Macromolecular Chemistry, WAKE spol. s r. o.

- Visualization of polymeric nanoparticles in situ. Institute of Macromolecular Chemistry, FEI Czech Republic s. r. o.
- Lanthanoid trackers for identification of explosives and rocket propellants, Institute of Macromolecular Chemistry, Explosia a. s.
- Flexible printed microelectronics based on organic or hybrid materials, FLEXPRIINT, Institute of Macromolecular Chemistry, OPTAGLIO s. r. o., University of West Bohemia, COC Pardubice
- Avian Sarcoma and Leukosis Virus-based Vectors and Their Potential for Transgenesis in Chicken, Institute of Molecular Genetics, BIOPHARM, spol. s. r. o., Research Institute of Biopharmacy and Veterinary Drugs
- New generations of DNA aptamers, Institute of Molecular Genetics, Top-Bio, s. r. o.
- Improved process for the preparation of Tenofovir Disoproxil and its pharmaceutically acceptable salts, Institute of Organic Chemistry and Biochemistry, Zentiva k. s.
- Research Center Gilead Sciences and IOCB, Institute of Organic Chemistry and Biochemistry, Foster City, USA
- Biomedical model of miniature pigs for testing of new medicaments and for new treatments of traumatic spinal cord injury and neurodegenerative diseases, Institute of Animal Physiology and Genetics, Meditox s. r. o.
- Application of spinal cord injury models in preclinical testing of cell therapy, Institute of Animal Physiology and Genetics, Neuralstem Inc.
- Great Moravia and 1150 years of Christianity in Central Europe, Institute of Archaeology, Moravian Museum, Brno
- Archaeological base Mikulcice - representative publications, Institute of Archaeology Brno, Ministry of Culture CR
- VITREA database administration and filling, Institute of Archaeology Prague, Institute of Chemical Technology, Prague (ICT)
- Integrated information system of archaeological sources in Prague, Institute of Archaeology, National Heritage Institute, Prague
- Innovation of educational process in ceramic subjects at SPŠKS Karlovy Vary, Institute of Archaeology Prague, MEYS CR
- Kramerius 4.8 CDK (open source system for digital libraries), Library of the ASCR, Incad, spol. s r. o.
- ProArc 1.0 K4 (open source system for digital document production and archiving), Knihovna, Incad, spol. s r. o.
- The relationships between skills, schooling and labor market outcomes: A longitudinal study, Economics Institute, Faculty of Economics, Technical University of Košice
- Macroeconomic models for prognostics and monetary and policy analysis in developing countries, OGRResearch, s. r. o.

- Migration and Its Consequences in Ukraine, Economics Institute, European Bank for Reconstruction and Development
- The concepts of ideal and charisma of a ruler in the East and West, Oriental Institute, Centre for Medieval Studies, Institute of Philosophy and Charles University
- Reflection on non-Western political thought, Oriental Institute Oriental Institute, Institute of International Relations
- Stress load and burn-out syndrome in health professionals in the Czech Republic, Institute of Psychology, Camera Medica Bohemica

APPENDIX 4.1: OVERVIEW OF INTERNATIONAL SCIENTIFIC COOPERATION OF THE INSTITUTES OF THE ASCR

1. Number of conferences with the participation of foreign scientists (institute as organiser or co-organiser)
2. Number of foreign visits by scientific employees of the institute
 - 2a. of which excepting bilateral agreements
3. Number of active participations of employees of the institute at international conferences
 - 3a. Number of lectures given at these conferences
 - 3b. of which invited lectures
 - 3c. Number of poster presentations
4. Number of lecturers at foreign universities
5. Number of memberships in editorial boards of international journals
6. Number of memberships in bodies of international scientific governmental and non-governmental organisations (societies, committees)
7. Number of lectures by foreign guests at the institute
8. Number of grants and projects financed from abroad
 - 8a. of which from EU programmes

	1	2	2a	3	3a	3b	3c	4	5	6	7	8	8a
I. Mathematics, Physics and Earth Sciences													
Section 1	60	2 788	2 730	1 129	983	257	398	76	190	98	165	51	35
Section 2	19	900	577	633	507	64	175	22	56	116	85	44	31
Section 3	19	586	528	441	280	49	224	9	57	50	21	20	15
TOTAL	98	4 274	3 835	2 203	1 770	370	797	107	303	264	271	115	81
II. Life and Chemical Sciences													
Section 4	25	1 351	1 285	967	389	95	593	20	80	78	74	50	34
Section 5	40	1 501	927	1 233	408	184	821	43	211	126	227	74	46
Section 6	28	915	880	726	374	93	261	46	128	45	75	46	32
TOTAL	93	3 767	3 092	2 926	1 171	372	1 675	109	419	249	376	170	112
III. The Humanities and Social Sciences													
Section 7	23	353	317	273	253	52	24	21	42	48	49	12	8
Section 8	42	305	265	287	276	129	28	11	43	62	25	24	8
Section 9	44	440	342	413	370	144	7	25	151	97	188	10	7
TOTAL	109	1 098	924	973	899	325	59	57	236	207	262	46	23
TOTAL AS	300	9 139	7 851	6 102	3 840	1 067	2 531	273	958	720	909	331	216

APPENDIX 4.2: SELECTED INTERNATIONAL PROJECTS RESOLVED BY THE INSTITUTES OF THE ASCR

PROJECTS OF 7th FRAMEWORK PROGRAMME OF THE EU

Projects of research cooperation (RC)

- Probing Strong Gravity by Black Holes Across the Range of Masses
Coordinator: Astronomical Institute
Co-researchers: 6 institutions from 6 European countries
- Socio-economics Meets Security
Coordinator: University degli Studi di Trento, Italy
Co-researchers: Institute of Sociology and another 10 institutions from 6 countries of the world
- Building a Platform for Enhanced Societal Research Related to Nuclear Energy in Central and Eastern Europe
Coordinator: Karita Research AB, Sweden
Co-researchers: Institute of Sociology and another 17 institutions from 11 European countries

Marie Curie Actions (MCA) – support for training and career development for researchers

- Mesoscopic framework for modeling physical processes in multiphase materials with defects
Researcher: Institute of Physics of Materials
- Real-time non-invasive characterization and selection of oil-producing microalgae at the single-cell level
Researcher: Institute of Scientific Instruments
- Study of protein dynamics in living cells after DNA damage
Coordinator: Institute of Biophysics
Co-researcher: Uniwersytet Jagiellonski, Poland
- Structure and function of the insect Juvenile hormone receptor
Researcher: Biology Centre
- Design and development of novel reagents, tools, and techniques targeting human glutamate carboxypeptidases II and III
Researcher: Institute of Biotechnology

- Elucidating the role of SALMs in the regulation of synapses and NMDA receptors
Researcher: Institute of Physiology
- Substrate specificity, mechanism and biological roles of rhomboid intramembrane proteases
Researcher: Institute of Organic Chemistry and Biochemistry
- Advanced Industrial Microseismic Monitoring
Coordinator: Institute of Geophysics
Co-researchers: 7 institutions from 5 countries of the world

Coordination and Support Actions (CSA)

- Use of model organisms to resolve crucial biological problems on the path to innovations
Coordinator: Biology Centre
Co-researchers: 4 institutions from 3 European countries
- Monitoring Public Opinion on Nanotechnology in Europe
Coordinator: ZSI Wien, Austria
Co-researchers: Institute of Philosophy and another 17 institutions from 11 countries of the world

Support of research infrastructure (CP-CSA-INFRA)

- ARIADNE – Advanced Research Infrastructure for Archaeological Dataset Networking in Europe
Coordinator: University of Florence, Italy
Co-researchers: Institute of Archaeology Prague and another 22 institutions from 15 European countries
- Multinational Advancement of Research Infrastructures on Ageing
Coordinator: Max Planck Gesellschaft zur Förderung der Wissenschaften, Germany
Co-researchers: Economics Institute and another 13 institutions from 9 countries of the world

Projects of frontier research (ERC)

- Spintronics based on relativistic phenomena in systems with zero magnetic moment
Researcher: Institute of Physics

- Mathematical Thermodynamics of Fluids
Researcher: Institute of Mathematics
- Long-term woodland dynamics in Central Europe: from estimations to a realistic model
Researcher: Institute of Botany
- Regular Arrays of Artificial Surface-Mounted Dipolar Molecular Rotors
Researcher: Institute of Organic Chemistry and Biochemistry
- Regime and Society in Eastern Europe (1956–1989). From extended Reproduction to Social and Political Change
Coordinator: Sophia University St. Kliment Ohridski, Bulgaria
Co-researchers: Institute of Contemporary History
- Origins of the Vernacular Mode
Coordinator: Institut für Mittelalterforschung, ÖAW Austria
Co-researchers: Institute of Philosophy and 1 institution from Austria
- Negotiating Modernity: History of Modern Political Thought in East Central Europe
Coordinator: Institute of Contemporary History
Co-researchers: 30 co-researchers from European countries

COOPERATION WITHIN THE NETWORK OF COOPERATION IN SCIENCE AND TECHNOLOGY (COST)

- Rich-Model Toolkit – An Infrastructure for Reliable Computer Systems
Coordinator: IMDEA Software Facultad de Informatica (UPM), Spain
Co-researchers: Institute of Computer Science and another 40 institutes from 15 European countries
- Medieval Europe – Medieval Culture and Technological Means (IS 1005) – The Dictionary of Medieval Latin in Czech Lands – Latinitatis medii aevi lexicon Bohemorum
Coordinator: Institute of Philosophy and another 20 countries of the world
- Individuals, Societies, Cultures and Health (ISCH) – Gender, Science, Technology and Environment (genderSTE)
Coordinator: Institute of Sociology
Co-researchers: 14 institutions from 11 countries

MEYS INTERNATIONAL COOPERATION PROGRAMMES

- ESS – contribution to partnership in large research infrastructure of Pan-European importance
Programme: Projects of large scientific infrastructures for RDI

Researcher: Nuclear Physics Institute

- Doped DLC nanocomposite biomedical rating created by laser hybrid systems
Programme: COST CZ
Coordinator: Institute of Physics
Co-researchers: 4 institutions from European countries
- Separation of fatty acids and lipids from wet algal biomass for the production of 3rd-generation biofuels by enzymatically catalyzed transesterification
Programme: GESHER/MOST
Coordinator: EcoFuel Laboratories s. r. o
Co-researchers: Institute of Chemical Process Fundamentals
- Surface Plasmon Resonance Based Biosensing Using Hybrid Nanoplasmonic Materials Fabricated by Self-Assembly Processes
Programme: KONTAKT II
Coordinator: Institute of Photonics and Electronics
Co-researchers: Ewha Womens University, South Korea

OTHER SELECTED COOPERATION PROJECTS

- Application of magnetic susceptibility as a paleoclimatic proxy on Paleozoic sedimentary rocks and characterization of the magnetic signal
Umbrella organization: UNESCO a International Union of Geological Sciences (IUGS)
Coordinator: Université de Liège, Belgium
Co-researchers: Institute of Geology
- Solar Orbiter – instrument STIX
Umbrella organization: European Space Agency (ESA)
Programme: PRODEX
Coordinator: Astronomical Institute
Co-researchers: 7 institutions from 7 countries of the world
- An investigation and comparison of fluorescent activity among three classes of bats: naive, presumed survivors and European
Umbrella organization: NSS/USA
Coordinator: Institute of Vertebrate Biology
Co-researchers: 2 institutions from the USA
- Corpus of Roman findings in Barbaricum - Corpus of Roman findings on the territory of Moravia
Umbrella organization: Roman-Germanic Commission, Frankfurt an. M., Germany
Coordinator: Roman-Germanic Commission, Frankfurt an. M., Germany
Co-researchers: Institute of Archaeology Brno and another 20 institutions from European countries

- Preservation and Enhancement of Folk Culture Heritage in Central Europe (Etnofolk)
Subsidised from the structural funds, Transnational Cooperation Operational Programme 'Central Europe'
Coordinator: Institute of Ethnology
Co-researchers: 5 institutions from 4 European countries
- PALADIUM – Court Residences as Places of Exchange in Late Medieval and Early Modern Europe (1400-1700)
Umbrella organization: ESF
Coordinator: Institute of Art History
Co-researchers: 10 institutions from European countries
- Moravia – Great-Moravian Cemeteries
Coordinator: Institute of Archaeology of the ASCR Brno
Co-researchers: 4 institutions from 4 European countries
- A Corpus of Sources to the History of Jews in the Late Medieval Holy Roman Empire
Coordinator: Arye-Maimon-Institut Trier, Germany
Co-researchers: Institute of Philosophy and another 5 institutions from European countries and Israel
- Responsibility, Formal Knowledge and the Life-World
Coordinator: Murdoch University, Australia
Co-researchers: Institute of Philosophy and 1 institution from Australia
- European Network of Research and Documentation of Ancient Greek Drama
Coordinator: Institute of Philosophy
Co-researchers: 22 institutions

SIGNIFICANT PUBLICATIONS

- Early Responses to the Mendeleev Periodic System of Elements
Coordinator: Institute of Contemporary History
Co-researchers: 17 institutions from European countries and Japan
- Greek-Old Church Slavonic Lexicon-Index
Coordinator: Institute of Slavonic Studies
Co-researchers: 5 institutions from European countries
- The Dictionary of Medieval Latin in the Czech Lands

Coordinator: Institute of Philosophy

Co-researchers: 12 institutions from 12 countries of the world

- Linguistic Atlas of Europe
Umbrella organization: UNESCO
Coordinator: Romanian Academy of Sciences
Co-researchers: another 60 institutions from 40 European countries
- Historical Town's Atlas of the Czech Republic
Umbrella organization and coordinator: International Commission for the History of Towns
Co-researchers: Institute of History and another 60 institutions from 14 European countries

APPENDIX 5: OVERVIEW OF IMPORTANT INTERNATIONALLY ATTENDED CONFERENCES ORGANIZED BY THE INSTITUTES OF THE ASCR

The institutes of the ASCR actively participate in international scientific meetings abroad and organise a number of international scientific congresses and conferences in the CR. These activities help to extend scientific cooperation, to augment the prestige of Czech science on an international scale, to establish new scientific contacts and to engage the Czech scientific community into the European research area. Meetings also give scientists significant occasions for the presentation of new results of scientific research and for the exchange of opinions and valuable knowledge. The overview given below includes examples of significant scientific events with international participation organised or co-organised by the institutes of the ASCR in 2013.

I. Mathematics, Physics and Earth Sciences

- CESRA Workshop 2013
Organizer: *Astronomical Institute* – number of participants 120, of whom 100 foreign; held on: June 24–29, 2013
- SPIE Optics and Optoelectronics 2013
Organizers: SPIE (International Society for Optics and Photonics), *Institute of Physics* – number of participants 800, of whom 750 foreign; held on: April 15–18, 2013
- Frontiers of Quantum and Mesoscopic Thermodynamics
Organizer: *Institute of Physics* – number of participants 196, of whom 183 foreign; held on: July, 29 – August 3, 2013
- 16th International Congress of Speleology
Organizers: Czech Speleological Society, *Institute of Geology* – number of participants 1, 007, of whom 893 foreign; held on: July 21–28, 2013
- European Control Conference 2013
Co-organizer: *Institute of Mathematics* – number of participants 1, 000, of whom 995 foreign; held on: July 17–19, 2013
- Equadiff 13
Organizer: *Institute of Mathematics* – number of participants 354, of whom 267 foreign; held on: August 26–30, 2013
- SOFSEM 2013
Organizer: *Institute of Computer Science* – number of participants 99, of whom 82 foreign; held on: January 26–31, 2013
- HADES Collaboration Meeting XXVI
Organizer: *Nuclear Physics Institute* – number of participants 63, of whom 57 foreign; held on: May 27–31, 2013

- ManyVal'13: Games, Decisions and Rationality
Organizers: *Institute of Computer Science, Institute of Information Theory and Automation* – number of participants 39, of whom 27 foreign; held on: September 4–6, 2013
- Engineering Mechanics 2013
Organizer: *Institute of Thermomechanics* – number of participants 132, of whom 24 foreign; held on: May 13–16, 2013

II. Life and Chemical Sciences

- 10th Carbohydrate Bioengineering Meeting
Organizer: *Institute of Microbiology* – number of participants 350, of whom 305 foreign; held on: April 21–24, 2013
- 26th Congress of the Czechoslovak Society for Microbiology
Organizers: St. Anne's University Hospital, *Institute of Microbiology* – number of participants 450, of whom 255 foreign; held on: June 24–25, 2013
- 9th International Pollen Monitoring Program Meeting Prague
Organizers: *Institute of Botany, Faculty of Science, Charles University, Prague* – number of participants 56, of whom 46 foreign; held on: August 26–30, 2013
- European Aerosol Conference 2013
Organizers: Czech Aerosol Society, *Institute of Chemical Process Fundamentals* – number of participants 997, of whom 994 foreign; held on: September 1–6, 2013
- FENS Featured Regional Meeting
Organizer: *Institute of Experimental Medicine* – number of participants 626, of whom 536 foreign; held on: September 11–14, 2013
- Conference ESOR 2013
Organizers: *Institute of Organic Chemistry and Biochemistry, Faculty of Science, Charles University in Prague* – number of participants 224, of whom 179 foreign; held on: September 1–6, 2013
- Smart and Green Interfaces 2013 (MP1106 Workshop)
Organizers: *Institute of Chemical Process Fundamentals* – number of participants 142, of whom 130 foreign; held on: March 21–22, 2013
- XXV. International Symposium on Molecular Beams 2013
Organizer: *J. Heyrovský Institute of Physical Chemistry* – number of participants 115, of whom 104 foreign; held on: June 9–13, 2013
- Zoological Days Brno 2013
Organizer: *Institute of Vertebrate Biology* – number of participants 487, of whom 71 foreign; held on: February 7–8, 2013

III. Humanities and Social Sciences

- The Cyril and Methodius Mission and Europe – 1150 Years Since the Arrival of the Thessaloniki Brothers in Great Moravia
Organizers: *Institute of Archaeology Brno*; Institute of History; Institute of Slavonic Studies – number of participants 220, of whom 23 foreign; held on: May 13–17, 2013
- 19th Annual Meeting of the European Association of Archaeologists
Organizer: *Institute of Archaeology* – number of participants 1,397, of whom 1,249 foreign; held on: September 4–8, 2013
- 45th International Conference on Medieval Archaeology – *Archaeologia historica*
Organizer: *Institute of Archaeology* – number of participants 120, of whom 40 foreign; held on: September 16–19, 2013
- New Emigration from the Czech Republic after 1989 and Return Politics
Organizers: Senate of the Parliament CR, *Institute of Ethnology* – number of participants 200, of whom 150 foreign; held on: September 30–October 1, 2013
- Prague: the City of National Minorities
Organizers: Magistrate of the Capital City of Prague, House of National Minorities – number of participants 320, of whom 80 foreign; held on: November 26, 2013
- LOGICA 2013
Organizer: *Institute of Philosophy* – number of participants 59, of whom 37 foreign; held on: June 17–21, 2013
- Conference Philosophy and Social Sciences
Organizer: *Institute of Philosophy* (Centre of Global Studies) – number of participants 92, of whom 88 foreign; held on: May 23–26, 2013
- The Causes, Means and Consequences of Resettlements of Nations in the 20th Century
Organizers: *Institute of History*, Institute of History SAV – number of participants 80, of whom 31 foreign; held on: October 23–24, 2013
- A Ceremonial Meeting to Commemorate the 1150th Anniversary of St. Cyril and Methodius' Arrival in Great Moravia
Organizers: *Institute of History* – number of participants 125, of whom 40 foreign; held on: October 22, 2013
- Inforum 2013
Co-organizer: Library – number of participants 500, of whom 100 foreign; held on: May 20–21, 2013
- Social Processes and Personality
Organizer: *Institute of Psychology* – number of participants 85, of whom 35 foreign; held on: September 23–25, 2013

- Ethnographies of Higher Education: Researching and Reflecting “at Home”
Co-organizer: *Institute of Sociology* – number of participants 50, of whom 25 foreign; held on: May 22–24, 2013
- The Past is the Battleground of our Contemporaries
Organizer: *Institute of Contemporary History* – number of participants 150, of whom 50 foreign; held on: January 24–25, 2013
- Viktor Knapp
Organizers: *Institute of State and Law*, Law Faculty of Charles University – number of participants 150, of whom 50 foreign; held on: December 12–14, 2013

APPENDIX 6: OVERVIEW OF THE MOST IMPORTANT ACTIVITIES OF COOPERATION WITH UNIVERSITIES AND OTHER HIGHER EDUCATION INSTITUTIONS

1. Number of PhD. graduates trained at the institutes
2. Newly accepted doctoral students
3. MS/MA students trained at the institutes
4. Pre-graduate students at the institutes sharing in scientific activities
5. Number of hours lectured by employees of the ASCR at HEIs, 5a – Spring Semester, 5b – Fall Semester
6. Number of cycles of semester lectures, seminars and exercises led by employees of the ASCR at HEIs, 6a – Spring Semester, 6b – Fall Semester

ASCR Institute	1.	2.	3.	4.	5a	5b	6a	6b
I. RA								
1 ASÚ	3	1	14	14	169	125	11	8
1 FZÚ	15	12	27	53	1818	2985	78	145
1 MÚ	3	6	10	1	1 277	1 223	26	28
1 ÚI	2	14	12	3	651	1 045	27	46
1 ÚJF	1	9	16	23	684	459	29	21
1 ÚTIA	6	8	39	20	1 248	1 066	54	52
	30	50	118	114	5 847	6 903	225	300
2 ÚFE	1	6	9	4	132	126	2	4
2 ÚFM	4	7	11	11	217	367	8	12
2 ÚFP	3	6	27	29	451	282	38	22
2 ÚPT	3	2	19	10	116	73	15	19
2 ÚH	2	0	5	0	242	170	10	8
2 ÚTAM	0	0	2	3	232	244	13	21
2 ÚT	2	0	7	10	1 176	0	58	0
	15	21	80	67	2 566	1 262	144	86
3 GFÚ	2	2	5	7	44	198	2	7
3 GLÚ	1	4	8	2	230	435	14	23
3 ÚFA	0	6	17	6	388	315	19	18
3 ÚGN	4	2	10	5	271	410	18	21
3 ÚSMH	2	4	4	4	105	283	17	18
	9	18	44	24	1 038	1 641	70	87
II. RA								
4 ÚIACH	2	4	11	19	25	45	1	2
4 ÚACH	0	3	8	26	122	160	5	4
4 ÚCHP	3	7	7	11	514	603	22	39
4 ÚFCH JH	4	9	12	25	367	1 003	43	51
4 ÚMCH	7	11	6	14	275	253	9	10
4 ÚOCHB	16	30	49	18	261	282	6	11
	32	64	93	113	1 564	2 346	86	117

APPENDIX 6 – CONTINUED

ASCR Institute	1.	2.	3.	4.	5a	5b	6a	6b
5 BFÚ	9	14	37	43	764	798	11	15
5 BTÚ	3	7	11	11	65	206	7	19
5 FGÚ	5	12	26	19	768	747	33	42
5 MBÚ	11	19	140	164	674	785	54	58
5 ÚEB	4	15	48	36	1 005	990	39	35
5 ÚEM	3	11	22	21	240	354	20	21
5 ÚMG	9	13	39	39	165	343	8	16
5 ÚZFG	4	27	12	15	289	350	11	11
	48	118	335	348	3 970	4 573	183	217
6 BC	28	14	134	84	1 957	2 350	136	161
6 BÚ	2	7	57	22	702	261	19	13
6 CVGZ	7	11	13	17	296	304	63	63
6 ÚBO	6	7	45	90	450	576	48	47
	43	39	249	213	3 405	3 491	266	284
III. RA								
7 KNAV	0	0	0	0	0	18	0	12
7 NHÚ	12	48	0	0	1 640	1 408	24	43
7 PSÚ	2	8	45	6	595	693	53	43
7 SOÚ	3	2	66	51	1 078	1 440	51	56
7 ÚSP	0	3	0	0	1 071	977	71	79
	17	61	111	57	4 384	4 536	199	233
8 ARÚB	1	1	3	2	459	537	17	20
8 ARÚP	2	1	4	5	919	741	46	37
8 HÚ	2	1	41	0	1 360	1 443	84	116
8 MÚA	6	0	73	3	1 187	1 163	110	102
8 ÚDU	5	2	0	0	474	484	28	30
8 ÚSD	0	2	98	20	1 223	1 316	65	63
	16	7	219	30	5 622	5 684	350	368
9 EÚ	1	1	0	10	860	866	55	53
9 FLÚ	7	7	54	10	3 843	3 247	203	168
9 OÚ	2	4	0	0	350	333	13	13
9 SLÚ	0	0	11	1	396	335	33	29
9 ÚČL	0	3	24	0	1 122	1 432	62	68
9 ÚJČ	4	4	24	4	1 335	1 247	60	62
	14	19	113	25	7 906	7 460	426	393
S 1	30	50	118	114	5 847	6 903	225	300
S 2	15	21	80	67	2 566	1 262	144	86
S 3	9	18	44	24	1 038	1 641	70	87
S 4	32	64	93	113	1 564	2 346	86	117
S 5	48	118	335	348	3 970	4 573	183	217
S 6	43	39	249	213	3 405	3 491	266	284
S 7	17	61	111	57	4 384	4 536	199	233
S 8	16	7	219	30	5 622	5 684	350	368
S 9	14	19	113	25	7 906	7 460	426	393
TOTAL RA	224	397	1 362	991	36 302	37 896	1 949	2 085

APPENDIX 7: PROJECTS OF OPERATIONAL PROGRAMMES STARTED IN 2013

Recipient Coordinator	Project name	Total sum of subsidy approved for the project in thousands of CZK
OP Czech Republic – Poland		
MBÚ	Pollen and food allergies know no borders! Joint research and education.	348
OP Czech Republic – Austria		
ÚTAM	Use of nanomaterials for sustainable preservation of historical and architectural sculptural works from Lithothamnion limestone	2 415
OP Human resources and employment		
BC	Children group MOTÝL	1 237
BÚ	Průhoníček – Company nursery school at the Institute of Botany, the Průhonice Park.	1 237
OP Prague – Adaptability		
SSČ	Academic children group Národní	2 856
OP Prague – Competitiveness		
FZÚ	FUNBIO	60 608
OP Education for Competitiveness		
CVGZ	Environmental metabolics and Ecophysiology scientific team: forming and connecting to the international network	27 510
MBÚ	ALGAMAN – Development of human resources in the research on photosynthesis and algal biotechnologies	30 000
ÚMG	Development of BIOCEV team – a key condition for excellence	10 255

Among the most significant and the most expensive projects of the EU Structural Funds Operational Programmes resolved at the institutes of the ASCR belongs building and modernization of research infrastructures financed from RDIOP and OPPC.

APPENDIX 8.1: ECONOMIC MANAGEMENT OF PUBLIC RESEARCH INSTITUTIONS OF THE ASCR IN 2013

In thousands of CZK

Institute	Total revenues	of which		Total expenses	of which		Economic results (profit +) (loss -)
		Transfers from the SB	Own resources		Personnel costs	Material costs	
1 ASÚ	132 495	104 179	28 316	131 254	82 903	48 351	1 242
1 FZÚ	921 310	745 968	175 343	890 906	558 309	332 597	30 405
1 MÚ	62 106	54 767	7 339	62 106	46 512	15 594	0
1 ÚI	85 799	72 727	13 072	83 718	61 104	22 613	2 081
1 ÚJF	257 866	182 777	75 088	248 448	123 313	125 135	9 418
1 ÚTIA	137 964	120 687	17 277	135 839	103 465	32 374	2 125
2 ÚFE	116 213	85 515	30 698	113 335	62 090	51 245	2 878
2 ÚFM	165 080	114 415	50 665	161 032	87 408	73 624	4 047
2 ÚFP	223 449	148 354	75 095	212 548	113 972	98 576	10 900
2 ÚH	43 829	37 773	6 056	43 562	28 820	14 742	267
2 ÚPT	226 681	147 062	79 619	217 427	95 034	122 393	9 254
2 ÚTAM	119 974	92 039	27 935	119 036	66 761	52 274	938
2 ÚT	138 292	116 215	22 077	138 064	95 337	42 727	228
3 GFÚ	89 824	72 455	17 369	89 067	57 590	31 477	757
3 GLÚ	67 972	46 927	21 045	67 799	38 076	29 723	173
3 ÚFA	82 193	63 524	18 669	81 508	52 570	28 938	685
3 ÚGN	95 488	73 611	21 878	95 487	58 567	36 921	1
3 ÚSMH	97 347	76 082	21 265	97 116	53 707	43 409	231
4 ÚIACH	76 743	61 785	14 957	75 926	43 846	32 080	816
4 ÚACH	75 075	55 045	20 030	74 491	40 182	34 309	584
4 ÚFCH JH	230 811	157 815	72 996	223 864	112 269	111 595	6 947
4 ÚCHP	181 391	136 467	44 925	174 002	95 100	78 902	7 390
4 ÚMCH	309 091	238 234	70 857	305 226	180 557	124 669	3 865
4 ÚOCHB	2 949 058	260 558	2 688 500	1 820 233	276 178	1 544 056	1 128 825
5 BFÚ	171 883	148 349	23 534	171 227	106 611	64 617	656
5 BTÚ	69 826	56 596	13 230	69 252	39 757	29 494	574
5 FGÚ	333 239	241 964	91 275	325 597	172 627	152 970	7 641
5 MBÚ	544 079	349 047	195 032	539 151	250 747	288 405	4 927
5 ÚEB	263 539	150 438	113 101	260 171	110 624	149 547	3 367

5	ÚEM	173 496	127 111	46 386	171 709	87 194	84 515	1 787
5	ÚMG	482 432	354 284	128 148	482 431	203 770	278 661	1
5	ÚŽFG	127 979	79 234	48 745	127 121	64 298	62 822	859
6	BC	411 575	323 466	88 109	410 879	236 041	174 838	696
6	BÚ	211 183	167 140	44 043	211 015	133 368	77 647	168
6	CVGZ	248 782	170 248	78 534	248 391	111 548	136 843	390
6	ÚBO	74 464	47 870	26 594	74 425	44 056	30 370	38
7	KNAV	110 891	91 785	19 106	110 891	39 050	71 841	0
7	NHÚ	89 475	64 746	24 730	89 051	44 494	44 556	424
7	PSÚ	27 929	25 400	2 529	27 927	21 304	6 623	2
7	SOÚ	85 655	72 262	13 393	85 655	59 552	26 103	0
7	ÚSP	24 512	19 458	5 054	24 512	18 748	5 764	0
8	ARÚB	62 724	48 816	13 908	60 876	30 950	29 927	1 848
8	ARÚ	102 307	70 192	32 115	102 183	56 184	45 999	124
8	HÚ	59 189	57 124	2 064	58 227	42 385	15 842	961
8	MÚA	33 517	29 888	3 630	32 613	22 500	10 113	905
8	ÚDU	42 781	38 228	4 553	42 780	26 937	15 843	1
8	ÚSD	42 175	39 334	2 841	42 173	32 584	9 589	2
9	EÚ	39 666	35 152	4 513	39 377	27 114	12 263	289
9	FLÚ	104 421	90 525	13 896	104 421	77 740	26 681	0
9	OÚ	15 816	14 786	1 030	15 738	12 492	3 246	77
9	SLÚ	19 798	18 466	1 332	19 573	14 807	4 766	225
9	ÚČL	53 018	47 211	5 807	53 018	39 830	13 188	0
9	ÚJČ	85 524	79 421	6 103	81 956	65 565	16 391	3 568
O	SSČ	455 114	195 812	259 302	453 838	173 225	280 613	1 276
	ASCR total	11 453 038	6 519 330	4 933 708	10 198 174	4 899 773	5 298 401	1 254 864
	Book depreciation of PRI *)	-1 073 038		-1 073 038	-1 073 038		-1 073 038	
	ASCR total	10 380 000	6 519 330	3 860 670	9 125 136	4 899 773	4 225 363	1 254 864

*) Book depreciation of assets acquired from subsidy that do not comprise a resource of the asset reproduction fund.

APPENDIX 8.2: INVESTMENT RESOURCES AND THEIR USE IN 2013

In
thousands
of CZK

Institute	Investment resources total	Use of investment resources total	of which				FRM at the end of the period (source by 2014)
			Buildings	Instruments	Mntn and repairs	Other	
1 ASÚ	22 462	12 094	337	6 738	0	5 019	10 368
1 FZÚ	2 523 133	1 005 277	309 360	677 447	3 729	14 742	1 517 856
1 MÚ	5 107	1 466	0	114	836	516	3 641
1 ÚI	8 369	445	130	315	0	0	7 924
1 ÚJF	102 384	75 486	26 423	48 985	0	78	26 898
1 ÚTIA	3 043	481	0	481	0	0	2 562
2 ÚFE	40 778	23 031	4 352	18 284	0	395	17 747
2 ÚFM	113 941	92 506	815	87 345	3 169	1 176	21 435
2 ÚFP	72 985	47 969	4 528	41 594	0	1 847	25 016
2 ÚH	10 863	998	0	998	0	0	9 865
2 ÚPT	34 845	29 527	1 191	27 962	0	374	5 318
2 ÚTAM	75 857	59 133	29 303	29 829	0	0	16 725
2 ÚT	42 599	15 495	5 565	8 851	0	1 079	27 104
3 GFÚ	12 316	3 981	1 568	2 033	0	380	8 334
3 GLÚ	12 278	6 160	0	6 160	0	0	6 118
3 ÚFA	6 486	2 393	49	1 434	641	270	4 093
3 ÚGN	10 405	5 311	1 664	3 307	0	341	5 094
3 ÚSMH	10 470	9 555	0	5 772	3 777	6	914
4 ÚIACH	9 045	7 603	3 260	3 883	0	460	1 442
4 ÚACH	7 684	4 316	0	3 911	0	405	3 368
4 ÚFCH JH	62 047	51 055	11 835	39 220	0	0	10 991
4 ÚCHP	11 295	11 235	522	10 713	0	0	60
4 ÚMCH	97 194	58 380	7 109	50 266	0	1 005	38 814
4 ÚOCHB	2 094 616	1 006 293	967 641	35 127	3 524	0	1 088 323
5 BFÚ	23 333	15 516	10 867	4 649	0	0	7 817
5 BTÚ	5 324	5 324	0	5 324	0	0	0
5 FGÚ	35 709	17 764	0	12 331	3 844	1 589	17 945
5 MBÚ	107 971	87 911	24 768	57 508	0	5 635	20 060
5 ÚEB	52 406	43 777	118	41 901	1 639	119	8 629

5	ÚEM	14 566	13 879	4 800	9 079	0	0	686
5	ÚMG	122 523	122 523	61 047	61 440	0	35	0
5	ÚŽFG	53 762	34 746	3 008	31 506	0	231	19 017
6	BC	53 966	34 246	2 385	31 698	0	163	19 720
6	BÚ	28 272	24 250	13 299	10 771	0	180	4 022
6	CVGZ	384 598	260 570	135 579	122 134	0	2 857	124 029
6	ÚBO	16 440	10 069	8 364	1 426	0	279	6 371
7	KNAV	23 543	8 909	0	7 774	306	828	14 634
7	NHÚ	3 844	1 964	1 840	0	124	0	1 880
7	PSÚ	4 033	0	0	0	0	0	4 033
7	SOÚ	7 129	195	153	42		0	6 934
7	ÚSP	1 288	397	0	0	0	397	891
8	ARÚB	65 348	64 730	60 639	775	0	3 316	618
8	ARÚ	13 251	2 624	1 515	712	0	397	10 627
8	HÚ	1 781	948	0	948	0	0	833
8	MÚA	18 312	17 000	15 635	1 365	0	0	1 311
8	ÚDU	4 288	570	153	416	0	0	3 719
8	ÚSD	3 437	0	0	0	0	0	3 437
9	EÚ	3 084	509	0	509	0	0	2 575
9	FLÚ	15 396	3 298	153	2 946	199	0	12 097
9	OÚ	702	66	0	0	0	66	635
9	SLÚ	2 036	524	473	51	0	0	1 512
9	ÚČL	9 270	224	0	134	0	90	9 046
9	ÚJČ	15 553	528	0	520	0	8	15 025
O	SSČ	62 052	58 755	42 655	8 550	7 328	221	3 297
ASCR total		6 543 417	3 362 006	1 763 107	1 525 281	29 117	44 501	3 181 411

**APPENDIX 9.1: NUMBER OF EMPLOYEES, WAGE RESOURCES AND EARNINGS
IN 2013**

Institute	Adjusted number of employees total	Wage and salary resources in thous. of CZK			Other personnel costs in thous. of CZK			Average monthly earning in CZK
		Total	of which		Total	of which		
			Institutional	Special-purpose and extra-budgetary		Institutional	Special-purpose and extra-budgetary	
1 ASÚ	120,24	58 333	42 448	15 885	2 521	1 277	1 244	40 428
1 FZÚ	818,55	399 427	202 413	197 014	7 764	2 348	5 417	40 664
1 MÚ	65,81	33 453	26 878	6 574	801	376	425	42 360
1 ÚI	90,78	41 011	29 155	11 855	2 902	365	2 537	37 647
1 ÚJF	199,06	87 347	53 341	34 006	1 107	526	581	36 566
1 ÚTIA	139,08	71 595	44 250	27 345	2 670	958	1 712	42 898
2 ÚFE	90,39	44 178	34 213	9 964	930	502	428	40 729
2 ÚFM	131,40	62 014	28 948	33 065	890	235	655	39 329
2 ÚFP	167,93	79 917	38 565	41 352	2 400	1 571	829	39 658
2 ÚH	46,70	20 378	16 336	4 042	741	216	525	36 363
2 ÚPT	147,24	66 967	30 565	36 402	3 637	829	2 808	37 901
2 ÚTAM	102,54	46 292	16 141	30 151	2 038	257	1 781	37 621
2 ÚT	176,74	68 005	50 504	17 500	493	70	423	32 064
3 GFÚ	94,41	41 345	31 509	9 836	895	385	510	36 494
3 GLÚ	67,76	26 747	22 823	3 924	1 188	848	341	32 894
3 ÚFA	79,81	36 702	24 498	12 204	786	265	521	38 322
3 ÚGN	99,88	41 470	24 168	17 303	1 246	391	855	34 600
3 ÚSMH	101,93	38 478	29 230	9 248	1 181	572	610	31 458
4 ÚIACH	66,86	31 208	18 278	12 930	450	226	224	38 897

4	ÚACH	63,51	27 623	20 553	7 070	1 346	779	566	36 245
4	ÚFCH JH	158,96	78 222	43 009	35 213	2 422	397	2 025	41 007
4	ÚCHP	153,38	67 802	37 001	30 800	1 398	326	1 072	36 838
4	ÚMCH	252,88	130 496	79 980	50 516	1 693	361	1 332	43 003
4	ÚOCHB	451,03	194 999	117 645	77 355	2 879	1 154	1 725	36 029
5	BFÚ	159,09	76 377	44 033	32 344	1 747	367	1 380	40 007
5	BTÚ	67,44	28 282	12 500	15 782	364	226	138	34 947
5	FGÚ	310,43	123 071	70 049	53 021	3 251	1 678	1 573	33 038
5	MBÚ	466,63	178 981	86 024	92 957	3 204	899	2 305	31 963
5	ÚEB	196,84	78 567	40 524	38 043	1 684	544	1 140	33 262
5	ÚEM	151,77	62 149	31 312	30 837	2 037	665	1 372	34 124
5	ÚMG	325,91	144 366	54 743	89 623	3 828	874	2 955	36 914
5	ÚŽFG	130,32	44 888	24 768	20 120	954	248	706	28 704
6	BC	430,53	164 353	95 651	68 702	9 475	1 248	8 227	31 812
6	BÚ	270,16	93 076	54 829	38 247	3 549	862	2 687	28 710
6	CVGZ	192,77	77 853	19 811	58 041	3 762	1 449	2 313	33 655
6	ÚBO	75,99	28 506	14 630	13 876	3 591	358	3 233	31 261
7	KNAV	81,10	25 535	23 029	2 507	2 992	1 230	1 762	26 239
7	NHÚ	75,90	29 693	18 523	11 170	3 322	814	2 508	32 601
7	PSÚ	31,88	14 450	10 490	3 961	1 153	410	743	37 773
7	SOÚ	86,68	38 354	21 053	17 301	5 808	2 338	3 470	36 873
7	ÚSP	32,06	12 860	11 498	1 362	584	505	79	33 426
8	ARÚB	67,17	19 766	15 439	4 326	3 339	732	2 608	24 522
8	ARÚ	104,30	36 348	25 181	11 166	4 816	1 070	3 746	29 041
8	HÚ	71,23	25 621	23 175	2 445	5 676	1 751	3 926	29 974
8	MÚA	39,40	14 634	11 484	3 150	2 162	1 111	1 051	30 951
8	ÚDU	47,74	17 690	14 206	3 484	1 724	889	835	30 879
8	ÚSD	48,80	21 224	15 151	6 073	2 656	1 496	1 160	36 244
9	EÚ	54,69	18 333	14 631	3 702	1 869	977	893	27 935
9	FLÚ	154,26	53 626	44 709	8 916	3 606	1 778	1 829	28 969
9	OÚ	20,81	8 117	8 117	0	842	812	30	32 503
9	SLÚ	25,71	9 446	8 239	1 207	1 764	1 375	389	30 617
9	ÚČL	81,84	27 755	21 069	6 686	1 447	675	772	28 261
9	ÚJČ	112,90	44 578	30 432	14 146	3 854	1 726	2 128	32 904

O SSČ	279,57	108 897	69 174	39 723	17 716	9 756	7 959	32 460
KAV	73,63	36 713	36 713	0	1 127	1 127	0	41 551
PRI total	8 080,79	3 421 402	1 996 927	1 424 475	147 153	54 092	93 061	35 283
ASCR total	8 154,42	3 458 115	2 033 640	1 424 475	148 280	55 219	93 061	35 340

APPENDIX 9.2: NUMBER OF INSTITUTES AND EMPLOYEES OF THE ASCR BY SECTIONS

	Number of institutes in 2013	Average adjusted number of employees in 2012				Average adjusted number of employees in 2013			
		Total		of whom university educated employees of research units		Total		of whom university educated employees of research units	
		Number	%	Number	%	Number	%	Number	%
1. Section of Mathematics, Physics and Information Science	6	1 352,5	17,3	781,8	17,4	1 433,5	17,6	807,1	17,2
2. Section of Applied Physics	7	820,2	10,5	474,9	10,6	862,9	10,6	499,5	10,7
3. Section of Earth Sciences	5	449,5	5,7	288,8	6,4	443,8	5,4	283,5	6,1
4. Section of Chemical Sciences	6	1 135,4	14,5	761,5	17,0	1 146,6	14,1	775,7	16,6
5. Section of Biological and Medical Sciences	8	1 691,3	21,6	1 050,6	23,4	1 808,4	22,2	1 146,6	24,5
6. Section of Biological-Ecological Sciences	4	912,8	11,7	481,3	10,7	969,5	11,9	511,2	10,9
7. Section of Social-Economic Sciences	5	301,7	3,9	131,6	2,9	307,6	3,8	130,2	2,8
8. Section of Historical Sciences	6	368,0	4,7	200,4	4,5	378,7	4,6	204,2	4,4
9. Section of the Humanities and Philological Sciences	6	441,0	5,6	318,5	7,1	450,2	5,5	320,6	6,8

CAO (SSČ)	1	279,3	3,6	0,0	0,0	279,6	3,4	0,0	0,0
Head Office (KAV)	1	69,5	0,9	0,0	0,0	73,6	0,9	0,0	0,0
ASCR total	55	7 821,2	100,0	4 489,4	100,0	8 154,4	100,0	4 678,6	100,0

APPENDIX 10: ANNUAL REPORT OF THE LEARNED SOCIETY OF THE CZECH REPUBLIC FOR 2012

The Learned Society of the Czech Republic (hereafter 'Society') associates eminent scientists of all research areas. Membership in the Society is possible in two ways: regular and honorary. The condition for membership is a distinctive and creative contribution to science and moral integrity. Significant domestic scientific figures from universities and other higher education institutions, the ASCR or ministry branches may be elected regular members of the Society. The Society associates outstanding researchers from the areas of natural sciences and humanities working in various organisations. The other category is that of honorary members. They are elected from among the significant foreign researchers who have exceptional ties to the Czech scientific community. The Society is tightly selective. The aim of the Society is to stimulate the free and unimpeded cultivation of science in all of its manifestations, to encourage the desire for and enjoyment from knowledge, to spread scientific knowledge in society, to support the the increase in the level of education and a creative, rational and humanly responsible social environment in the Czech Republic

In 2013, the Society was governed by an eight-member Council comprising Petr Pokorný (President), Jiří Bičák (1st Vice President), Václav Pačes (2nd Vice President), Zdeněk Havlas (Scientific Secretary), Tomáš Jungwirth (President of the Section of Mathematical-Physical Sciences), Pavel Jungwirth (President of the Section of Chemical Sciences), Helena Tlaskalová (President of the Section of Biological-Medical Sciences), Jan Bouzek (President of the Section of Social Sciences and the Humanities). At the end of the year, the Society had 102 regular and 40 honorary members.

The premises of the Secretariat were severely damaged at the end of April 2013 by a gas explosion in the neighbouring Divadelní street, therefore the Society continued its work in a makeshift office environment until the end of the year. The Society performed lectures on current issues of science, education, etc., including specialised lectures and profiles at plenary sessions, public lectures on topical issues, and the lectures at the 19th General Assembly and discussion sessions. The Society held seven working meetings. It also organised a three-day excursion for its members to the region of North-West Bohemia with the areas of Most and Sokolov severely modified by opencast mining of lignite. The excursion served as a preparation for the planned conference on energetics. The conference, organized by the Society together with Heidelberg Academy of Sciences and Humanities (HAW), was held in Prague at the headquarters of the ASCR on December 18-19, 2013. The following issues were of primary interest in the conference discussions: the role of renewable resources in energetics and the future of nuclear energetics; the impacts of extraction and burning of lignite on nature and the health of people; current trends of research expected to contribute to new, clean and cheap sources and technologies for acquiring energy. In September, a conference of young German and Czech scientists was held in Heidelberg; the topic was the role of the House of Luxembourg in the history of Europe. The conference was organized by the Society in cooperation with HAW. The Society has been collaborating on many other joint projects with the Göttingen Academy of Sciences and Humanities. In another project, the Society took

care of narrative history of science as it is preserved in the memories of its selected members and had it recorded in the form of interviews. An important source of information both on the activities of the Society and on its members is the website <http://www.learned.cz>. Among other information, lecture presentations can be found there. The members represented the Society at meetings with the representatives of foreign learned societies and scientific institutions. In May, the Society organised the 19th General Assembly at the Karolinum in Prague, with a lecture by Philip Ball and a series of lectures by honorary members of the Society on the topic subtitled “Biomedical research – and where it goes”. During the working part of the Assembly, four new regular and three honorary members were elected. Members of the Endowment Fund for the Support of Science associated with the Learned Society were elected and prestigious Society awards and medals for 2013 were presented ceremonially. The financial aspect of the awards is taken care of by the Endowment Fund for the Support of Science chaired by Jiří Krajčůek.

The prizes and awards obtained:

In the category of “Young Researcher”

Marek Eliáš

Faculty of Science University of Ostrava, for elegant analyses of protist genomes

Martin Lamač

J. Heyrovský Institute of Physical Chemistry, for the development of new metallocene organometallic catalysts

In the category of ‘Secondary school student’

prizes were awarded to 18 students

Award for Pedagogues was received by

Peter Krupka

Gymnázium Brno-Řečkovice

Josef Kubát

(retired)

Medals were awarded to **Blanka Řihová**, a member of the Learned Society (Institute of Microbiology) for outstanding discoveries in targeted polymeric drugs, and to **Pavel Pultr**, a member of the Learned Society (Department of Applied Mathematics of the Faculty of Mathematics and Physics at the Charles University in Prague), whose

work covers various areas of abstract mathematics, such as theory of categories and theory of structures, combinatorics and theory of graphs, or topology.

Prague, February 11, 2014

Petr Pokorný, President of the Learned Society of the Czech Republic

APPENDIX 11: ACTIVITIES OF THE COUNCIL OF SCIENTIFIC SOCIETIES OF THE CR AND THE ASSOCIATED SCIENTIFIC SOCIETIES

The Council of Scientific Societies of the Czech Republic (CSSCR) is an independent, not-for-profit, voluntary association of scientific societies active in the Czech Republic. The CSSCR has been constituted with the aim to formulate, implement and advocate the interests of its member scientific societies and science as a whole, to support their activities and mutual cooperation. The CSSCR performs the tasks in cooperation with the ASCR and with its support. In 2013, the CSSCR affiliated 75 scientific societies having more than 25,000 members – experts, students and individuals interested in science. In 2013, Czech Society for Structural Biology was admitted as a new member. The orientations range from basic research to application and technical areas. Through their activities, the Scientific societies associated in the CSSCR fulfil a unique role in the support of science and its applications thus complementing and broadening the work of the ASCR in a number of directions, particularly in its popularisation efforts.

In 2013, the CSSCR and its scientific societies focused more of their attention to stronger support of science in the CR, including the areas where neither public nor non-public scientific and research institutions are active. The CSSCR encouraged the interest in knowledge and development of science and technology that is not always sufficient in areas where commercial interest, industry, financial investment, political influences and social pressures dominate. Information on the activities of the CSSCR and its societies are published on the following websites: <http://rvs.avcr.cz/aktuality> and <http://rvs.paleontologie.cz/>.

The range of the activities implemented in 2013 was as usual very broad. Scientific societies independently or with the support or direct participation of the CSSCR organised and co-organised a total number of 355 international and national congresses, conferences and seminars; 71 of them were joint Czech-Slovak events.

The societies actively supported instruction at elementary or secondary schools and universities or other higher education institutions through a total of 1,097 events of the type of mathematical, chemical and natural-science or astronomical Olympiad contests, field courses for secondary school and university students, doctoral-candidate seminars, preparatory courses within doctoral study programmes and various competitions. They participated in creating teaching materials and textbooks as well as legal norms. They gave a total of 39 awards to significant personalities of scientific fields and to talented young researchers as recognition of their outstanding work. The scientific societies themselves or by their members are involved in the work of 113 organizations; this is possible mainly thanks to the financial support from the ASCR. In addition, a number of representatives of the CSSCR work in governing bodies of those organizations.

An equally important component of the work of the majority of the societies are their publishing activities. It has often been for dozens of years that scientific societies

issue a number of very important journals and non-periodical publications. In 2013, they published or participated in the publication of 27 internationally distinguished journals and 74 national journals and bulletins, of which four are high-impact (Preslia, Journal of Geosciences, Chemické listy, Geografie). International high-impact journals in particular work as a scientific advert for the societies and a top publishing platform for the researchers from the ASCR and universities or other higher education institutions. There is no substitute for published journals in their role of mediators between research and wider public of information about the current achievements, in communicating information about the work of the societies and about interesting Czech and foreign seminars, congresses and similar events; 194 conference proceedings, books or other non-periodical publications were issued in 2013.

The centre of the work of the majority of the societies, however, consists in their lecture, popularisation and other societal, often interdisciplinary activities. In 2013, the societies organised 1,201 lectures, excursions or seminars and dozens of media inputs and broadcasts, which stimulate the interest of the public, particularly students, in scientific work and enhance the utilization of new information.

An important activity of the societies and of the CSSCR is building their internet pages and making them accessible. The absolute majority of the societies administer their own websites, which contain a great deal of important information for those interested in scientific research and for the media. In 2013, the CSSCR evaluated and in opponent proceedings approved a total of 117 applications for a subsidy from the ASCR for projects of scientific societies. Subsidies from the ASCR allow the societies to expand significantly their publishing and lecturing activities. Within Science and Technology Week 2013, the CSSCR organised lectures for secondary school students. The societies within the CSSCR are segmented into three areas in a way similar to the structure of the ASCR. To point out the most significant result for 2013 in each branch area, let us mention the 10th International Conference on Local Mechanical Properties (Metal Science Society of the Czech Republic) in the area of Mathematics, Physics and Earth Sciences; Environmental changes and adaptation strategies (Czech Bioclimatological Society) in the area of Life and Chemical Sciences; and Symposium Platonicum Pragense, Platos dialogoue Philebus (Czech Plato Society) in the area of the Humanities and Social Sciences.

Based on the above overview of the activities provided for 2013, it is possible to affirm that through their activities the CSSCR and the associated scientific societies fulfil their important role for Czech society. In this way, they distinctly improve not only the general interest in science, but also assist research, knowledge and the attainment of excellence.

In 2013, a change occurred in the Executive Board of the Council of Scientific Societies. One year ahead of term of office expiration, the existing chairman Ivo Hána decided to resign his office having served for 10 years. The Executive Board called election of chairperson to serve for a period of one year. This will allow in the following year the election of the whole Executive Board for the regular period of four years. Ivo Hána remains a regular member of the Executive Board.

APPENDIX 12: ANNUAL REPORT OF THE ACADEMY OF SCIENCES OF THE CZECH REPUBLIC ON THE PROVISION OF INFORMATION ACCORDING TO ACT NO. 106/1999 COLL., ON FREE ACCESS TO INFORMATION, AS SUBSEQUENTLY AMENDED, FOR THE PERIOD JANUARY 1 – DECEMBER 31, 2012

a) Number of requests for information submitted	9
Number of decisions issued to dismiss the request	0
b) Number of appeals submitted against the decision to dismiss the request	0
c) Number of court judgments on the review of the legality of the request dismissal	0
d) Number of exclusive licences granted	0
e) Number of complaints submitted under Section 16a of the Act	0

LIST OF ACRONYMS

Acronym	Name of the Institute or Section
S1	Section of Mathematics, Physics and Information Science
ASÚ	Astronomical Institute of the ASCR
FZÚ	Institute of Physics of the ASCR
MÚ	Institute of Mathematics of the ASCR
ÚI	Institute of Computer Science of the ASCR
ÚJF	Nuclear Physics Institute of the ASCR
ÚTIA	Institute of Information Theory and Automation of the ASCR
S2	Section of Applied Physics
ÚFE	Institute of Photonics and Electronics of the ASCR
ÚFM	Institute of Physics of Materials of the ASCR
ÚFP	Institute of Plasma Physics of the ASCR
ÚH	Institute of Hydrodynamics of the ASCR
ÚPT	Institute of Scientific Instruments of the ASCR
ÚTAM	Institute of Theoretical and Applied Mechanics of the ASCR
ÚT	Institute of Thermomechanics of the ASCR
S3	Section of Earth Sciences
GFÚ	Institute of Geophysics of the ASCR
GLÚ	Institute of Geology of the ASCR
ÚFA	Institute of Atmospheric Physics of the ASCR
ÚGN	Institute of Geonics of the ASCR
ÚSMH	Institute of Rock Structure and Mechanics of the ASCR
S4	Section of Chemical Science
ÚIACH	Institute of Analytical Chemistry of the ASCR
ÚACH	Institute of Inorganic Chemistry of the ASCR
ÚFCH JH	J. Heyrovský Institute of Physical Chemistry of the ASCR
ÚCHP	Institute of Chemical Process Fundamentals of the ASCR
ÚMCH	Institute of Macromolecular Chemistry of the ASCR
ÚOCHB	Institute of Organic Chemistry and Biochemistry of the ASCR

S5 Section of Biological and Medical Sciences
 BFÚ Institute of Biophysics of the ASCR
 BTÚ Institute of Biotechnology of the ASCR
 FGÚ Institute of Physiology of the ASCR
 MBÚ Institute of Microbiology of the ASCR
 ÚEB Institute of Experimental Botany of the ASCR
 ÚEM Institute of Experimental Medicine of the ASCR
 ÚMG Institute of Molecular Genetics of the ASCR
 ÚŽFG Institute of Animal Physiology and Genetics of the ASCR

S6 Section of Biological-Ecological Sciences
 BC Biology Centre of the ASCR
 BÚ Institute of Botany of the ASCR
 CVGZ Global Change Research Centre of the ASCR
 ÚBO Institute of Vertebrate Biology of the ASCR

S7 Section of Social-Economic Science
 KNAV Library of the ASCR
 NHÚ Economics Institute of the ASCR
 PSÚ Institute of Psychology of the ASCR
 SOÚ Institute of Sociology of the ASCR
 ÚSP Institute of State and Law of the ASCR

S8 Section of Historical Science
 ARÚB Institute of Archaeology of the ASCR Brno
 ARÚ Institute of Archaeology of the ASCR Prague
 HÚ Institute of History of the ASCR
 MÚA Masaryk Institute and Archive of the ASCR
 ÚDU Institute of Art History of the ASCR
 ÚSD Institute of Contemporary History of the ASCR

S9 Section of the Humanities and Philological Sciences

EÚ Institute of Ethnology of the ASCR
 FLÚ Institute of Philosophy of the ASCR
 OÚ Oriental Institute of the ASCR
 SLÚ Institute of Slavonic Studies of the ASCR
 ÚČL Institute of Czech Literature of the ASCR
 ÚJČ Institute of the Czech Language of the ASCR

AVCR Academy of Sciences of the Czech Republic
 KAV Head Office of the ASC

MC Ministry of Culture
 MIT Ministry of Industry and Trade
 MEYS Ministry of Education, Youth and Sports
 MH Ministry of Health

MA Ministry of Agriculture
SAO Supreme Audit Office
RIV Information Register of R&D Results
CAO Centre for Administration and Operations ASCR
S (1–9) Section (1–9)

Proposed Resolution of the Academic Assembly

Academic Assembly in accordance with article 14, items b) and e) of the Statutes of the Academy of Sciences CR approves the Annual Report on the Activity of the Academy of Sciences CR for year 2013 (with objections).