The Human Resources Strategy for Researches (HRS4R)

at Jerzy Haber Institute of Catalysis and Surface Chemistry Polish Academy of Sciences (ICSC PAS)

Action Plan for 2022-2025

December 2022

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I. Introduction

1. General information about the Institute

The origins of the present Jerzy Haber Institute of Catalysis and Surface Chemistry of the Polish Academy of Sciences (ICSC PAS) lie in the opening of the Laboratory of Surface Chemistry in 1954, initially as a research unit at the Institute of Physical Chemistry PAS in Warsaw. In 1968, the unit was transformed into the independent Laboratory of Catalysis and Surface Chemistry. In 1978, the Laboratory's status was altered to that of the Institute which would pursue interdisciplinary research of phenomena occurring at gas-solid, gas-liquid and liquid-solid interfaces.

The Institute conducts research combining significant aspects of chemistry, physics, chemical technology, material engineering, biochemistry, biology and medicine. The fundamental theoretical and experimental studies are combined with applied research so that the results obtained can be used directly to improve technological processes. The Institute is equipped with state-of-the-art research facilities, in many cases unique on the national scale.

In 1990, the Institute was granted the right to award doctoral degrees and, in 2000, degrees of 'doktor habilitowany' ('habilitation' rights). In the same year, the International Doctoral Programme was established. In the framework of cooperation with the leading universities of Krakow, students can develop their Master theses at the institute.

In the period 2002-2005, the Institute had the status of the European Center of Excellence 'Cracow Research Center of Molecular Catalysis and Soft Matter'. The Institute was distinguished with a status of the National Leading Research Centre KNOW in physical sciences for 2012 – 2017 in the framework of the Marian Smoluchowski Krakow Research Consortium, formed with faculties of the Jagiellonian University and the AGH University of Science and Technology, as well as with the Henryk Niewodniczański Institute of Nuclear Physics Polish Academy of Sciences.

KNOW | Krajowy Naukowy Ośrodek Wiodący

The Institute has a long-standing tradition of animating and coordinating research in the field of catalysis and surface science in Poland. For over fifty years, the Institute has organized the Polish Annual Conference on Catalysis, the key event for the research community in the field. The Institute is involved in extensive international cooperation. These activities include numerous bilateral international collaboration schemes, research projects of diverse programmes of the European Commission and European Economic Area, as well as actions of the COST Initiative.

2. Mission

The research team of the Jerzy Haber Institute of Catalysis and Surface Chemistry Polish Academy of Sciences is committed to in-depth understanding of phenomena and material transformations occurring at gas-solid, gas-liquid and liquid-solid interfaces through research combining significant aspects of chemistry, physics, chemical technology, material engineering, biology and medicine.

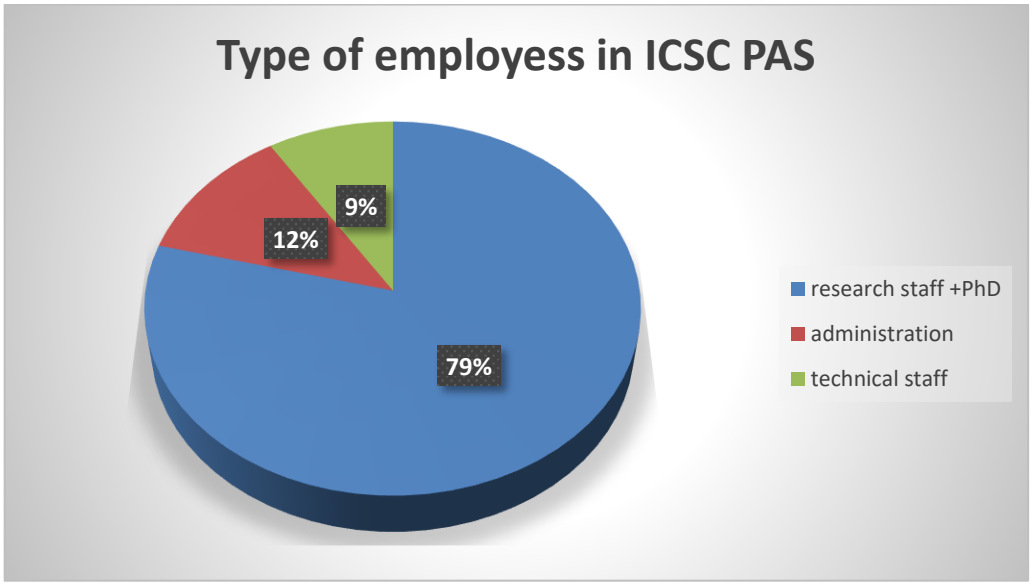
Our fundamental theoretical and experimental studies are combined with applied research so that the results obtained are used in the protection of health, environment and cultural heritage, as well as to improve technological processes.

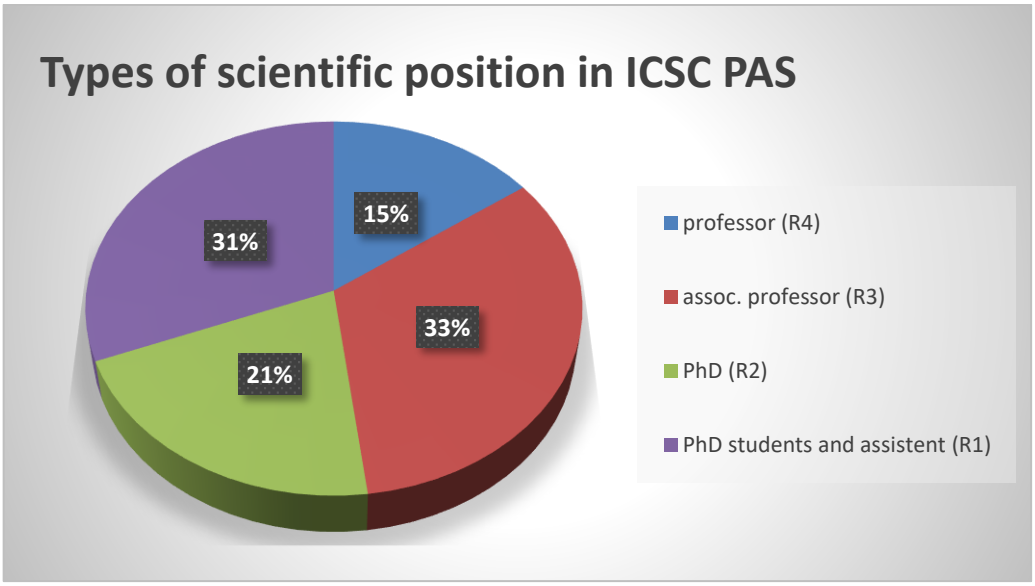
We educate and train doctoral students in the theoretical foundations and methods of surface studies by engaging them in innovative research projects and making available our unique instrumentation.

3. Institute Activity

Currently, there are 130 employees at the ICSC PAS (70 women (56%) and 60 men) and 26 PhD students (18 women (69%) and 8 men), out of which 123 are involved in research, employees + PhD students (70 women 56% and 53 men).

The structure of the ICSC PAS employees is presented in the figures below.





The structure of positions at the Institute is constantly evolving as doctoral students and employees are obtaining subsequent degrees and titles.

Scientific advancements in the year 2016-2022

No. of employees obtaining degrees or titles	2016	2017	2018	2019	2020	2021	2022
title of professor	2	1	0	1	2	2	0
habilitation degree	2	1	2	4	0	3	1
doctoral degree	6	10	3	4	1	9	4

The Institute's activity is based on four pillars

I. Research

II. Education

III. Exploitation

IV. Communication to society

RESEARCH	EDUCATION	EXPLOITATION
STATUTORY RESEARCH GRANTS and PROJECTS FROM EXTERNAL FUNDS COOPERATION with NATIONAL and INTERNATIONAL PARTNERS JOINT RESEARCH with INDUSTRY and PUBLIC INSTITUTIONS	PHD STUDIES MASTER COURSES MASTER THESES BACHELOR THESES SCIENTIFIC TRAINING SEMINARS SCIENTIFIC CONFERENCES RESEARCH INTERNSHIPS CONTINUOUS PROFESSIONAL DEVELOPMENT COURSES DEVELOPMENT of DIGITAL TOOLS SUPPORTING EDUCATION and AWARENESS RISING	COMMERCIALIZATION of RESEARCH RESULTS SUPPORTING PUBLIC INSTITUTIONS in the PRESERVATION of CULTURAL HERITAGE ENGAGING with SOCIETY to ENHANCE CITIZEN SCIENCE POLICY DEVELOPMENT STANDARDISATION
COMMUNICATION to SOCIETY		
OPEN DOOR DAYS SCIENCE FESTIVALS INSTITUTE’s PICNICS RADIO & TV LECTURES in SCHOOLS PAPERS POPULARIZING SCIENCE ARTICLES in NEWSPAPERS		

3.1 Research

Structure

Jerzy Haber Institute of Catalysis and Surface Chemistry Polish Academy of Sciences in Krakow has a well-established and documented scientific both country- and worldwide position that has been steadily growing for the last 50 years. This is a result of the overlap of several key factors, such as excellent research potential, modern research infrastructure, fruitful national and foreign scientific cooperation and well-conducted PhD studies.

ICSC PAS is the only scientific institution in Poland and one of very few in the world solely devoted to interdisciplinary studies of phenomena occurring at gas-solid, gas-liquid and liquid-solid interfaces. The fundamental theoretical and experimental studies carried out in the Institute are combined with applied research encompassing catalytic materials and processes for pollutant removal to protect the environment, manufacturing of innovative biomedical materials and improving materials and methods for cultural heritage conservation.

Currently, the research is carried out in nine research groups and seven independent laboratories which provide their services to the entire research community. The composition of the research groups, their research topics, information about the cooperation, implemented projects, publications, and equipment are presented on the webpage: https://ikifp.edu.pl/en/structure/research-groups/ and https://ikifp.edu.pl/en/research/

Research groups

1. Theoretical and Experimental Biocatalysis
2. Heterogeneous catalysis: theory and experiment
3. Adsorption
4. Physical physicochemistry of colloidal systems
5. Nano and Microscale Systems
6. Nanostructures of Soft Matter
7. Interfacial Interactions in Dispersed Systems
8. Surface Nanostructures
9. Cultural Heritage Research

Laboratories

1. XRD and Thermoanalysis Laboratory
2. Surface Nanostructures
3. Joint Laboratory of Biotechnology and Enzyme Catalysis
4. Laboratory of Atomic Force Microscopy
5. Laboratory of Scanning Electron Microscopy
6. Nanotechnology Laboratory
7. Bioprocess Development Laboratory

The scientific activities of the Institute in the domain of catalysis encompass the design, synthesis, and testing new catalytic materials. In the area of heterogeneous catalysis, the effort is focused on developing new materials, with well-defined structure-property relations, tunable to the requirements of a particular catalytic reaction. The materials under investigation include new types of oxidic structures, nanodispersed metal catalysts and novel micro- and mesoporous inorganic solids, mostly zeolite-based. The work is targeted at the application in processing of selective oxidation reaction of hydrocarbons, selective hydrogenation of bio-waste feedstock as well as small molecules activation including CO_2 and CH_4 utilization. The studies combine experimental and theoretical research and involve the description of kinetic and mechanistic aspects of the studied processes. An important aspect is to provide theoretical background, mostly based on Density Functional Theory (DFT), for catalytic experiments and to lay the foundations to structure-activity relationships for the studied processes. The field of expertise ranges from modelling the structures of transition metal oxides, composite nanomaterials, and enzyme active centers to elucidating catalytic reaction mechanisms.

In the field of surface chemistry of dispersed systems, investigations are focused on adsorption phenomena, surfactants, mechanism of foam formation, nano- and colloidal particles interactions, thin polymer layers, encapsulation of active chemical compounds, nanostructured coatings in an application for biocompatible materials such as stents or bone implants. Model systems, such as well-defined single crystal surfaces, epitaxial films and nanostructures are studied in view of their catalytic and magnetic applications. An important aspect of the research carried out at ICSC PAS is to provide the theoretical background for experimental studies. The field of expertise ranges from elucidating catalytic reaction mechanisms and modelling the structures of transition metal oxides, composite nanomaterials and enzyme active centres, to describing surfactant adsorption at liquid/gas and liquid/liquid interfaces, and simulating polymer particle adsorption on solid homogenous surfaces.

Biocatalytic studies are conducted at ICSC PAS in a group of Theoretical and Experimental Biocatalysis and within the Joint Laboratory of Biotechnology and Enzyme Catalysis, which goes with its organizational framework beyond ICSC PAS. The research conducted in the group focus on fundamental studies of the mechanism for the reaction catalyzed by the enzymes. This goal is pursued with a range of experimental techniques encompassing the whole research cycle, starting from the development and optimization of enzyme expression systems (wild type and recombinant), bacteria growth, enzyme isolation and purification, followed by structural (by means of X-ray crystallography and cryo-EM), kinetic (steady and pre-steady state using spectrophotometric and LC-MS/MS techniques) and biophysical studies. The experimental research is accompanied by theoretical studies such as MD simulation, QM and QM:MM modelling of reaction profiles. The theory is combined with experiments using kinetic isotope studies or prediction of enzyme reactivity and enantioselectivity based on theoretical calculations. The researchers of ICSC PAS pursue several topics, such as the study of i) bacterial and eukaryotic metalloenzymes that catalyze redox reactions (e.g. Fe-dependent monooxygenases, Mo and W-dependent oxidoreductases), ii) bacterial dehydrogenases catalyzing the synthesis of chiral alcohols or regioselective dehydrogenation of steroids as well as iii) bacterial glycin radical synthases that catalyze C-C bond formation. The fundamental studies are supplemented by applied research focusing on developing catalytic methods that can be applied in the pharmaceutical and fine chemical industries. The scope of this study encompasses reaction engineering,

reactor tests, upscaling of reaction scale, enzyme immobilization and analysis of enzyme deactivation processes, as well as rational-based computer-aided enzyme mutation leading to the broadening of substrate specificity. The obtained methods are secured with patents and know-how and transferred to the industrial partners.

One of the focal points in the research carried out at ICSC PAS is the preservation of the cultural heritage at the crossroads of science and the humanities. Research has particularly focused on understanding of environmentally induced deterioration processes, in particular related to microclimatic variations and the monitoring of physical changes in the materials of historical objects using non-invasive research methods. The basic research has been linked to extensive programmes in museums and historical buildings, practical conservation work and the development of tools supporting preservation strategies for collections. Institute has develop of the on-line HERIe software for quantitative assessment of risk of physical damage to cultural objects due to relative humidity variations. The tool is freely available to conservation and museum professionals who do not have specialized competence in modelling the risk of damage to objects, as a support in the decision-making process for the control of indoor environmental conditions in historical buildings and museums. Our researchers experimentally determined properties of historic and artistic materials contained in heritage objects – wood, grounds, paints, parchment, paper – necessary for modelling objects' temperature and moisture response, and determining their vulnerability to physical damage: sorption of water vapour, moisture-related swelling and shrinkage, water vapour diffusion and surface emission, stress-strain relationships, resistance to cracking and fatigue failure. They make use of time-dependent analysis of the response of cultural objects to variations in microclimate parameters, with the use of the finite element method to model water vapour movement and the resulting strain and stress fields across objects, as a tool for quantitative assessment of the risk of physical damage. Moreover, our researchers are involved in the direct tracing of the development of climate-induced physical damage to support the objective assessment of the safety of objects of art in their real-world environments, with the use of acoustic and optical methods.

Research achievements

The research activity of ICSC PAS has been presented in scientific publications. The results from 2016-2021 are presented below:

Publications

	2016	2017	2018	2019	2020	2021
publications (JCR)	112	110	130	142	151	168
chapters in books	4	4+1	6	6	2	1
other publications	21	10	8	6	2	5

The table below summarizes the conference activity of our researchers in the last six years.

Conference activity

	2016	2017	2018	2019	2020	2021
plenary & invited lectures	21	27	22	17	7	17
orals	73	92	137	93	66	100
posters	208	140	216	141	10	57

The current information on publications and patents is published on the websites https://ikifp.edu.pl/en/research/publications/

The Institute is very active in securing funding and conducting research projects, financed from the national budget (statutory project + grants from the Polish funding agencies e.g National Centre for Research and Development, Foundation for Polish Science, Ministry of Science and Higher Education, National Science Centre), European Union funds (EU Framework Programmes for Research and Innovation + Structural Funds), other international agency e.g. Norwegian Research Council, Getty Foundation and others (bilateral research and innovation programmes (e.g. Bilateral Cooperation PAS, Polish National Agency for Academic Exchange).

Projects	2016	2017	2018	2019	2020	2021
Statutory	18	18	17	15	18	21
Polish funding agences	35	31	36	39	33	41
UE COST Action	4	2	2	2	2	1
UE H2020	-	-	-	2	2	3
Structural Funds	-	-	2	1	2	2
Norwegian Research Council	2	1	1	1	1	1
others	1	3	3	7	9	12

The list of projects is available at: https://ikifp.edu.pl/en/research/grants/

The Institute cooperates with leading institutions in Poland and abroad as apart of many networks and consortia. As an example, it is worth mentioning the selected consortia from recent years: E-RIHS PL (2015), Regional Center of Materials Chemistry (2015), Chemical and Medical Sciences (2011), European Research Institute of Catalysis ERIC (2010), Laboratory of Electrochemistry and Surface Chemistry (2007), Interdisciplinary Center for Physical, National Surface Research Laboratory (2002), Interinstitutional Laboratory of Catalysis and Enzyme Biotechnology (2002).

The Institute actively promotes the results of scientific research both in the academic community and in broadly understood society. The Institute's employees and PhD students present their research results at both national and international conferences.

International cooperation

The high international stance of ICSC PAS can be measured by joint publications, conference talks, scientific exchange of our employees and foreign guests with external institutions.

The table below reflects international cooperation of our researchers and students in numbers.

	2016	2017	2018	2019	2020	2021
publications with foreign authors	45	39	51	45	54	69
conference presentations with foreign authors	29	25	57	38	19	49
internships of employees in external institutions	125	106	122	100	2	14
organized conferences	5	4	6	6	3	4
seminars (foreign guests)	25(8)	22(13)	31(17)	30(14)	14(4)	16(6)

The Institute's employees are also actively involved in the organization and co-organization of national and international conferences and working meetings. One of the most important achievements of the Institute in the field of environmental consolidation is the organization of the Polish Annual Conferences on Catalysis that are very popular (usually attract about 200 people from Poland and abroad). The most important conferences organized by ICSC PAS were: a series of 51 Polish Annual Conferences on Catalysis (organized since 1968), 5th EC Conference 'Cultural Heritage Research, and Pan-European Challenge' (2002), 4th International Symposium on Surface Imaging / Spectroscopy at the Solid / Liquid Interface (2015), European School on Interfacial Engineering: Fundamentals, Applications, and Analytical Methods (2017), 8th World Congress on Oxidation Catalysis (2017), 7th Meeting 'X-Ray and other Techniques in Investigations of the Objects of Cultural Heritage' (2018). The international position of the Institute is also demonstrated by the prestigious functions performed by the employees of ICSC PAS: the vice-presidency of EFCATS (European Federation of Catalysis Societies); a membership in the Board of Directors ERIC (European Research Institute on Catalysis); a presidency of ECIS (European Colloid and Interface Society); editorships of 'Current Opinion in Colloid and Interface Science'; 'Colloids and Surfaces A', 'Physicochemical Problems of Mineral Processes'; members of the scientific advisory board of 'Journal of Colloid Interface Science', 'Catalysis Letters', 'Topics in Catalysis', 'Surface Innovations', and 'Innovations & Impact'.

Equipment

The facilities of the Institute are constantly enriched with unique research equipment. Among the large number of scientific equipment, the following are worth highlighting: various microscopes, apparatus for photocatalytic and photoelectrochemical measurements, Ultra-High-Vacuum systems for surface science analysis, thermal analysis and calorimetric equipment as well as equipment for surface nanostructures and thin films analysis, study of art and cultural heritage preservation, equipment for study of air-sensitive enzymes, various installations for conducting catalytic tests, structural analysis of solid materials, and computer clusters for theoretical calculations. In the recent years, the first experimental beamline employing photoemission electron microscope, PEEM, was launched with the Institute`s participation at the National Synchrotron Radiation Center Solaris. Equipment specifications and measurement details are available at:

https://ikifp.edu.pl/en/research/facilities/

Selected outstanding facilities are presented below:

Demonstration Biorefinery

It is a pilot installation of a prototype biorefinery (ended at September 2022). The demonstration prototype will be able to be widely used in the development of Małopolska biotechnology. The installation includes elements that enable the processing of any biomass into higher value products, especially biodegradable bioplastics. It consists of, among other things, a semi-industrial fermentation line (bioreactors with volumes of 5L, 30 and 200L), hydrolysis equipment, advanced dryers and a freeze-dryer, as well as fully equipped preparatory, analytical and biological laboratories. The demonstration prototype biorefinery will be able to be widely used in the development of Lesser Poland biotechnology. It will enable the testing of fermentor strategies for the production of enzymes and other small molecules. The resources of such an installation will not only benefit the academic community, but also industry at large.

Optical Waveguide Lightmode Spectroscopy (OWLS)

OWLS is an excellent method for the *in situ* investigation of protein formation. This technique is capable of monitoring, in real time, changes in the polarizability density, i.e. in the reflective index, in the vicinity of the waveguide surface. The sensing principle in OWLS is based on an evanescent light field, thus confining the probe depth to the region extending less than a few hundred nanometers above the waveguide. The evanescent light originates from light propagating in a planar optical waveguide. OWLS allows for an on-line monitoring of (bio)molecular adsorption and deposition process in real-time without the need for any labeling procedure. OWLS is highly sensitive with a detection limit below10 mg/m^2 and a time resolution of a few seconds. OWLS apparatus in the Institute is only one in Poland.

Electrokinetic Cell used in the streaming potential measurements (SPM)

Streaming Potential is a direct experimental technique providing one with reliable information about the electric charge of interfaces (particles) for various physicochemical conditions. Using thihomemadede apparatus one has a unique possibility of direct, in situ determination of the electric properties of particles, proteins, and bare and covered solid interfaces. The group Physicochemistry of Colloidal Systems possesses two unique electrokinetic cells dedicated to mica and silicon surfaces.

SPR and QCM-D

SPR and QCM are powerful methods that enable sensitive, qualitative, real-time, label-free, and noninvasive detection of adsorbed proteins. SPR determines the dry mass of adsorbed protein from changes in the dielectric constant at the interface, and QCM probes the variation in the electromechanical response of a shear oscillating piezoelectric sensor caused by total mass changes due to the adsorption of biomolecules, with water molecules coupled to the system. Combining the above techniques has provided important information on the mechanisms behind protein-material interactions, structural changes, and biomolecular rearrangements.

CD

Circular dichroism (CD) spectroscopy is a crucial method in structural biology used to examine proteins, polypeptides, and peptide structures. This method is widely recognized as suitable for analyzing structural and conformational changes of proteins after their adsorption or deposition on functionalized surfaces. Studies on the spatial structure of molecules following conformation changes have become increasingly needed in many fields. A few critical applications: protein structure and conformation studies, testing purity of drugs, tracking stereoselectivity processes, kinetic of organic reaction, nanoparticles protein interaction. A high-resolution CD dedicated to the following conformation changes in the far-UV region (180−250 nm) is used to probe the secondary structure, conformation, and stability of proteins in the solution.

FT-IR

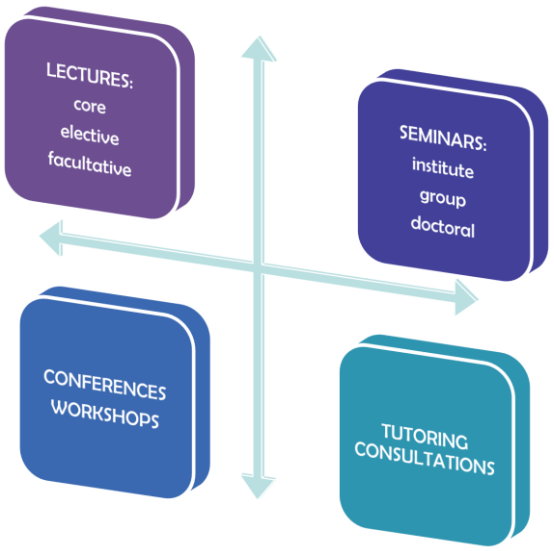
Infrared spectroscopy FT-IR is sensitive to following conformational changes in different kinds of biomolecules upon functional transitions and is an essential method of analyzing changes in biological systems. The imaging of such changes is critical not only from the point of view of clinical diagnosis of diseases but also in the context of fundamental studies on their mechanisms aimed at finding new effective therapies. Infrared absorption spectroscopy is a handy research tool that allows for a precise analysis of the structure of biological systems. For example, using the spectrum of Amide I, it is possible to track changes in the secondary structure of proteins in the context of neurodegenerative diseases caused by changes in the structure of amyloid proteins.

PEEM end-station at the National Synchrotron Radiation Centre SOLARIS

The PEEM end-station operates under the cooperation of the ICSC PAS with the National Synchrotron Radiation Center ‘SOLARIS’ and the AGH University of Science and Technology in Krakow and is a fully equipped ‘surface science laboratory’. The PEEM microscope is owned by the Institute, which is responsible for its functioning and operation in the Solaris synchrotron. PEEM is a photoelectron microscope using low-energy electrons excited by monochromatic X-rays, allowing for selective examination of surfaces, boundary layers, thin films and nanomaterials with a spatial resolution of several dozen nanometers and elemental, chemical and magnetic sensitivity. The unique features of PEEM microscopy allow it to be used in such fields of science as physics, chemistry, materials science, nanomagnetism or geology.

3.2 Education

The Institute has a very rich educational experience. In the years 2000-2022, the Institute, as a coordinator or partner of various doctoral projects, took an active part in educating (as supervisors, mentors, lecturers) almost 400 young students of science. Since then, 129 people (111 PhD students and 18 employees) have successfully completed their doctoral degree under the supervision of the Institute's employees and further 26 PhD students (31.10.2022) are carrying out their PhD research now.



Each of our doctoral students receives the opportunity for comprehensive development: they receive professional mentoring, have the opportunity to participate in lectures given by our employees, employees of partner units and other world-renowned specialists, gain knowledge at group and institute seminars, participate in national and international conferences.

In 1990, when the Institute was granted the right to award degrees of 'doktor habilitowany' ('habilitation' rights), the **International PhD Studies** was established. They are conducted on a full-time basis and last for 4 years. The subjects of doctoral thesis offered by ICSC PAS include a range of specialties, both experimental and theoretical, covering: heterogeneous, homogeneous and enzymatic catalysis, synthesis and physicochemistry of nanomaterials, quantum chemistry of catalytic systems and reactions, colloid chemistry, surfactants and dispersed systems, chemistry and plastic technology, organic, inorganic chemistry and technology as well as cultural heritage science. Within International PhD Studies, in the years 2008-2012 the Institute implemented the project 'Krakow Interdisciplinary PhD-Projects in Nanoscience and Advanced Nanostructures', under which doctoral students carried out their doctoral dissertations in cooperation with foreign centers (including Norway, Sweden, Bulgaria) during the internship.

	Coordinator/Partners	**graduated**	**studying**
INTERNATIONAL PhD STUDIES 2000-present	**Jerzy Haber Institute of Catalysis and Surface Chemistry Polish Academy of Sciences**	**77**	**5**
	Faculty of Chemistry Cracow University of Technology	35(1)	---
	Faculty of Chemical Engineering and Technology Rzeszow University of Technology	34	---
		156(1)	**5**

In 2009-2015, the Institute participated in two Interdisciplinary PhD projects: 1) as a coordinator – in the **Interdisciplinary PhD project 'Molecular sciences for medicine' MolMed**, where PhD students received a PhD in chemical, pharmacology and medical sciences, working under the supervision of two supervisors, representing various scientific institutions and various scientific fields covering: enzymes in biocatalytic transformations for pharmacy, nanoparticles based drug delivery systems, nanoparticles as photoantibiotics, new materials for implants, mechanisms of boosters activities, recognition and molecular mechanisms of oxidative stress, psychiatric disorders, role of pharmacological or neuroendocrine parameters, intracellular pathways by antidepressant drugs, role of central nervous system in the regulation of cytochromes.
2) as a partner – in the **Interdisciplinary PhD project 'Advanced materials for modern technologies and energy of the future' ISD**, where education and research covered physical, chemical and technological aspects of materials science and modern energy; in this project, 60 doctorates (17 at ICSC PAS) implemented an interdisciplinary scientific program, whose task was to prepare young science adepts for the implementation of interdisciplinary research focused on modern technologies.

		graduated	**studying**
INTERDISCIPLINARY PhD PROGRAMME 'Molecular Sciences for Medicine' **2012-2017** **Programme completed**	**Jerzy Haber Institute of Catalysis and Surface Chemistry Polish Academy of Sciences**	**6**	**---**
	May Institute of Catalysis of Pharmacology Polish Academy of Sciences	10	---
	Faculty of Chemistry Jagiellonian University	11	---
	Faculty of Medicine Jagiellonian University Collegium Medicum	13	---
		40	**---**
INTERDISCIPLINARY PhD PROGRAMME 'Advanced Materials for Modern technologies and Energy of the Future' **2012-2017** **Programme completed**	Faculty of Physics and Applied Computer Science AGH University Science and Technology	28	---
	Jerzy Haber Institute of Catalysis and Surface Chemistry Polish Academy of Sciences	**17**	**---**
	The Henryk Niewodniczański Institute of Nuclear Physics Polish Academy of Sciences	15(1)	---
		60	**---**

Since 2017, the Institute participates in two new Interdisciplinary PhD projects:
1) as a coordinator – in the project **InterDokMed 'PhD Studies in Interdisciplinarity for Innovative Medicine'**, where PhD students from different units implement a common framework program, covering classes in various fields and translational sciences; dissertations will be conducted under the supervision of two promoters representing different institutions and fields of science. The choice of implementing units guarantees the implementation of interdisciplinarity through the implementation of scientific research covering more than one area of knowledge (exact sciences / medical sciences), more than one field (chemical / physical / medical sciences) and several scientific disciplines (physics, chemistry, pharmacology, medicine).
2) as a partner – in the project **FCB 'Physical, Chemical and Biophysical Foundations of Modern Technologies and Materials Engineering'**, where the studies offer the opportunity to obtain a degree in the following disciplines: physics, chemistry, biophysics, material engineering and chemical technology.

		graduated	**studying**
INTERDISCIPLINARY PhD Programme 'Interdisciplinarity for innovation medicine' **2017-present**	**Jerzy Haber Institute of Catalysis and Surface Chemistry Polish Academy of Sciences**	**4**	**4**
	May Institute of Catalysis of Pharmacology Polish Academy of Sciences	5	3
	The Henryk Niewodniczański Institute of Nuclear Physics Polish Academy of Sciences	7	1
	Faculty of Chemistry Jagiellonian University	5	6
	Faculty of Medicine Jagiellonian University Collegium Medicum	2	7
		23	**21**
INTERDISCIPLINARY PhD Programme 'Physical Chemical and Biophysical Foundations of Modern Technologies and Materials Engineering' **2017-present**	Faculty of Physics and Applied Computer Science AGH University Science and Technology	4	31
	Jerzy Haber Institute of Catalysis and Surface Chemistry Polish Academy of Sciences	---	**3**
	The Henryk Niewodniczański Institute of Nuclear Physics Polish Academy of Sciences	1	8
	Faculty of Chemistry Jagiellonian University	4	8
	Faculty of Materials Science and Ceramics AGH University Science and Technology	4	11
		13	**61**

Doctoral students who start their doctoral studies before the academic year 2019-2020 academic year will continue their studies under the current regulations. Doctoral dissertation under the old rules must be completed by the end of 2023 (doctoral degree processes of those who do meet this deadline will be discontinued). Also the all doctoral projects, based on 'old' law has been gradually phased-out (to the end of 2023).

On 1st October 2018, the new Law on Higher Education and Science entered. According to the Act, Polish universities and institutes of Polish Academy of Sciences were required to establish doctoral schools. ICSC PAS participate at the moment in two doctoral school: 1) with partners from Krakow (three institutes of Polish Academy and Sciences and two Faculties of University Science and Technology) in **Krakow Interdisciplinary doctoral school KISD**, with where education prepares for obtaining the doctoral degree and is conducted in the following disciplines: physical sciences, chemical sciences, medical sciences, pharmaceutical sciences, material engineering, environmental engineering, mining and energy. Education in KISD is characterized by a modernity and up-to-date research topics as well as a flexible curriculum allowing for selection of classes depending on the needs of the doctoral student. It is carried out through the implementation of an individual research program and education programmes.

2) with partners from Lublin (Maria Curie-Sklodowska University, two institutes of Polish Academy and Sciences and State Research Institute) in **Doctoral School of Quantitative and Natural Sciences**

		graduated	**studying**
KRAKOW INTERDISCIPLINARY DOCTORAL SCHOOL **2019-present**	The Henryk Niewodniczański Institute of Nuclear Physics Polish Academy of Sciences	---	**33**
	Jerzy Haber Institute of Catalysis and Surface Chemistry Polish Academy of Sciences	**---**	**13**
	May Institute of Catalysis of Pharmacology Polish Academy of Sciences	---	**18**
	Institute of Metallurgy and Materials Science Polish Academy of Sciences	---	**14**
	Faculty of Physics and Applied Computer Science AGH University Science and Technology	---	**3**
	Faculty of Materials Science and Ceramics AGH University Science and Technology	---	**3**
			84
DOCTORAL SCHOOL of QUANTITATIVE and NATURAL SCIENCES **2019-present**	Maria Curie-Sklodowska University in Lublin	---	67
	Jerzy Haber Institute of Catalysis and Surface Chemistry Polish Academy of Sciences	**---**	**1**

	The Bohdan Dobrzański Institute of Agrophysics Polish Academy of Sciences	---	10
	The Institute of Soil Science and Plant Cultivation State Research Institute in Pulawy	---	3
			81

The Institute provides PhD students with unique conditions for scientific work: modern laboratories, equipped with apparatuses meeting international standards, organizational, substantive and social support. PhD students of the Institute are leaders and investigators of many scientific projects (PRELUDIUM, DOCTUS) and obtain prestigious funded scholarships (including scholarships of the president of the Polish Academy of Sciences, scholarships in TEAM and OPUS projects). Through numerous trips to domestic and foreign conferences, they participate in the life of the scientific community both at home and abroad, winning at the same time prestigious awards and prizes (for the best poster, presentation, or popular science article.

In 2016, doctoral studies at the Institute obtained the international accreditation of the European Chemistry Thematic Network (ECTN) and received the status of 'Chemistry Doctorate Eurolabel' (as the third center in the country and the only one of the PAS institutes).

The doctoral studies at the Institute were awarded many times in the PROPAN competition for the most pro-doctoral institute of the Polish Academy of Sciences (in 2013 the second place, in 2014 and in 2015 the first place, in 2017 the second place, in 2018 the second place).

As an expression of appreciation for the Institute in educational activities, the Institute participated in the implementation of the NanoEIS project 'Nanotechnology Education for Industry and Society', FP7-CSA-SA. The project proposed a model curriculum for nanotechnology for first, second and third-cycle studies. The full curriculum has been placed in the public domain and is available at: http://nanoeis.sbg.ac.at/index.html

The Institute takes an active part in educating young staff of the Institute's employees, and bachelor's, engineering and master's theses are created. The Institute is a place where students of Krakow universities made their practices and students of Krakow high schools are admitted to apprenticeships.

	2016	2017	2018	2019	2020	2021
bachelor's	-	-	2	-	-	-
master's theses	-	-	3	-	1	1
students practices	62	35	20	22	2	17
internships	3	13	15	17	1	8

3.3 Exploitation

Extremely important for the successful implementation of the Institute's mission is effective transfer of the research results to economy and society. The Institute actively promotes all measures helping is exploitation of research outputs. In this context, it should be noted that since 2019 the Institute supports their own researchers with two grants per year, of which one is focused on projects where exploitation is a cornerstone of the entire project. As mentioned in point 3.1 Institute continuously patents its results for effective protection of its Intellectual Property Rights. The table below summarizes the number of patents and patents application obtained by ICSC PAS employees in the last six years.

Patents

	2016	2017	2018	2019	2020	2021
patent	4	5	-	1	6	1
patent applications	2(1)	2	4(2)	-	-	5

To illustrate Institute success in this area we would like to quote case of industrial implementation of the innovative biotechnological method of hydroxylation of vitamin D3 (calcifediol) and its derivatives (which was found to be an effective medicine for the COVID-19 infection), elaborated by the ICSC PAS. Two pharmaceutical companies – DISPROQUIMA and Nobilus Ent – decided to invest over 3 million USD to finalize the eventual stage of API (Active Pharmaceutical Ingredients) introduction to the international market. Such interest and efforts in the method implementation was due to its cutting-edge character, providing outstanding benefits over existing and routinely used synthetic procedures. The innovative character of the method developed at the ICSC PAS is related to its pro-ecological character. The method is one-stage (with isolation efficiency above 70%), allow for process scaling and obtaining a product of purity much higher compared to the existing chemical methods. According to the involved pharmaceutical companies (DISPROQUIMA and Nobilus Ent), thanks to the method implementation, projected global growth of production of the calcifediol and its derivatives will exceed 40%.

Obviously, no all research outputs can be commercialized but they significantly contribute to the benefit of society. The best example of this activity is research focused on the use of experimental and theoretical physicochemical methods to research enhancing the preservation of tangible heritage that is linked to practical conservation and effective communication with museum and conservation communities.

The development of relevant standards and guidelines has been a key debate for the cultural heritage sector worldwide. This is because the implementation of innovative measures for care of heritage buildings and collections, based on physics and chemistry of materials, is often dismissed when the measures cannot be assessed against accepted standards. Therefore, the Institute engaged in the work of the Technical Committee 9_8 of the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) and worked on revision of the ASHRAE Handbook's Chapter 'Climate Control in Museums, Galleries, Libraries and Archives'. The document quotes 10 publications of the Institute and has a global influence, setting standards of climate control in museums worldwide.

A rational strategy for controlling microclimatic conditions in museums, libraries or archives requires an understanding of the relationship between the magnitude of a threat and the damage caused. In order to support the international community of museum and conservation professionals in assessing the safety of display and storage conditions for collections, the Institute translated research results into practice by developing a digital decision-supporting platform providing remote access to quantitative assessment of risks to heritage assets. The platform contains also modules corresponding to the environmental agents of deterioration: air pollutants, light (UV, IR), incorrect temperature or relative humidity. Risks from environmental conditions are assessed by analysing data prevailing in a space in which an object is displayed or stored. The effect of moving an object from one environment to another, a frequent problem when loans for exhibitions are made, can be also assessed. The developed software, the first of its kind in the world, has been made freely available on the internet under the HERIe name at herie.pl to anyone involved in the preservation of collections. Since 2020, the HERIe platform is being developed in the framework of the EU IPERION HS project 'Integrating Platforms for the European Research Infrastructure ON Heritage Science' (2020-23) which is supported within the H2020 programme 'Integrating and opening existing national and regional research infrastructures of European interest'. The platform is widely used across the international conservation sector, having a direct and indirect effect on the care of cultural heritage worldwide.

Saving energy is of vital economic interest to institutions preserving cultural heritage assets as energy costs are one of their largest expenditure category. To reduce energy consumption has also ecological and ethical aspects, as it means implementing practically the idea of a 'green institution' which preserves cultural heritage while respecting the natural environment and limited resources. Since 2019, members of the Cultural Heritage Research group work within a panel organized by the Polish National Institute for Museums and Public Collections to design and build a shared storage centre for several museums close to Warsaw combining high standards of collection care with very low energy consumption in the building. The project is based on a successful, accomplished low-energy storage facility in a new seat of the National Archive in Krakow which will ultimately house 70 000 linear metres of records. The CHR group authored the concept of the facility back in 2014-15, and since spring 2020 it has supported the archive's staff in optimizing the storage operation and safe moving of the collections to the new seat. In this way, the research of the CHR group has a direct effect on building museum and archive storage facilities across Poland.

Implementation of rigorous risk analysis in museums and historical buildings has been a spectacular application of the research of the CHR group affecting Polish cultural heritage. In 2017-20, comprehensive plans of risk management and long-term protection were developed for two highly recognizable Polish monuments: Veit Stoss's main altar dated 1477-89 for St. Mary's Church in Krakow and Hans Memling's triptych 'The Last Judgement' dated 1467-71 which is a star item in the collection of the National Museum in Gdansk. The expert opinion for the Veit Stoss's altar was based on monitoring concentrations of suspended particulate matter as well as temperature and relative humidity in St. Mary's church in 2013-20. Similarly, the risk management plan for Memling's painting was based on a thorough condition assessment in 2014-15, including an analysis of the microclimate in the painting's environment. The assessment of risks to the two works of art from the environmental hazards has been complemented by analyses of other risks such as wood damaging insects, fires and shocks.

3.4 Communication with society

The Institute is involved in the promotion of science among the public.

For 16 years the Institute has been actively promoting Science through the organization of the annual Open Days. The event is extremely popular among primary and secondary school students as the Institute is visited yearly by approximately 1,000 visitors.

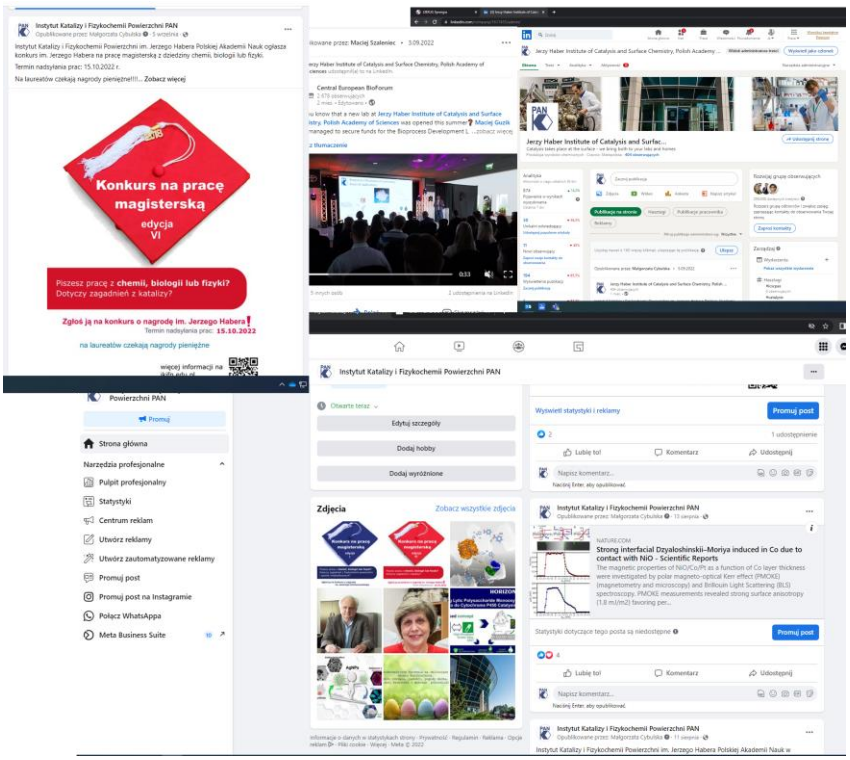
The Institute also participates in the organization of the annual Science Festival at the Main Market Square in Krakow, as well as participated in the 18th Science Picnic at the National Stadium in Warsaw.

The Institute is also involved in various outreach initiative during which the Institute's employees conduct lectures and experimental shows dedicated for various stages of educational institutions (pre-schools, primary and secondary level).

Furthermore, the Institute's employees regularly promote research in training for Polish museum workers organized by the National Institute of Museology and Collection Protection.

For several years the Institute organizes a popular competition for master's theses, for the prize of Jerzy Haber in the field of chemistry, physics and the borderline of chemistry and biology, chemistry and physics or physics and biology regarding the issues of surface physicochemistry and/or catalysis, which covers all university units in Poland. For a year, the Institute has also organized a competition for master's theses on the issues of physicochemistry surface and interfacial phenomena for the Andrzej Pomianowski.

In order to be noticeable in society, the Institute has been active in social media for several years. The image of the Institute is created on Likedin and on Facebook. Doctoral students conducting research at the Institute also have their accounts. The Institute notes that we live in a diverse global society and social media is an excellent tool that has facilitated the unification of different kinds of people across the world. Social media is a channel that is among the most popular forms of communication in the world today. Research estimates that there are close to 3.96 billion social media users across the world! Social media feasible to exchange large amounts of information, develop relationships, and enable global connections. Using social media, the Institute provides the latest information and news, we direct visitors to what we have to offer.



II. Internal Gap analysis

1. Internal & External Review

The scientific policy in the Institute is created by Board of Directors and Group Leaders with approval of Scientific Council as well as individual researchers, working in ten research groups. The Scientific Council (composed of 50% of the institute employees and 50% of outstanding national specialists from universities, external institutes, employees of industry and members of the Polish Academy of Sciences) supervises the Institute's activities on an ongoing basis, ensuring a high level of its scientific activity and the development of people starting their scientific careers. In particular the Scientific Council approves research programs, cooperation with foreign scientific institutions and publishing activities; it also approves the reports on the Institute's activities.

Every year, the Commission for Assessment and Personal Affairs and Promotion of Scientific Council evaluates the scientific activity of the Institute's research staff. Researchers with outstanding achievements are awarded. The assessment is carried out based self-assessment questionnaire, in accordance with the Regulations for the Evaluation of Researchers, Regulations for the Evaluation of Research Groups and the Regulations of Selection of the Best Publications. Selection and evaluation rules were discussed with employees and students and afterwards approved by the Scientific Council. All the regulations are available on the internal web pages of the Institute.

Once every three years, the institute's activities are evaluated by the International Advisory Board of ICSC PAS, which comprises the top scientists in the field of catalysis and surface phenomena. The current members of the Board (working in 2014-2022) are: Ewa Bulska (Warsaw University, Poland), Gabriele Centi (University of Messina, Italy), Hans Joachim Freund (Fritz-Haber-Institut der Max-Planck-Gesellschaft, Germany), Andrew Howe (Schlumberger Research Centre, Cambridge, UK), Valentin Parmon (Boreskov Institute of Catalysis SB RAS, Russia), Elena Mileva (Institute of Physical Chemistry BAS, Sofia, Bulgaria), Johann Heider (Philipps-Universität Marburg, Germany). In the last few reports the International Advisory Board pointed several gaps and areas needing improvement but none of the issue were related to HR policy. The follow-up reports and recommendations are published at the website: https://ikifp.edu.pl/en/institute/international-advisory-board/.

The financial report on the Institute's activities is evaluated annually by an external auditor and then approved by the authorities of the Polish Academy of Sciences. The Institute's financial results are published in the generally available Court and Economic Monitor.

The Polish Academy of Sciences regularly (last at November 2021) monitors the activity of its institutions. Every four years, a commission appointed by the Council of Curators Polish Academy of Sciences assesses the scientific, educational and equipment base of all institutes PAS.

The quality of scientific and other activities (e.g. impact on society) of the Institute is regularly assessed by the Polish Committee for the Evaluation of Scientific Units and the Ministry of Science and Higher Education. The scientific evaluation process (so called

'parameterization') of all scientific institutions in Poland is carried out every 4 years (most recently the process took place in 2022 and covered years 2018-2021).

Projects financed from external sources are controlled by financing institutions, on the principles and according to the rules presented in the terms of the competitions.

The internal and external reviews have been and are used as a key source of information for gap analysis and development of remediation strategy.

2. Methodology of HRS4R

2.1 Initial Phase 2015-2016

In April 2015, ICSC PAS signed the Declaration of endorsement for 'The European Charter for Researchers' and 'The Code of Conduct for the Recruitment of Researchers'. This fact was announced verbally on Institute's seminar and also on the web-page of the ICSC PAS.

At the beginning of July 2015, as the second step of preparation for application for the HR Excellence in Human Resources the HR working group (HR WG) was established, in the composition:

- prof. dr hab. Piotr Warszyński - Chair of the Committee for Evaluation, Awards and Promotion of the Scientific Staff of the Scientific Council
- prof. dr hab. Zbigniew Adamczyk - Chair of the Stipend and Award Committee
- dr hab. Anna Micek-Ilnicka - Head of PhD Studies
- Joanna Olszówka - representative of PhD students
- Magdalena Wieciech-Figura - representatives of the administrative staff
- Aleksandra Niedzielska - representatives of the administrative staff

<u>Steering committee</u>

- prof. dr hab. Małgorzata Witko - Director of the ICSC PAS
- prof. dr hab. Tomasz Borowski - Deputy Director for Research
- dr hab. Renata Tokarz-Sobieraj - Deputy Director for Operation

In the period 2015-2016 HR WG prepared two anonymous surveys (July-September 2015 and January 2016) in which researchers evaluated the level of fulfillment at ICSC PAS of the rules included in the Charter and the Code. Results of these surveys were critically analyzed by the HR WG, as well as they were presented and discussed on the forum of the Institute during two separate seminars. Following the broad public discussion of the issues that were identified in the surveys as challenges for ICSC PAS, the working group selected the following eight issues for monitoring and focus of its action:

1. *Ethical and professional principles* – Dissemination and exploitation of results
2. *Recruitment* – Transparency (Code)
3. *Working conditions and social security* – Recognition of the profession
4. *Working conditions and social security* – Research environment
5. *Working conditions and social security* – Working conditions
6. *Working conditions and social security* – Co-authorship
7. *Working conditions and social security* – Complaints / appeals
8. *Training* – Supervision and managerial duties

Based on the public discussion with employees, in May 2016, the HR WG settled, an action plan HSR4R ver.2016, which was implemented at ICSC PAS in the period 2016-2019.

2.2 Implementation of the Action Plan HSR4R ver.2016

In March 2017, to the HR WG joined:

- dr hab. Maciej Szaleniec - representative of adjunct
- dr hab. Dorota Rutkowska-Żbik - Chair of the Stipend and Award Committee
- dr Tomasz Szumełda - representative of assistant

In 2018 the composition of the HR Working Group was updated:

- prof. dr hab. Tomasz Borowski - representative of professors
- prof. dr hab. Piotr Warszyński - Chair of the Committee for Evaluation, Awards and Promotion of the Scientific Staff of the Scientific Council
- dr hab. Dorota Rutkowska-Żbik - Chair of the Committee for Employment of the Scientific Staff of the Scientific Council of ICSC PAS
- dr hab. Nika Spiridis - Secretary of the Scientific Board, Head of PhD School
- dr hab. Anna Micek-Ilnicka - Head of PhD Studies
- dr inż. Kinga Freindl - representative of research-technical staff
- dr Anna Pajor-Świerzy - representative of assistants
- Agata Ogórek - scientific secretary
- Aleksandra Niedzielska – a member of the Projects department
- Magdalena Wieciech-Figura – a member of the Projects department
- Agnieszka Winiarska - representative of PhD students

Steering committee

- prof. dr hab. Małgorzata Witko – Director of the ICSC PAS
- prof. dr hab. Maciej Szaleniec - Deputy Director for Research
- dr hab. Renata Tokarz-Sobieraj - former Deputy Director for Research

While the task of the first group was a gap analysis and prepare the first action plan, regular work carried out by both the first and the newly established HR WG aimed at:

- implementation of the plan proposed in the 2016 strategy,
- monitoring changes,
- analyzing the impact of these changes on the work environment,
- analyzing new surveys,
- identifying new challenges,
- discussion of working conditions and other issues during the seminars, meetings as well as individual contacts with employees.

Two surveys were conducted in 2017-2019, including the assessment for 2017 and 2018.

On the basis of the experience with the 2015&2016 surveys and feedback from colleagues, the HR WG changed the structure of the survey: the number of questions was reduced, a larger scale of grades was introduced, due to the small number of employees in individual groups, the characteristics of respondents were abandoned.

Based on the systematic work of the group the Internal Review was created. The Internal Review was focused on the level of implementation of HRS4R principles with a particular focus on those, which had received the lowest overall satisfaction scores in the 2015 & 2016 surveys and on those where - despite the high level of satisfaction of the staff and PhD students - improvements and changes were required. The activities implemented at ICSC PAS in 2016-2019 were summarized and an new action plan was established for years 2019-2022 HSR4R ver.2019.

2.3 Implementation of the Revised Action Plan HSR4R ver.2019

Anonymous surveys were continued in 2019-2022.

The composition of the group changed in October 2022, due to change of the Institute's Board of Directors. The following people have been selected as a members of the Human Resources Working Group:

- prof. dr hab. Łukasz Bratasz - Chairmen
- prof. dr hab. Maciej Szaleniec - representative of professors
- prof. dr hab. Tomasz Borowski - Chair of the Committee for Evaluation, Awards and Promotion of the Scientific Staff of the Scientific Council of ICSC PAS
- dr. hab. Dorota Rutkowska-Żbik - Chair of the Committee for Employment of the Scientific Staff of the Scientific Council of ICSC PAS
- prof. dr. hab. Nika Spiridis - Secretary of the Scientific Board
- dr. hab. Marta Kolasińska-Sojka - Head of PhD Studies
- dr. hab. Marcel Krzan – Chairmen of the team of Gender Quality Plan
- dr. Anna Pajor-Świerzy - representative of assistants
- dr. Urszula Filek - scientific secretary
- Aleksandra Niedzielska – a member of the Projects department
- Katarzyna Poznańska - representative of PhD students

Steering committee

- prof. dr. hab. Piotr Warszyński - Director of the ICSC PAS
- dr. hab. Jan Zawała - Deputy Director for Research
- dr. hab. Renata Tokarz-Sobieraj - former Deputy Director for Research

The HR Working Group will continue to analyze the results of all surveys, monitor and implement of the action plan and audit fulfillment of regulations of the Charter and Code in ICSC PAS. Such an evaluation will be conducted annually and a report from it, possibly with further recommendations, will be available at the website of the Institute.

2.4 Overview of surveys

All surveys, conducted in period 2017-2022, were prepared with the use of the SurveyMonkey internet service. Participation in the survey was anonymous with no information on identity of the responder or IP of its computer collected. The surveys consisted of nine closed questions:

- 7 questions with five plausible answers (in contrast to survey from 2015, 2016 where only four plausible answers where optional), where in parenthesis numerical value ascribed to a given answer which was used in results analysis:
  - ✓ Strongly agree
  - ✓ Agree
  - ✓ Neither agree nor disagree
  - ✓ Disagree
  - ✓ Strongly disagree
- 1 question with number rating scale (1-10), where 1 is for total lack of recognition of professionalism of researchers and 10 - exemplary treatment of researchers as professionals,
- 1 matrix question about roles of principal investigators in institution- evaluation of one or more row items using the same set of column choices (due to employee data, the question was anonymized).

	2015	2016	2017	2018	2019	2020	2021
number of invited responders	131	139	139	140	133	169	141
number of responders	95 (72%)	96 (69%)	69 (50%)	81 (58%)	86 (65%)	82 (49%)	72 (51%)

Results of survey conducted in 2022 (assessment for the year 2021) using questionnaire with extended 5-level scale.

Question	Options	2021
1.In your opinion in the ICSC PAS, researchers properly promote and use the results of scientific research (e.g. through publications, presentations at scientific conferences, commercialization).	Strongly agree	54.2%
	Agree	41.7%
	Neither agree nor disagree	4.2%
	Disagree	0%
	Strongly disagree	0%
2. In your opinion, employee recruitment procedures in the ICSC PAS, are open, effective, transparent, supportive and comparable to those used in the world.	Strongly agree	25%
	Agree	43.1%
	Neither agree nor disagree	26.4%
	Disagree	4.2%
	Strongly disagree	1.4%

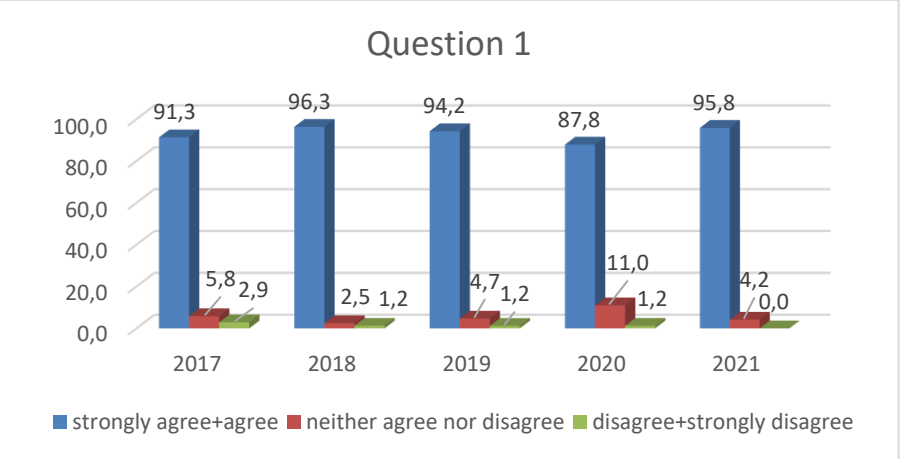
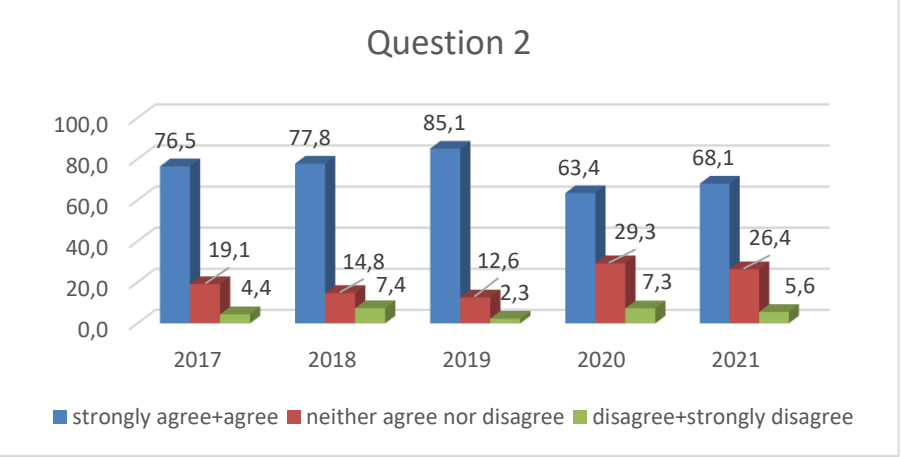
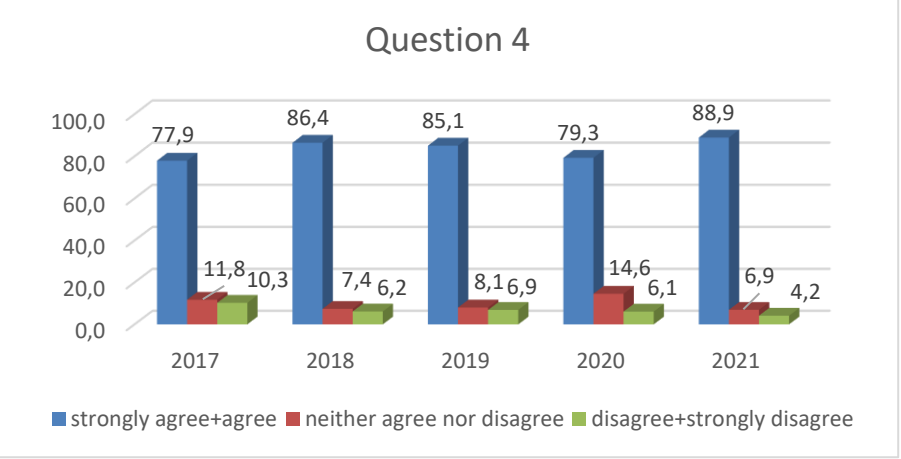
3. Evaluate to what extent, in your opinion, researchers in the ICSC PAS are treated as professionals in the following relationships (on a scale of 1 to 10: 1-complete lack of recognition of researchers' professionalism, 10-model treatment of researchers as professionals): **The numbers show the mean value for each relationship.**	Researcher - direct superior	8.4
	Researcher - an administration employee	7.4
	Researcher - management	7.1
	PhD student - supervisor	7.7
4.In your opinion, the ICSC PAS provides a safe and stimulating environment for research and learning, ensuring access to appropriate equipment and facilities, including remote scientific cooperation	Strongly agree	33.3%
	Agree	55.6%
	Neither agree nor disagree	6.9%
	Disagree	2.8%
	Strongly disagree	1.4%
5.In your opinion, in the ICSC PAS working conditions are flexible enough (and in accordance with applicable legal regulations and collective agreements) not to constitute an obstacle to achieving scientific success. They enable researchers to combine family life/and having children with work (mobile working hours, part-time work, telework).	Strongly agree	56.9%
	Agree	33.3%
	Neither agree nor disagree	5.6%
	Disagree	4.2%
	Strongly disagree	0%
6.In general in the ICSC PAS, the co-authorship of research is positively assessed and participation in the research of a given researcher, regardless of his status, is properly reflected in the co-authorship of publications, patents, etc.	Strongly agree	34.7%
	Agree	48.6%
	Neither agree nor disagree	13.9%
	Disagree	2.8%
	Strongly disagree	0%
7.In your opinion, In your research group in the ICSC PAS, the co-authorship of the research is positively assessed and participation in the research of a given researcher, regardless of his status, is properly reflected in the co-authorship of publications, patents, etc.	Strongly agree	58.3%
	Agree	33.3%
	Neither agree nor disagree	5.6%
	Disagree	2.8%
	Strongly disagree	0%
8.In your opinion in the ICSC PAS, complaints and conclusions of researchers are appropriate and impartial, including those regarding conflicts between researchers and their superiors.	Strongly agree	16.7%
	Agree	26.4%
	Neither agree nor disagree	51.4%
	Disagree	5.6%
	Strongly disagree	0%

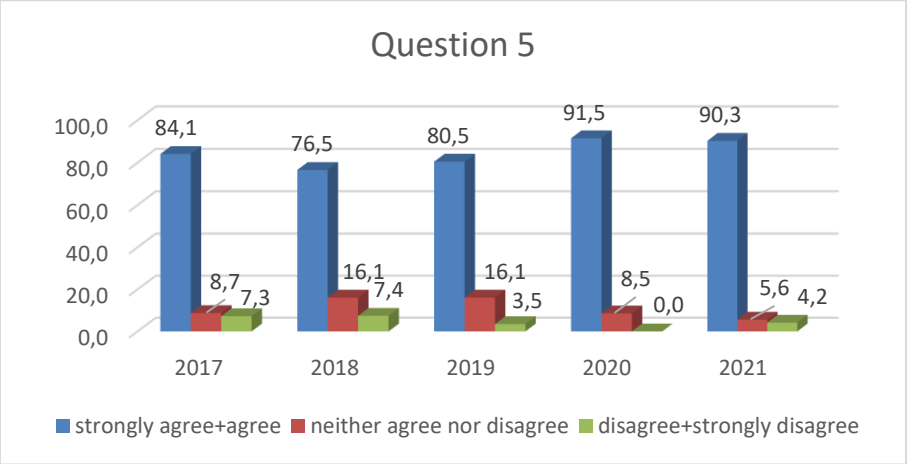
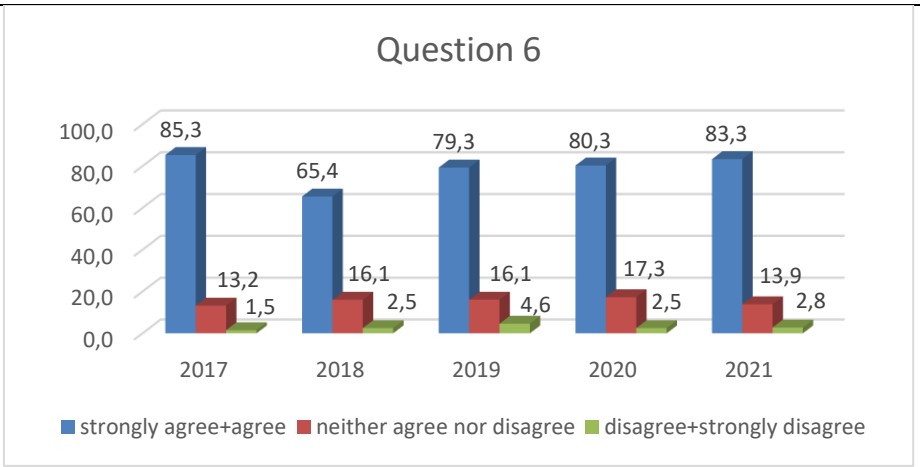
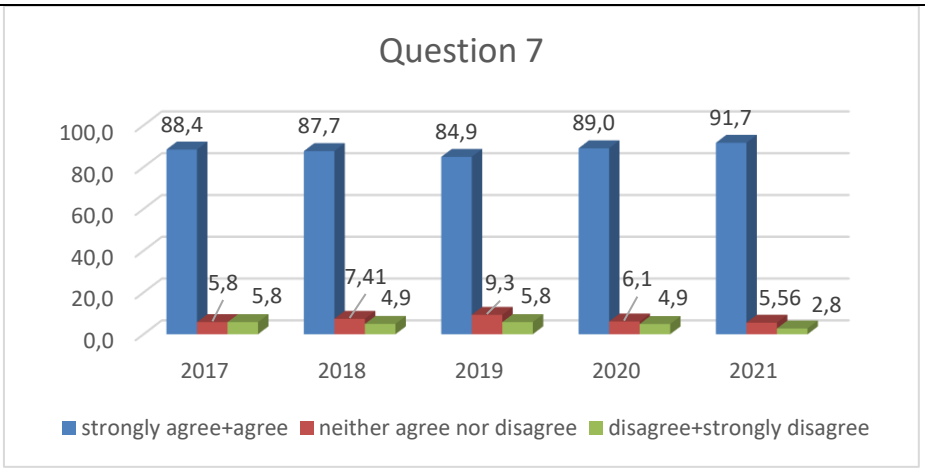
It can be observed that positive answers (strongly agree & agree) gave more than 80% of respondents for six questions (1, 4, 5, 6, 7). The number of negative answers to these questions did not exceed 5%

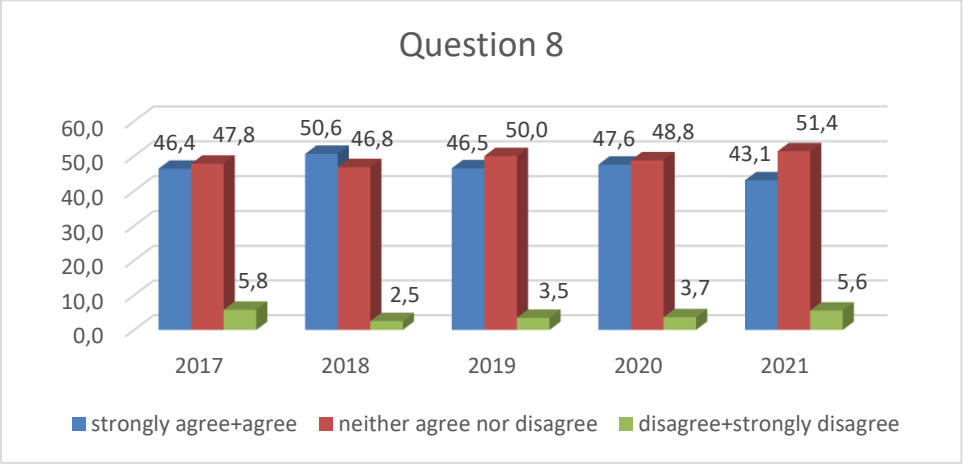
In responses to two questions (No. 2 and 8), a relatively large number of people (26,4% and 51,4%, respectively) do not express themselves positively (strongly agree + agree) or negatively, but remain indifferent. As in the other questions, here too dominate positive

answers 68% in question 2 and 43% in question 8. Negative responses account for less than 6% of all responses.

Below, a comparative analysis of the surveys conducted in 2018-2022 is presented (assessment for 2017-2021). The responses were grouped into three groups: first – included positive strongly agree and agree, second – included neither agree nor disagree and third – included negative disagree and strongly disagree.

1. At ICSC PAS researchers properly promote and use the results of scientific research (e.g. through publications, presentations at scientific conferences, commercialization).	
2. Employee recruitment procedures at ICSC PAS are open, effective, transparent, supportive and comparable to those used in the world.	
4. ICSC PAS provides a safe and stimulating environment for research and learning, ensuring access to appropriate equipment and facilities, including remote scientific cooperation.	

5. At ICSC PAS working conditions are flexible enough (and in accordance with applicable legal regulations and collective agreements) not to constitute an obstacle for scientific success. They enable researchers to maintain an appropriate work-life balance providing time for family life and children (flexible working hours, part-time work, telework).	
6. In general, at ICSC PAS research co-authorship is assessed positively and participation in the research of a given researcher, regardless of his status, is properly reflected in co-authorship of publications, patents, etc.	
7. In your research group co-authorship of research is assessed positively and participation in the research of a given researcher, regardless of his status, is properly reflected in co-authorship of publications, patents, etc.	

8. At ICSC PAS, complaints and appeals of researchers are properly and impartially examined, including those concerning conflicts between researchers and their superiors.	

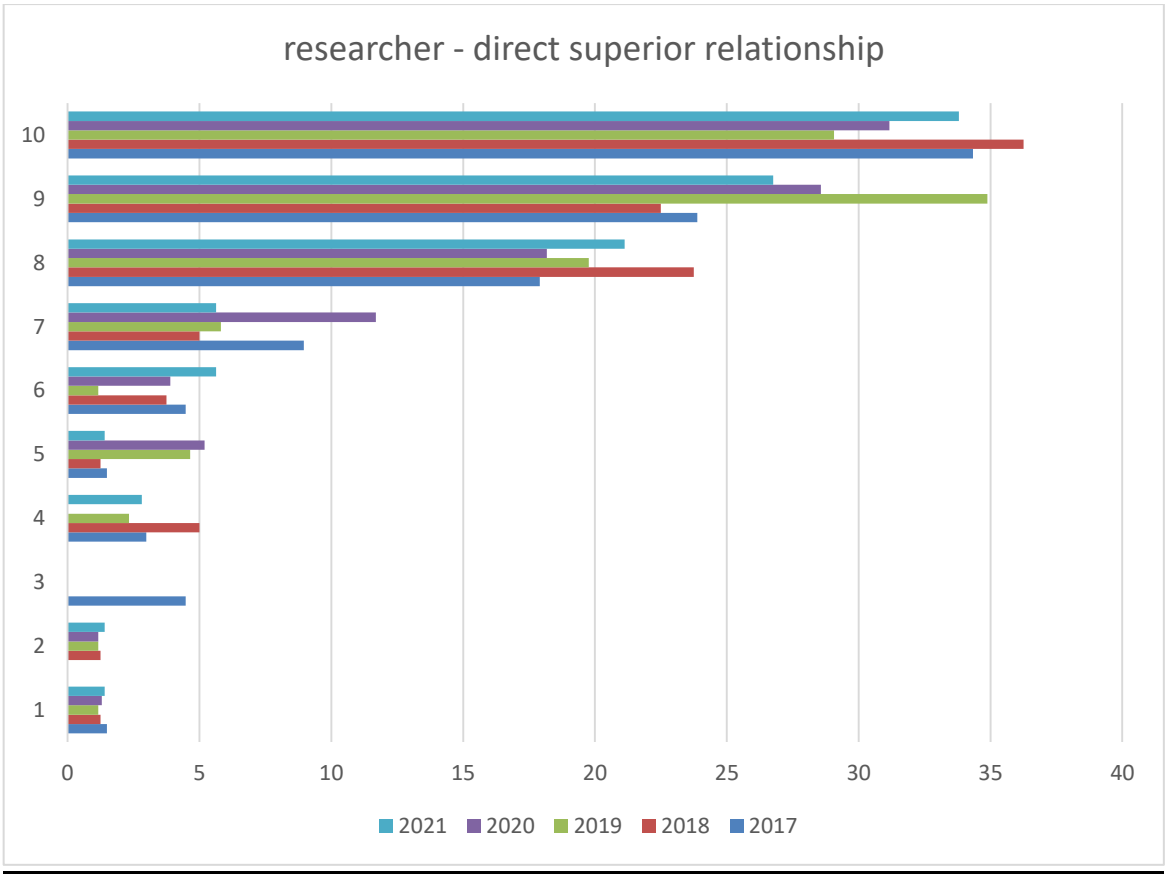
Positive answers dominate **in questions 1, 4, 5, 7**. Almost 90% of the respondents have a positive opinion (strongly agree and agree) on the promotion of scientific research, the Institute as a stimulating environment for research and learning, flexible working conditions and co-authorship of the research. The answers to question 1 have remained almost unchanged over the last five years. Results of the survey have shown that for the remaining questions (4, 5, 7), there has been an increase in positive responses in recent years, which indicates an improvement in working conditions.

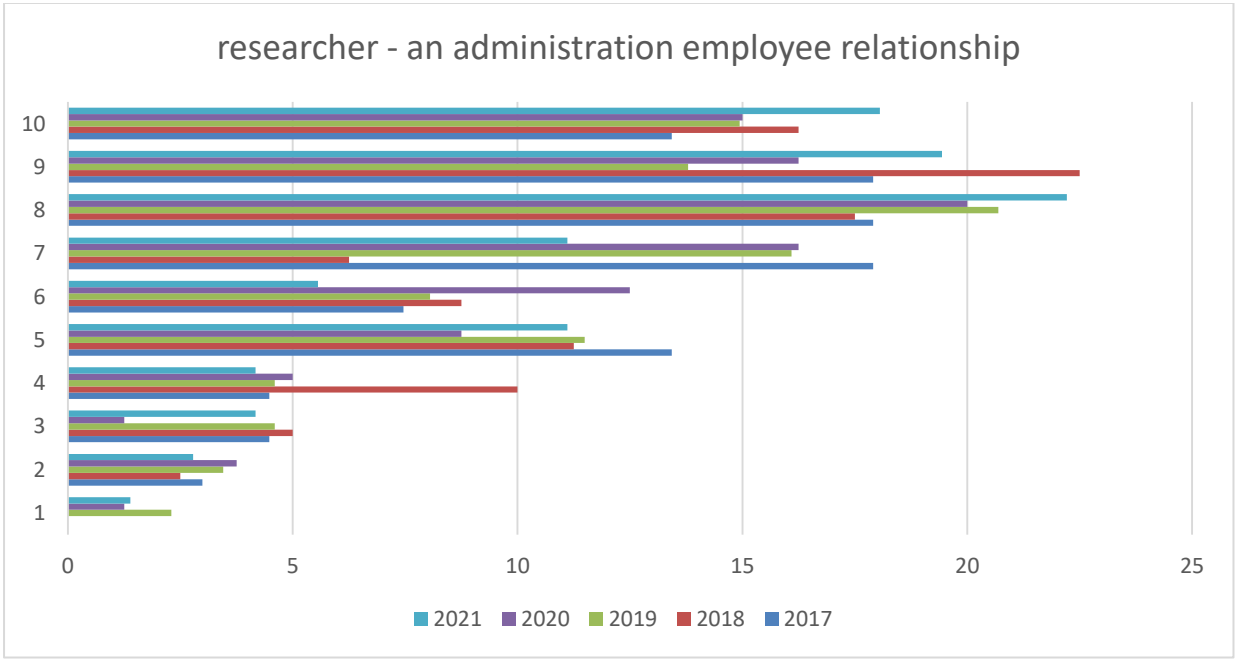
Question 2 concerns the opinion on the employee recruitment procedures. The number of positive responses varies from 63% to 85% over the years. The number of negative responses ranges from 2-7%. Neutral opinions constitute a relatively large group 12-26% (this number has increased in the last two years). In-depth analysis and conversations with employees indicate that people who did not participate directly in such a procedure do not want to comment
on this topic.

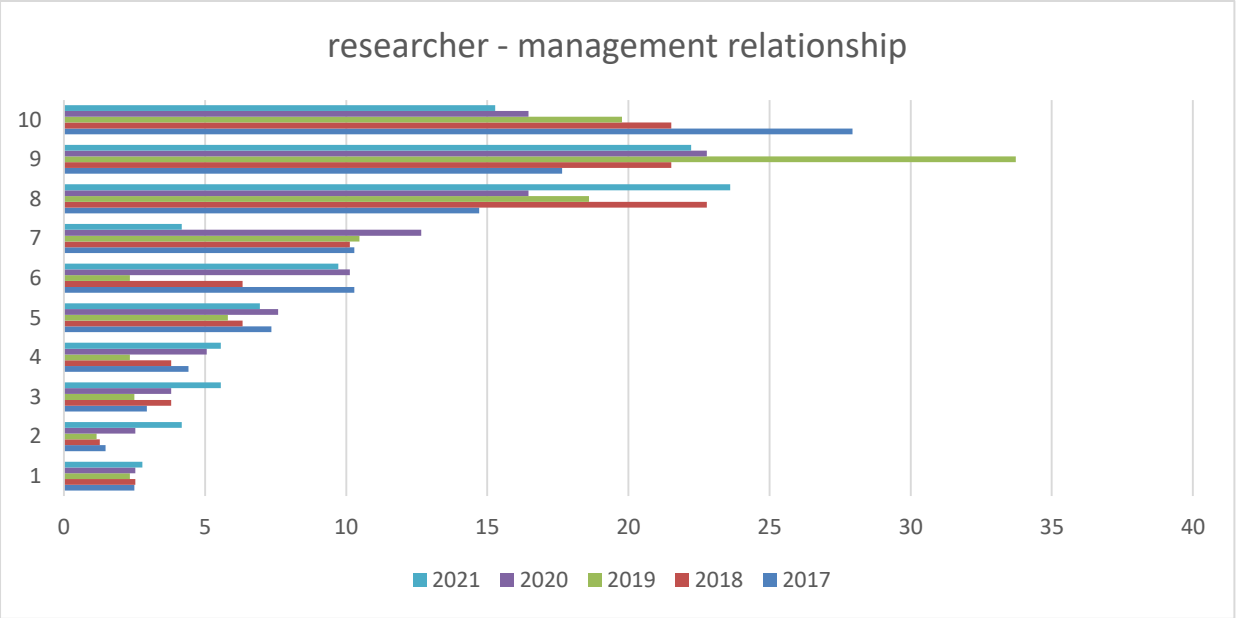
Questions 6 and 7 deals with the evaluation of research co-authorship and their reflection on the co-authorship of publications or patents in general at the Institute (question 6) and in the research group (question 7). Respondents rate co-authorship in their group more positively (it varies over the years from 85-91%) than in relation to the whole Institute (65-85%). In the case of the whole Institute's assessment, a large group of people (13-17%) do not want to comment on this issue.

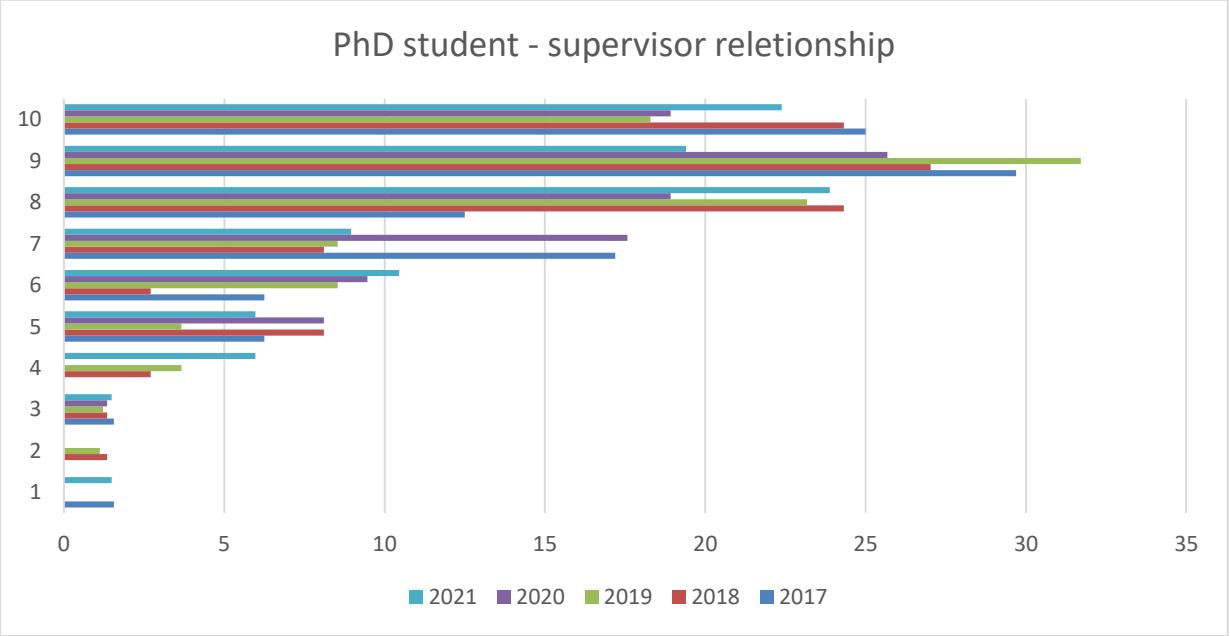
In question number 8 where respondents were asked about complaints and solving current problems in the Institute, most respondents (almost 50%) chose the neutral answer 'Neither agree nor disagree' and it can be concluded that this is related to the lack of conflicts in which the entire community of the Institute would be involved and hence the lack of knowledge on this subject among uninterested people.

Question number 3 concerns the relationship between selected professional groups at the Institute. The results of surveys have shown that from the last five years, relationships between employees are correct and assessed relatively highly by employees.

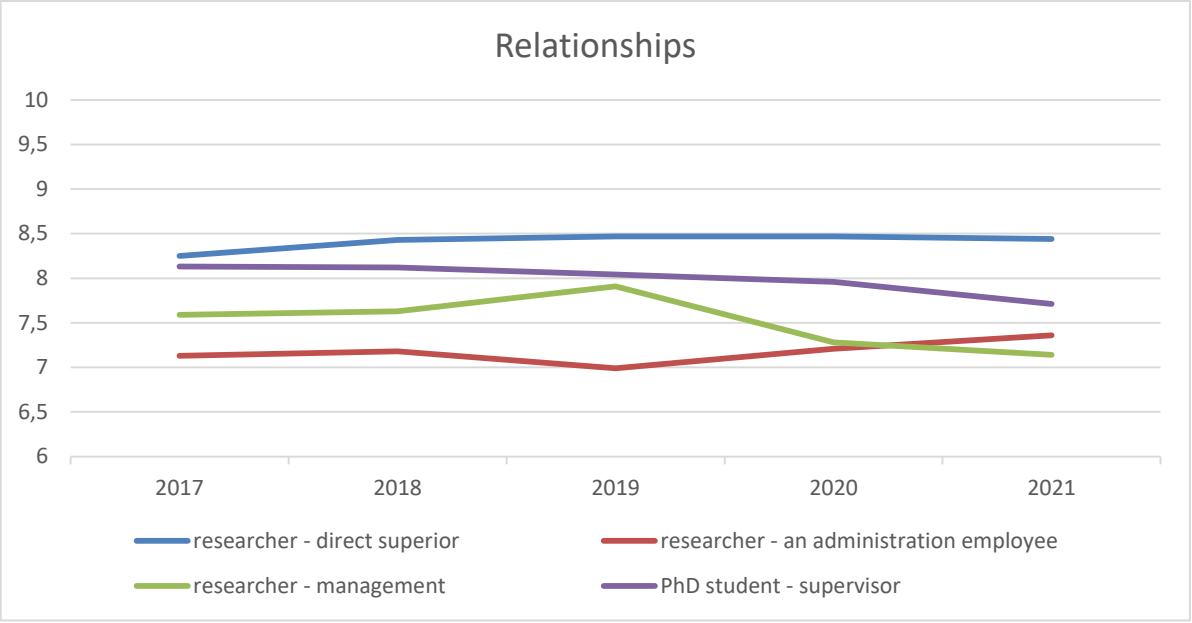






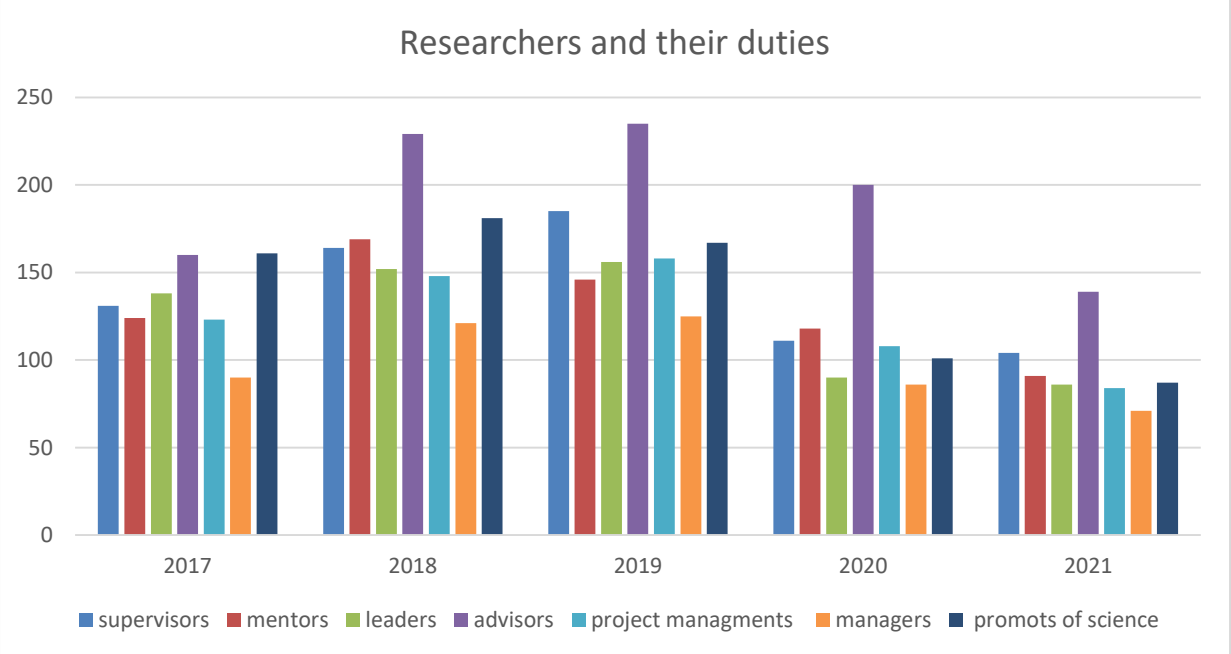


Relationships between employees were highly rated (question 3), in the following order (on a scale of 1-10): researcher-direct superior (average of five years equal 8.4) > PhD students–supervisor (average of two years equal 8) > researcher-management (average of two years equal 7.5) > researcher-an administration employee (7, 17).



Question 9 measures how the senior PIs are perceived in the Institute by other employees and PhD students (including other PIs). The answers consistently point to an **advisory** role as a dominant perceived role of PI, followed by science popularization and supervisory role. The survey shows a low level of managerial role among the PI. This last effect may be due to the fact that not all PI are managers of the groups (in terms of HR and resource management) but it may also indicate low skills in that area among PIs, which require special addressing in future actions.

Also, we observed the severe impact of COVID-19 on a drop in perceived science popularization roles due to brake in the Open Day fair and Science Festival. More detailed personal indications are provided to individual PIs, which provides them with information on how their activity is perceived in the Institute.



3. Identified challenges for ISCS PAS

This section presents the summary of the internal review findings: expectations, implemented actions, current situation and new action plans to achieve the highest quality.

Ethical and professional aspects

Objectives: Researchers at ICSC PAS should focus their research for the good of mankind and for expanding the frontiers of scientific knowledge while enjoying the freedom of thought and expression, and the freedom to identify methods by which problems are solved, according to recognized ethical principles and practices.

In particular they should: adhere to the recognized ethical practices and fundamental ethical principles appropriate to their discipline(s) as well as to ethical standards as documented in the different national, sectoral or institutional Codes of Ethics; be familiar with the strategic goals governing their research environment and funding mechanisms; undertake original research problems that do not duplicate research previously carried out elsewhere; abide by the principle of intellectual property and joint data ownership in the case of research carried out in collaboration with a supervisor(s) and/or other researchers; seek all necessary approvals before starting their research or accessing the resources provided; adhere to the principles of sound, transparent and efficient financial management; adopt safe working practices in line with national legislation; ensure that their research activities are effectively communicated to society.

Current status *(in italic – actions implemented 2016-2022)*:

The Code of ethics describing proper conduct in research practices and procedures are available on the webpage of the Institute https://ikifp.edu.pl/en/ethics/.

Employees and doctoral students are systematically encouraged to read materials on ethical behavior.

Training workshops on ethics in research are organized for PhD students and employees every year.

Researchers from the Institute are supported by the Projects Department, the Scientific Secretariat, the Accounting Department, the Public Procurement Department and the Technical Staff.

Regulations on the management of Intellectual Property Rights have been developed and approved by the Scientific Council of ICSC PAS and introduced (March 2015) by the Director of ICSC PAS directive.

The Patent Attorney provides services to all interested researchers of ICSC PAS. These regulations are adequate and guarantee that researchers at all career stages can reap the benefits of the exploitation of their R&D results.

Training on IP rules were organized for PhD students and employees every two years.

Since 2018, the Institute's employees have been obliged to submit written declarations for each publication, where each co-author defines his/her contribution to a given article. A special database was created to archive these statements to facilitate future doctoral and postdoctoral procedures and to protect young researchers in their professional careers.

Over the past four years, based on national legislation, in accordance with the General Data Protection Regulation, the Institute has implemented GDPR procedures, among others: Personal Data Protection Policy (July 2018), and Information Security Policy (December 2021).

Each employee is obliged to participate in anti-corruption training on an e-learning platform, organized by the Central Anti-corruption Bureau. They are required to complete at least minimum two separate modules (e.g. Counteracting corruption and Corruption in public administration) and obtain the appropriate certificate, confirming the completion of the training.

A Gender Equality Policy was developed and a team was appointed to it implement (November 2021), including supporting equality in the careers of female and female research workers at various levels, monitoring gender balance in decision-making processes and decision-making bodies, integrating the gender dimension into the design of research and innovation.

All groups of employees (assistants, PhD students, technicians/ service staff) are represented in the decision-making bodies of the Institute (the Scientific Council, the HR Working Group) to protect and promote their individual and collective interests as professionals and to actively contribute to the work of the institution.

Group leaders and independent researchers, i.e. habilitated doctors and full professors, are members of the Collegium & Extended Collegium, which is an advisory body supporting the Director.

A Disciplinary Intercessor (Ombudsman) and a Disciplinary Commission were elected, to deal with complaints/appeals of researchers, including those concerning conflicts between supervisor(s) and early-stage researchers. The information about respective Commissions is available at the Institute webpage: https://ikifp.edu.pl/en/ethics/.

A separate Disciplinary Commission is responsible for investigating and prosecuting claims of misconduct against PhD students.

An Anti-mobbing Policy was developed and implemented in November 2021.

Beforehand any research that concerns additional approval, the designated researchers are providing the Directorship with the required information in order to obtain said approvals. For example, the Institute works in the area of regulated drugs and genetically modified organisms. For these operations, the Institute adopted internal procedures and regulations, which are based between others on national and international relevant legal documents and best practices.

All employees of the Institute are trained in health and safety rules, according to their positions.

The health and safety inspector together with the fire protection inspector monitor work sites to check that they're safe for people to work at and adopt safe working practices in line with national legislation.

On May 2019, Jerzy Haber Institute of Catalysis and Surface Chemistry, Polish Academy of Sciences, Henryk Niewodniczański Institute of Nuclear Physics, Polish Academy of Sciences, Maj Institute of Pharmacology, Polish Academy of Sciences, Aleksander Krupkowski Institute of Metallurgy and Materials Science, Polish Academy of Sciences and AGH University of Science and Technology signed the agreement on establishing a PhD school 'Krakow Interdisciplinary Doctoral School'.

On October 2020, Jerzy Haber Institute of Catalysis and Surface Chemistry, Polish Academy of Sciences, joined the Doctoral Scholl of Quantitative and Natural Sciences coordinated by the Maria Curie-Skłodowska University in Lublin, run jointly with the Institute of Agrophysics of the Polish Academy of Sciences in Lublin, the Institute of Soil Science and Plant Cultivation in Pulawy.

In accordance with the national legislation ('Ustawa 2.0') the Institute has prepared (September 2019) new procedures for granting the scientific degree of doctor and habilitation. The processes for an award of the scientific degree were fully approved by the Scientific Council of ICSC PAS and the Council of Scientific Excellence (a scientific body that works to ensure the development of scientific staff in accordance with sets of quality standards). The open, transparent procedures are available on the website in Polish and English versions: https://ikifp.edu.pl/en/research/degrees/

In accordance with the polish legislation ('Ustawa 2.0') the Institute together with partners introduced regulations governing the creation and operation of doctoral schools (Krakow Interdisciplinary Doctoral School and Doctoral Scholl of Quantitative and Natural Sciences). All documents are available on the website in Polish and English versions: https://kisd.ifj.edu.pl/documents/, https://www.umcs.pl/en/doctoral-schools.htm.

Pursuant to the Act on the Polish Academy of Sciences, all research members of the Institute undergo periodic evaluations. The criteria and procedure for conducting the evaluation are laid down in the Rules for the periodic assessment of researchers (the last from October 2021). Moreover, the Institute introduced Regulations for assessing the progress of researchers at the Institute. Employees are assessed annually over the last three years. Both regulations are available on the internal website in Polish and English versions and additionally in a paper version at the Institute's office. It is worth mentioning, that evaluation criteria in both regulations were set to stimulate the mobility of researchers, i.e. they get a significant number of scores for mobility actions.

The detailed procedure and criteria for conducting the mid-term evaluation of PhD students in Doctoral Schools are available on their website.

The current scientific activity of the research groups is presented annually at a reporting seminar (open for employees, PhD students, and external guests). In addition, every 2-3 years the institute analysis the scientific activity by organizing special seminars at which each of the research groups presents the research subject, equipment, methodology, collaboration, outcomes and achievements, as well as research plans for the coming years.

Detailed annual reports on research activity and a list of scientific achievements of the Institute's employees are available on the website.

Information about papers, and patents made at the Institute are presented on the institute's website in Polish and English versions: https://ikifp.edu.pl/en/research/publications/, https://ikifp.edu.pl/en/research/patents/

The list of equipment available at the Institute, the rules of its use and contact details are presented on the institute's website in Polish and English versions: https://ikifp.edu.pl/en/research/facilities/,

Every year (except 2020-2022 due to COVID epidemic), the Institute actively promotes science in general, and specific research is carried out in the institute between various target groups, local communities, and stakeholders with a particular focus on young people. All interested are invited to laboratories for a fascinating meeting with physics and chemistry but also to show the interdisciplinary links between various – sometimes very distant – disciplines as it is in the case of heritage science. ICSC PAS offers lectures, various demonstrations and a mini-competition of chemical knowledge. Institute prepares classes for participants of all ages, starting with students of the upper classes of primary schools.

Through the organization of Open Days, participation in the Science Festival, and organization of lectures and demonstrations in schools, the Institute conducts an extensive campaign aimed at promoting knowledge about scientific research in society.

Institute provides access to selected laboratories for small groups of students throughout the year.

On the Institute's website, a subpage 'For society' has been created where the institute's achievements, popular science articles and information about 'Open Days' and Science Festival' are presented.

Anonymous survey monitoring HR aspects is organized every year.

Strengths and weaknesses of the current practice:

All information obtained by formal and informal means has been analyzed in order to identify strengths and weaknesses in the area of Ethics and Professional Aspects. The table below summarizes the findings.

Thematic heading of the Charter and Code	**STRENGTHS and WEAKNESSES**
Ethical and Professional Aspects	The Institute's research staff is fully aware of their rights and obligations related to Ethics and other professional aspects. The HR WG will consequently peruse the training activity between all employees and PhD students to maintain a high level of awareness. The monitoring, supervision and mitigation of misconduct procedures are in place and are continuously adapted to changing research environment. The Institute (Board of Directors and HR WG) is committed to monitoring and analysing Ethics and Professional Aspects using adopted actions. The success of the Institute's recruitment policy in opening to geographical diversity requires continuous translation of all legal documents into English. Last year, the legal interpretation of the recruitment policy changed in Poland. So far, any promotion of the researcher was subjected to the same rules as the recruitment of a new employee. Since 2022, this has changed and the Institute developed a new regulation that was accepted by Scientific Board and implemented in September 2022. The new situation requires both translations of the relevant documents into English as well as the development Researcher

	Career Framework to facilitate researchers to plan and navigate their professional careers. In spite of the success of the survey in delivering crucial information on the perception of HR procedures and professional relations between research staff, it is not guaranteed that all questions cover relevant aspects of HR policy, as the survey was developed rather through a top-bottom approach. A thorough analysis of the Institute's activity indicated that the exploitation of the research results is satisfactory but could be further strengthened. It should be noted that the effectiveness and intensity of the exploitation depend mainly on external factors not so much on the institute's policy. However, this aspect needs further support from the institute.

New and continued actions:

A.16 (C) HRS4R principles (including training on ethics) will be propagated at seminars and meetings.

A.18 (C) Information activities for grant leaders on project financial management in special seminars

A.19 (C) Training in knowledge transfer and commercialization of research results will be carried out.

A.20 (C) Further translation of legal acts and regulations regulating the work at the institute into English will be continued.

A.23 (N) Annual survey on key HR aspects with possible adjustments of activities (Evaluation of the survey and its refinement if needed.)

A.24 (N) Analysis of potential measures promoting more effective exploitation of the research results.

A.25 (N) Development of the Researcher Career Framework

A.28 (N) Development of the institute's Data management strategy.

Recruitment and Selection

Objectives: ICSC PAS should establish recruitment procedures which are open, efficient, transparent, supportive and internationally comparable, as well as tailored to the type of positions advertised.

In particular: all available instruments should be used, in particular, international or globally accessible web-based resources; advertisements should give a broad description of knowledge and competencies required; career breaks or variations in the chronological order of CVs should not be penalized; a wide range of selection practices should be used, such as external expert assessment and face-to-face interviews; candidates should be informed, prior to the selection, about the recruitment process and the selection criteria; the selection process should take into consideration the whole range of experience of the candidates.

Current status *(in italic – actions implemented 2016-2022)*:

Recruitment of staff for all categories of scientific positions (in accordance with the Act on Polish Academy of Sciences dated 30 April 2010; Dz.U. Nr 96, poz. 619) is conducted through a competitive selection process.

The recruitment procedures of ICSC PAS are open, transparent, internationally comparable and tailored to the type of position advertised.

Rules of the selection procedure in case of employing at the academic position were set by Scientific Council of ICSC PAS.

The recruitment procedure is described on the webpage of the Institute, both in Polish and in English version: https://ikifp.edu.pl/en/cooperation/job-opportunities/

Competition for a scientific post in Jerzy Haber Institute of Catalysis of Surface Chemistry, Polish Academy of Science (ICSC PAS) is announced by the Director of the Institute or his Deputy for Research.

The announcement of the recruitment procedure includes: job/position title and number of available positions; a short description of research to be conducted by the candidate; list of skills and qualifications e.g. required education level, languages, scientific degree or scientific title, mobility experience, required research experience (R1-R4 or years in specific field of science) and information on the job-related expertise; each skill/qualification is described by 'required' or 'desirable' category; a list of specific requirements to be enclosed in the application e.g. an application, a copy of the scientific degree certificate or scientific title confirmation, full CV including information on maternal leaves, voluntary work, periods of work in the industry, at least one opinion on the Candidate from an independent researcher, preferably former/current supervisor, record of the candidate's scientific achievement and his/her own report with short information on the candidate's scientific interests and research objectives (one A4 page); consent to the processing of personal data for the needs necessary to carry out the recruitment process, in accordance with the Act of 29 August 1997 on the protection of personal data (GDPR) provided on the Institute's form; information on the possibility of an interview with a candidate during the recruitment; reference to the contact person responsible for providing information on the vacancy; a date of the final result of the competition; an envisaged job starting date; hours per week

and intended period of employment at ICSC PAS; working conditions, work location, entitlements (salary, other benefits, etc.), type of contract; facilities for the disabled provided by ICSC PAS; reference to the institute's equal opportunities policy; reference to the institute's OTM-R policy;

Information on the open call for a scientific position at ICSC PAS is posted on the web-page of the Institute, in the job-post database of the Ministry of Science and Higher Education, and in the EURAXESS portal.

The Institute unified templates for job announcements (between EURAXESS and our web-page news system) which decreases the administrative burden on employees involved in the preparation of the recruitment as well as minimize the risk of information discrimination for candidates reaching the recruitment process through different information channels.

Institute's secretary checks if the applications are complete and arrived on time.

Each candidate is notified by email acknowledging the receipt of his/her complete application or a list of the missing documents. The deadline for resubmission of the lacking documents is 3 working days. This e-mail will include an indicative time schedule of the process so it will allow sufficient time for external candidates to make the necessary travel arrangements and prepare properly for the interview. All applicants will be informed by e-mail of any significant changes to this timeline.

The evaluation process is carried out by the Commission for Personal Affairs of the Scientific Council of ICSC PAS (referred to as the Commission), elected by secret ballot from among the members of the scientific council. Current members of the commission can be found at the Institute web-page. The meetings of the Commission are conducted in the presence of a person from the Scientific secretariat.

The composition of the recruitment commission may differ in the case of the recruitment process for a full job within the project financed from external sources. In such a case it is set up in accordance with the provisions of the contract with the project provider.

The selection process takes into consideration the whole range of experience of the candidates, focusing on candidates' overall potential as a researcher, their creativity and their level of independence; career breaks or variations in the chronological order of CVs are not penalized.

The Commission makes a list of candidates who fulfil the formal conditions (i.e. are complete) and whose applications have arrived on time.

The Commission organizes interviews with the candidates and conducts them in order to check their knowledge and skills if needed. The face-to-face interviews (over the internet for foreign candidates) will be introduced if needed.

The Commission may ask for an opinion from the Head of the Research Group in which the candidate would be employed.

The Commission prepares a ranking list and its recommendation based on the information provided by the applicants and in accordance with the regulations of the above-mentioned rules of procedure and recommendations of the Code of Conduct for the Recruitment of Researchers.

The Commission prepares a list of strengths and weaknesses for all applications and provides this information to the Scientific secretary.

The scientific secretary informs all candidates about the results of the competition by e-mail, providing each of them with information about the strengths and weaknesses of their applications, the selected person, their own position on the ranking list and information about the complaint procedure.

After publishing the results of the recruitment process on the webpage, all candidates are given a 14-day deadline for filing a complaint.

All complaints are addressed to the Institute's Director, who, if he/she finds them justified sends them to be reconsidered by the Commission. In case the Commission positively reviews the complaint a new ranking list is formulated and communicated to the participants of the competition.

The final ranking list and its justification are presented at the Scientific Council meeting, and subsequently, a secret ballot in support of the selected candidate takes place.

The Secretary of the Scientific Council prepares the list of recommended candidates for the Director of the Institute and HR department in order to prepare and sign work contracts.

If a winner of the competition for a position resigns from signing the contract the job is offered automatically to the next person on the ranking list

If none of the candidates has been recommended by the Commission, agreed to sign a contract or none has applied within the 14-day time limit the Director of the Institute announces the competition unresolved and may reopen it for a new competition.

The leader of the group, in which a selected employee will work, or project leader contacts her/him, and negotiates, after prior agreement with the Director of the Institute, remuneration based on the candidate's work experience and other working conditions (i.e. starting date of the contract).

In the case of non-EU employees, the Deputy Director for Research issues an invitation letter which facilitates the application for Polish Visa.

Strengths and weaknesses of the current practice:

The above analysis allowed the identification of the institute's strengths and weaknesses in the area of Recruitment and Selection. The table below summarizes the findings.

Thematic heading of the Charter and Code	STRENGTHS and WEAKNESSES
Recruitment and Selection	The Institute's procedures related to Recruitment and Selection are in place. The monitoring of compliance with the rules didn't reveal any deviations or misconduct and will be continued. The Institute will consequently peruse with the promotion of HR policy and training for all employees and PhD students to maintain a high level of awareness and professional preparedness. The monitoring, supervision and mitigation of misconduct procedures are in place and are continuously adapted to changing research environment. The success of the Institute's recruitment policy in opening to geographical diversity requires continuous translation of all legal and supporting documents into English.

New and continued actions:

A.16 (C) HRS4R principles (including OTMR policy) will be propagated at seminars and meetings.

A.20 (C) Further translation of legal acts and regulations regulating the work at the institute into English will be continued.

A.23 (N) Annual survey on key HR aspects with possible adjustments of activities.

A.25 (N) Development of the Researcher Career Framework

Working conditions

Objectives: ICSC PAS should ensure that the most stimulating research environment is created which offers appropriate equipment, facilities and opportunities, including for remote collaboration over research networks, and that the national or sectoral regulations concerning health and safety in research are observed.

In particular, it should: ensure that the working conditions for researchers, including for disabled researchers, provide where appropriate the flexibility deemed essential for successful research performance; aim to provide working conditions which allow both women and men researchers to combine family and work, children and career; attention should be paid, inter alia, to flexible working hours, part-time working, teleworking and sabbatical leave, as well as to the necessary financial and administrative provisions governing such arrangements; improve the stability of employment conditions for researchers; ensure that researchers enjoy fair and attractive conditions of funding and/or salaries in accordance with the existing national legislation.

Current status *(in italic – actions implemented 2016-2022)*:

The Institute provides satisfying working conditions to all employees.

ICSC PAS is recognized as an employee-friendly place, providing good working conditions.

Group leaders have freedom as to the way in which the working time of their co-workers is registered. In addition by Director's Directive (June 2020) the possibility of remote work was introduced. Flexible working hours give the possibility to reconcile private and professional life, keeping it balanced.

Every year, research staff takes part in the development of the research plan for the coming year, which guarantees complete freedom in the implementation of scientific research.

Employees and PhD students participate in weekly institute seminars, where speakers are employees or invited guests from various domestic institutions or foreign guests.

Interdisciplinary seminars are organized for doctoral students, at which each student has an opportunity to present and discuss the results of their doctoral dissertation.

ICSC PAS encourage internal and external scientific collaborations.

The Institute encourages and creates opportunities for scientific exchange and the presentation of scientific results at domestic and foreign conferences.

Researchers of ICSC PAS have wide scientific contacts with research institutions all over the world (both formal and informal), and both senior and younger researchers reap the benefits from them, e.g. via scientific visits, and joint projects.

The Institute participates in the ERASMUS+ network as well as National Agency for Academic Exchange Programme. Both PhD students and employees benefit from research and training visits at foreign research institutions financed by these networks. In addition, the Institute regularly hosts visiting students from abroad.

Researchers receive support in administrative, including financial, aspects of their work from dedicated administration units such as the Project Department, Department of International Cooperation, Scientific Secretariat and Patent Attorney.

In the latest evaluation of the quality of Polish research units (including 2016-2018 years), the Institute was awarded the highest A+ category. Evaluation including 2019-2022 years is in progress.

The Institute is well-equipped with up-to-date instruments for research.

Scientists at ICSC PAS have free access to professional research equipment.

Access to scientific equipment was facilitated by establishing (and publishing on Internet webpage) access rules and contact persons.

The Internet connection with the Institute is carried out via optical fiber, which allows data to be transmitted at high speed and without interference.

The Institute created VPN (Virtual Private Network) which extends the institute network across a public network and enables users to send and receive data across shared or public networks as if their computing devices were directly connected to the private network.

In 2018, the Institute significantly improved the internal Internet: group computers were connected within subnets, which allowed easy data sharing and remote access to devices; an integrated wireless network has been introduced at the Institute.

The Institute introduced Microsoft-365, a user-friendly cloud environment that gives access to all the tools anywhere, anytime, on any device. The innovative platform combines well-known applications such as Word, Excel, PowerPoint, and Outlook with advanced cloud services – 1 TB of OneDrive, SharePoint, Azure Bot Service.

Meetings, webinars, and group work are organized using Microsoft Teams software which provides the ultimate messaging, and a workspace for real-time collaboration and communication.

Researchers have online access to the major scientific journals in the disciplines represented in research topics covered by ICSC PAS.

All applicable legal acts, regulations and ordinances regulating work at the Institute are available on the internal website.

Legal acts and regulations regulating the work at the institute are successively translated into English, to make the institutional webpage more friendly for foreign employees.

Preparation and delivery of lectures for PhD students as well as supervisor duties are taken into account in the self-assessment system, i.e. in the annual evaluation of research staff; lecturing is remunerated since October 2015.

During the period 2015-2019 two pay rises were offered. The minimum wages of researchers in individual groups have been equated with the wages of university employees, which in turn are regulated by Polish legislation.

Employee Benefit Fund distributes financial support to employees in need of assistance.

The Institute encourages researchers to participate in competitions organized by external agencies to raise funds for individual / group research.

ICSC PAS subsidizes employees' participation in multiple sports activities, i.e. the fee of a tennis court and also individual ‘Multisport’ cards, which allow access to a wide range of sports facilities.

Subsidized theatre and philharmonic tickets are available for all employees.

Each year a social event called Institute's picnic is organized and it is accompanied by a volleyball match and/or table tennis competition for a trophy of the ICSC PAS Director.

Infrastructure and facilities in Institute are handicapped-user-friendly (without architectural barriers).

Parking is available in front of the Institute.

Renovation of offices and rooms was carried out to improve the working conditions of employees.

From 2021, a new institute website is available, more transparent, and adapted to people with disabilities.

Information about the accessibility of websites and mobile applications and architectural accessibility are presented on the website in both Polish and English versions: https://ikifp.edu.pl/deklaracja-dostepnosci/

Strengths and weaknesses of the current practice:

The above analysis allowed the identification of the institute's strengths and weaknesses in the area of Working conditions and social security. The table below summarizes the findings.

Thematic heading of the Charter and Code	**STRENGTHS and WEAKNESSES**
Working Conditions and Social Security	The strength of the Institute is that the Board of directors and senior staff are aware that the success of the institute depends hugely on Working Conditions and Social Security. The awareness of the issue has greatly increased in recent years also due to the selection procedure of a new Director. All group leaders were consulted by all candidates for the office as well as electors from the Institute about the most urgent issues in the Institute. Analysis of all relevant aspects showed that almost all of them is successfully implemented and the Institute is dedicated to further improving all relevant aspects or maintaining the current status. Most of the weaknesses are related to the limited funding of research in Poland, in particular for the Polish Academy of Sciences, this includes the development of research infrastructure, renovation of the building, development of the infrastructure for intersectoral and international collaboration, and unsatisfactory salaries. One of the issues frequently mentioned by research staff is the lack of a common space for free discussion and exchange of ideas between researchers from various groups and disciplines, and relationship building between young and experienced researchers. Similarly to the above, the relationship building among ICSC PAS staff

	and PhDs is mainly concentrated around the Institute building. This is perceived by young and experienced researchers as insufficient for the full exploitation of their intellectual, emotional and organizational potential. The second weakness is insufficient IT infrastructure development enabling remote collaboration with the research community, particularly the lack of connection of ICSC PAS with Eduroam and ERASMUS + platform. Another issue that starts to appear as an issue and requires strengthening is improving information about current tendencies and solutions for Data management in research. It also requires coordination of the issue at the Institute's level to improve the Research environment in the Institute.

New and continued actions:

A.5 (C) Further development of IT infrastructure will be continued.

A.16 (C) HRS4R principles will be propagated at seminars and meetings.

A.23 (N) Annual survey on key HR aspects with possible adjustments of activities.

A.25 (N) Development of the Researcher Career Framework

A.26 (N) Creation of the common space for ICSC PAS employees and PhD students for the free exchange of ideas, building team spirit recognition of profession and relation building.

A.27 (N) Organization of the 'Strategic retreats' to enhance Recognition of the profession, building a more unified Research environment at ICSC PAS. It will also contribute to the strengthening of the fourth pillar – relation with supervisors.

A.28 (N) Development of the institute's Data management strategy.

Training and development

Objectives: ICSC PAS should draw up, preferably within the framework of their human resources management, a specific career development strategy for researchers at all stages of their career, regardless of their contractual situation, including researchers on fixed-term contracts. It should include the availability of mentors involved in providing support and guidance for the personal and professional development of researchers, thus motivating them and contributing to reducing any insecurity in their professional future.

in particular: one should devote particular attention to the multi-faceted role of researchers as supervisors, mentors, career advisors, leaders, project coordinators, managers or science communicators; the researchers should perform these tasks to the highest professional standards; senior researchers should build up a constructive and positive relationship with the early-stage researchers in order to set the conditions for efficient transfer of knowledge and for the further successful development of the researchers' careers.

Current status *(in italic – actions implemented 2016-2022)*:

Institute employees and doctoral students have the opportunity to participate in various workshops and training aimed at improving their qualifications.

ICSC provides career counselling for both researchers and administrative staff.

Great importance is attached to the training of administrative staff whose competencies facilitate conducting scientific research without administrative burdens.

Over the period 2016-2019 Institute`s staff have undertaken training in the following areas:

- *personal data protection,*
- *intellectual property rights, commercialization of research results,*
- *financing of research in Poland,*
- *the possibility of external financing of research,*
- *access to the library database,*
- *access to computer center PL-Grid.*

All employees were trained in the principles of occupational health and safety, and some employees were additionally trained in the principles of providing first aid.

Researchers and PhD students participate in free language courses, organised by Institute.

Researchers can test themselves in the role of mentors by supervising graduate students who carry out master's theses as well as interns and apprentices.

Researchers conduct lectures for doctoral students, and some of them also lectures for students and PhD students of other institutes and Krakow's universities, which is crucial for recruiting young students from outside the Institute.

Anonymous survey monitors the relations between the researchers and administration as well as between various group of researchers.

Anonymous survey monitors young scientists' perception of senior scientists.

Strengths and weaknesses of the current practice:

The above analysis allowed the identification of the institute's strengths and weaknesses in the area of Training and Development. The table below summarizes the findings.

Thematic heading of the Charter and Code	STRENGTHS and WEAKNESSES
Training and Development	Most of the issues are well covered by existing policies, documents, procedures, monitoring and responsibilities. ICSC PAS staff and PhD students are well-informed, periodically trained and committed to implementing relevant policies. Institute's decision-making bodies are dedicated to maintaining a high level of compliance with HR best practices and improving if new challenges emerge. Although the institute fulfils all good practice requirements in this area, several employees requested continuous professional development in the field of soft skills, particularly, in job opening announcements and CV writing. The discussion between HR WG members revealed that adopted in previous reporting periods action towards the development of career development plan for the institute's staff and PhD students was ineffective. The institute's administration (HR department) is not an optimal unit to implement this action both in terms of lack of adequate resources as well as specialized knowledge about career paths in science both at the national and international scene. As a result of the discussion, the group leaders and principal investigators are the actors that have an adequate understanding of the field to supervise the career development plan of their younger colleagues. However, they need training on how to develop career development plans.

New and continued actions:

A.11 (C) Mentorship training will be carried out.

A.16 (C) HRS4R principles will be propagated at seminars and meetings.

A.17 (C) Training on open access will be organized for researchers.

A.23 (N) Annual survey on key HR aspects with possible adjustments of activities.

A.28 (N) Training on Data management plans for ICSC PAS staff and PhD students.

A.29 (N) The training of soft skills (i.e. 'how to write a good CV' , 'How to prepare a good job offer?') for employees and students will be organized.

No.	Action	GAP Principle(s)	Timing	Responsible Unit	Indicator(s)/Target(s)	Current Status
1.	ICSC PAS as an employer should ensure that the entry and admission standards for researchers, particularly at the beginning at their careers, are clearly specified and should also facilitate access for disadvantaged groups or for researchers returning to a research career, including teachers (of any level) returning to a research career.	12. Recruitment	IIQ 2016	Head of the evaluation commission, Deputy director for research	https://www.gov.pl/web/edukacja-i-nauka/informacje-o-naborach2 https://www2.ncn.gov.pl/baza-ofert/ https://www.e-bip.org.pl/instytutkatifiz/16156 https://euraxess.ec.europa.eu/jobs	Completed
2.	ICSC PAS should establish recruitment procedures which are open, efficient, transparent, supportive and internationally comparable, as well as tailored to the type of positions advertised; Each recruitment will be followed by a short anonymous survey sent to all applicants, in which they will be asked to which degree they agree with the following statements: 1. time frame of the competition was adequate 2. the feedback information from ICSC PAS was useful Possible answers: definitely disagree, disagree, hard to say, agree, definitely agree.	13. Recruitment (Code)	IIQ2016	Deputy Director	https://ikifp.edu.pl/en/cooperation/job-opportunities/	Completed

3.	Candidates should be informed, prior to the selection, about the recruitment process and the selection criteria, the number of available positions and the career development prospects. They should also be informed after the selection process about the strengths and weaknesses of their applications.	12. Recruitment 15. Transparency (Code)	from IIQ2016 - present	Deputy Director and evaluation comission	The each applicant receives a report on their individual assessment with identified strong and weak points of their application. The information on strong/weak points is attached to the letter sent by Deputy Director for Research with information on results of the competition.	Completed
4.	All researchers engaged in a research career should be recognized as professionals and be treated accordingly.	22. Recognition of the profession 24. Working conditions	since QI 2017-2022	Deputy Director	https://ikifp.edu.pl/en/human-resources/?acf-label=grupa_robocza_hr	Completed
5.	ICSC PAS should ensure that the most stimulating research or research training environment is created which offers appropriate equipment, facilities and opportunities, including for remote collaboration over research networks.	23. Research environment 24. Working conditions	2016-2025	Director's proxy for IT issues, Deputy Director	https://ikifp.edu.pl/en/research/facilities/ https://ikifp.edu.pl/en/cooperation/ https://ikifp.edu.pl/en/teaching/internships/	Extended
6.	ICSC PAS should ensure that the working conditions for researchers, including for disabled researchers, provide where appropriate the flexibility deemed essential for successful research performance in accordance with existing national legislation and with national or sectoral collective-bargaining agreements. They should aim to provide working conditions which allow both women and men researchers to combine family and work, children and career. Particular attention should be paid, inter alia, to flexible working hours, part-time working,	24. Working conditions	QI 2016-2022	Research group leaders	https://ikifp.edu.pl/intranet/	Completed

	tele-working and sabbatical leave, as well as to the necessary financial and administrative provisions governing such arrangements.					
7.	ICSC PAS should draw up, preferably within the framework of their human resources management, a specific career development strategy for researchers at all stages of their career, regardless of their contractual situation, including for researchers on fixed-term contracts. It should include the availability of mentors involved in providing support and guidance for the personal and professional development of researchers, thus motivating them and contributing to reducing any insecurity in their professional future. All researchers should be made familiar with such provisions and arrangements.	24. Working conditions 28. Career development	2015-2022	Head of PhD School	List of individual training courses and those organized by the Institute - available at the secretary's office	Completed
8.	ICSC PAS must recognize the value of geographical, intersectorial, inter- and trans-disciplinary and virtual mobility as well as mobility between the public and private sector as an important means of enhancing scientific knowledge and professional development at any stage of a researcher's career. Consequently, ICSC PAS should build such options into the specific career development strategy and fully value and acknowledge any mobility experience within their career progression/appraisal system. This also requires that the necessary administrative instruments be put in place to allow the portability of both grants and social	24. Working conditions 29. Value of mobility	since IQ 2017-2022	Deputy Director	REGULATIONS for conducting periodic assessments of researchers at the ICSC PAS (Resolution 5/118/2021 of Scientific Council of ISSC PAS) REGULATIONS for assessing the progress of researchers at the ICSC PAS (Resolution 5/118/2021 of Scientific (Director Directive 23/2019) REGULATION determining the amount, granting and paying benefits paid from the Scholarship Fund for PhD students of the ICSC PAS (Director Directive 16/2019)	Completed

	security provisions, in accordance with national legislation.					
9.	ICSC PAS should establish, in compliance with national rules and regulations, appropriate procedures, possibly in the form of an impartial (ombudsman-type) person to deal with complaints/appeals of researchers, including those concerning conflicts between supervisor(s) and early-stage researchers.	24. Working conditions 33. Teaching	IIIQ 2015/ IIIQ 2018	Director, Disciplinary Intercessor	https://ikifp.edu.pl/en/ethics/?acf-label=rzecznik_dyscyplinarny https://ikifp.edu.pl/en/ethics/?acf-label=komisja_dyscyplinarna	Completed
10	ICSC PAS should recognize it as wholly legitimate, and indeed desirable, that researchers be represented in the relevant information, consultation and decision-making bodies of the institutions for which they work, so as to protect and promote their individual and collective interests as professionals and to actively contribute to the workings of the institution.	24. Working conditions 35. Participation in decision-making bodies	IVQ 2015	Director	https://ikifp.edu.pl/en/institute/scientific-board/ composition of the collective bodies in ICSC PAS Gender Quality Plan	Completed
11	Senior researchers should devote particular attention to their multi-faceted role as supervisors, mentors, career advisors, leaders, project coordinators, managers or science communicators. They should perform these tasks to the highest professional standards. With regard to their role as supervisors or mentors of researchers, senior researchers should build up a constructive and positive relationship with the early-stage researchers, in order to set the conditions for efficient transfer of knowledge and for the further	37. Supervision and managerial duties	2016-2025	Deputy Director for Research	https://ikifp.edu.pl/en/human-resources/?acf-label=grupa_robocza_hr	In Progress

	successful development of the researchers' careers.					
12	ICSC PAS should ensure that researchers at all career stages reap the benefits of the exploitation (if any) of their R&D results through legal protection and, in particular, through appropriate protection of Intellectual Property Rights, including copyrights.	24. Working conditions 31. Intellectual Property Rights	IQ, IVQ 2015	Director	REGULATIONS or the management of copyrights and related rights, industrial property rights and the principles of commercialization of research results and works development at the ICSC PAS https://ikifp.edu.pl/intranet/	Completed
13	ICSC PAS should develop strategies, practices and procedures to provide researchers, including those at the beginning of their research careers, with the necessary framework conditions so that they can enjoy the right to be recognised and listed and/or quoted, in the context of their actual contributions, as co-authors of papers, patents, etc, or to publish their own research results independently from their supervisor(s).	24. Working conditions 32. Co-authorship	2015	Director	https://ikifp.edu.pl/en/ethics/	Completed
14	ICSC PAS should ensure that teaching duties are adequately remunerated and taken into account in the evaluation/appraisal systems, and that time devoted by senior members of staff to the training of early stage researchers should be counted as part of their teaching commitment.	24. Working conditions 33. Teaching	2015-2022	Director	Documents in Finance and Accounting Department in ICSC PAS	Completed

15	Implementation of revised OTM-R policy.	13. Recruitment (Code) 14. Selection (Code) 15. Transparency (Code)	2019-2022	Director	https://ikifp.edu.pl/en/cooperation/job-opportunities/	Completed
16	Promotion of HRS4R among ICSC PAS staff and PhD students.	2. Ethical principles	2019-2025 October - every year	Deputy Director for Research, HR Working Group, Head of PhD School	List of individual training courses and those organized by the Institute - available at the secretary's office	In progress
17	Training of ICSC PAS scientific staff and PhD students on Open Access.	8. Dissemination, exploitation of results 31. Intellectual Property Rights	2019-2025 two-year cycle	Scientific secretary	List of individual training courses and those organized by the Institute - available at the secretary's office	In progress
18	Information activities for grant leaders on project financial management.	5. Contractual and legal obligations 6. Accountability 26. Funding and salaries	2019-2025 every year – as needed	Deputy Director, Projects' Department	List of individual training courses and those organized by the Institute - available at the secretary's office	In progress
19	Training in knowledge transfer and commercialization of research results. The employees of Institute should be able to recognize commercial value of their research and to secure their IPs according to regulations established in ICSC PAS. The ethical principles of conducting commercial research will also be a subject of the seminars.	8. Dissemination, exploitation of results 31. Intellectual Property Rights 38. Continuing Professional Development 39. Access to research training and	2019-2025 two-year cycle	Deputy Director for Research	List of individual training courses and those organized by the Institute - available at the secretary's office	In progress

		continuous development				
20	Translation of ICSC forms and regulations into English As staff of ICSC PAS becomes more international all regulations and forms should be accessible to non-polish speaking employees.	10. Non discrimination 24. Working conditions	III Q 2025	Deputy Director for Operations	https://ikifp.edu.pl/intranet/	In progress
21	IT data security policy. According to GDPR regulation the new policy ensuring safety of persona data has to be implemented wherever the personal data are being processed.	24. Working conditions	IIIQ 2020	Deputy Director for Operations	https://ikifp.edu.pl/intranet/	Completed
22	Implement of new procedures for granting the degree of doctor or habilitation and regulations governing the creation and operation of a doctoral school. In July 2018 a new Law 'Ustawa 2.0' was implemented in Polish legislation, that has revolutionized the system of science and higher education in Poland. The law changed the rules for obtaining degrees and research titles and gave opportunity for doctoral schools formation. ICSC PAS together with other institutions and higher schools from Krakow created new 'Krakow Interdisciplinary Doctoral School' (May 2019).	24. Working conditions	IVQ 2019	Director	https://www.e-bip.org.pl/instytutkatifiz/22612 https://ikifp.edu.pl/en/research/degrees/postdoctoral-degree/ https://ikifp.edu.pl/en/research/degrees/postdoctoral-degree/	Completed

23	Evaluation of the survey and its refinement if needed. To maintain and improve monitoring tools adopted in the previous action plans the HR WG will identify new or refine existing questions in the survey that will be presented and discussed with the research staff. If the new relevant questions are identified they will be implemented in the next survey. It will help to identify potential GAPs not covered by current monitoring tools.	2. Ethical principles 4. Professional attitude 7. Good practice in research 8. Dissemination, exploitation of results 10. Non discrimination 11. Evaluation/ appraisal systems 12. Recruitment 13. Recruitment (Code) 24. Working conditions 27. Gender balance 28. Career development 30. Access to career advice 32. Co-authorship 36. Relation with supervisors	2016-2025 IQ every year	HR WG	Minutes from the meeting and updated survey.	New
24	Analysis of potential measures promoting more effective exploitation of the research results. The HR WG will organize a meeting of the Board of directors, group leaders, and the Commission for Assessment and Personal Affairs and Promotion of Scientific Council to discuss how more active exploitation can be promoted in the institute.	8. Dissemination, exploitation of results	2023-2025 II Q every year	Deputy Director for Research	Minutes from the meetings	New
25	Development of the Researcher Career Framework	11. Evaluation/ appraisal systems 28. Career development	IVQ 2023	Committee for Employment of the Scientific Staff	https://ikifp.edu.pl/intranet/	New

26	Creation of the common space for ICSC PAS employees and PhD students for the free exchange of ideas, building team spirit recognition of profession and relation building.	22. Recognition of the profession 23. Research environment 24. Working conditions	IQ 2024	Deputy Director for Research /Deputy Director for Operations	Space ready for use	New
27	Organization of the 'Strategic retreats' to enhance Recognition of the profession, building a more unified Research environment at ICSC PAS. It will also contribute to the strengthening of the fourth pillar – relation with supervisors.	22. Recognition of the profession 23. Research environment 24. Working conditions 35. Participation in decision-making bodies	2023-2025	Director	List of Strategic retreats - available at the secretary's office.	New
28	Development of the institute's Data management strategy and Training on Data management plans for ICSC PAS staff and PhD students.	23. Research environment 24. Working conditions 38. Continuing Professional Development	IV 2025	Deputy Director for Research	https://ikifp.edu.pl/intranet/ List of individual training courses and those organized by the Institute - available at the secretary's office.	New
29	The soft skills trainings for employees	38. Continuing Professional Development 39. Access to research training and continuous development	2023-2025 every year	Deputy Director for Operations	List of individual training courses and those organized by the Institute - available at the secretary's office.	New

IV Timeline for implementation of HRS4R in ICSC PAS

The summary of the actions for years 2023-2025 is presented below. They comprise actions continued (C) from the first action plan as well as the new ones (N).

2022		
III Q	Information activities for grant leaders on project financial management; seminars **A.18 (C)**	Deputy Director for Research, Project Department
IV Q	Training in HRS4R **A.16 (C)**	Deputy Director for Research, HR WG, Head of PhD School
2023		
I Q	Annual survey on key HR aspects with possible adjustments of activities **A.23 (N)**	HR WG
	Connection with Eduroam and ERASMUS platform **A.5 (C)**	Deputy Director for Operation,
II Q	Information activities for grant leaders on project financial management; seminars **A.18 (C)**	Deputy Director for Research, Project Department
	Analysis of potential measures promoting more effective exploitation of the research results. **A.24 (N)**	Deputy Director for Research
III Q	Mentorship training **A.11 (C)**	Deputy Director
	Training 'How to write a good CV' and 'How to prepare a good job offer' **A.29 (N)**	Chair of the Committee for Employment of the Scientific Staff of the Scientific Council of ICSC PAS
	Organization of the 'Strategic retreats' **A.27 (N)**	Director
IV Q	Training in HRS4R **A.16 (C)**	Deputy Director for Research, HR WG, Head of PhD School
	Training on ethics in research **A.16 (C)**	Deputy Director for Research, Head of PhD School
	Development of the Researcher Career Framework **A.25 (N)**	Committee for Employment of the Scientific Staff
2024		
I Q	Training on Open Access **A.17 (C)**	Scientific secretary
	Creation of the common space for ICSC PAS employees and PhD students **A.26 (N)**	Deputy Director for Operation,
	Annual survey on key HR aspects with possible adjustments of activities **A.23 (N)**	HR WG

II Q	Information activities for grant leaders on project financial management; seminars **A.18 (C)**	Deputy Director for Research, Project Department
	Analysis of potential measures promoting more effective exploitation of the research results **A.24 (N)**	Deputy Director for Research
III Q	Organization of the 'Strategic retreats' **A.27 (N)**	Director
IV Q	Training in HRS4R **A.16 (C)**	Deputy Director for Research, HR WG, Head of PhD School
	Training in knowledge transfer and commercial research **A.19 (C)**	Deputy Director, HR WG, Head of PhD
2025		
I Q	Annual survey on key HR aspects with possible adjustments of activities **A.23 (N)**	HR WG
II Q	Information activities for grant leaders on project financial management; seminars **A.18 (C)**	Deputy Director for Research, Project Department
	Analysis of potential measures promoting more effective exploitation of the research results **A.24 (N)**	Deputy Director for Research
III Q	Translation of ICSC form and regulation into English **A.20 (C)**	Deputy Director for Operations
	Mentorship training **A.11 (C)**	Deputy Director for Research
	Organization of the 'Strategic retreats' **A.27 (N)**	Director
IV Q	Training in HRS4R **A.16 (C)**	Deputy Director for Research, HR WG, Head of PhD School
	Development of IT networks and strengthening of network protection **A.5 (C)**	Deputy Director for Operations
	Development of the institute's Data management strategy **A.28 (N)**	Deputy Director for Research