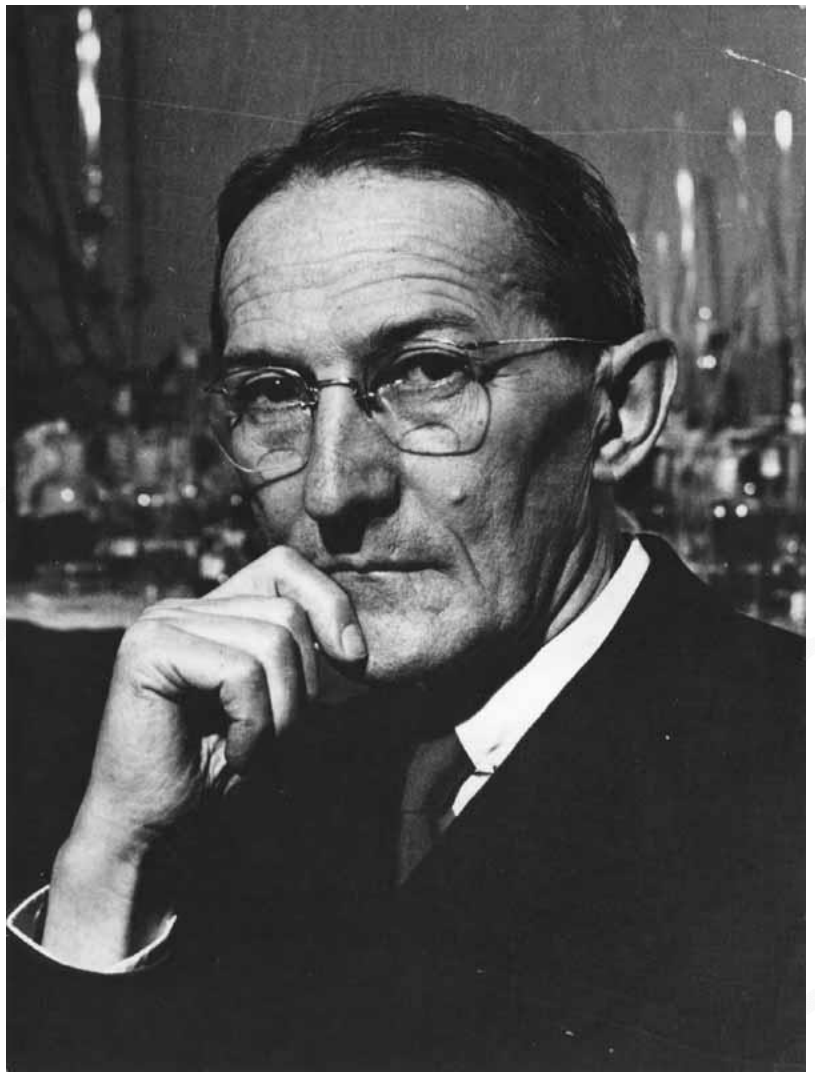
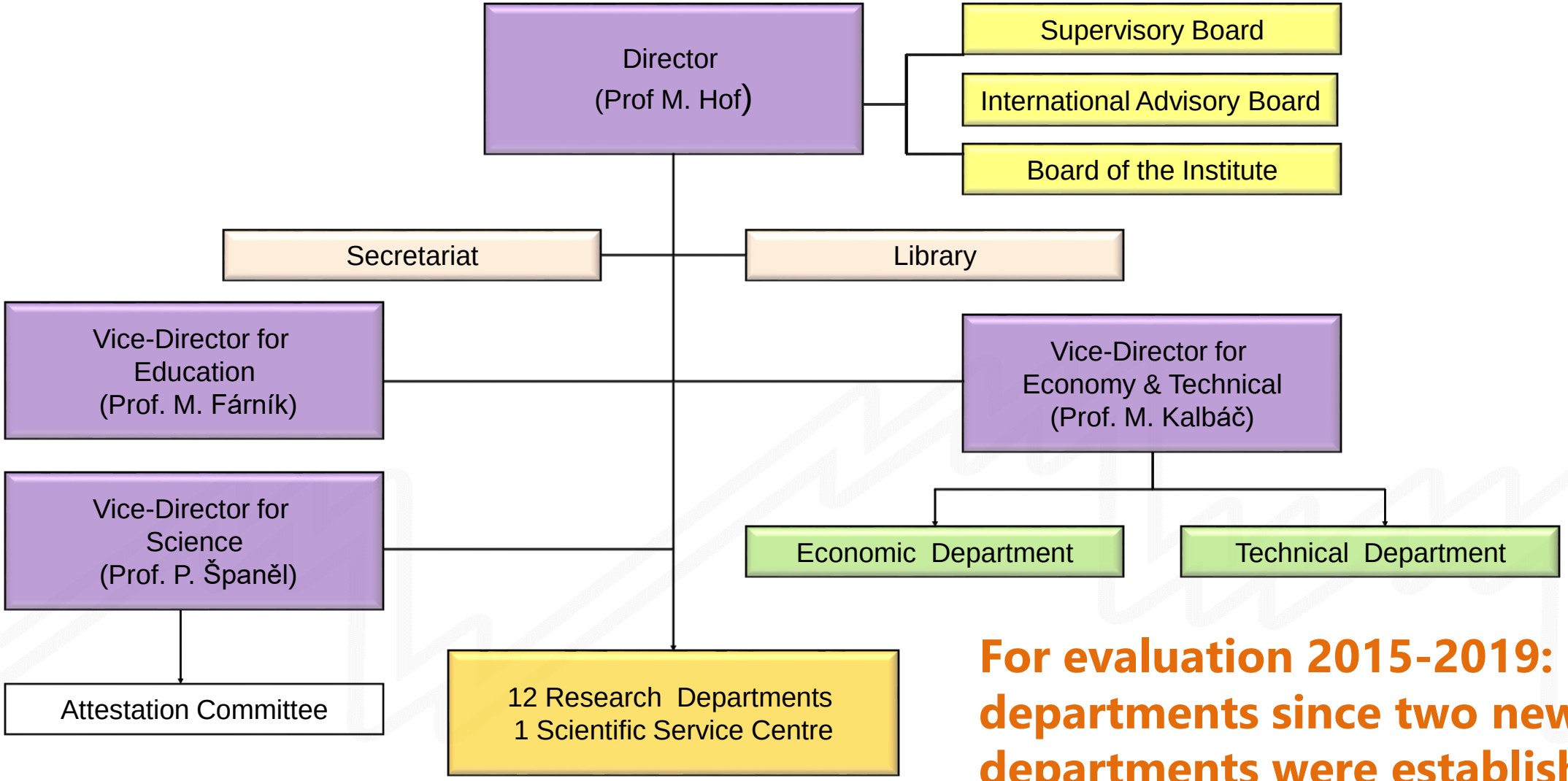
J. Heyrovský Institute of Physical Chemistry

Continuing the legacy of Prof. Jaroslav Heyrovský

- Scientific Excellence
- Scientific Ethics and Integrity
- International Openness
- Giving Opportunities to Perspective Scientists

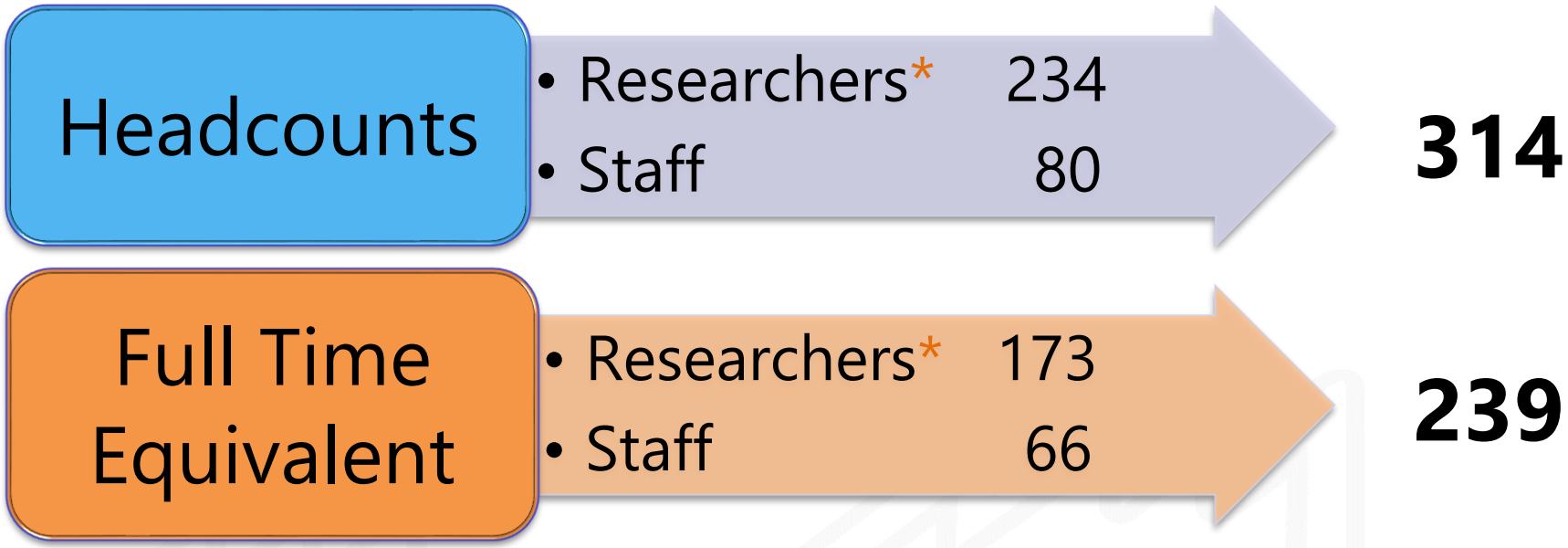


Organization Structure since 1/2019



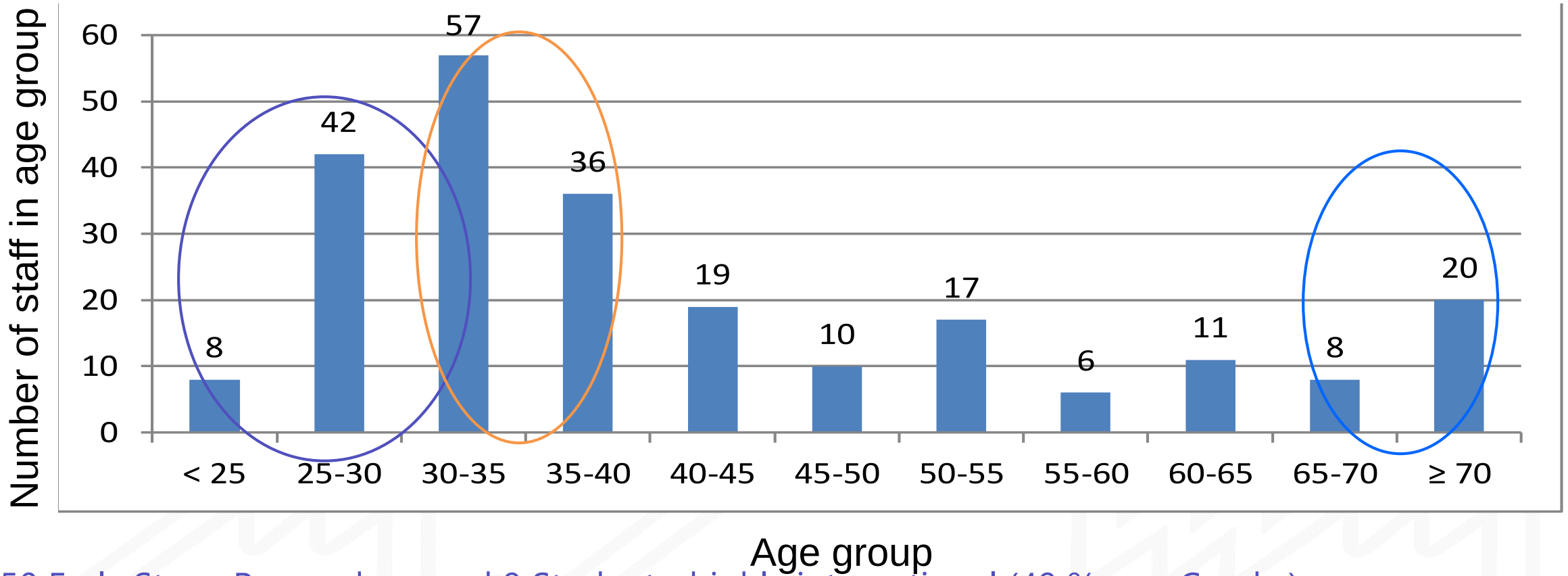
For evaluation 2015-2019: 10 departments since two new departments were established in 1/2019

Employees 2019 (head counts)



**Senior scientists, scientists, research assistants, postdoctoral fellows, Early Stage Researchers (PhD students)*

Age profile of Researchers
(Total headcounts 2019)



- 50 Early Stage Researchers and 9 Students; highly international (49 % non Czechs)
  Students (MSc, PhD) have minimum 0.1 FTE + addition to stipend
- Retirement policy: "Age 66" and "Age 70" : 0.5 and 0.05 FTE from Institutional Resources
- 72 Post-Docs, 6 Heyrovský Young Scientists and 6 Department's (Deputy) Heads (33 % non Czechs)

Subsidies in millions CZK/€ (% from Total)

Year	2015	2016	2017	2018	2019
Total budget*	280/10.8	282/10.8	267/10.3	315/12.1	360/13.8
Institutional	93/3.6 33 %	127/4.9 45 %	124/4.8 46 %	127/4.9 40 %	131/5.0 36 %
Personnel	124/4.8 44 %	135/5.2 48 %	138/5.3 52 %	161/6.2 51 %	183/7.0 51 %

2019:
8.8 Mio Euro from external sources

- Institutional budget is **40%** of the overall budget; **60%** gained by external sources
- 50% of the overall budget is used for salaries

*including institutional subsidies and grant agencies; including investment money

Projects funded by various grant agencies

Year	Czech Science Foundation	Technology Agency CZ	Ministry of Education, Youth and Sport CR	Ministry of Industry and Trade CR	Others+	European Commission
2015	53	6	17	1	11	10
2016	49	6	15	0	9	10
2017	46	4	16	2	16	10
2018	48	5	19	2	14	9
2019	56	7	21	3	18	8

+ Czech Academy of Science, Prague City Hall grants, Foundation Neuron, Ministry of Culture CZ, Ministry of the Interior CZ

HR EXCELLENCE IN RESEARCH

International Openness
>1/3 scientists are foreigners

- Bilingual environment, manuals and guidelines

Scientific Ethics and Integrity

HR EXCELLENCE IN RESEARCH

In January 2019 the J. Heyrovský Institute as the first Institute of the CAS obtained the

"**Human Resources Excellence in Research Award**"

The **HR Award is** awarded by the European Commission to research institutions that implement a personnel strategy based on the 40 principles of the **European Charter for Researchers** and the **Code of Conduct for the Recruitment of Researchers**.

Supported by the Ministry of Education, Youth and Sport

- Capacity Development of ÚFCH JH, v.v.i. for Research and Development (CZ.02.2.69/0.0/0.0/16_028/0006251) obtained in 2017
- Capacity Development of ÚFCH JH, v.v.i. for Research and Development II– obtained in 2019

EUROPEAN UNION
European Structural and Investment Funds
Operational Programme Research, Development and Education

MINISTRY OF EDUCATION, YOUTH AND SPORTS

Scientific Ethics and Integrity

HR EXCELLENCE IN RESEARCH

- Female and Male Ombudspersons
- Committee for Scientific Work Ethics
- German Ombudsman for Ethics in Science is Member of our International Advisory Board
- Guidance on Authorship in Scientific Publications

Giving Opportunities to Perspective Scientists

A. J. Heyrovský Young Scientist Position

"Carreer development scheme towards heading a department"

- **Scientific excellence** (assessed by international reviewers)
- Younger than 35 years
- Extensive experience from aboard

After 5 years evaluation resulting in carrier recommendation

J. Heyrovský Young Scientists

2017:
Petr Kovaříček
Strasbourg
Berlin

2018:
Jaroslav Kočišek
Fribourg
Caen

2017:
Libor Veis
Budapest

2019:
Eva Pluhařová
Paris

2017:
Radek Šachl
Umea
Stochkolm

2017:
Viliam Kolivoška
Bern

head/vice-head of departments

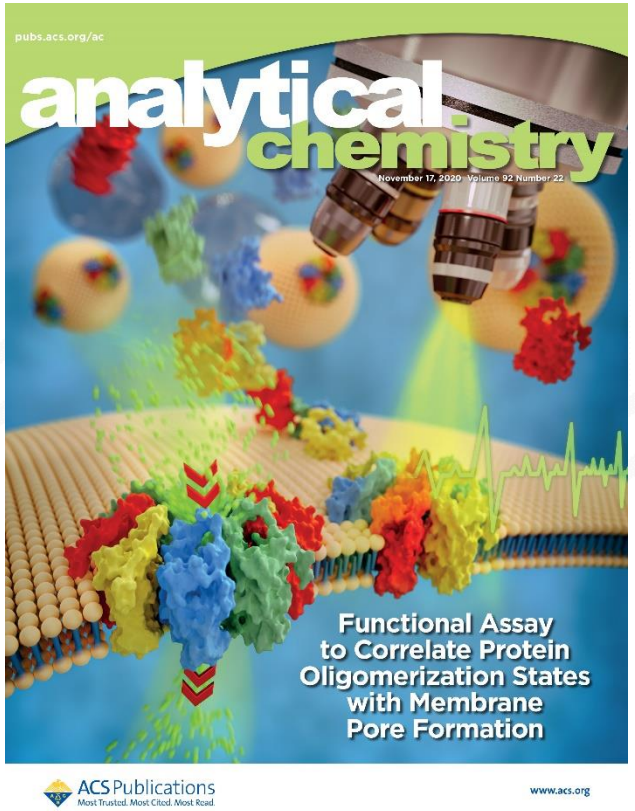
J. Heyrovský Institute

Development of single-molecule fluorescence methods for applications in membrane biophysics

Dr. Radek Šachl, Ph.D. Umeå University in 2012, Post-Doc at Royal Institute of Technology (Stockholm) in 2014.Since 2020 Head of department of Biophysical Chemistry; Heyrovský Young Scientist Position 2017, *Otto Wichterle Award 2017*

Very recent paper:
Šachl*, S. Čujová, V. Singh, P. Riegerová, P. Kapusta, H. Müller, J. Steringer, M. Hof, W. Nickel

Functional Assay to Correlate Protein Oligomerization States with Membrane Pore Formation
Analytical Chemistry Nov. 2020



Identifying functional pores formed by protein oligomers by single molecule based approaches

…with applications for cellular apoptosis and protein translocation across the plasma membrane

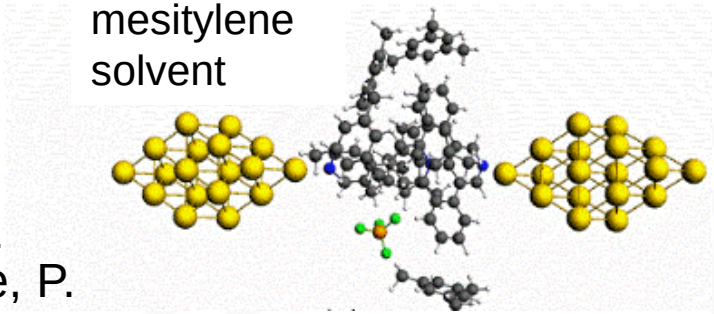
J. Heyrovský Institute

Development of functional circuit elements for single-molecule electronic devices

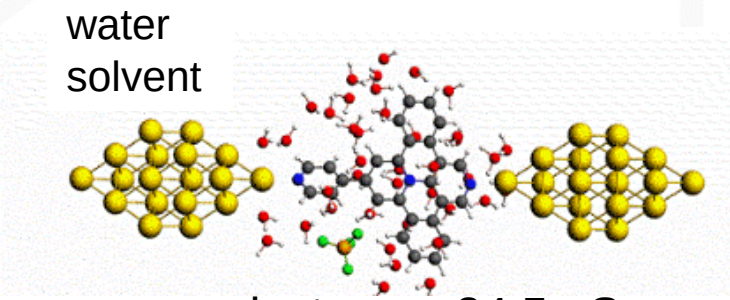
Dr. Viliam Kolivoška, Ph.D. UCT Prague 2011; Post-Doc, University of Bern till 2013. Since 2018 Vice-head of department of Electrochemistry at the Nanoscale; Heyrovský Young Scientist Position 2017, *Otto Wichterle Award 2019*

Very recent paper:
S. Novakova Lachmanova, **V. Kolivoska**, J. Sebera, J. Gasior, G. Meszaros, G. Dupeyre, P. P. Laine*, M. Hromadova*

Environmental Control of Single-Molecule Junction Evolution and Conductance: A Case Study of Expanded Pyridinium Wiring
Angewandte Chemie Jan. 2021



conductance: 6.1 nS



conductance: 24.5 nS

Conductance tuning via molecule-electrode interactions in solvent-controlled single molecule junctions

... with applications as switches in molecular electronic devices

Giving Opportunities to Perspective Scientists

B. Purkyně Fellowship (from 2018 Lumina Quaeruntur)

"Competition on the level of the CAS for attracting incoming scientists providing over-average salary"

- Martin Srnec, Stanford with Edward Solomon, 2014/18, since 2019 heading Computational Chemistry Dept.
- Juraj Fedor, Fribourg with Michael Allan, 2015/19, since 2020 heading Dynamics of Molecules and Clusters Dept.
- Vladimira Petrakova, FU Berlin with Stephanie Reich, awarded in 2020
- Matej Velicky, Manchester with Kostya Novoselov, application approved by Institute's Board

Research Departments and their Heads

Spectroscopy
RNDr. Martin Ferus, PhD.

Full Time Equivalent of Department 9,9

Biophysical Chemistry
RNDr. Radek Šachl, PhD.

FTE 21,2

Chemistry of Ions in Gaseous Phase
Prof. RNDr. Patrik Španěl, Dr. rer.nat.
FTE 9,6

Dynamics of Molecules and Clusters
Mgr. Juraj Fedor, Ph.D.

FTE 9,4

Research Departments and their Heads

Structure and Dynamics in Catalysis
Mgr. Jiří Dědeček, CSc.,DSc.
FTE 27,4

Molecular Electrochemistry and Catalysis
Mgr. Michal Horáček, Ph.D.
FTE 10,5

Electrochemical Materials
Prof. RNDr. Ladislav Kavan, CSc., DSc.
FTE 16,8

Electrochemistry at the Nanoscale
Mgr. Magdaléna Hromadová, CSc.
FTE 12,2

Research Departments and their Heads

Theoretical Chemistry
As.prof. Mgr. Jiří Pittner, DSc.

FTE 10,4

Computational Chemistry
est.1/2019
RNDr. Martin Srnec, Ph.D.

FTE 10,3

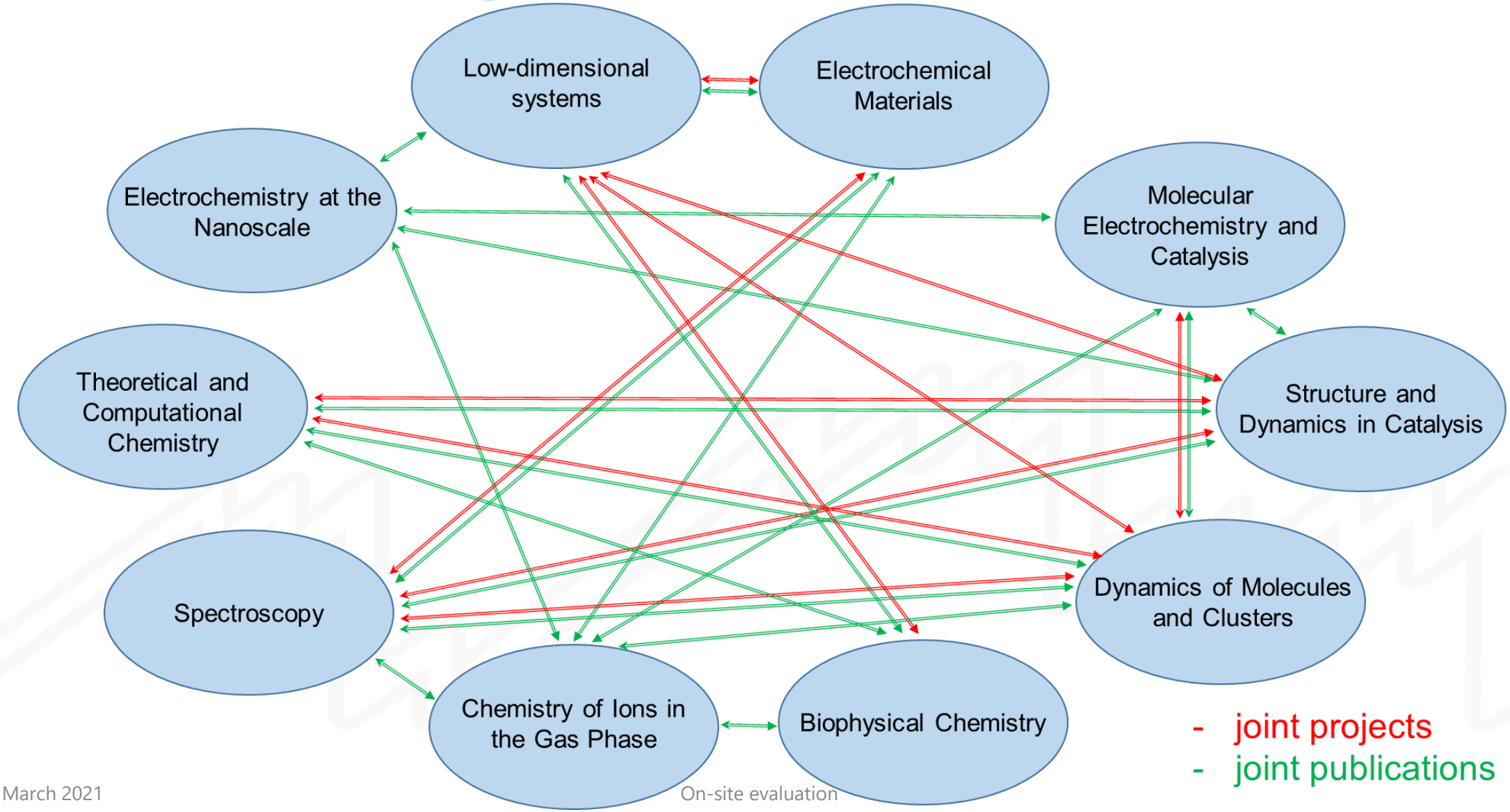
Low-dimensional Systems
As.prof. RNDr. Ing. Martin Kalbáč, Ph.D.

FTE 9,5

Nanocatalysis
est.1/2019
RNDr. Štefan Vajda, CSc., Dr. habil.

FTE 9,5

Inter-Departmental Collaborations



Two new Departments established in 1/2019

Computational Chemistry
RNDr. Martin Srnec, Ph.D.

2011-13 Postdoctoral Stay – Stanford University
2010 PhD – Charles University, Prague
joint 2014 the Institute via Purkyně Fellowship

Nanocatalysis
RNDr. Štefan Vajda, CSc., Dr. habil.

2002-2018 Senior Scientist at Argonne National Lab
1995-2002 Freie Universität Berlin; Habilitation
1990/91 Fellowship – Fulbright University of Chicago
1990 PhD – Charles University, Prague
joint 2019 the Institute via Horizon 2020 ERA chair

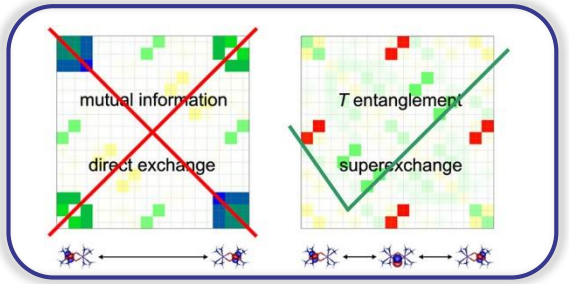
Department of Computational Chemistry

(Head: Dr. Srnec)

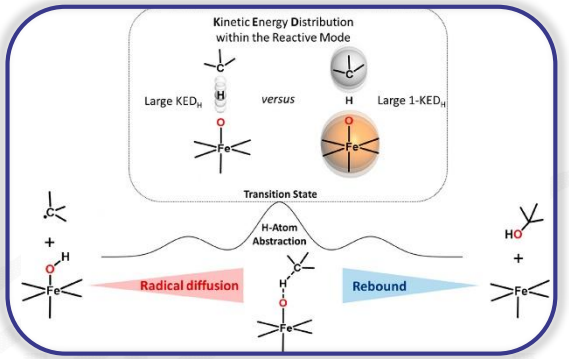
"Computational modeling of complex systems including studies of practical catalytic and biochemical processes."

Very recent papers:

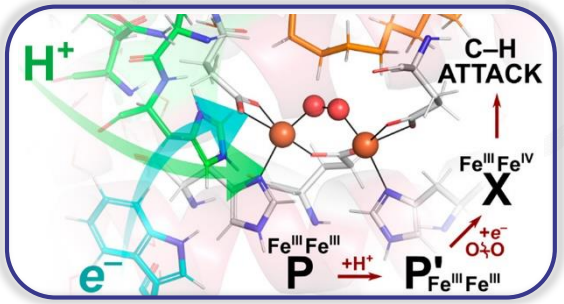
Chalupský J., **Srnec M.*,** Yanai, T.
Interpretation of Exchange Interaction through Orbital Entanglement
J. Phys. Chem. Lett 2021



Maldonado-Domiguez M., **Srnec M.***
Understanding and Predicting Post H-Atom Abstraction Selectivity through Reactive Mode Composition Factor Analysis
JACS 2020

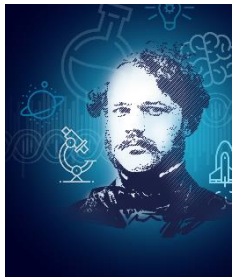


Bím D., Chalupský J., Culka M., Solomon E. I., Rulíšek L., **Srnec M.***
Proton-Electron Transfer to the Active Site Is Essential for the Reaction Mechanism of Soluble Δ9 Desaturase
JACS 2020



Martin Srnec – prizes and awards

Werner von Siemens Award 2020
for the most significant result in fundamental research



Quantum Bio-Inorganic Chemistry Society Award 2020
The award recognizes the outstanding contributions of Dr. Srnec to the theoretical treatment of chemical reactivity.

Prize of Learned Society of Czech Republic 2020

Otto Wichterle Award 2015

Fellowship J. E. Purkyně 2013-2018

The Czech Academy of Sciences

Department of Nanocatalysis

(Head: Prof. Vajda)

"Catalysis and Electrocatalysis at the (sub)nanometer Scale"

"J. Heyrovský Chair"
ERA Horizon 2020 application on Nanocatalysis, 11/2017

€ 2.5M for 5 years; start 7/2018

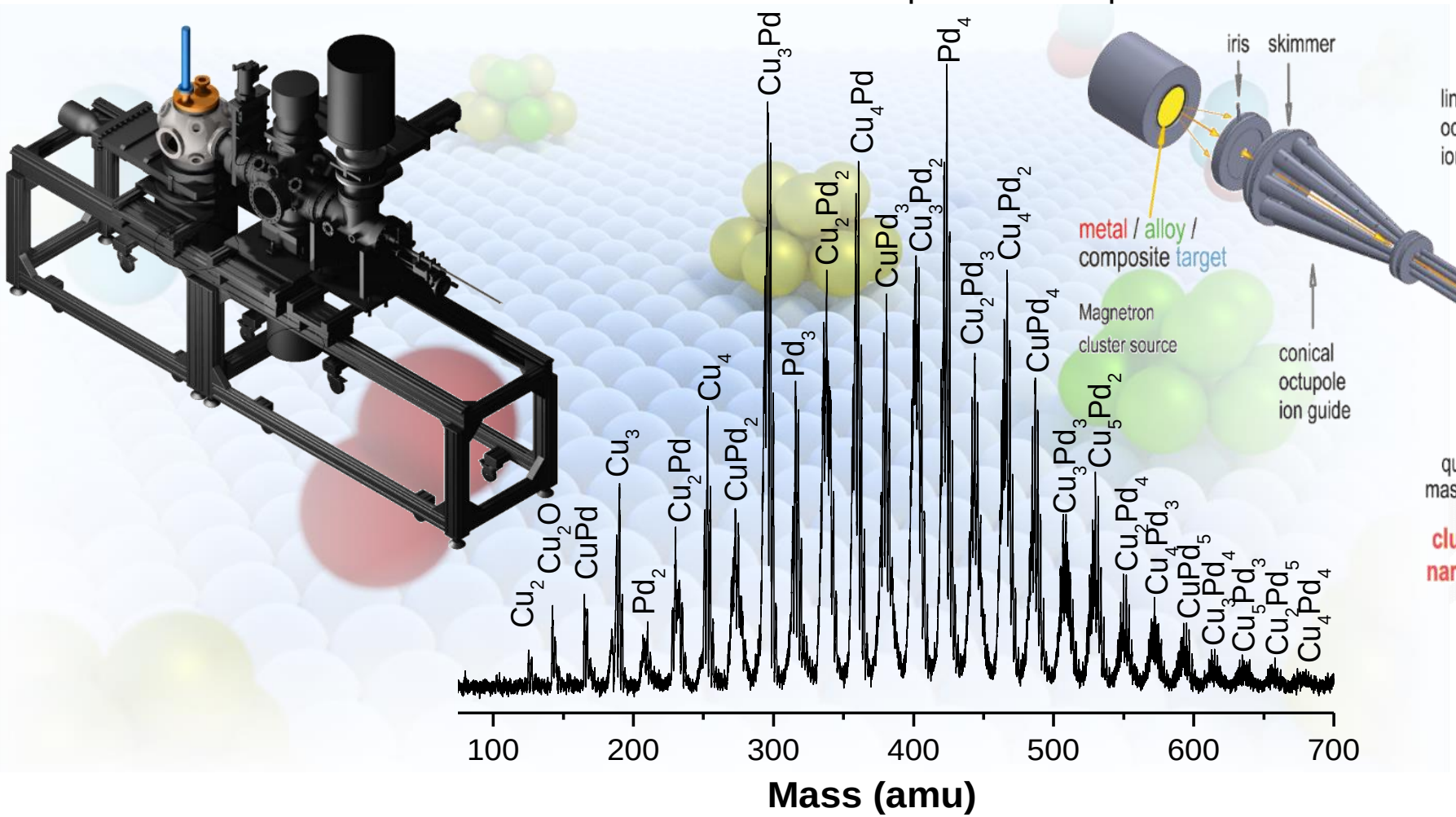
Prof. Stefan Vajda,
ERA Chair since 1/2019
2002-2018 Senior Scientist at Argonne National Lab
Habilitation – Freie Universität Berlin (2003)
Fellowship – Fulbright 1990/1991
University of Chicago
PhD – Charles University, Prague (1990)

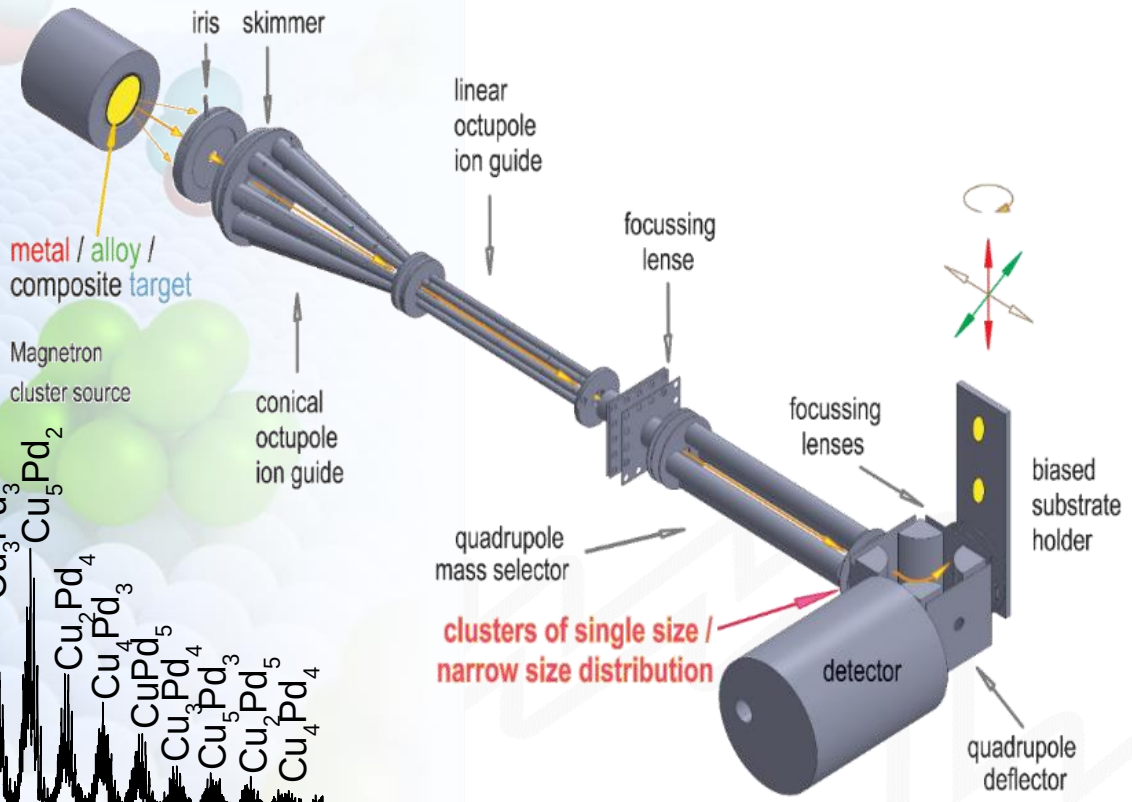
This project has received funding from the European Union´s Horizon 2020 research and innovation programme under grant agreement No. 810310

Department of Nanocatalysis

Design of catalysts atom-by-atom

Cluster Deposition Setup #1





Department of Nanocatalysis

November 2019
Inauguration of the newly renovated labs

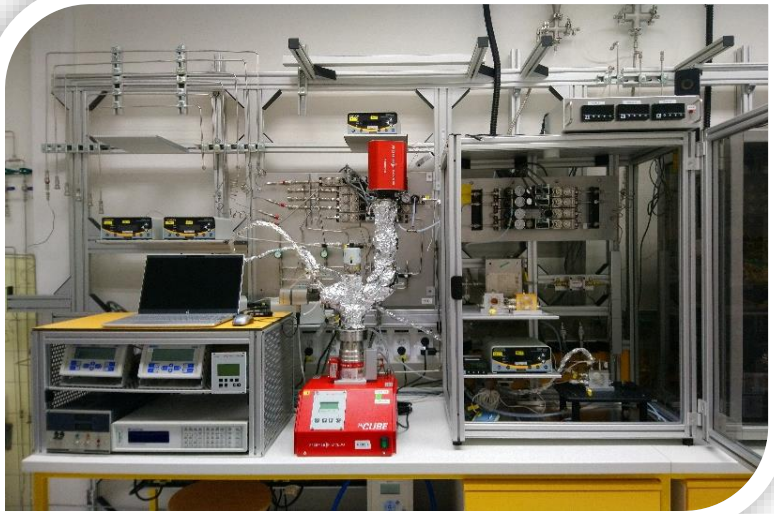
December 2019
Delivery of equipment from Argonne National Laboratory

Department of Nanocatalysis

JUNE 2020

CLUSTER LAB

TEST LAB II – mass spectrometry



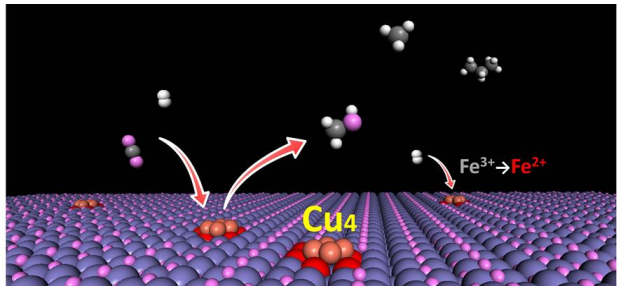
TEST LAB I – gas chromatography

Department of Nanocatalysis

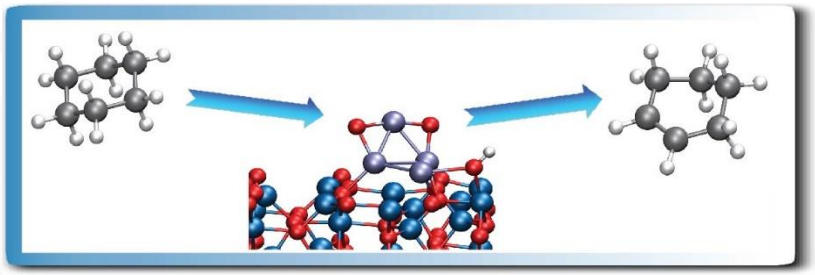
(Head: Prof. Vajda)

"Catalysis and Electrocatalysis at the (sub)nanometer Scale"

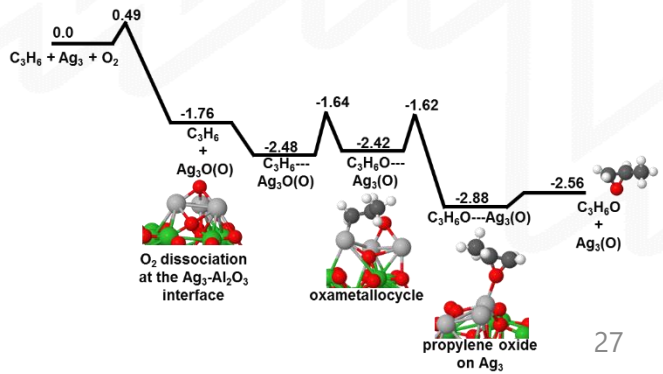
B. Yang, XI. Yu, A. Halder, XI. Zhang, XI. Zhou, G. J. A. Mannie, E. Tyo, M. J. Pellin, S. Seifert, D. Su, **S. Vajda**: Dynamic Interplay between Copper tetramers and Iron Oxide Boosting CO_2 Conversion to Methanol and Hydrocarbons under Mild Conditions, **ACS Sustain Chem Eng** 2019



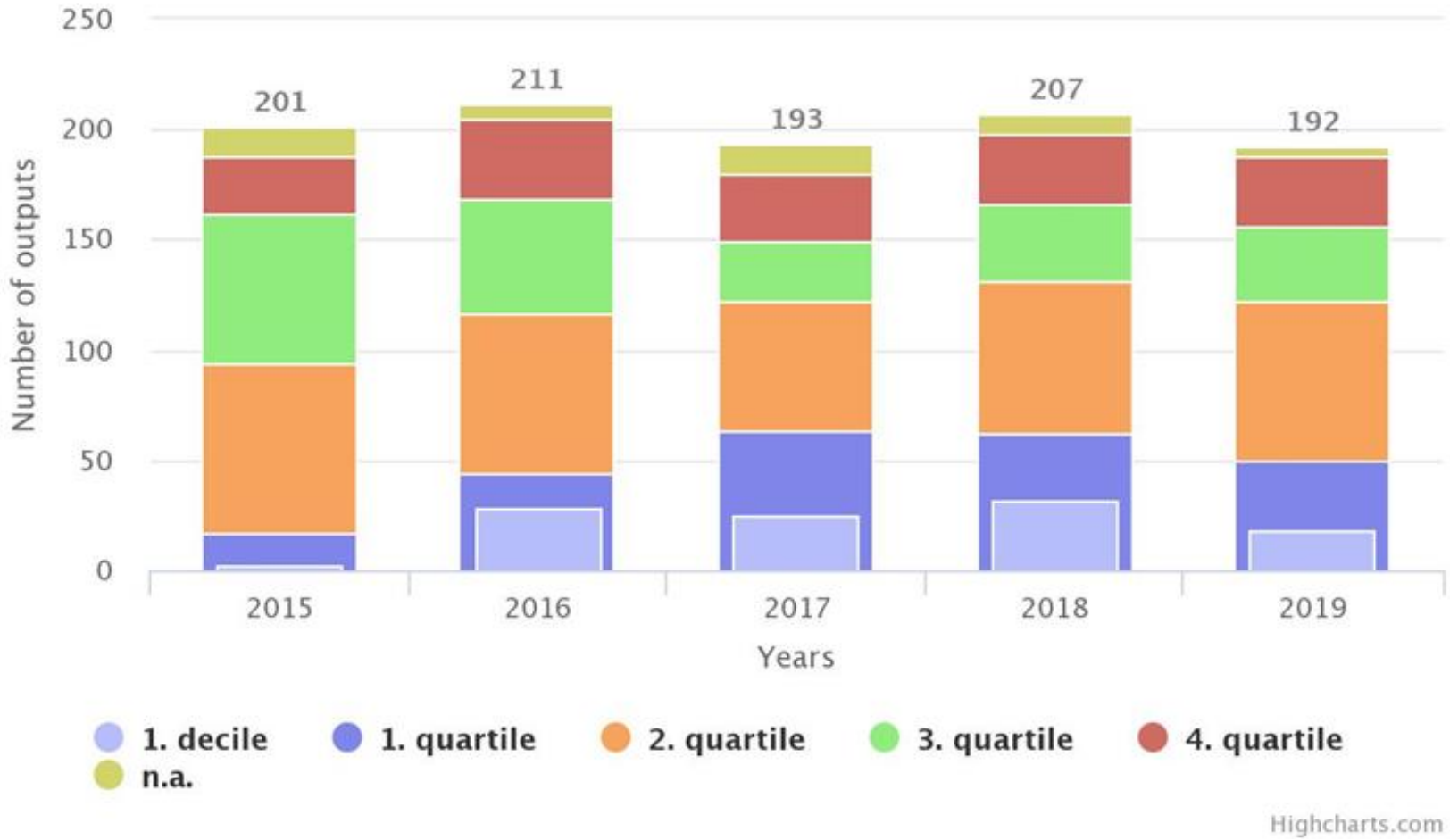
S. Lee, A. Halder, G. A. Ferguson, S. Seifert, R. E. Winans, D. Teschner, R. Schlögl, V. Papaefthimiou, J. Greeley, L. A. Curtiss, **S. Vajda**: Subnanometer Cobalt Oxide Clusters as Selective Low Temperature Oxidative Dehydrogenation Catalysts, **Nat Commun** 2019



Y. Lei, F. Mehmood, S. Lee, J. P. Greeley, B. Lee, S. Seifert, R. E. Winans, J. W. Elam, R. J. Meyer, P. C. Redfern, D. Teschner, R. Schlögl, M. J. Pellin, L. C. Curtiss, **S. Vajda**, Increased Silver Activity for Direct Propylene Epoxidation via Subnanometer Size Effects, **Science** 2010



Number of outputs in selected years in first decile and quartiles



Quality of Science: National Standing

"Evaluation of Research Organisations by the Czech Government in the years 2015-2019"

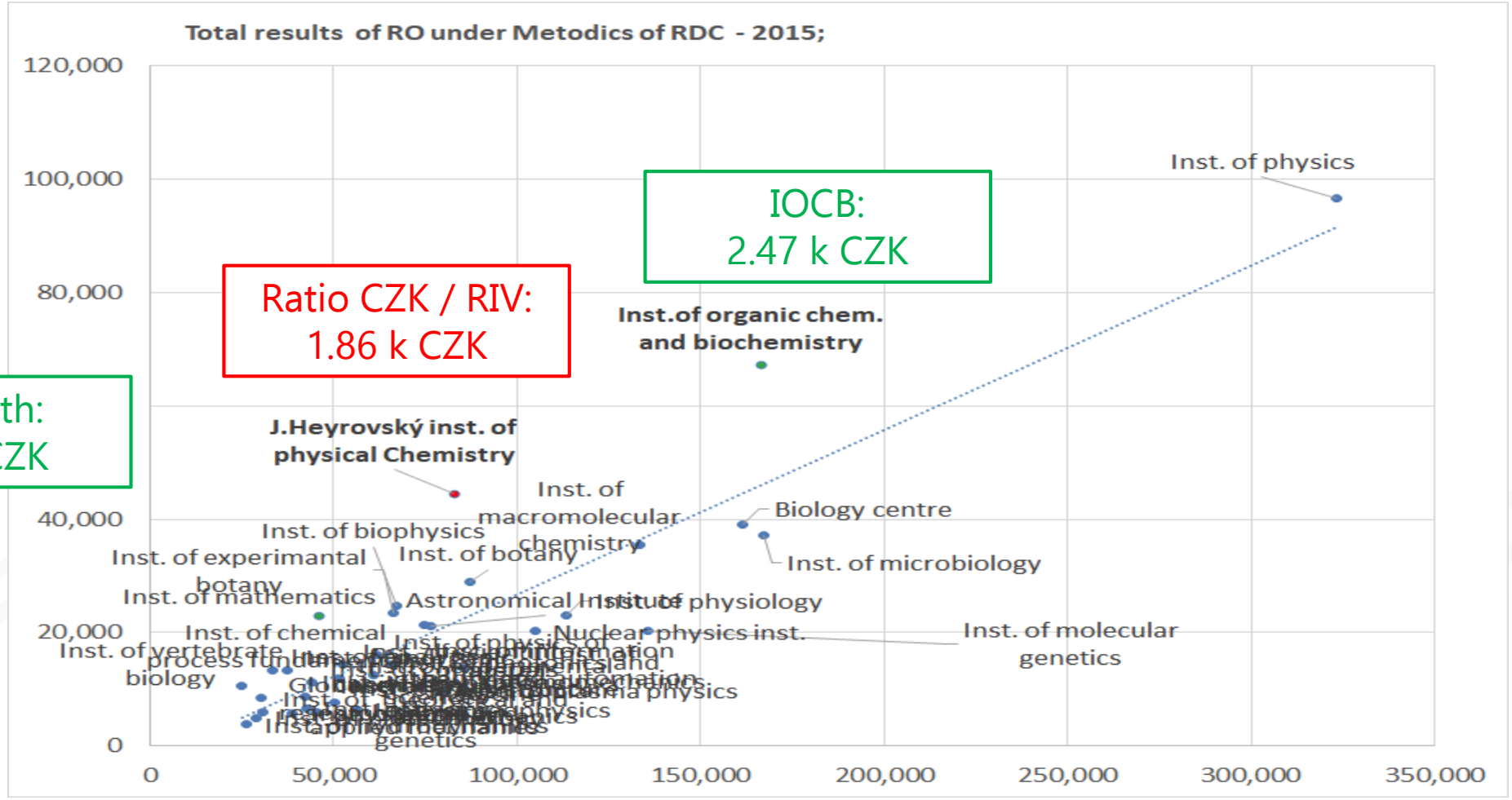
- (Numerical) Evaluation organized by the government till 2016 resulting in **one number ("RIV points")** was criticized that it supports to much quantity to quality

- From 2017 so-called "Metodika 17+" based on **"D1 and Q1"classification**. Evaluators used that to compare the Czech Research Organization among each other but also with EU15 standards

RIV points 2015 / CZK Institutional Support

Heyrovský Institute has been repeatedly the most efficient CAS Institute according RIV points

RIV points



IOCB:
2.47 k CZK

Ratio CZK / RIV:
1.86 k CZK

Inst Math:
2.00 k CZK

CZK Institutional support 2016 from CAS in thousand CZK

Evaluation of Research Organisations by the Czech Government – "The M17+" for 2016-2018

1.4 Chemical Sciences (2016-2018, database WoS)

Order	Research organization	Share in the field in D1	The number of results of the organization in D1
1	Charles University	21%	121
2	Palacký University in Olomouc	19%	114
3	University of Chemistry and Technology in Prague	16%	96
4	Institute of Organic Chemistry and Biochemistry of the CAS	15%	86
5	**J. Heyrovský Institute of Physical Chemistry of the CAS**	**12%**	**71**
6	Institute of Physics of the CAS	9%	52
7	Masaryk University	8%	44
8	Brno University of Technology	6%	33
9	Institute of Macromolecular Chemistry of CAS	5%	28
10	Institute of Biophysics of the CAS	4%	26

Evaluation of Research Organisations by the Czech Government – "The M17+" for 2016-2018

How is the bibliometric profile of the Czech research organizations (RO) compared to world / EU15 level?

"The **bibliometric profiles of large universities** are mostly at the global (national) level, however**, compared to the EU15,** the shares of publications **are significantly lower for D1 and Q1**. However, **J. Heyrovsky Institute was pointed out as an exception: excellent research organization, at the top on a national scale** in its main fields. **It is significantly better compared to EU15 in chemical sciences,** very high share of publications in D1 with corresponding author from the institute indicating that the know-how originates from the institute."

If one takes the size of the RO's into account, are there smaller RO's that exceed the performance of larger institutions in terms of quality

"Yes, **the J. Heyrovsky Institute stands out amongst other Institutes of the CAS, having compared to their FTE a higher number of publications in D1** with corresponding author from the institutes compared to other Institutes of the CAS."

Quality of Science: National Standing

- Numerical Evaluation ("RIV" points) done till 2015 has seen the J. Heyrovský Institute is the most effective Institute of the CAS

- "Metodika 17+" based on "D1 and Q1"classification as well as sees the J. Heyrovský Institute as the most effective Research Organisation in Chemical Sciences

Selected Awards confirm highest national standing

Awards of the Academy of Sciences of the Czech Republic:

A) Praemium Academiae – M. Fárník (2017), M. Kalbáč (2019)

B) The J. Heyrovský Honorary Medal for Merit in Chemical Sciences – Z. Samec (2018)

C) Otto Wichterle Award – J. Kočišek (2018), V. Kolivoška, P. Kovařiček, E. Krupičková Pluhařová (2019)

D) Purkyně Fellowship (Lumina Quaeruntur) – J. Fedor (2019), Vladimira Petrakova (2020)

The Josef Hlávka Award: A. Melcrová (2019)

Prize of the Learned Society of the Czech Republic for young scientists

J. Fedor (2019)

Awards of MEYS - František Běhounek Award: L. Kavan (2017)

Czech Intelect for Doctorandus in Natural Science:

D. Bím (2019)

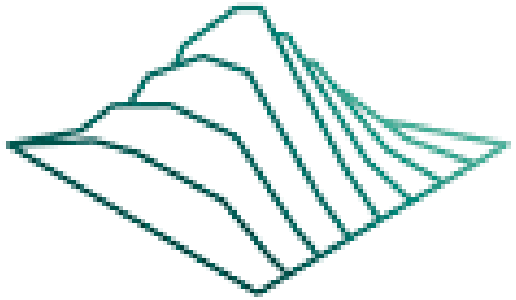
Czech Intelect for the Invention Category:

J. Dědeček, E. Tabor, Š. Sklenák (2020)

Otto Wichterle Award 2019
V. Kolivoška, P. Kovařiček, and
E. Krupičková Pluhařová

Quality of Science: International Standing

Comparison with

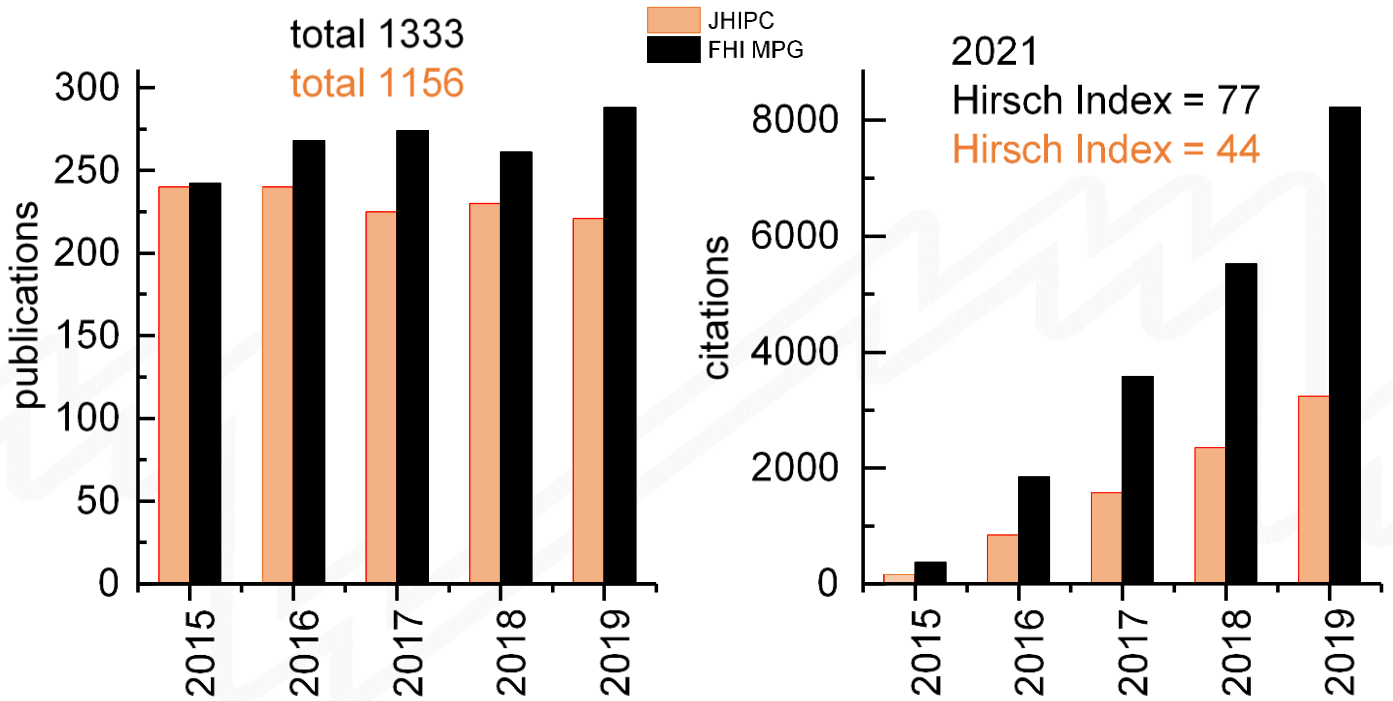


FRITZ-HABER-INSTITUT
MAX-PLANCK-GESELLSCHAFT

Heyrovský Inst. vs. Fritz-Haber-Institute MPG

Heyrovský Inst (2015): 244 employees - 182 scientists (FTE including 40 PGS), budget ca. Mio ca 10 EUR

FHI MPG (2015): 400 employees – 192 scientists (38 senior, 92 PGS, 62 postdocs), budget ca Mio 28 EUR



International Standing

- Comparison with Fritz-Haber-Institute (Berlin) of the Max-Planck-Gesellschaft:
  - The number of full time employees is smaller, but somewhat comparable
  - Budget of FHI is 3 times higher
  - Publication profiles of both institutions are comparable in quantitative and qualitative means
  - Number of citations at Fritz-Haber-Institute is higher

Fritz-Haber-Institute is better integrated into the European research landscape than the J. Heyrovsky institute

EC Projects as an Indicator for Excellence

Acronym	Title	Funding scheme	EU contribution (thousand €)	years
J. Heyrovský Chair	The ERA-Chair at J. Heyrovský Institute - The institutional approach towards ERA	Widening	2 483	2018-23
ONEM	Optical Near-field Electron Microscopy	FET Proactive	885	2021-24
TSuNAMI	Trans-Spin NanoArchitectures: from birth to functionalities in magnetic field	ERC-STG	486	2017-22
ELCOREL	Electrochemical Conversion of Renewable Electricity into Fuels and Chemicals	MSCA-ITN	465	2017-21
StR-ESFRI2	Support to Reinforce the European Strategy Forum on Research Infrastructures	CSA	283	2019-22
PROTON	Proton transport and proton-coupled transport	MSCA-ITN	235	2019-23
TAGGED	Graphene light emitting hybrid MOEMS Device	ERA-NET	233	2021-24
IMPACT	Ion-Molecule Processes for Analytical Chemical Technologies	MSCA-ITN	232	2016-19
ShaleXenvironmen T	Maximizing the EU shale gas potential by minimizing its environmental footprint	RIA	210	2015-18
GrapheneCore1	Graphene-based disruptive technologies	RIA	207	2016-18
GRAPHENE	Graphene-Based Revolutions in ICT And Beyond / Flagship	CP-CSA	90	2013-16
InRoad	Research Infrastructures Beyond National Relevance	CSA	78	2017-19
ENERGY-X	ENERGY-X: Transformative chemistry for a sustainable energy future / Flagship	CSA	41	2019-20
SUNRISE	Solar Energy for a Circular Economy / Flagship	CSA	11	2019-20

CP- CSA Collaborative projects - The Coordination and Support Action
MSCA-ITN Marie Skłodowska-Curie Actions - The Innovative Training Networks
ERC-STG European Research Council: Starting Grants
FET Proactive The Future Emerging Technologies programme
RIA Research and Innovation Action
ERA-NET Horizon 2020 ERA-NET COFUND

EC Projects as an Indicator for Excellence

•Compared to other Institutes of CAS the Heyrovský Inst. is one of the most successful Institutes in obtaining EC funding

•Success in EU Horizon 2020 programs, e.g.:

- Coordinating / participating in three Marie Curie Initial Training Networks (ITN)
- Involvement in three Flagship actions
- Co-PI of ERC starting grant
- ERA Chair (Widening)
- Very Recent: FET Proactive: Emerging Paradigms and Communities

- Even several applications were submitted, no ERC Advanced / Consolidator Grant was yet awarded to the Institute

J. Heyrovský Inst. has to be better integrated into the European research landscape

Strategy for better integrating into the European research landscape

Formulated with three **objectives:**

1. **Establishing a consolidated inter-institutional international network** allowing cooperation among various scientific lines, but also including science training aspects. Using EC funding schemes like Twinning for that.

2. **Closely collaborate with international partners in sharing unique scientific infrastructure**, equipment and related services.

3. **Attract talented students and early stage researchers** and provide together with international partners high-quality training in sophisticated scientific techniques in the broader field of physical chemistry. The mid-term perspective of this objective is to intensify the scientific cooperation with a foreign university working towards a jointly awarded doctorate.

Strategy for better integrating into the European research landscape

Collaboration with a Strong Partner on the Institutional Level

Helmholtz-Zentrum Dresden- Rossendorf (HZDR)

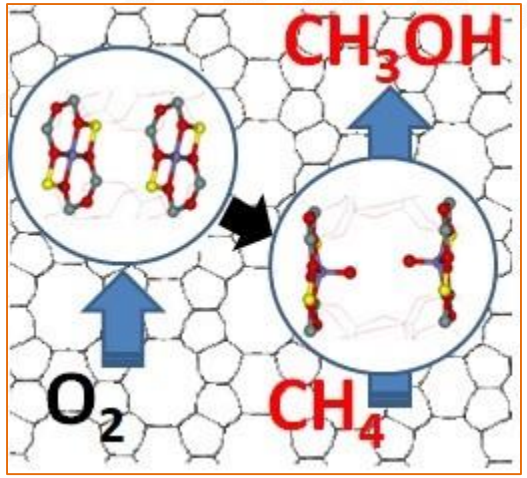
Signing Memorandum of Understanding with the Director of HZDR Prof. Roland Sauerbrey

Knowledge Transfer into Practice
Patents and utility models

Jirkovsky, Rathousky et al.
Self cleaning paint, BETOSAN, sro, Advanced Materials-JTJ

Year	Patents		Utility models	
	applied	granted	applied	registered
2015	3	7	0	0
2016	1	5	4	3
2017	4	1	0	0
2018	1	4	0	1
2019	1	2	3	1

Dědeček et al. 2020
Direct methane (CH_4) to methanol (CH_3OH) oxidation by molecular oxygen (O_2)



Awarded by Czech Intelect for the Invention Category:
J. Dědeček, E. Tabor, Š. Sklenák (2020)

Joint projects with partners from industry

1. Carbon nanostructures for sensor applications (M. Kalbáč, 2013-16)
2. Research for the production of multifunctional photoactive nanocomposite for use in construction and paints (J.Jirkovský, 2013-16)
3. Use of photoactive nano-surfaces to solve current problems of air and water purification (J. Jirkovský, 2013-16)
4. Advanced phosphor for high power LEDs and laser diodes (S. Civiš, 2014-17)
5. Catalytic process for complete elimination of nitrogen oxide emissions for nitric acid production technology (P. Sazama, 2015-17)
6. Progressive materials for protection against serious environmental damage (J. Dědeček, 2018-21)
7. Replacement of SF6 gas in switchboards (J. Fedor, 2017-20)
8. Development of high-performance alkylation and isomerization catalysts (P. Sazama, 2018-20)
9. Powerful light sources (S. Civiš, 2018 -19)
10. SEPIOT - Gas sensors based on hybrid nanostructures for IoT applications (M. Kalbáč, 2019-22)
11. Photoactive nanocomposite systems for environmental improvement (J. Jirkovský, 2019-21)
12. National Competence Center for Materials, Advanced Technologies, Coating and Their Applications (M. Kalbáč, 2019-22)
13. Research and Construction Design of 48V Lithium Accumulators for New Generation of Automobiles (Zukalová, 2017-2020)

Year	Projects	Contractual research
2015	7	12
2016	6	7
2017	6	9
2018	7	9
2019	10	8

Cooperation with Universities and Participation in Education

- 50 Early Stage Researchers in common PhD programs with Universities; 9 Master Students
- Close to 500 lectures or seminars / year by 40 scientists are given at 7 Czech Universities (more than half at Charles University Prague) and the University of Dresden (i.e. Privat-Dozent P. Krtil)
- 17 of running grants do have the co-PI located at the Universities (2019)

J. Heyrovský Institute

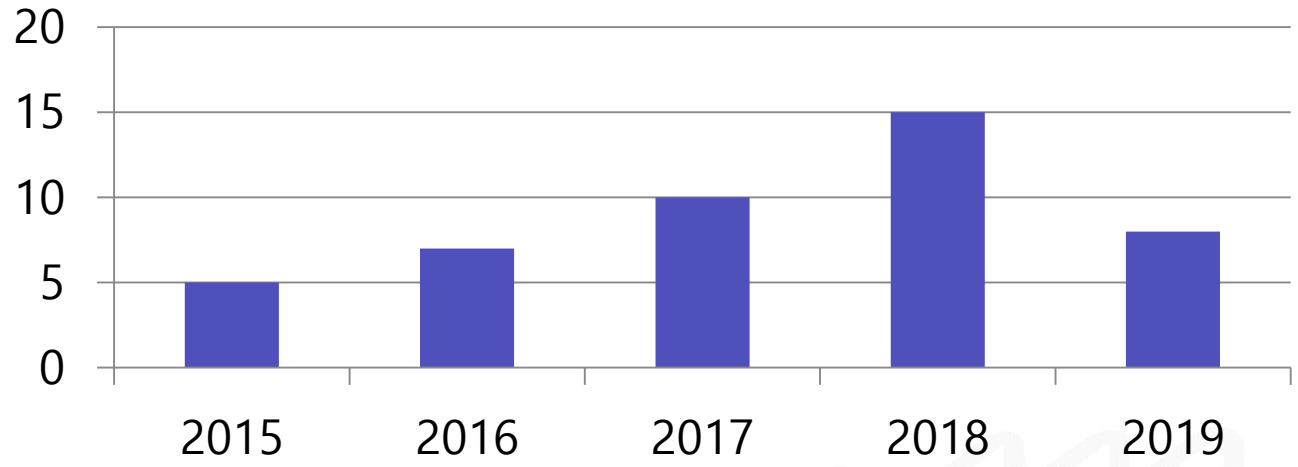
Education activities for high school students
Popularization of science for public

POPULARIZATION EXPERIMENTAL EDUCATION

Year	Total number of realized programs ***	Lectures for secondary and basic school students (hours)	Stays of second. school students	Number of visitors of Open Days	Exhibitions organized by institute
2015	78	55	32	230	6
2016	85	77	42	210	6
2017	90	84	53	210	8
2018	117	87	77	355	7
2019	115	50	80	360	10

*** *programs: e.g. lectures for students, educative seminars for teachers, practices in laboratories and stays in laboratories; chemical performances for children from kinder garden, workshops for basic school pupils or secondary school students, summer school for secondary school students, exhibitions, stands with experiments on yearly science fair. Web page of Heyrovsky educative team PEXED (Popularization Experimental Eduction) - http://www.3nastroje.cz*

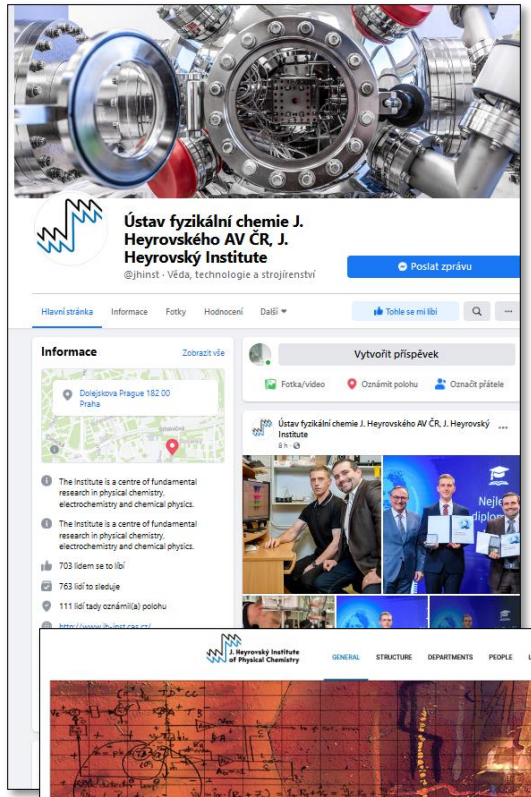
Organization of conferences and festive lectures (2015-2019)



Organised by the institute :

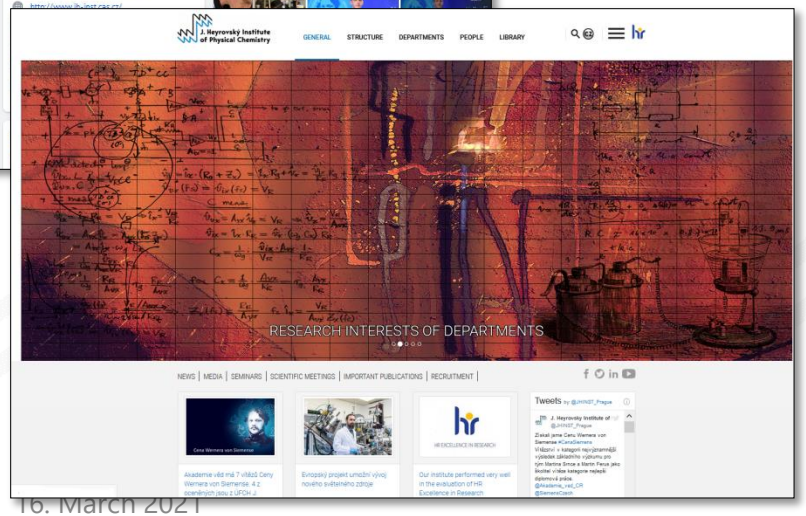
- R. Brdička Memorial lecture (**annually** since 1991)
- Heyrovský Discussion (Castle Třešť, **annually**, c.a. 50 participants)
- Seminar of students of the Heyrovský Institute (Liblice, **annually**, ca. 60 participants)
- The scientists of the institute organised **over 40 conferences and workshops** in the period 2015-2019 including

Other Outreach Activities



We have professionalised our Outreach Activities within the last 3 years. As a results the Institute presents the results of its activities in the media and on social networks continuously year-round.

For more details, see
https://web.jh-inst.cas.cz/press-releases
and
https://web.jh-inst.cas.cz/media



SWOT analysis

Strengths

The institute is internationally respected for the quality of scientific research

- The research program at the institute is well balanced in the field of contemporary physical chemistry
- Highly qualified senior research staff with a good or excellent international reputation
- Leading scientists are invited as plenary speakers at international conferences and to evaluate science on the European level

The institute is one of the best research Institutions within the Czech Republic

The institute is well-equipped by instrumentation and expertise

- Unique instrumentation and expertise located at one place, which was further extended by Nanocatalysis lab

The institute is internally well-balanced

- A comparable level of the scientific performance in all research departments of the institute.
- Well-balanced personnel structure.
- The number of Non-Czech scientists has increased to 38%, which is well above the national standards.

The institute is active in education and popularization

The institute has established European standards in research management

SWOT analysis

Weaknesses

Lower impact and limited visibility of the research performed in the institute compared to top Western Research Organizations

- Some research strategies are determined by evolution from traditional directions of electrochem., catalysis and chemical physics
- Difficulties to compete with top world research institutions in some areas of the material and methodological research
- Attempts to obtain ERC consolidator / advanced grants have not yet been successful.

Financial weaknesses

- Salary level of the institute is substantially lower not only when compared to western research institutes, but also when compared to certain Czech research units. Recruitment of prospective young scientists is difficult.
- Expensive maintenance and operation of sophisticated research instruments
- Presently 60% of the FTE in research is financed by external funding resources.

Organizational weaknesses

- The majority of the leading scientists has Czech citizenship, and have spent the largest part of their scientific career in the CR.
- A lack of PhD students is felt in several departments.
- Absence of administrative and technical staff within the individual departments.

SWOT analysis

Opportunities

- Better integrate the Institute into the European research landscape and increase overall visibility
- Developing and implementing strategies to make the institute more attractive to ESR and Post-Doc's
- Increasing the success rate in EC funding
- Continuing supporting the best young scientists by selecting more J. Heyrovský Young Scientists
- Promoting them to department head / vice-heads

Threats

- The biggest threat is the omnipresent underfunding of research in the Czech Republic and fluctuations of funding based on political interventions
- The financial instability may, despite successfully introduced structural changes at the institute, cause lag of institutional funding sufficient for following the world trends in science.
- Low success rates grant funding would threaten the balanced budget of the institute.
- The reluctance of the Czech Scientific decision-makers to establish European standards regarding continuity and transparency in the management of science.

Thank you for your attention!