Continuing the legacy of Prof. Jaroslav Heyrovský

Nobel Prize in Chemistry
(10.12.1959)
The legacy of Prof. Heyrovský

• Highest Scientific Excellence
The legacy of Prof. Heyrovský

• Highest Scientific Excellence

• Scientific Ethics and Integrity

• International Openness

• Giving Opportunities to Perspective Scientists
In January 2019 the J. Heyrovský Institute 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

- Rozvoj kapacit ÚFCH JH, v. v. i. pro výzkum a vývoj (CZ.02.2.69/0.0/0.0/16_028/0006251) obtained in 2017
- Rozvoj kapacit ÚFCH JH, v. v. i. pro výzkum a vývoj II – recommended for funding
Scientific Ethics and Integrity

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

1/3 scientists are foreigners

- Open, Transparent and Merit-based recruitment
- Bilingual environment, manuals and guidelines
International Openness

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
J. Heyrovský Young Scientist Position

“Carrier development scheme towards heading a department”

• **Scientific excellence**
• Younger than 35 years
• Extensive experience from aboard

After 5 years evaluation resulting in carrier recommendation
J. Heyrovský Young Scientists

Petr Kovaříček
Strasbourg
Berlin

Jaroslav Kočišek
Fribourg
Caen

Libor Veis
Budapest

Eva Pluhařová
Paris

Radek Šachl
Umea
Stochkolm

Viliam Kolivoška
Bern
Synthesis of nanomaterials and controlling its self-assembly

Dr. Petr Kovaříček,
Ph.D. from University of Strasbourg (France) with Jean-Marie Lehn
Post-doc at Humboldt University of Berlin (Germany)
*Otto Wichterle Award 2019*


Development of novel optoelectronic detectors in an **one step** approach starting from functionalized graphene

Graphene, functionalization, **on-surface polymerization of a semiconductor**, **2D perovskite self-assembly**, encapsulation, integration into a circuit

**Result**: Fully self-assembled optoelectronic detectors
Highest Scientific Excellence
ERA Chair at the J. Heyrovský Institute

Start of the action: 1. July 2018
Duration: 60 months
EU contribution: 2,483,750 €
Institute contribution: 500,000 €
Scientific Topic: Catalysis

J. Heyrovský Chair project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 810310.
Dr. habil. RNDr. Stefan Vajda, CSc.

“Scientific Excellence in Nanocatalysis”

- 2003-2018: Senior scientists at Argonne National Laboratories (USA Department of Energy)
- 1994-2002 Freie Universität Berlin; Habilitation
- Fulbright Scholar at The University of Chicago (1991-1992)
- PhD, Charles University (1990)

Since 1. January 2019 at the J. Heyrovský Institute
Dr. habil. RNDr. Stefan Vajda, CSc.

“Scientific Excellence in Nanocatalysis”

- Demonstrated, for the first time, that size-selected subnanometer clusters can be stabilized and be highly efficient and selective catalysts

- Pioneered synchrotron based in situ / operando characterization of subnano clusters

Y. Lei, …… and S. Vajda, Increased Silver Activity for Direct Propylene Epoxidation via Subnanometer Size Effects, Science 2010

S. Lee, …… and S. Vajda, Subnanometer Cobalt Oxide Clusters as Selective Low Temperature Oxidative Dehydrogenation Catalysts, Nat. Commun. 2019
“Catalysis by size and composition selected subnanometer & nanometer clusters”

- Design of catalysts atom-by-atom
Goal:
Discovery of new classes of catalytic materials for industrial processes* based on bridging the gap from single atoms to nanometer sub-nm clusters and nanostructures assembled from clusters:

- single component
- multi-component

Economic Implications
Defined clusters made of a handful atoms of *precious* elements are:
- highly active
- selective
- INEXPENSIVE

* e.g. United States Patent 10,385,032  *Selective oxidation of propane to propylene oxide* 16/029,363
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7.12.2019: Nanocatalysis lab moves from USA to Ladvi