RCPTM newsletter
1
2019

# RCPTM employs four Highly Cited researchers

**RCPTM features strongly in the *Highly Cited Researchers 2018* list. In this elite group, which includes 17 Nobel laureates, RCPTM has four representatives. This achievement means that RCPTM, as an institute, employs more highly cited researchers than some countries, like Hungary and Slovenia.**

Radek Zbořil, RCPTM's General Director, has appeared in the list for the first time. He is a world-renowned scientist, who has been behind the discovery of the thinnest insulator known to date, non-metal magnets, the first two-dimensional carboxylic acid, and bacterial resistance to nanosilver. "I believe that the high citation of our papers not only reflects their quality, but also justifies the choice of our research area. We have been focusing on research on materials and technologies that have great potential applications in medicine, biotechnology, water treatment and identification of new energy sources. However, such multidisciplinary research is expensive and the competition is fierce. Success is possible only if talented people are exploiting innovative ideas in an international environment equipped with state-of-the-art infrastructure. RCPTM and Palacký University have all qualities, which has been reflected in the Clarivate Analytics rating," said Radek Zbořil.

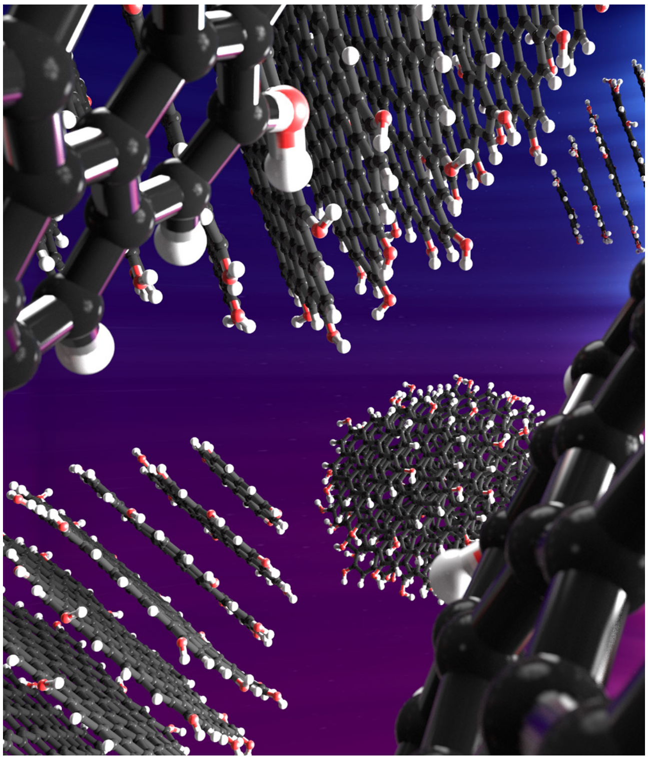
Another RCPTM researcher named in the list is Pavel Hobza, who also works at the Institute of Organic Chemistry and Biochemistry of the Czech Academy of Sciences (CAS). He has re-joined this elite group after a year's absence. Prof. Hobza is also a recipient of a *Schrödinger Medal* and *Česká hlava 2018* award. He has become widely recognized for the discovery of improper hydrogen bonds and non-covalent interactions. "Being ranked among the top one percent of the most highly cited researchers in the world for the fourth time is the evidence that our long-term scientific project aimed at non-covalent interactions and their use in bio- and nanoscience is still very prospective. During the past few years we have been moving on from fundamental research to applications and the results obtained from the close connection between theory and experiments are more than promising," said Prof. Hobza.

The list repeatedly features two other scientists attached to RCPTM: chemist Rajender S. Varma, a visiting scientist who is also a staff member at the U.S. Environmental Protection Agency (US EPA), and Patrick Schmuki, who leads one research group at RCPTM and also works at the University of Erlangen–Nuremberg. Professor Schmuki has become recognized for the preparation of photoactive semiconductor materials that are used in technologies for solar water splitting.

The Highly Cited Researchers list, prepared annually by Clarivate Analytics (formerly Thomson Reuters), tabulates world-class researchers whose publications rank in the top 1% in terms of numbers of citations, by field and year, in Web of Science. The 2018 list features 12 researchers from the Czech Republic, Slovakia has no representatives, Hungary has three, and Poland six. In contrast, Austrian universities host about 40 of the listed researchers and Germany ranks among the most fruitful countries, with more than 350 representatives in the *Highly Cited* list.

# Carbon quantum dots show high efficiency in photothermal anticancer therapy

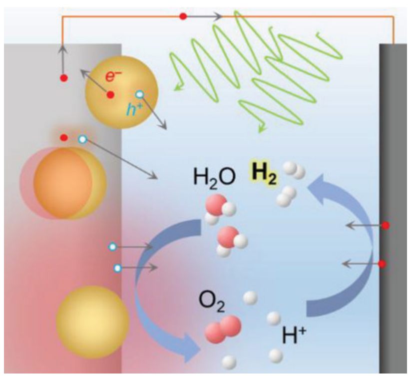
Carbon quantum dots are small carbon nanoparticles with a graphite-like structure, less than 10 nm in size. During the past 15 years, these fluorescent particles have attracted intense interest in various scientific areas, such as photocatalysis, photoelectronics, LED technology, and biomedical applications. In a recent publication, the RCPTM team (in collaboration with researchers from the Chinese Academy of Sciences) reported their utility not only as a diagnostic medium for optical imaging but also as therapeutic agents that can raise the temperature of the surrounding environment after laser irradiation. They showed that newly-developed carbon dots, doped with sulphur and nitrogen atoms, are highly biocompatible, and emit radiation near the infrared spectrum, making them highly efficient in fluorescent imaging. Remarkably, they afford up to 60% efficiency in photothermal conversion, and during in vivo tests with mice models they displayed an unprecedented tendency to accumulate in tumour tissue after intravenous application. Thus, they strongly enhanced the efficiency of ongoing photothermal therapy, leading to remission of the generated tumours. Residual particles are released from the bloodstream through urine, posing an insignificant toxic risk. They appear to be ideal theranostics, combining high diagnostic and therapeutic capabilities. We published these outstanding results in *Light: Science and Application*, a prestigious journal of the *Nature* family. The team in Olomouc has recently published a series of significant works describing tuning optical properties of carbon dots (e. g. Holá K. et al. *ACS Nano* 11, 12402–12410, 2017; Li D. et al. *Adv. Mater.* 30, 1705913, 2018) and their application in measurement of live cells' temperature, for instance (Kalytchuk S. et al. *ACS Nano* 11, 1432–1442, 2017) or development of new types of LED diodes (Tian Z. et al. *Adv. Opt. Mater.* 5, 1700416, 2017; Wang Y. et al. *Chem. Commun.* 51, 2950–2953, 2015).



Bao X., Yuan Y., Chen J., Zhang B., Li D., Zhou D., Jing P., Xu G., Wang Y., Holá K., Shen D., Wu C., Song L., Liu C., Zbořil R., Qu S.: In vivo theranostics with near-infrared-emitting carbon dots–highly efficient photothermal therapy based on passive targeting after intravenous administration, *Light: Science & Applications* 2018, 7 (1), 91. IF = 13.625

# The potential of plasmonics in photoelectrochemical water splitting

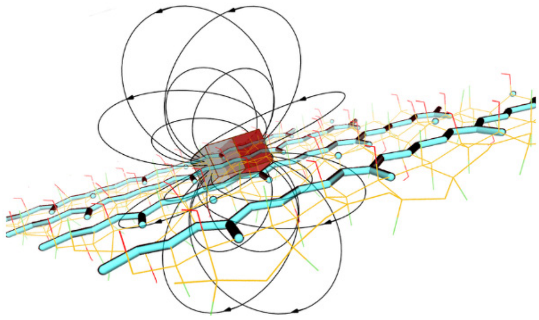
Photoelectrochemical water splitting (PEC WS) is one of the most promising approaches for producing hydrogen without greenhouse gas emissions. Nevertheless, its large-scale realization is still hindered by material limitations; an ideal photoelectrode combining high light absorption, high charge mobility, and low recombination rate is still lacking. Scientists have proposed several strategies to address these limitations, including exploitation of plasmonic effects induced by metal nanostructures (Au, Ag, Cu etc.) RCPTM researchers, in collaboration with colleagues from Purdue University (USA), have evaluated the progress in photoelectrochemical water splitting introduced by plasmonics in a review published in the journal *Advanced Materials*. The review provides a comprehensive physical description of the various plasmonic effects together with their exploitation in solar water splitting experiments. It also highlights the synergistic combination of plasmonic and photonic effects, the catalytic effects of metal nanostructures, and the generation of charge carriers for PEC WS applications depending on the plasmonic unit. Finally, the review illustrates possible ways to improve the efficiency of plasmonic photoelectrodes such as more thorough exploitation of thermal effects, and use of metal nitrides (TiN, ZrN) instead of gold and silver. It also notes a need for deeper understanding of the processes involved in charge transfer between the plasmonic unit and semiconductor material by direct observation of plasmonic effects under operational conditions using scanning photoelectrochemical (PEC) microscopy and synchrotron techniques. Contributions covered in the review included a number of advances by the team in Olomouc in photoelectrochemistry and catalysis (examples include: Kment S. et al. *ACS Nano* 9, 7113–7123, 2015; Naldoni A. et al. *ACS Catal.* 9, 345–364, 2019; Spanu D. et al. *ACS Catal.* 8, 5298–5305, 2018; Kment S. et al. *Chem. Soc. Rev.* 46, 3716–3769, 2017) and plasmonics (e. g. Naldoni A. et al. *Science* 356, 908–909, 2017).




Mascaretti L., Dutta A., Kment Š., Shalaev V.M., Boltasseva A., Zbořil R., Naldoni A.: Plasmon-Enhanced Photoelectrochemical Water Splitting for Efficient Renewable Energy Storage, *Advanced Materials* 2019, in press, DOI: 10.1002/adma.201805513. IF = 21.95

# Scientists introduce a strategy to maintain 'ferromagnetic graphene' at room temperature

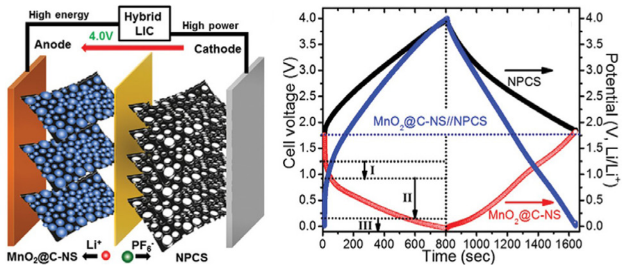
Currently, graphene is one of the most intensively studied materials due to its extraordinary electric, optical, and transport properties. However, graphene is intrinsically nonmagnetic. In order to make graphene magnetic, four main strategies have been proposed with the aim to induce self-sustainable magnetic ordering in it. These approaches include substitution with non-carbon atoms, adsorption of atoms on the surface of graphene, *sp*$^3$ functionalization, and spatial confinement and edge engineering. However, these physicochemical strategies have some limitations in maintenance of the ferromagnetic ordering at up to room temperature. In a paper recently published in the American Chemical Society journal *ACS Nano*, RCPTM researchers have introduced a new method based on sophisticated *sp*$^3$ functionalization of the material, with a suitable F/OH ratio. This affords synthesis of zigzag-conjugated *sp*$^2$ carbon chains, which can act as communication pathways among radical motifs carrying magnetic moments. Zigzag alternating *sp*$^2$/*sp*$^3$ configurations in the basal plane of graphene have been clearly visualized by high-resolution scanning transmission electron microscopy and provided a suitable matrix for stabilization of ferromagnetic ordering up to room temperature due to synergistic contributions from itinerant π-electrons (Stoner magnetism) and superexchange interactions. The results highlight the utility of superorganization of radical motifs in graphene in the production of non-metallic magnets, which could have profound applications in biomedicine, magnetic separation, and molecular electronics. The reported advances follow previous research by the team in Olomouc on graphene magnetism (Tuček J. et al. *Chem. Soc. Rev.* 47, 3899–3990, 2018) ), and the impact of doping (Błoński P. et al. *J. Am. Chem. Soc.* 139, 3171–3180, 2017; Tuček J. et al. *Adv. Mater.* 28, 5045–5053, 2016), morphology (Tuček J. et al. *Adv. Funct. Mater.* 28, 1800592, 2018) and *sp*$^3$ functionalization (Tuček J. et al. *Nat. Commun.* 8, 14525, 2017) on the temperature-related sustainability and character of the magnetic ordering.



Tuček J., Holá K., Zoppellaro G., Błoński P., Langer R., Medveď M., Susi T., Otyepka M., Zbořil R.: Zigzag sp$^2$ Carbon Chains Passing through an sp$^3$ Framework: A Driving Force toward Room-Temperature Ferromagnetic Graphene, *ACS Nano* 2018, 12 (12), 12847–12859. IF = 13.709

# Electrochemical cells developed from metal-organic frameworks showing high efficiency in lithium storage technologies

Temperature-mediated transformation of suitable precursors based on metal-organic frameworks (MOF) helped the research team in Olomouc (in collaboration with colleagues from Australia and Germany) develop a composite consisting of graphene leaves with incorporated $MnO_2$ nanoparticles. Owing to the specifically hierarchical and porous architecture, and the synergistic effects of the two components, this anodic material shows extraordinary reversible specific capacity (1054 mAh to 0.1 Ah g$^{-1}$) with high stability (90% per 1000 cycles). A material prepared by the degradation of nitrogen-based MOF was used as the cathode and the resulting lithium hybrid cell shows unprecedented capacity for lithium storage. This work opens avenues for developing a new generation of electrochemical cells derived from MOF materials. The reported study follows a series of collaborative projects by researchers from RCPTM and the Technical University of Munich in the development of new types of supercapacitors and electrochemical systems for energy storage (e.g. Jayaramulu K. et al. *Adv. Sci.* 5, 1801029, 2018; Jayaramulu K. et al. *Adv. Mater.* 30, 1705789, 2018; Jayaramulu K. et al. *Adv. Funct. Mater.* 27, 1700451, 2017).




Dubal D.P., Jayaramulu K., Sunil J., Kment Š., Gomez-Romero P., Narayana C., Zbořil R., Fischer R.A.: Metal-Organic Framework (MOF) Derived Electrodes with Robust and Fast Lithium Storage for Li-Ion Hybrid Capacitors, *Advanced Functional Materials* 2019, in press, DOI: 10.1002/adfm.201900532. IF = 13.325

# Other publications from RCPTM

Naldoni A., Altomare M., Zoppellaro G., Liu N., Kment Š., Zbořil R., Schmuki P.: Photocatalysis with Reduced TiO2: From Black TiO2 to Cocatalyst-Free Hydrogen Production, *ACS Catalysis* 2019, 9 (1), 345–364. IF = 11.384

Pieta I.S., Rathi A., Pieta P., Nowakowski R., Hołdynski M., Pisarek M., Kaminska A., Gawande M.B., Zboril R.: Electrocatalytic methanol oxidation over Cu, Ni and bimetallic Cu-Ni nanoparticles supported on graphitic carbon nitride, *Applied Catalysis B: Environmental* 2019, 244, 272–283. IF = 11.698

Štarha P., Vančo J., Trávníček Z.: Platinum iodido complexes: A comprehensive overview of anticancer activity and mechanisms of action, *Coordination Chemistry Reviews* 2019, 380, 103–135. IF = 14.499

Barès H., Bakandritsos A., Medveď M., Ugolotti J., Jakubec P., Tomanec O., Kalytchuk S., Zbořil R., Otyepka M.: Bimodal role of fluorine atoms in fluorographene chemistry opens a simple way toward double functionalization of graphene, *Carbon* 2019, 145, 251–258. IF = 7.082

Černík M., Nosek J., Filip J., Hrabal J., Elliott D.W., Zbořil R.: Electric-field enhanced reactivity and migration of iron nanoparticles with implications for groundwater treatment technologies: Proof of concept, *Water Research* 2019, 154, 361–369. IF = 7.051

## Roland A. Fischer:

# „Supporting young researchers, fostering diversity, and internationalization are healthy strategies in any science system“

*Roland A. Fischer, a world-renowned expert in inorganic chemistry and metal-organic materials, and director of the Catalysis Research Centre at the Technical University of Munich, finds RCPTM excellent. His ideas resonate with the centre, which has been confirmed not only by joint research and publications in prestigious journals, but also by his membership of the RCPTM Scientific Board. Roland A. Fischer is also vice-president of the German Research Foundation, another source of his valuable experience.*

**How long have you been collaborating with RCPTM? How did it start?**

We have been collaborating since 2015. It was initiated by networking of two post-doctoral fellows, who were associated with our two research groups and knew each other previously. Jaya Ramulu Kolleboyina joined my group at Ruhr-University Bochum (RUB) in 2014, with funding from the Alexander von Humboldt Foundation, and he introduced me to his friend Dr. K.K.R. Datta, who was affiliated with RCPTM at that time. My first visit to RCPTM was in October 2015, just after I accepted the invitation to move from RUB to the Technical University Munich (TUM). Dr. Kolleboyina also moved from RUB to TUM in 2016, and on to RCPTM in late 2017. He has been the primary link between our groups, even after Dr. Datta left RCPTM.

**You focus on development of functional materials that can be deployed for energy transformation, catalysis, gas storage and separation, sensor techniques, photonics, and microelectronics. Which research area is of primary focus when collaborating with colleagues from RCPTM?**

The primary focus and perspective of our TUM/RCPTM collaboration is on energy materials, particularly nanoscale and low-dimensional hybrid or composite materials that are composed of, or derived from, metal-organic frameworks (MOFs) and (porous) nanocarbons (e.g. graphene and related materials). We are aiming to develop advanced nanomaterials for applications in photo-(electro) catalysis (water splitting, $CO_2$ reduction) and novel components (electrodes) for battery materials. At TUM, we engage in a broad range of fundamental research on MOFs with respect to gas separation (light hydrocarbons) and gas sensing (MOF thin films), photonics (non-linear optical properties of MOFs), electrically conductive MOFs, and other physical properties of MOFs.

**What new challenges do you intend to address—with either researchers from Olomouc or your group?**

Regarding RCPTM, we are intending to intensify our collaboration through joint research proposals to obtain more sustainable bilateral funding or research personnel in the future. This can be done within the DFG-GACR Cooperation framework or via the European Union. I really would like to set up a Marie Curie European Innovative Training Network (ITN-ETN) for graduate students. Recently, for example, the DFG [Deutsche Forschungsgemeinschaft] awarded a grant for a collaborative project called “Metal-organic framework supported metal-oxide semiconductor hetero-nanostructures for efficient photoelectrochemical water splitting (MOFMOX)” (FI 502/43-1). In my group at TUM and my capacity as Director of the TUM Catalysis research centre we are working on establishing a larger collaborative research centre aiming to link cutting-edge materials science with catalysis science. Recently, the DFG established an ‘Energy Conversion’ research ‘Cluster of Excellence’. The TUM is a leading member of this Cluster, and the field tallies nicely with our collaborative efforts with RCPTM, so we anticipate interesting synergies in the future.

**You have held the position of vice-president of the German Research Foundation since 2016. Owing to the collaboration with Czech scientists, you have become familiar with the Czech scientific environment and how it works. What are the major differences between the two systems/environments?**

Well, I hesitate to comment about this. What I have seen at RCPTM, during my visits and as a member of the Advisory Board, is truly excellent. It definitely matches the standards of internationally competitive research institutions. The German academic and science system is very large, highly differentiated and includes universities, the Max-Planck Institute, Helmholtz and Leibnitz Societies and Associations, Fraunhofer Institutions and so on. It is difficult to compare scientific systems of quite diverse scales and structures.

**You can look at Czech science from a different perspective. What are the strengths and weaknesses in your opinion? How does RCPTM compare with similar institutions in Europe?’**

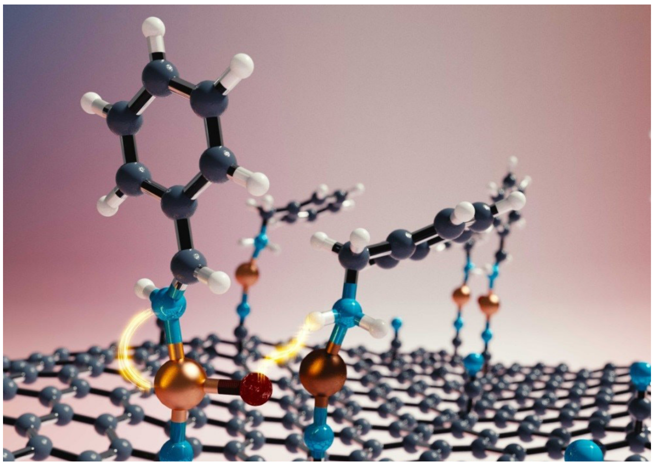
My recommendation for ‘Czech science’ is to further strengthen and follow-up the existing best practice examples, such as RCPTM, and there are others, I believe. However, avoid a two-class system by integrating, as much as possible, the most excellent research institutions and their staff and leading figures in the Czech university landscape. Try to identify, hire, and support young academics and researchers with high potential. Take note of any change, and foster diversity and internationalization. Give good money to good people! Strategies like that will be very healthy for any science system, and certainly the Czech system.

# A prestigious EXPRO grant enables researchers to tune properties of molecules via 2D materials

**Pavel Hobza and Radek Zbořil, physical chemists from the Institute of Organic Chemistry and Biochemistry of CAS and the RCPTM, together with teams, are aiming to find new ways to control properties of metal-containing molecules using 2D materials in a 5-year EXPRO project, funded with 53.3 million Czech crowns, by the Czech Science Foundation (GAČR). The novel approaches will then be tested in real applications.**

We would prefer, 'The project, *Control of electronic properties of metal-containing molecules through their noncovalent interactions with solvents, ligands and 2D nanosystems*, continues long-term research by the two scientists, and their teams, at their host institutions. A major aim is to prove that molecules' properties can be controlled by 2D materials. "The goal of the project is to explore the 2D chemistry of graphene to identify ways to control electronic states and properties of molecules. We assume that graphene or its derivatives could provide suitable substrates for modulating molecules' electronic, magnetic, or optical properties via covalent and non-covalent interactions," said the RCPTM Director and one of the Principal Investigators, Radek Zbořil.

The researchers need to create a communication pathway between target molecules and the property-changing 2D surfaces, through chemical bonds that emerge between them. "We have opted for covalent chemistry as it is becoming increasingly clear that they can strengthen synergistic interactions between target molecules and substrates. We will attempt to employ non-covalent bonds as well. The choice of the 2D material will determine the approach we should adopt," explained Pavel Hobza, the most highly cited Czech scientist, widely recognized for the discovery of improper hydrogen bonds. Much of the efforts will focus on planar molecules based on phthalocyanines with an iron atom, which are structurally related to haemoglobin (the key oxygen-carrying molecule in the blood).



The main goal of the project is to confirm the hypothesis that molecules' properties can be affected by 2D chemistry. The next step will be to confirm the research findings in real applications. Such hybrid systems of 2D materials with a bound molecule will open avenues for applications in molecular electronics, biomedicine, electrocatalysis, and novel technologies for energy storage.

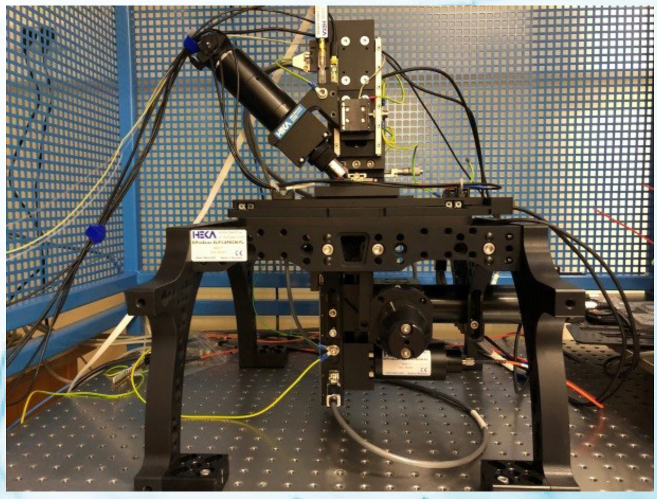
EXPRO grants are intended to support research teams led by prominent, world-renowned scientists or young researchers with great potential for excellence. The projects should enhance the quality of Czech science. The grant has been awarded on condition that the key researcher will apply for a European Research Council (ERC) grant. There were 36 successful applicants for these grants for excellent fundamental research projects.

# Introducing scientific infrastructure

## Scanning photoelectrochemical microscope

RCPTM's infrastructure has been extended by installation of a new scanning photoelectrochemical microscope (SPECM) for measuring electrodes' microscale properties, which will provide new opportunities to develop novel materials for energy applications

In scanning electrochemical microscopy (SECM), a small electrode (µm to nm in diameter) scans the surface of a substrate immersed in an electrolyte solution and the current response is recorded. This response depends on both the surface topography and electrochemical activity of the substrate. RCPTM's photoelectrochemical division has developed a unique instrument that combines new functionalities of traditional SECM with advanced optical elements, thus opening avenues for microscale investigation of photoactive materials. The instrument can be coupled to a broadband light source and generate very precise photocurrent maps of photoelectrodes designed to generate hydrogen by photoelectrochemical water splitting. Such information can strongly facilitate development of novel types of electrodes and provide important feedback on the microscopic reactivity and its dependence on morphology, structure, and composition. The new SPECM has also been designed to enable advanced measurements of surface-plasmon-induced activity. Further, it enables analyses of dark field scattering images of single nanostructures, single-molecule fluorescence, and catalytic activity in the single particle/single molecule regime. The new infrastructure provides unprecedented opportunities and will stimulate internal research as well as fostering new international collaborations. These efforts are strongly anticipated to enhance understanding of nanomaterials and nanocomposites, including descriptions of their functions in operational photoelectrocatalytic conditions.



# RCPTM Award 2018 has four laureates

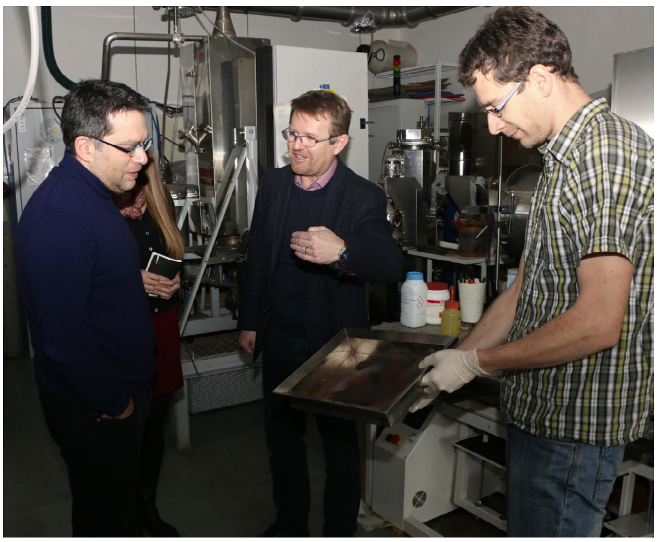
It has become traditional for Radek Zbořil, RCPTM's Director, to present *RCPTM Awards for Outstanding Scientific Output & Fruitful Cooperation* at the end of the year. The laureates for 2018 are: Rajender Varma, currently a member of the U.S. Environmental Protection Agency; Pavel Jelínek, a physicist who also works at the Institute of Physics of the Czech Academy of Sciences; Alberto Naldoni, a member of RCPTM's photoelectrochemistry group; and Jiří Šponer, who is also based at the Institute of Biophysics of the Czech Academy of Sciences. The centre's management praised not only the outstanding scientific results the laureates had published in prestigious journals in 2018, but also their close collaboration with RCPTM.


# Academic Senate of Palacký University approves proposal to integrate research centres

On February 13, the Academic Senate of Palacký University approved a proposal to integrate the research capacities and activities of Palacký University in a new university institute. The newly established university institute will unite three research centres, two based at the Faculty of Science (PřF) and one at the Faculty of Medicine and Dentistry (LF), with support from the Institute of Organic Chemistry and Biochemistry of the Czech Academy of Sciences (IOCB) and the University Hospital Olomouc (FNOL). The integration received 20 yes votes and 2 undecided votes. The merger, which was formally proposed by Jaroslav Miller, the university's Rector, was a result of long-term deliberations of a special committee with representatives of the university's management; the two faculties involved, and directors of three associated centres: RCPTM, Centre of the Region Haná for Biotechnological and Agricultural Research (CRH), and Institute of Molecular and Translational Medicine (IMTM). The next step must be adjustment of the university regulations in accordance with the new structure, subject to approval by the Academic Senate. Establishment of the new institute is considered crucial for increasing the university's chances of success in international science competitions.

# Scientific Attaché of the French Embassy visits RCPTM

Mathieu Wellhoff, the Attaché for Scientific and Higher Education Cooperation of the French Embassy in Prague, visited RCPTM in January. The main goal of his mission was to learn more about the main research areas at RCPTM and discuss possibilities for future collaboration. In his own words, the research performed here exceeded his expectations. "In Prague, where I am based, I often hear only about local research centres along with Brno, but what I saw in Olomouc was terrific. The quality of the research here is higher than I expected. What really caught my interest was the fact that a small-scale institute can achieve better results than far bigger ones." His visit was triggered, *inter alia*, by the centre's promotion by CzechInvest and the centre's strong representation in candidates for (and winners of) various awards presented by the French Embassy. For instance, in 2016 a second prize in the *Jean-Marie Lehn* chemistry competition was awarded to Kateřina Holá, while Markéta Paloncýová showed her expertise in computational chemistry by coming third in the *Joseph Fourier* competition, and receiving a special *IT4Innovations* prize.



# Contemporary Chemistry lecture series: 14th year

The 14th year of the Contemporary Chemistry lecture series, presided over by Pavel Hobza (one of the most highly cited chemists globally) provided the opportunity for academics and the general public to hear about advances in science, focusing particularly on outstanding contributions of researchers based in Olomouc. This time round, the audience had chances to hear thoughts of four speakers regarding issues in their respective fields: the plant geneticist Jaroslav Doležel, physical chemist Radek Zbořil, molecular oncologist Marián Hajdúch, and political scientist Pavel Šaradín. Those who could not attend the lectures can still keep track of the latest research via the Department of Physical Chemistry's official website (http://fch.upol.cz/vyuka/soucasna-chemie/), where videos of all the presentations are available.


"My intention was to demonstrate the progress that scientists in Olomouc have made in recent years. All the lectures presented excellent, international-level science. Perhaps more importantly, the students' questions and responses to the speakers showed that science in Olomouc has taken major steps up. The students are fully aware of all the possibilities that have opened up for them. I'm also glad that the idea of combining science with humanities has worked out very well. It's vital to grasp that our future is determined by progress in handling not only scientific and technological challenges, but also social, economic, and political issues," said Prof. Hobza.

Previous speakers have included the cardiologist Jan Pirk, Egyptologist Miroslav Bárta, physicist Pavel Jelínek, several chemists (such as Rudolf Zahradník, Josef Michl, and Michal Hocek), and Josef Koutecký (recognized as the founder of children's oncology research and services in the Czech Republic).

# RCPTM Scientific Board meeting

The annual meeting of the RCPTM Scientific Board was held on March 21. The Board met in its updated form last year for the first time. The members were introduced to the Centre's latest scientific results, grants, and success achieved in technology transfer.

Prof. Paolo Fornasiero from Trieste, editor of the journal *ACS Catalysis* of the American Chemical Society, highlighted results obtained in the area of atomic catalysts. Prof. Arben Merkoçi from Barcelona recommended stimulating research on potential applications of graphene derivatives and transfer of the results into real applications. The major recommendations were presented by Professor Roland A. Fisher from the Technical University of Munich, who appreciated the way the RCPTM research groups are intertwined, and suggested that the teams should focus on a particular area.

# Coming Next...

## Prof. Matthias Beller

The next guest speaker in the *Rudolf Zahradník Lecture Series* will be Matthias Beller, an expert on chemical catalysis and organic/organometallic chemistry from Leibniz Institute for Catalysis, University of Rostock. The goal of this lecture series, presided over by RCPTM Director Radek Zbořil, is to introduce the academics and general public in Olomouc to world-renowned researchers in chemistry, materials science, and optics. The lecture will be delivered at the assembly hall of the Faculty of Science on May 3, at 10 a.m.

Prof. Beller is one of the leading researchers in chemical catalysis and novel technologies involving nanomaterials. He focuses on catalytic processes, high pressure chemistry, and synthesis of biologically active agents that are environmentally benign and have industrial applications. In his lecture called *Catalysis for a Sustainable World*, Prof. Beller will explain the pros and cons of catalytic processes in various fields, such as drug development, food production, and synthesis of materials.

Prof. Beller has obtained an advanced ERC grant, and been awarded various honorary doctorates and other prizes including a *Dr. Karl Wamsler Innovation Award*. He is also a highly cited researcher, who repeatedly appears in the Highly Cited Researchers list, with an H-index of 124, and more than 1000 publications, many in the most prestigious journals such as *Science, Nature, Nature Chemistry,* and *Nature Catalysis*.

RCPTM Regional Centre of Advanced Technologies and Materials

Palacký University Olomouc

**Regional Centre of Advanced Technologies and Materials**

Šlechtitelů 27
783 71 Olomouc
Czech Republic

Phone: (+420) 58 563 4973
Email: rcptm@upol.cz
Web: www.rcptm.com
Facebook: www.facebook.com/rcptmcz
Twitter: https://twitter.com/RCPTM1

Published by: Regional Centre of Advanced Technologies and Materials, 2019
Editor: Martina Šaradínová
Photo: Viktor Čáp, Martin Pykal, RCPTM archive
Graphics: Zoran Kerkez, Ondřej Růžička