CURRICULUM VITAE – Prof. RADEK ZBOŘIL, Ph.D.

Family name: Zbořil
First Name: Radek
Nationality: Czech Republic
Date of birth: 21. May 1973
ORCID: 0000-0002-3147-2196
Researcher ID: K-1530-2019
Scopus ID: 6602583148

https://www.rcptm.com/about/personnel/radek-zboril/#about
https://mel.vsb.cz/en/team/radek-zboril/
https://scholar.google.cz/citations?user=VDAfX9gAAAAJ&hl=en

EDUCATION

2000 -2002	Postdoctoral stays at University of Delaware, USA and University of Tokyo, Japan
1996 – 2000	PhD thesis at Palacký University, Olomouc, Czech Republic
1991 – 1996	Study of Mathematics and Chemistry at Palacký University, Olomouc, Czech Republic

CURRENT POSITION(S)

Since 2021	Scientific Director of the Regional Centre of Advanced Technologies and Materials (RCPTM) under Czech Advanced Technology and Research Institute (CATRIN) at Palacký University in Olomouc, Czech Republic. https://www.rcptm.com/
Since 2020	Scientific Director of Nanotechnology Centre, Head of Materials-Envi Lab, Centre of Energy and Environmental Technologies (CEET), VŠB-Technical University of Ostrava, Czech Republic. https://mel.vsb.cz/en/

PREVIOUS POSITIONS

2010 – 2020	Full Professor for Physical Chemistry, General Director of "Regional Centre of Advanced Technologies and Materials", Palacký University in Olomouc
2006 – 2009	Associate Professor for Physical Chemistry, Palacký University in Olomouc
2002 – 2005	Project leader at Palacký University in Olomouc

FELLOWSHIPS AND AWARDS (Selection)

2024	The Prince Sultan Bin Abdulaziz International Prize for Water (PSIPW)
2023	The Miloš Hudlický Award given by the Czech Chemical Society
2023	External Panel Evaluator . ERC Advanced and ERC Consolidator Grants
2022	Member of ERC Advanced Grants Evaluation Panel (PE8)
2022-2023	Materials Science in Czech Republic Leader Award – the most cited CZ scientist in materials science: https://research.com/u/radek-zboril
2022-2024	Chemistry in Czech Republic Leader Award
2020-2021	Highly Cited Researcher in Chemistry, awarded by Clarivate Analytics, USA
2020-2024	World's top 2% scientists according to the Stanford University
2021	Visionary 2021 Award for the works in water treatment and antimicrobial technologies
2019	Highly Cited Researcher in Cross-field, awarded by Clarivate Analytics, USA
2019-2021	Visiting Professor at Institute of Organic Chemistry and Biochemistry, Academy of Sciences of the Czech Republic, Prague
2018	Highly Cited Researcher in Chemistry, awarded by Clarivate Analytics, USA
2018	Werner von Siemens Award
Since 2018	Guest scientist at Friedrich–Alexander University Erlangen–Nürnberg, Germany
2016	Gold Medal at International Exhibition of Technical Innovations, Patents, and Inventions INVENT ARENA, Třinec, Czech Republic
2015	City Olomouc award for the year 2014 in the field of science and research
2011	Prize of the Czech Republic's Minister of Education for extraordinary results achieved in the field of research, experimental development and innovations.

SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS, TEACHING

2006 – 2021	ca 40 Postdocs/ 20 PhD Students, Palacký University in Olomouc, Czech Republic
Currently -	ca 15 Postdocs/ 2 PhD Students supervised at VSB Technical University of Ostrava
Since 1998	Masters/Bachelors: Courses *Materials Chemistry*, *Nanomaterials Chemistry*, and *Nuclear*

Chemistry, Dept. of Physical Chemistry, Palacký University in Olomouc, Czech Republic; he has also contributed to the establishment of several new studying fields, e.g. Nanomaterials Chemistry.

ORGANISATION OF SCIENTIFIC MEETINGS (Selection)

Over 20 national and international conferences and workshops. Since 2012, the General Chairman of Nanocon, one of the largest conferences in the field of nanotechnologies in the Central European region with many outstanding plenary speakers including the Noble Prize laureate (https://www.nanocon.eu/en//). Since 2014, the General Chairman of the prestigious Zahradník lecture series (https://www.rcptm.com/lectures/). Selected events organized as a General Chairman/co-organizer:

2021-2024	Nanocon 2020-2024, ca 300 participants, Brno, Czech Republic
2020	Workshop on Low-dimensional Materials, Liblice, Czech Republic
2019	Zahradník Lecture Series, ca 100 participants, Olomouc, Czech Republic
2019	Nanocon 2019, ca 300 participants, Brno, Czech Republic
2018	The U.S.-Czech Conference on Advanced Nanotechnology and Chemistry under the auspices of US Ambassador, Mr. Stephen B. King (https://cz.usembassy.gov/ambassador-king-opens-u-s-czech-conference-advanced-nanotechnology-chemistry/)
2018	Nanocon 2018, over 300 participants, Brno, Czech Republic
2017	Zahradník Lecture Series, ca 100 participants, Olomouc, Czech Republic

INSTITUTIONAL RESPONSIBILITIES (Selection)

since 2021	Member of the Scientific Board of VSB-Technical University Ostrava
since 2021	Member of the Scientific Board of Faculty of Materials Science and Technology, VSB-Technical University Ostrava
2014-2021	Member of Scientific Board of Palacký University in Olomouc
2010-2019	Member of Scientific Board of Faculty of Science, Palacký University in Olomouc
2012-2019	The Director of Competence Centre of the Technology Agency of the Czech Republic (www.nanobiowat.com).

COMMISSIONS OF TRUST

Membership in European Grant Councils (Selection) – Member of ERC Advanced Grants Evaluation Panel (2022), External ERC Panel Evaluator – Consolidator/Advanced Grants (2023)

Reviewing for Journals (Selection) -*Science, JACS, Angew. Chem., Advanced Materials, ACS Nano, Nature Nanotechnology, Nature Chemistry, Nature Materials, Nature Communications.*

Editorships (Selection) -Member of the editorial boards of several journals, e.g. *Applied Materials Today* (Elsevier, since 2018), *Scientific Reports* (Springer Nature, 2016-2020), *View* (Wiley, since 2020).

MEMBERSHIPS IN SCIENTIFIC SOCIETIES (Selection)

Since 2022	The member od Steering Committee of the EBEAM Centre - Electron Beam Precision Manufacturing; https://ebeam.vsb.cz/
2015-2020	The elected member of the Learned Society of the Czech Republic
2015-2019	The member of the Scientific Board for chemistry in the Neuron endowment fund
2016-2019	The member of the Scientific Board of Central European Institute of Technology, Masaryk University in Brno
2013-2016	The member of the Scientific Board of the West-Bohemian Centre of Materials and Metallurgy, COMTES FHT, Pilsen
2012-2014	The member of the Scientific Board of the Technology Agency of the Czech Republic

MAJOR RESEARCH COLLABORATIONS (Selection of those with joint publications/grants)

Prof. Paolo Fornasiero, University of Trieste, Italy, on nanocatalysis, electrocatalysis and plasmonics.

Prof. Matthias Beller, University of Rostock, Germany, on nanocatalysis and single atom catalysis

Prof. Patrik Schmuki, University of Erlangen (FAU), Germany, on metal oxides for photocatalysis

Prof. Andrey Rogach, City University of Hong Kong, on photoluminescence nanoparticles and quantum dots

Prof. Roland Fischer, Technical University Munich, Germany, on MOF-derived and carbon-based materials

Prof. Markus Antonietti, Max Planck Institute of Colloids and Interfaces, on single atom catalysis

Prof. Emmanuel Giannelis, Cornell University, USA, on carbon-based nanostructures

Prof. Vasilios Georgakilas, University of Patras, Greece, on graphene derivatives

Prof. Michal Graetzel, EPFL Lausanne, Switzerland, on metal oxides for photoelectrocatalysis

Prof. Kwang S. Kim, Ulsan National Institute of Science & Technology, South Korea, on graphene chemistry
Prof. Virender K. Sharma, University of Texas, USA, on nanomaterials for water treatment

RESEARCH PROFILE

The research of Prof. Zbořil's is focused on advanced nanotechnologies, low-dimensional materials and single-atom engineering towards applications in biomedicine, water treatment, catalysis, energy, and environmental technologies, with other application strategies being developed. Examples of his main achievements include the development of the world's thinnest insulator based on fluorographene (*Small* 2010), room-temperature organic magnets based on functionalized graphene (*Nature Communications* 2018), and the first two-dimensional carboxylic acid named graphene acid (*ACS Nano* 2017). Furthermore, his team contributed to, for example, the discovery of the mechanism behind the bacterial resistance to silver nanoparticles, alongside a way to overcome it (*Nature Nanotechnology* 2019), the development of 1D non-metallic conductors (*Nature Nanotechnology* 2020), the first iron-based heterogeneous catalyst for hydrogenation of nitriles (*Nature Catalysis* 2022) or novel plasmonic catalysts for selective reduction of nitroarenes under visible light (*Nature Nanotechnology* 2022; *Nature Nanotechnology* 2023). Recently, his team devleoped a new generation of materials considered as single atom antibiotics (*Advanced Materials* 2024).

Prof. Zbořil has also contributed to the development of numerous technologies that have been successfully implemented in the fields of water treatment and biotechnologies (e.g., EP 2 873 329, EP 3 585 736 and EP 2 164 656). Among others, the technology for the large-scale production of iron nanoparticles is successfully applied by NANO IRON company for groundwater treatment in Europe, US, and Asia; or the technology for the separation of antiviral and antimicrobial lactoferrin protein from the milk medium has been licensed to companies in the Czech Republic and Poland. He is also co-inventor of the technology being in Phase II of clinical trials in metastatic breast cancer treatment (2016-001386-81 EudraCT).

RESEARCH OUTPUT (updated in October 2024)

Over 700 papers in international peer-reviewed journals, the full list of publications: https://www.rcptm.com/about/personnel/radek-zboril/#publications

H-index (Google Scholar): 128; H-index (Web of Science): 112

Over 78 000 citations (Google Scholar); over 59 000 (Web of Science)

Recognition of the citation output:

Web of Science: *Highly Cited Researcher 2018-2021* – among the top 1% of researchers with most cited documents in a specific field

Research.com: Materials Science in Czech Republic Leader Award 2022-2024 – the most cited Czech scientist in materials science: https://research.com/u/radek-zboril

Google Scholar.: **Top 5 world most cited scientists in *Water Treatment***

https://scholar.google.com/citations?view_op=search_authors&hl=en&mauthors=label:water_treatment

Top 10 world most cited scientists in *Energy*

https://scholar.google.com/citations?view_op=search_authors&hl=en&mauthors=label:energy&after_author=s55VAPPh_v8J&astart=10

REPRESENTATIVE PUBLICATIONS – 10 SELECTED

1. A. Cheruvathoor Poulose, M. Medveď, V. R. Bakuru, A. Sharma, D. Singh, S. B. Kalidindi, H. Bares, M. Otyepka, K. Jayaramulu, A. Bakandritsos and **R. Zboril***, Acidic graphene organocatalyst for the superior transformation of wastes into high-added-value chemicals," NATURE COMMUNICATIONS, vol. 14, pp. 1373, 2023.
2. D. Panáček, J. Belza, L. Hochvaldová, Z. Baďura, G. Zoppellaro, M. Šrejber, T. Malina, V. Šedajová, M. Paloncýová, R. Langer, L. Zdražil, J. Zeng, L. Li, E. Zhao, Z. Chen, Z. Xiong, R. Li, A. Panáček, R. Večeřová, P. Kučová, M. Kolář, M. Otyepka, A. Bakandritsos and **R. Zboril***, "Single Atom Engineered Antibiotics Overcome Bacterial Resistance," ADVANCED MATERIALS, Article in press, 2024. DOI: 10.1002/adma.202410652.
3. V. G. Chandrashekhar, T. Senthamarai, R. G. Kadam, O. Malina, J. Kašlík, **R. Zboril*,** M. B. Gawande, R. V. Jagadeesh and M. Beller, "Silica-supported Fe/Fe–O nanoparticles for the catalytic hydrogenation of nitriles to amines in the presence of aluminium additives," NATURE CATALYSIS, vol. 5, iss. 1, pp. 20-29, 2022.
4. A. Cheruvathoor Poulose, G. Zoppellaro, I. Konidakis, E. Serpetzoglou, E. Stratakis, O. Tomanec, M. Beller, A. Bakandritsos and **R. Zboril***, "Fast and selective reduction of nitroarenes under visible light with an earth-abundant plasmonic photocatalyst," NATURE NANOTECHNOLOGY, vol. 17, iss. 5, pp. 485-492, 2022.
5. B. Cirera, A. Sánchez-Grande, B. de la Torre, J. Santos, S. Edalatmanesh, E. Rodriguez-Sánchez, K. Lauwaet, B. Mallada, **R. Zbořil**, R. Miranda, O. Gröning, P. Jelinek, N. Martin, and D. Ecija, "Tailoring topological

order and π-conjugation to engineer quasi-metallic polymers," NATURE NANOTECHNOLOGY, vol. 15, p. 437–443, 2020.

6. A. Bakandritsos, R. G. Kadam, P. Kumar, G. Zoppellaro, M. Medveď, J. Tuček, T. Montini, O. Tomanec, P. Andrýsková, B. Drahoš, R. S. Varma, M. Otyepka, M. B. Gawande, P. Fornasiero, and **R. Zboril***, "Mixed-Valence Single-Atom Catalyst Derived from Functionalized Graphene," ADVANCED MATERIALS, vol. 31, iss. 17, p. 1900323, 2019.
7. A. Panácek, L. Kvítek, M. Smékalová, R. Vecerová, M. Kolár, M. Röderová, F. Dycka, M. Sebela, R. Prucek, O. Tomanec, and **R. Zboril***, "Bacterial resistance to silver nanoparticles and how to overcome it," NATURE NANOTECHNOLOGY, vol. 13, iss. 1, pp. 65-71, 2018.
8. B. de la Torre, M. Svec, P. Hapala, J. Redondo, O. Krejčí, R. Lo, D. Manna, A. Sarmah, D. Nachtigallová, J. Tucek, P. Blonski, M. Otyepka, **R. Zboril***, P. Hobza, and P. Jelínek, "Non-covalent control of spin-state in metal-organic complex by positioning on N-doped graphene," NATURE COMMUNICATIONS, vol. 9, iss. 1, p. 2831, 2018.
9. A. Bakandritsos, M. Pykal, P. Blonski, P. Jakubec, D. D. Chronopoulos, K. Polakova, V. Georgakilas, K. Čépe, O. Tomanec, V. Ranc, A. B. Bourlinos, **R. Zboril***, and M. Otyepka, "Cyanographene and Graphene Acid: Emerging Derivatives Enabling High-Yield and Selective Functionalization of Graphene," ACS NANO, vol. 11, iss. 3, pp. 2982-2991, 2017.
10. J. Tucek, K. Hola, A. B. Bourlinos, P. Blonski, A. Bakandritsos, J. Ugolotti, M. Dubecky, F. Karlicky, V. Ranc, K. Cepe, M. Otyepka, and **R. Zboril***, "Room temperature organic magnets derived from sp3 functionalized graphene," NATURE COMMUNICATIONS, vol. 8, p. 14525, 2017.

RESEARCH MONOGRAPHS AND CHAPTERS IN COLLECTIVE VOLUMES (SELECTION)

Together with colleagues, I have edited several books and contributed to several Chapters in books on various aspects of nanotechnologies. Selected examples:

- Filip J., Cajthaml T, Najmanová P., Černík M., **Zboril R.** (Editors). *Advanced nano-bio technologies for water and soil treatment*, Springer GmbH, **2020**.
- Datta K.K.R., Reddy B.V.S., **Zboril R.**, *Polysaccharides as functional scaffolds for noble metal nanoparticles and their catalytic applications*, edited by H. S. Nalwa, American Scientific Publishers, Encyclopedia of Nanoscience and Nanotechnology, volume 29: pp. 439–458, **2018.**
- Sharma V.K. and **Zboril R**.: *Silver Nanoparticles in Natural Environment: Formation, Fate, and Toxicity, in: Bioactivity of Engineered Nanoparticles*, edited by B. Yan, H. Zhou and J. L. Gardea Torresdey, Springer Nature, Singapore, Chapter 10, **2017**.
- Rathi A.K., Zboril, R., Varma, R.S., Gawande M.B., *Magnetite (Ferites)-Supported Nano-Catalysts: Sustainable Applications in Organic Transformations*, in: Ferrites and Ferrates: Chemistry and Applications in Sustainable Energy and Environmental Remediation, American Chemical Society, Washington DC, Chapter 2, pp. 39-78, **2016.**
- Datta K.K.R. and **Zboril R**: *Halogenated Graphenes: Emerging Family of Two Dimensional Materials*, edited by V. Georgakilas, Wiley-VCH Verlag GmbH & Co. KGaA, pp. 173-198, **2014**.

PLENARY/INVITED TALKS (SELECTION)

- *Nanonoseries 2024* in Lisbon, Portugal, June 17-19, 2024.
- *Global Summit and Expo on Graphene and 2D Materials (2DMAT2021)* in Paris, France, August 23-25, 2021 (plenary talk together with prof. Konstantin Novoselov, Nobel Laureate in Physics 2010)
- *8th edition of the largest European Conference & Exhibition in Graphene and 2D Materials (GRAPHENE 2018)*, Dresden, Germany, June 26-29, 2018.
- *IV. Mediterranean Thematic Workshop in Advanced Molecular Imaging (MEDAMI 2016)*, Ajaccio, Corsica, May 1-5, 2016.
- *International Scientific Conference on Nanomaterials & Applications (NANOAPP),* Portoroz, Slovenia, September 22-26, 2013.
- *4th International Conference from Nanoparticles and Nanomaterials to Nanodevices and Nanosystems (IC4N)*, Corfu, Greece, June 16-20, 2013 (keynote talk together with prof. Daniel Shechtman, Nobel Laureate in Chemistry 2011)

GRANTS

Principal investigator (PI) or co-author of grant projects with subsidy for Palacky University Olomouc (UP) and VSB Technical University of Ostrava (VSB-TUO) over 150 mil. EUR

Selected grants solved as PI/co-PI and grant author are involved in the Table below.

Project Title	*Funding source*	*Amount (Euros)*	*Period*	*Role*
REFRESH – Research Excellence For REgion Sustainability and High-tech Industries	European Union from the Operational Programme Just Transition	80 million	2022-2027	Project co-author, PI of Materials-Envi Lab (VSB-TUO)
SAN4Fuel - Single atom based nanohybrid photocatalysts for green fuels	HORIZON-WIDERA-2021-ACCESS-03-01	237 000	2022-2025	project co-leader (at VSB-TUO)
Control of electronic properties of metal-containing molecules through their noncovalent interactions with solvents, ligands and 2D nanosystems	Czech Science Foundation (GAČR), call EXPRO	1.1 million	2019 - 2023	project co-leader (at VSB-TUO)
Nanotechnologies for Future	ESF/Ministry of Education, Youth and Sports CZ, call: Operational programme OPVVV, "Excellent Research"	13 million	2018 - 2022	project leader (at UP)
Advanced Hybrid Nanostructures for Renewable Energy Applications	ESF/Ministry of Education, Youth and Sports CZ, call: Operational programme OPVVV, "Excellent Teams"	5 million	2017 - 2022	project leader (at UP)
Environmentally friendly nanotechnologies and biotechnologies in water and soil treatment (NANOBIOWAT)	Technology Agency of the Czech Republic (TAČR), call: Centres of Competence	11.7 million	2012-2019	project leader (at UP)
Development of Regional Centre of Advanced Technologies and Materials	Ministry of Education, Youth and Sports CZ, call: National Programme of Sustainability	21 million	2014-2019	project leader (at UP)
Centre for environment friendly high effective polymer antimicrobial agents for industrial applications, (ALTERBIO)	Technology Agency of the Czech Republic (TAČR), call: Centres of Competence	650 000 (UP budget)	2014-2019	leader of the team at UP
Taking Nanotechnological Remediation Processes from Lab Scale to End User Applications for the Restoration of a Clean Environment (NANOREM)	EU: FP7- NMP	274 000 (UP budget)	2013-2017	leader of the team at UP
Regional Centre of Advanced Technologies and Materials	ERDF/ Ministry of Education, Youth and Sports CZ, call: Operational programme OP VaVpI	20.1 million	2010-2014	project leader (at UP)
Development of the research team of the Regional Centre of Advanced Technologies and Materials and its involvement in international networks and projects	ERDF/ Ministry of Education, Youth and Sports CZ, call: Operational programme OPVK	1.5 million	2011-2014	project leader (at UP)
Research team of the Regional Centre of Advanced Technologies and Materials with a focus on unconventional experimental techniques in materials and optical research	ERDF/ Ministry of Education, Youth and Sports CZ, call: Operational programme OPVK	835 000	2012-2015	project leader (at UP)
Nanomaterials and nanotechnologies for environmental protection and a sustainable future	Ministry of Education, Youth and Sports CZ, call: Large Research Infrastructures	603 000 (UP budget)	2016-2019	leader of the team at UP