

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



Family name: Zbořil
First Name: Radek
Nationality: Czech Republic
Date of birth: 21 May 1973
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[Profile: MEL VSB-TUO](#)

[Google Scholar: Publications](#)

EDUCATION

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

CURRENT POSITION(S)

Since 2020 Scientific Director of Nanotechnology Center, Head of Materials-Envi Lab, Center for Energy and Environmental Technologies, VSB – Technical University of Ostrava, Czech Republic; <https://mel.vsb.cz/en/>
Since 2021 Scientific Director of CATRIN-MAT Division at Czech Advanced Technology and Research Institute (CATRIN), Palacký University Olomouc, Czech Republic; <https://www.catrin.com/>

PREVIOUS POSITIONS

2010–2020 Full Professor of Physical Chemistry, General Director of Regional Center of Advanced Technologies and Materials, Palacký University Olomouc
2006–2009 Associate Professor for Physical Chemistry, Palacký University Olomouc

FELLOWSHIPS AND AWARDS (Selection)

2024 The Prince Sultan Bin Abdulaziz International Prize for Water (PSIPW) awarded under the auspices of the UN Secretary-General
2023 The Miloš Hudlický Award awarded by the Czech Chemical Society
2022 Member of the ERC Advanced Grants Evaluation Panel (PE8)
2022–2025 Materials Science in Czech Republic Leader Award – the most cited Czech scientist in materials science, according to [Research.com](https://www.research.com)
2020–2021 Highly Cited Researcher in Chemistry, awarded by Clarivate Analytics, USA
2021 World's top 2% Scientists according to Stanford University
2021 Visionary 2021 Award for achievements in water treatment and antimicrobial technologies
2019 Highly Cited Researcher in Cross-Field, awarded by Clarivate Analytics, USA
2019–2021 Visiting Professor at the Institute of Organic Chemistry and Biochemistry of the Czech Academy of Sciences, CZ
2018 Highly Cited Researcher in Chemistry, awarded by Clarivate Analytics, USA
2018 Werner von Siemens Award
Since 2018 Visiting Scientist at Friedrich–Alexander University Erlangen–Nürnberg, Germany
2011 Prize of the Czech Republic's Minister of Education, Youth and Sport for Outstanding results in research, experimental development and innovations

SUPERVISION OF JUNIOR SCIENTISTS AND POSTDOCTORAL FELLOWS

2006–2021 Approximately 55 postdoctoral researchers and 20 PhD students supervised at Palacký University Olomouc
Currently Approximately 40 postdoctoral researchers and 3 PhD students supervised at VSB-Technical University of Ostrava

SERVICE TO THE SCIENTIFIC COMMUNITY

Membership in Grant Evaluation Panels (Selection): Member of the ERC Advanced Grant Evaluation Panel (2022), ERC External Evaluator – Advanced Grants (2023), ERC External Evaluator – Starting, Consolidator and Advanced Grants (2025).

Journal Reviewing (Selection): *Science, Journal of the American Chemical Society, Angewandte Chemie, Advanced Materials, ACS Nano, Nature Nanotechnology, Nature Chemistry, Nature Materials, Nature Communications.*

Editorial Boards (Selection): Member of the editorial boards of several international journals, e.g. *Applied*

Materials Today (Elsevier, since 2018), *Scientific Reports* (Springer Nature, 2016-2020), *VIEW* (Wiley, since 2020), *Energy Z* (OAE Publishing Inc., since 2026).

Organization of Scientific Meetings: Organization of more than 20 national and international conferences and workshops. Since 2012, the General Chairman of *Nanocon*, one of the largest conferences in nanotechnology in Central Europe, featuring numerous outstanding plenary speakers including a Nobel Prize laureate (<https://www.nanocon.eu/en/>).

MAJOR RESEARCH COLLABORATIONS (Selection of Collaborations with Joint Publications and/or Grants)

Prof. Paolo Fornasiero, University of Trieste (15 co-authored publications), Prof. Matthias Beller, University of Rostock (10), Prof. Patrik Schmuki, Friedrich-Alexander-Universität Erlangen-Nürnberg (47), Prof. Andrey Rogach, City University of Hong Kong (26), Prof. Roland Fischer, Technical University of Munich (26), Prof. Markus Antonietti, Max Planck Institute of Colloids and Interfaces (2), Prof. Emmanuel Giannelis, Cornell University (14), Prof. Michael Grätzel, École Polytechnique Fédérale de Lausanne (3), Prof. Kwang S. Kim, Ulsan National Institute of Science and Technology (2), Prof. Arben Merkoçi, Catalan Institute of Nanoscience and Nanotechnology (2), Prof. Dirk Guldi, Friedrich-Alexander-Universität Erlangen-Nürnberg (3), Prof. W.A. Goddard III, California Institute of Technology (1), Prof. Mingdong Dong, Aarhus University (4).

MAIN ACTIVITIES/ACHIEVEMENTS OVER THE LAST 5 YEARS

The research of Prof. Zbořil focuses on advanced nanotechnologies, low-dimensional materials, and single-atom engineering, with applications in biomedicine, water treatment, catalysis, and energy. In 2021–2026, he co-authored more than 150 publications (source: WOS, August 2026). Key achievements over this period include the development of the first iron-based heterogeneous catalyst for the hydrogenation of nitriles (*Nature Catalysis*, 2022), novel plasmonic catalysts for the selective reduction of nitroarenes under visible light (*Nature Nanotechnology*, 2022), a single-atom Fe catalyst for the selective ammoxidation of C-H bonds (*Nature Catalysis*, 2026), single-atom antibiotics capable of overcoming bacterial resistance (*Advanced Materials*, 2024), enzyme-mimicking photocatalysts for hydrogen peroxide synthesis (*Nature Communications*, 2025), and 2D organocatalysts for biofuel production (*Nature Communications*, 2023).

RESEARCH VALORIZATION

Prof. Zbořil has contributed to the development and implementation of technologies in water treatment and biotechnology. The technology for large-scale production of iron nanoparticles is applied by NANO IRON (<https://nanoiron.cz/en/>) for groundwater remediation in Europe, the United States, and Asia. A method for the separation of antimicrobial lactoferrin from milk has been licensed to companies in the Czech Republic and Poland. A patented effervescent tablet technology for water treatment has been licensed to Water Treatment Nanotechnologies (Czech Republic). He is also co-inventor of a technology being evaluated in Phase II clinical trials for the treatment of metastatic breast cancer (EudraCT 2016-001386-81).

RESEARCH OUTPUT

Over 650 papers in international peer-reviewed journals, 12 papers over 1,000 citations; 18 papers over 500 citations. Selected journals: *Nature Nanotechnology* (4x), *Nature Catalysis* (2x), *Advanced Materials* (13x), *Chemical Reviews* (8x), *ACS Nano* (16x), *Advanced Functional Materials* (17x), *Angewandte Chemie* (8x), *Nature Communications* (8x).

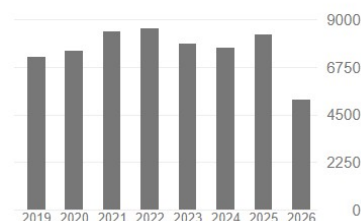
[Full list of publications](#)

H-index: 135; over 88,000 citations (Google Scholar)

H-index: 117; over 66,000 citations (Web of Science)

Google Scholar, August 2026

	All	Since 2021
Citations	88738	46108
h-index	135	100
i10-index	606	477



RECOGNITION OF CITATION IMPACT

Highly Cited Researcher 2018–2021 - among the world's top 1% of researchers based on highly cited publications in their respective fields, according to Clarivate Analytics/ Web of Science

Materials Science in Czech Republic Leader Award 2022–2025 – the most cited Czech scientist in materials science, according to [Research.com](https://www.research.com)

Top 5 Most Cited Scientists Worldwide in Water Treatment, according to [Google Scholar](https://scholar.google.com)

GRANTS

Principal investigator or co-PI of approximately 20 grant projects with total funding exceeding **EUR 150 million for Palacký University Olomouc and VSB - Technical University of Ostrava. *Selected grants:*** Nanotechnologies for Future (ESF/CZ Ministry of Education; 2018–2022; 13 mil. EUR, PI), Regional Center of Advanced Technologies and Materials (ERDF/CZ Ministry of Education; 2010–2014; 20 mil. EUR, PI - Center Director); Environmentally friendly nanotechnologies and biotechnologies in water and soil treatment (Technology Agency of the Czech Republic; 2012–2019; 11.7 mil. EUR, PI - Center Director); SAN4Fuel (Horizon-Widera-Twinning; 2022–2025; 1.5 mil. EUR, co-PI); Control of electronic properties of metal-containing molecules through their noncovalent interactions with solvents, ligands and 2D nanosystems (Czech Science Foundation, EXPRO, 2019–2023; 1.1 mil. EUR, co-PI); LESIA (HORIZON-TMA-MSCA-SE; 2024–2028; 1.2 mil. EUR, co-PI).

10 SELECTED PUBLICATIONS (PI AS CORRESPONDING AUTHOR IN ALL CASES)

1. Ma, Z.; Rockstroh, N.; Chen, Z.; Goyal, V.; Kuloor, C.; Bartling, S.; Badura, Z.; Rabeah, J.; Dong, L.; Lund, H.; Nan, B.; **Zboril, R.**; Jagadeesh, R. V.; Beller, M. Iron-based single-atom catalysts for selective ammoxidation of C(sp³)–H bonds and oxidative C–C cleavage reactions. *Nat. Catal.* 2026, 9 (4), 389–403. DOI: 10.1038/s41929-026-01513-y.
Key novelty: Demonstration that precise single-atom architecture combined with an engineered B/N chemical environment can unlock unique catalytic reactivity in industrially relevant organic synthesis.
2. Zdrzil, L.; Cadranet, A.; Zoppellaro, G.; Gunay-Gurer, A.; Badura, Z.; Panacek, D.; Kmentova, H.; Otero, C.; Kment, S.; Huergo, M. A.; Fonda, E.; **Zboril, R.**; Guldi, D. M. Enzyme-inspired single-atom photocatalysis for oxygen reduction to hydrogen peroxide. *Nat. Commun.* 2025, 16, 10949. DOI: 10.1038/s41467-025-67189-3.
Key novelty: Translation of enzyme-like site-specific electron-transfer pathways into single-atom photocatalysis, enabling precise control over photocatalytic selectivity.
3. Sun, R.; Cui, Y.; Wu, Y.; Gao, M.; Xue, S.; Li, R.; **Zboril, R.**; Zhang, C. Overcoming Nanosilver Resistance: Resensitizing Bacteria and Targeting Evolutionary Mechanisms. *ACS Nano* 2025, 19 (1), 1702–1712. DOI: 10.1021/acsnano.4c15607.
Key novelty: Discovery of dynamic transitions between distinct bacterial nanoresistance mechanisms and their targeted suppression through mechanism-specific physicochemical interventions.
4. Panacek, D.; Belza, J.; Hochvaldova, L.; Badura, Z.; Zoppellaro, G.; Srejber, M.; Malina, T.; Sedajova, V.; Paloncyova, M.; Langer, R.; Zdrzil, L.; Zeng, J.; Li, L.; Zhao, E.; Chen, Z.; Xiong, Z.; Li, R.; Panacek, A.; Vecerova, R.; Kucova, P.; Kolar, M.; Otyepka, M.; Bakandritsos, A.; **Zboril, R.** Single Atom Engineered Antibiotics Overcome Bacterial Resistance. *Adv. Mater.* 2024, 36 (50), e2410652. DOI: 10.1002/adma.202410652.
Key novelty: Revealing that single-atom engineering of graphene can trigger a new antibacterial mode of action against highly resistant bacterial strains.
5. Poulou, A. C.; Medved, M.; Bakuru, V. R.; Sharma, A.; Singh, D.; Kalidindi, S. B.; Bares, H.; Otyepka, M.; Jayaramulu, K.; Bakandritsos, A.; **Zboril, R.** Acidic graphene organocatalyst for the superior transformation of wastes into high-added-value chemicals. *Nat. Commun.* 2023, 14, 1373. DOI: 10.1038/s41467-023-36602-0.
Key novelty: Establishing that chemical functionalization can transform graphene into a highly acidic organocatalyst for the synthesis of high-value chemicals.
6. Chandrashekhara, V. G.; Senthamarai, T.; Kadam, R. G.; Malina, O.; Kaslik, J.; **Zboril, R.**; Gawande, M. B.; Jagadeesh, R. V.; Beller, M. Silica-supported Fe/Fe–O nanoparticles for the catalytic hydrogenation of nitriles to amines in the presence of aluminium additives. *Nat. Catal.* 2022, 5 (1), 20–29. DOI: 10.1038/s41929-021-00722-x.
Key novelty: First catalytic system using cheap, environmentally benign and earth-abundant iron for the industrially important hydrogenation of nitriles to amines.
7. Poulou, A. C.; Zoppellaro, G.; Konidakis, I.; Serpetzoglou, E.; Stratakis, E.; Tomanec, O.; Beller, M.; Bakandritsos, A.; **Zboril, R.** Fast and selective reduction of nitroarenes under visible light with an earth-abundant plasmonic photocatalyst. *Nat. Nanotechnol.* 2022, 17 (5), 485–492. DOI: 10.1038/s41565-022-01087-3.
Key novelty: Demonstration that an earth-abundant Fe/Cu plasmonic catalyst enables room-temperature reduction of nitroarenes to anilines, overcoming conventional high-pressure/high-temperature technologies.
8. Bakandritsos, A.; Kadam, R. G.; Kumar, P.; Zoppellaro, G.; Medved, M.; Tucek, J.; Montini, T.; Tomanec, O.; Andryskova, P.; Drahos, B.; Varma, R. S.; Otyepka, M.; Gawande, M. B.; Fornasiero, P.; **Zboril, R.**

Mixed-Valence Single-Atom Catalyst Derived from Functionalized Graphene. *Adv. Mater.* 2019, 31 (17), e1900323. DOI: 10.1002/adma.201900323.

Key novelty: Development of one of the first mixed-valence (Cu(I)/Cu(II)) single-atom catalysts, mimicking key catalytic features of natural metalloenzymes.

9. Panacek, A.; Kvitek, L.; Smekalova, M.; Vecerova, R.; Kolar, M.; Roderova, M.; Dycka, F.; Sebel, M.; Prucek, R.; Tomanec, O.; **Zboril, R.** Bacterial resistance to silver nanoparticles and how to overcome it. *Nat. Nanotechnol.* 2018, 13 (1), 65–71. DOI: 10.1038/s41565-017-0013-y.

Key novelty: First demonstration that repeated exposure to silver nanoparticles can induce bacterial resistance.

10. Bao, X.; Yuan, Y.; Chen, J.; Zhang, B.; Li, D.; Zhou, D.; Jing, P.; Xu, G.; Wang, Y.; Hola, K.; Shen, D.; Wu, C.; Song, L.; Liu, C.; **Zboril, R.**; Qu, S. In vivo theranostics with near-infrared-emitting carbon dots – highly efficient photothermal therapy based on passive targeting after intravenous administration. *Light Sci. Appl.* 2018, 7, 91. DOI: 10.1038/s41377-018-0090-1.

Key novelty: Development of carbon dots enabling in vivo tumor targeting with simultaneous multimodal imaging and highly efficient photothermal cancer therapy.

RESEARCH MONOGRAPHS AND BOOK CHAPTERS (SELECTION)

Selected edited monographs and book chapters covering nanomaterials, catalysis, environmental nanotechnology and two-dimensional materials:

- J. Filip, T. Cajthaml, P. Najmanová and **R. Zbořil** (Editors), *Advanced Nano-Bio Technologies for Water and Soil Treatment*, Springer, 2020.
- K. K. R. Datta, B. V. S. Reddy and **R. Zbořil**, “Polysaccharides as Functional Scaffolds for Noble Metal Nanoparticles and Their Catalytic Applications,” in *Encyclopedia of Nanoscience and Nanotechnology*, edited by H. S. Nalwa, American Scientific Publishers, vol. 29, pp. 439–458, 2018.
- V. K. Sharma and **R. Zbořil**, “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.
- K. Rathi, **R. Zbořil**, R. S. Varma and M. B. Gawande, “Magnetite (Ferrites)-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.
- K. K. R. Datta and **R. Zbořil**, “Halogenated Graphenes: Emerging Family of Two-Dimensional Materials,” in *Functionalization of Graphene*, edited by V. Georgakilas, Wiley-VCH Verlag GmbH & Co. KGaA, pp. 173–198, 2014.

SELECTED RECENT PLENARY AND KEYNOTE TALKS

- *Symposium on Advanced Materials: Advancing the Safety of Advanced Materials*, Nobel Forum, Karolinska Institutet, Stockholm, Sweden, November 6, 2026.
- *School on Sustainable Catalysis*, Liblice, Czech Republic, October 21–24, 2025.
- *NanoBalkan*, Tirana, Albania, October 28–November 1, 2024.
- *NanoSeries2024*, Lisbon, Portugal, June 17–19, 2024.
- *Global Summit and Expo on Graphene and 2D Materials (2DMAT2021)*, Paris, France, August 23–25, 2021.