

PERSONAL INFORMATION

Dr. Michal CIFRA, born 19th July 1983, Slovakia

Current position: Team leader - Bioelectrodynamics research team, Institute of Photonics and Electronics, The Czech Academy of Sciences (CAS), Prague, Czech Republic

Statement: My long term vision is to explore novel paths to future electrodynamic and electronic therapeutic and diagnostic methods in biotechnology and medicine. Within this vision, bioelectrochemistry is essential for both fundamental understanding of electric and electronic processes in biosystems as well as for bio-medical and –technological applications. For my role in Bioelectrochemical society (BES) council, my main aim is to increase visibility of BES through modern and highly effective communication tools so that the scientific result of BES members deliver a maximal impact on broader scientific community.

Web links: [LinkedIn](#) [Research Gate](#) [Team web site](#)

EDUCATION/ACADEMIC DEGREES

- 2009 **PhD.** in **Radioelectronics**, Department of Electromagnetic Field, Faculty of Electrical Engineering, Czech Technical University in Prague, Czech Republic
- 2006 **M.Sc. (Ing.)** in **Biomedical Engineering**, Faculty of Electrical Engineering, University of Žilina, Slovakia

POSITIONS

- 2013 – now **Team leader** - Institute of Photonics and Electronics, CAS, Czech Republic
- 2014 – 2015 **Visiting researcher**, 8 months, University of Chicago, James Franck Institute / Physical Sciences Div. (Dept. of Chemistry), Chicago, USA
- 2013 Sept. **Visiting researcher**, National Institute for Materials Science, Tsukuba, Japan
- 2010 – 2012 **Postdoctoral researcher**, Institute of Photonics and Electronics, CAS, Czech Republic
- 2010 Sept. **Erasmus Mundus visiting researcher**, State University of Campinas, Brazil
- 2005 – 2010 3 months total – **Visiting student researcher**, International Institute of Biophysics, Neuss, Germany
- 2004 – 2005 7 months total - **Student researcher (HiWi) / Socrates Erasmus fellow / Leonardo da Vinci trainee**, ELCAT GmbH & Institut für Hochfrequenztechnik, RWTH Aachen, Germany

PROJECTS

- 2017 – 2019 Czech Science Foundation - 17-11898S – Nanosecond electric pulses for modulation of microtubule dynamics, 110 kEUR share, **co-principal investigator**
- 2017 – 2021 COST Action CA15211 Atmospheric Electricity Network: coupling with the Earth System, climate and biological systems, **management committee member**
- 2015 – 2017 Czech Science Foundation - 15-17102S – Radiofrequency characterization of microtubules using micro- and nanosensors, 180 kEUR, **principal investigator**
- 2015 – 2017 Joint Research Project Proposal CAS&SAS: Exploring physical basis of electromagnetic field interactions with biomolecules, cells and tissue, **principal investigator**
- 2014 – 2018 COST Action BM1309 European network for innovative uses of EMFs in biomedical applications, **management committee member**
- 2013 – 2015 Czech Science Foundation - 13-29294S - 2013 – 2015 - Photonic Biosignals: measurement and characterization, 280 kEUR, **principal investigator**
- 2010 – 2012 Czech Science Foundation - P102/10/P454 – Postdoc project - Measurement and Analysis of Local Electric Oscillations and Optical Emission of Biomolecular Nanostructures, 72 kEUR, **principal investigator**
- 2008 small scale biophotonics and bioelectronics projects ~ 10 kEUR, **principal investigator**

INVITED / TRAVEL-COST-COVERED TALKS

- 2016 International Workshop on Ultra-weak Photon Emission, Tehran, Iran, 7-9 February
- 2015 Cong. Internacional en Tecnología, Innovación y Docencia, Mexico 20-24 April

- 2012 Biophysical Aspects of Complexity in Health and Disease / Lugano, Switzerland, 18-19 May
2011 Conf. on the Physics, Chemistry and Biology of Water / Vermont, USA, 20-23 October
2011 Electromagnetic fields and Quantum phenomena in the BioSystems / Poznań, Poland, 20 May
2010 Summer School on Biophotonics and Applications of Biophotons, International Institute for Biophysics / Neuss, Germany, 1-6 August
2008 – 2015 9 other invited conference talks and invited local seminars in Czech Republic, France, Japan, Mexico, USA, UK

FELLOWSHIPS, AWARDS, HONORS

- 2016 Otto Wichterle Award from the Czech Academy of Sciences in the field of Mathematics, Physics and Earth Sciences
2015 IEEE, Senior Member
2015 International Travel Award *to support attendance to the Biophysical Society Annual meeting 2015 and to present outstanding achievements in biophysics research*, Biophysical Society / Baltimore / USA (competition success rate: 39%)
2014 European Molecular Biology Laboratory Advanced Training Centre Corporate Partnership Programme Fellowship / Heidelberg / Germany (success rate in program: 12%)
2009 Diploma from Natural Sciences section of 13th International Student Conference of Electrical Engineering – POSTER (competition success rate 10%)
2008 Young Scientist Award / URSI – International Union of Radio Science, Belgium/USA
2007 – 2008 5 Czech national scholarships (Czechoslovak section of IEEE, Hlávka foundation, Stanislav Hanzl foundation, 2 x scholarship from Rectorate of the Czech Technical University in Prague)
2006 Student scientific competition award, Faculty of Electr. Eng., University of Žilina, Slovakia

ORGANIZATION OF SCIENTIFIC MEETINGS

2007 – 2015 Chairman / Local organizer / Scientific committee member of 9 scientific meetings with 1000 participants in total

SUPERVISION OF STUDENTS AND POSTDOCS

supervisor /co-supervisor of **10 master students** (finished), **6 doctoral students** (1 graduated, with distinction / 5 ongoing), **2 postdocs** (ongoing)

MEMBERSHIP IN SCIENTIFIC SOCIETIES

Senior Member of IEEE, **secretary of CSS IEEE EMB** (societies: Engineering in Biology and Medicine (2015 -), Microwave Theory and Techniques (2015 -), Photonics Society (2013 -), Young Professionals (2013 -), Life Sciences Community (2013 -), Czechoslovakia section (2007 -)

Member of national committee (URSI – International Union of Radio Science)

Member (AAAS, Bioelectrochemical Society, Bioelectromagnetics Society, Biophysical Society, European Microwave Association, International Committee on Electromagnetic safety, International Society for Bioelectromagnetism, Czechoslovak Biological Society, Material Research Society, Optical Society of America, SPIE)

FEATURED IN MEDIA

- 2016 Science week lecture on light emission from organisms - <http://bit.ly/2hBa1B9>
2015 [Czechoslovak Radio in Chicago](#) – Friday night interview on bioelectromagnetics
2012 [TEDx Bratislava](#) – popular talk on electromagnetic (optical) activity of living cells
2012 [Slovak Economy Journal](#) – interview about biomedical applications of cellular electrodynamic
2008 [Czech Radio](#) – together with vice-dean for science, interview about student research conference

BIBLIOGRAPHY

61 documents in Web of Science (30 journal papers), guest editor for 2 special issues of different journals, 1 book editor. **Citations** 301 (WoS, wo self-citations), 489 (Scopus), 863 (Google Scholar), **Hirsch index** 12 (Scopus), 14 Google Scholar

publications ORCID: [0000-0002-8853-9523](https://orcid.org/0000-0002-8853-9523)/ Researcher ID: [D-4416-2013](https://orcid.org/D-4416-2013) [Google Scholar](#)

SELECTED PUBLICATIONS

- R.C.R. Burgos, J.C. Schoeman, ... **M. Cifra**, R. Berger, T. Hankemeier, J. van der Greef, Ultra-weak photon emission as a dynamic tool for monitoring oxidative stress metabolism, *Scientific Reports* 7, 1229, 2017
- D. Havelka, M.A. Deriu, **M. Cifra**, O. Kučera, Deformation pattern in vibrating microtubule: Structural mechanics study based on an atomistic approach, *Scientific Reports* 7, 4227, 2017
- O. Krivosudský, P. Dráber, **M. Cifra**: Resolving controversy of unusually high refractive index of a tubulin, *EPL (Europhysics Letters)*, vol. 117, 2017
- O. Kučera, D. Havelka, **M. Cifra**: Vibrations of microtubules: Physics that has not met biology yet, *Wave Motion*, vol. 72, 2017
- V. Procházka, **M. Cifra**, P. Kulha, T. Ižák, B. Rezek and A. Kromka: Influence of non-adherent yeast cells on electrical characteristics of diamond-based field-effect transistors, *Applied Surface Science*, 395, 2017
- O. Krivosudský, **M. Cifra**: Microwave absorption by nanoresonator vibrations tuned with surface modification, *EPL (Europhysics Letters)*, vol. 115, no.4, 2016
- O. Kučera and **M. Cifra**: Radiofrequency and microwave interactions between biomolecular systems. *Journal of Biological Physics*, vol. 42, no. 1, 2016
- M. Cifra**, Ch. Brouder, M. Nerudová and O. Kučera: Biophotons, coherence and photocount statistics: A critical review. *Journal of Luminescence*, vol. 164, 2015
- O. Kučera, K. Červinková, M. Nerudová and **M. Cifra**: Spectral Perspective on the Electromagnetic Activity of Cells. *Current Topics in Medicinal Chemistry*, vol. 15, no. 6, 2015
- D. Havelka, **M. Cifra** and O. Kučera: Multi-mode electro-mechanical vibrations of a microtubule: In silico demonstration of electric pulse moving along a microtubule. *Applied Physics Letters*, vol. 104, no. 24, 2014
- M. Cifra** and P. Pospíšil: Ultra-weak photon emission from biological samples: Definition, mechanisms, properties, detection and applications. *Journal of Photochemistry and Photobiology B: Biology*, vol. 139, 2014
- D. Havelka, O. Kučera, M.A. Deriu and **M. Cifra**: Electro-acoustic behavior of the mitotic spindle: a semi-classical coarse-grained model. *PLoS ONE*, vol. 9, no. 1, 2014
- C.M. Gallep, T.A. Moraes, K. Červinková, **M. Cifra**, M. Katsumata, P.W. Barlow: Lunisolar tidal synchronism with biophoton emission during intercontinental wheat-seedling germination tests. *Plant Signaling & Behavior*, vol. 9, no. 3, 2014
- O. Kučera and **M. Cifra**: Cell-to-Cell Signaling Through Light: Just a Ghost of Chance? *Cell Communication and Signaling*, vol. 11, no. 87, 2013
- F. Scholkmann, D. Fels and **M. Cifra**: Non-chemical and non-contact cell-to-cell communication: a short review. *American Journal of Translational Research*, vol. 5, no. 6, pp. 586-593, 2013
- D. Havelka, **M. Cifra**, O. Kučera, J. Pokorný, and J. Vrba: High-frequency electric field and radiation characteristics of cellular microtubule network. *Journal of Theoretical Biology*, no. 286, pp. 31-40, 2011
- J. Pokorný, C. Vedruccio, **M. Cifra** and O. Kučera: Cancer physics: diagnostics based on damped cellular elastoelectrical vibrations in microtubules. *European Biophysics Journal*, no. 40, pp. 747-759, 2011
- M. Cifra**, J. Z. Fields and A. Farhadi: Electromagnetic cellular interactions. *Progress in Biophysics and Molecular Biology*, vol. 105, no. 3, pp. 223-246, 2011
- O. Kučera, **M. Cifra** and J. Pokorný: Technical aspects of measurement of cellular electromagnetic activity. *European Biophysics Journal*, vol. 39, no. 10, pp. 1465-1470, 2010
- M. Cifra**, J. Pokorný, D. Havelka and O. Kučera: Electric field generated by axial longitudinal vibration modes of microtubule. *BioSystems*, vol. 100, pp. 122-131, 2010