



ZORAN JAKŠIĆ

Full member of Serbian Academy of Nonlinear Sciences since April 5, 2018. Since 1991 he has been a member of the IEEE (The Institute of Electric and Electronic Engineers), USA, currently a *Senior Member*. He has been a member of The Optical Society (OSA) USA since 2005, currently a *Senior Member*. He is a fellow of the ETRAN Society, the largest and the oldest professional society in Serbia.

Born on April 14, 1960 in Pančevo, where he attended primary school and gymnasium. He received his diploma-engineer, magister and doctoral degrees from School of Electrical Engineering, University of Belgrade, Serbia. From 1983 to 1987 he was employed in the Avionics Development Department of the aircraft factory “Utva,” Pančevo. In 1987 he started working under the affiliation of the Institute of Chemistry, Technology and

Metallurgy (ICTM), University of Belgrade. He became the associate research professor in 2001, and he received tenure as a full research professor of ICTM in 2006.

He has full professional proficiency in English (since 1986 he has been a member of the Society of Literary Translators of Serbia), professional working proficiency in German, limited proficiency in Spanish, elementary proficiency in French, Russian and Italian. He has spent his whole research career in Serbia.

Although in 2017 Dr Jakšić suffered a heavy hemorrhagic stroke and was forced to withdraw to disability retirement, he continued his research work, even more intensively than before, which resulted in a number of publications, including monographic works and journal papers.

Research Interests: The research fields of interest of Dr Jakšić are chemical and biological sensors based on electromagnetic optics of mesoscopic and subwavelength structures (nanooptics and nanophotonics), plasmonics and optical metamaterials, photonic crystals, micro and nanoelectromechanical systems (MEMS and NEMS), infrared semiconductor detectors, biomimetic nanomembranes and photocatalysts with plasmonic enhancement.

Scientific Results: Up to the end of 2020 he published 382 peer reviewed research publications, including a book for Springer, two monographs, 4 chapters in monograph books and 92 papers in international research journals, 77 of which are with SCI impact factor. In a majority of these publications Dr Jakšić is the principal author. He authored or co-authored 18 technological innovations.

Dr Jakšić introduced into the national science the fields of photonic crystals, metamaterials, plasmonics and freestanding nanomembranes, among others. A list of his selected contributions includes the following:

- Chemical and biological sensors based on metamaterials. Dr Jakšić published in 2007 the pioneering journal paper dedicated to this topic.
- Optical noise in plasmonic sensors – optical flicker ($1/f$) noise, optical Johnson-Nyquist noise, Casimir (zero-point) noise and adsorption-desorption optical noise.
- Introduction of effective specific detectivity analogous to that of infrared photodetectors as a figure of merit of chemical and biological sensors.
- Alternative materials for plasmonics like transparent conductive oxides (Dr Jakšić’s journal paper had been published practically at the same time as a very similar proposal in *Science* journal), 2D nanomaterials (e.g. MXenes), etc.

- The first paper on photonic crystals published in Serbia.
- A proposal of fabricating 3D photonic crystals for the optical range as generalized holograms, 2 years before an analogous concept was presented in *Nature* (its authors later cited the publication of Dr Jakšić).
- Achieving super-resolution in photolithography by combining Boolean operation (AND, OR, NAND, NOR) with photoresist overexposure: using an equipment with 2 μm resolution nanoantennas were fabricated with details below 200).

Response to Research Results: According to Google Scholar Dr Jakšić had been cited 1429 times, with an h-factor of 20. The number of citations without self-citations and indirect self-citations is 592. Dr Jakšić has been a reviewer of 22 journals, including *Nature* publications, *Optics Express*, *Opt. Comm*, etc.

He presented 15 keynote or invited talks on international conferences. The paper Z. Jakšić et al, *J. Nanophotonics*, 5, 051818, 2011 had been chosen as the first among Top 5 articles on plasmonics in 2011 by the International Society for Optics and Photonics – SPIE, USA. The article Z. Jakšić et al, *Phys. Scr.* 149, 014051, 2012 had been included among the *Highlights of the year 2012* in *Physica Scripta*. Dr Jakšić received several best paper awards on international conferences. He also won the award “June 27” of the City Council of Pančevo for the best innovation.

Educational activities: As a full research professor of the ICTM he established and lectured several courses at the School of Electrical Engineering, Belgrade, including MEMS Systems (undergraduate), Elements of Nano-Optics and Nanophotonics (master) and Photonic Crystals and Metamaterials (doctoral). Dr Jakšić supervised three doctoral dissertations, a number of master and diploma engineer theses. He had been a member of a number of doctoral thesis defense committees, at the ETF Belgrade, FTN Novi Sad, Twente University and Indian Institute Of Technology Kanpur, India.

Organizational: Dr Jakšić had been the science director of the Center of Microelectronic Technologies with the ICTM and the deputy director of the Center (2011–2018). He established the Center for Microsystems and Nanosystems (with Dr Dana Vasiljević Radović) which has been accredited in 2014 as a national center of excellence. Dr Jakšić established the first national group for plasmonics and nanophotonics, which in the meantime become recognizable on international level. He was one of the main founders of the Optical Society of Serbia and its president. He organized a number of international and national scientific conferences. Since 2002 he has been engaged in organization of annual conference series ETRAN, where he had been the Chair of the Program Committee, chief editor of their annual full paper proceedings, and initiator and organizer of the series of annual workshops on nanoscience nanoETAN. He had been the only committee member from the Western Balkans of the series of Mediterranean conferences on nanoscience MediNano. Dr Jakšić reviewed books for Elsevier. He was elected an EU expert. He is one of the associate editors of the journals *Biomimetics* (Basel), *Electronics and Facta Universitatis Series EE*.

Dr Jakšić participated as a chair, co-chair or participant in 14 international projects, including 3 EU framework projects, as well as in 12 national projects. He established scientific cooperation with teams from Austria, Israel, Spain, Sweden, Croatia and Germany.

Contribution to Nonlinear Sciences: Until now, the complete research work of Dr Jakšić has been dedicated to nonlinear sciences, more specifically the fields of microelectronic, microsystem and nanosystem sensors, detectors and other devices, with an accent to nanophotonics and nanoplasmonics. It can be said that Dr Jakšić dedicated his whole opus to nonlinear sciences in micro and nanotechnologies and their use in solving practical technical and technological problems.

A List of 5 Selected Research Publications

1. Z. Jakšić, "*Micro and Nanophotonics for Semiconductor Infrared Detectors: Towards an Ultimate Uncooled Device*", Springer Verlag, Berlin Heidelberg, ISBN 978-3-319-09673-5, doi: 10.1007/978-3-319-09674-2, 2014.

2. Z. Jakšić, "Optical metamaterials as the platform for a novel generation of ultrasensitive chemical or biological sensors", in *"Metamaterials: Classes, Properties and Applications"*, ed. E. J. Tremblay, Nova Science Publishers, Hauppauge, New York, pp. 1-42, 2010, ISBN: 978-1-61668-958-2.
3. Z. Jakšić, O. Jakšić, "Biomimetic Nanomembranes: An Overview", *Biomimetics*, vol. 5, art. no. 24, pp. 1-46, doi: 10.3390/biomimetics5020024, 2020.
4. Z. Jakšić, O. Jakšić, Z. Djurić, C. Kment, "A consideration of the use of metamaterials for sensing applications: field fluctuations and ultimate performance", *J. Opt. A*, 9, S377–S384, doi: 10.1088/1464-4258/9/9/S16, 2007.
5. Z. Jakšić, S. Vuković, J. Matović, D. Tanasković, "Negative Refractive Index Metasurfaces for Enhanced Biosensing", *Materials*, 4 (1), pp. 1-36; doi:10.3390/ma4010001, 2011.

Link to Extended CV: <http://www.nanosys.ihtm.bg.ac.rs/english/staff/jaksic.htm>