

**Ing. Libor Juha, CSc.**

**Date and place of birth:** 28 February 1964; Krnov, Czech Republic

**Marital status:** married, two children

**Current position:** Researcher in the Institute of Physics of the Czech Academy of Sciences (1992 - present). Head of the Department of Radiation and Chemical Physics of the Institute (2010 - present). Head of the Workgroup "Diagnostics and Applications" in the Department of Laser Plasma of the Institute of Plasma Physics of the Czech Academy of Sciences (2015 - 2020). Editor-in-chief of the Journal "Československý časopis pro fyziku" (2008 -2017). Since May 2019 he is scientific director of the PALS (Prague Asterix Laser System) Research Center.

**Education:** Czech Technical University (Prague), M.Sc. (Ing.) in Nuclear Chemistry, 1987. Additional coursework in photochemistry, molecular photophysics, radiation chemistry and physics, kinetics and mechanisms of organic and inorganic reactions, laser physics, atomic and molecular physics and spectroscopy, and plasma chemistry and physics during undergraduate and PhD studies. Ph.D. (CSc.) from the Faculty of Nuclear Sciences and Physical Engineering of the Czech Technical University in Prague (April 1995; The thesis entitled *Ultraviolet and Near Infrared Radiation Assisted Ion Transport in Membrane and Ion Exchange Systems*).

**Honours and activities:** Award of the Czechoslovak Academy of Sciences for the best student scientific work, 1987. Member of the Union of Czech Mathematicians and Physicists and of the Czech Chemical Society. Guest-editor of *Fullerene Science and Technology* special issue entitled "Fullerene Research in the Czech Republic". Award of the Czech Academy of Sciences for outstanding young scientists - the Wichterle prize, 2002. Award of the president of the Czech Academy of Sciences for promotion and popularization of science and technology, 2018. Together with Judith Sponer and Martin Ferus, presidential award of the Czech Science Foundation (GAČR), 2020.

**Professional and research experience:** Permanent position in the Gas Lasers Department (since the beginning of 2003 it is called Laser Plasma Department; since the middle of 2010 it is a part of newly established Department of Radiation and Chemical Physics) of the Institute of Physics, Czech Academy of Sciences in Prague (photochemical and photophysical applications of gas lasers; characterization and use of soft X-ray and XUV/EUV emission from hot dense plasmas; laser-driven shock waves; chemical effects of laser sparks. Three research stays (October - November 1993, February - March 1995, June - November 1999) at the Institute of Electronic Structure and Laser (IESL) of the Foundation for Research and Technology - Hellas (FORTH-ITE), Heraklion, Crete, Greece (photochemistry, photophysics, and nonlinear optics of all-carbon clusters). Sixteen months of postdoctoral research at the Fachhochschule Regensburg, Germany (starting March 1996, supported by fellowship from the Konferenz der deutschen Akademien der Wissenschaften; interaction of high-power excimer laser radiation with matter; laser-driven ion sources). One year (starting December 1997) of postdoctoral research at the Department of Physics, Bar-Ilan University, Ramat-Gan, Israel (photophysics and photochemistry of fullerenes). One-year stay (starting May 2002) at Deutsches Elektronen-Synchrotron (DESY) in Hamburg, Germany (Interaction of intense XUV radiation with matter; SASE free-electron lasers).

**Current research interests:** Interaction of intense XUV/x-ray radiation with matter and its chemical consequences; development, characterization, and applications of ultra-bright sources of short-wavelength radiation; physics and chemistry of discharge and laser plasmas; high-dose-rate effects in radiation chemistry and molecular radiobiology.

**Publication activity:** more than 280 publications according to the WOS database; three book chapters; h-index = 35; citations without self-citations: 3252.

### Supervised Theses / Teaching:

Students supervised during last 5 years: Bc.: 3; M.Sc.: 2; Ph.D.: 4 (2 Ph.D. theses defended; 2 Ph.D. theses in preparation)

One-semester courses:

Faculty of Mathematics and Physics, Charles University in Prague: "X-ray lasers and x-ray optics"

Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague: "Introduction to photochemistry and photobiology"; "Radiation chemistry and photochemistry"; "Theoretical foundations of radiation chemistry"

Faculty of Natural Sciences, Charles University in Prague: "Photochemistry and Electron Spectroscopy"

### Selected publications:

1. G. Mercurio, J. Chalupský, I. Nistea, M. Schneider, V. Hájková, N. Gerasimova, R. Carley, M. Cascella, L. Le Guyader, L. Mercadier, J. Schlappa, K. Setoodehnia, M. Teichmann, A. Yaroslavtsev, T. Burian, V. Vozda, L. Vyšín, J. Wild, D. Hickin, A. Silenzi, M. Stupar, J. T. Delitz, C. Broers, A. Reich, B. Pfau, S. Eisebitt, D. La Civita, H. Sinn, M. Vannoni, S. G. Alcock, **L. Juha**, and A. Scherz: Real-time spatial characterization of micrometer-sized x-ray free-electron laser beams focused by bendable mirrors, *Opt. Express* **30**, 20980 (2022).

2. T. Pisarczyk, O. Renner, R. Dudzak, T. Chodukowski, Z. Rusiniak, J. Domanski, J. Badziak, J. Dostal, M. Krupka, S. Singh, D. Klir, M. Ehret, P. Gajdos, A. Zaras-Szydłowska, M. Rosinski, P. Tchorz, M. Szymanski, J. Krasa, T. Burian, M. Pfeifer, J. Cikhart, S. Jelinek, G. Kocourkova, D. Batani, K. Batani, J. Santos, C. Vlachos, V. Ospina-Bohórquez, L. Volpe, S. Borodziuk, M. Krus, and **L. Juha**: Influence of the magnetic field on properties of hot electron emission from ablative plasma produced at laser irradiation of a disc-coil target, *Plasma Phys. Control. Fusion* **64**, 115012 (2022).

3. T. Burian, J. Chalupský, V. Hájková, M. Toufarová, V. Vorlíček, S. Hau-Riege, J. Krzywinski, J. D. Bozek, C. Bostedt, A. T. Graf, U. F. Jastrow, S. Kreis, R. A. London, M. Messerschmidt, S. Moeller, R. Sobierajski, K. Tiedtke, M. de Grazia, T. Auguste, B. Carré, S. Guizard, H. Merdji, N. Medvedev, and **L. Juha**: Subthreshold erosion of an organic polymer induced by multiple shots of an x-ray free-electron laser, *Phys. Rev. Applied* **14**, 034057 (2020).

4. G. Cristoforetti, L. Antonelli, D. Mancelli, S. Atzeni, F. Baffigi, F. Barbato, D. Batani, G. Boutoux, F. D'Amato, J. Dostal, R. Dudzak, E. Filippov, Y. J. Gu, **L. Juha**, O. Klimo, M. Krus, S. Malko, S. Martynenko, Ph. Nicolai, V. Ospina, S. Pikuz, O. Renner, J. Santos, V. T. Tikhonchuk, J. Trela, S. Viciani, L. Volpe, S. Weber, L. A. Gizzi: Time evolution of stimulated Raman scattering and two-plasmon decay at laser intensities relevant for shock ignition in a hot plasma, *High Power Laser Science and Engineering* **7**, 1 (2019).

5. M. Toufarová, V. Hájková, J. Chalupský, T. Burian, J. Vacík, V. Vorlíček, L. Vyšín, J. Gaudin, N. Medvedev, B. Ziaja, M. Nagasono, M. Yabashi, R. Sobierajski, J. Krzywinski, H. Sinn, M. Störmer, K. Koláček, K. Tiedtke, S. Toleikis, **L. Juha**: Contrasting behavior of covalent and molecular carbon allotropes exposed to extreme ultraviolet and soft x-ray free-electron laser radiation, *Phys. Rev. B* **96**, 214101 (2017).

6. O. Ciricosta, S. M. Vinko, B. Barbrel, D. S. Rackstraw, T. R. Preston, T. Burian, J. Chalupsky, B. I. Cho, H. K. Chung, G. L. Dakovski, K. Engelhorn, V. Hajkova, P. Heimann, M. Holmes, **L. Juha**, J. Krzywinski, R. W. Lee, S. Toleikis, J. J. Turner, U. Zastra, J. S. Wark: Measurements of continuum lowering in solid-density plasmas created from elements and compounds, *Nature Commun.* **7**, 11713 (2016).

7. S. M. Vinko, O. Ciricosta, B.-I. Cho, K. Engelhorn, H.-K. Chung, C. Brown, T. Burian, J. Chalupsky, R. Falcone, C. Graves, V. Hajkova, A. Higginbotham, **L. Juha**, J. Krzywinski, H. J. Lee, M. Messerschmidt, C. Murphy, Y. Ping, A. Scherz, W. Schlotter, S. Toleikis, J. J. Turner, L. Vysin, T. Wang, B. Wu, U. Zastra, D. Zhu, R. W. Lee, P. A. Heimann, B. Nagler, and J. S. Wark: Creation and diagnosis of solid-density hot-dense matter with an X-ray free-electron laser, *Nature* **482**, 59 (2012).

8. D. Babánková, S. Civiš, **L. Juha**: Chemical consequences of laser-induced breakdown in molecular gases, *Prog. Quant. Electron.* **30**, 75 (2006).
9. **L. Juha**, M. Bittner, D. Chvostova, J. Krasa, M. Kozlova, M. Pfeifer, J. Polan, A. R. Präg, B. Rus, M. Stupka, J. Feldhaus, V. Letal, Z. Otcenasek, J. Krzywinski, R. Nietubyc, J. B. Pelka, A. Andrejczuk, R. Sobierajski, L. Ryc, F. P. Boody, H. Fiedorowicz, A. Bartnik, J. Mikolajczyk, R. Rakowski, P. Kubat, L. Pina, M. Horvath, M. E. Grisham, G. O. Vaschenko, C. S. Menoni, J. J. Rocca: Short-wavelength ablation of molecular solids: pulse duration and wavelength effects, *J. Microlith. Microfab. Microsyst.* **4**, 033007 (2005).
10. **L. Juha**, M. Bittner, D. Chvostova, J. Krasa, Z. Otcenasek, A. R. Präg, J. Ullschmied, Z. Pientka, J. Krzywinski, J. B. Pelka, A. Wawro, M. E. Grisham, G. Vaschenko, C. S. Menoni, and J. J. Rocca: Ablation of organic polymers by 46.9-nm laser radiation, *Appl. Phys. Lett.* **86**, 034109 (2005).