

CURRICULUM VITAE

PROF. JUERGEN CZARSKÉ

Full Chair Professor for Electrical Engineering and Physics, Head and Founder of Laboratory for Measurement and Sensor Systems (MST) / Czarske Lab, Director of Institute for Circuits and Systems and of Competence Center for Biomedical Computational Laser Systems (BIOLAS), Faculty Electrical and Computer Engineering and co-opted Professor of Physics, TU Dresden (TUD), Helmholtz Str. 18, 01069 Dresden, Germany
Married, one daughter



PROFESSIONAL CAREER AND PROFESSIONAL ACTIVITIES

- Advisor of Optica-SPIE-Student Chapter of TU Dresden, dresdenoptik.de, since 3/2022
- Selected as outstanding editor for *Light: Advanced Manufacturing* (LAM) of Nature Publishing, China, 2/2022
- Curator and member of Fraunhofer society, appointed for Institute Photonics Microsystems (IPMS), since 1/2022
- Vice President of International Commission for Optics, ICO, Umbrella Organization for optics and photonics with over 50 territorial members and 7 organizations, PALAISEAU, Paris, France and Miami, Florida, USA, 9/2021
- Affiliated Investigator of Else Kröner-Fresenius Center for Digital Health (EKFZ), since 02/2021
- Co-opted Professor for Applied Physics, School of Sciences, TUD, since 11/2020
- Member of Award Committee of The Optical Society - OSA, Washington DC, USA, since 7/2020
- Member of Senate of TU Dresden, since 12/2019
- Recognition of OSA for commitments in reviewing scientific papers, Washington DC, USA, 12/2019
- Director of Center Biomedical Computational Laser Systems (BIOLAS), TUD, since 7/2019
- Affiliated Investigator of the Excellence Cluster "Physics of Life" of TUD, since 1/2019
- BrainLinks-BrainTools Excellence Cluster, SAB-Scientific Advisory Board Member, Freiburg, since 1/2019
- Elected Member of Saxon Academy of Science, Leipzig, since 3/2018
- Successful Transfer of Innovations into the Market (>1 MEUR volume), Company ILA, Jülich, 2018
- Advisor of SPIE Student Chapter of TU Dresden, dresdenoptik.de, since 7/2017
- Elected Member of Scientific Society for Laser Technology (WLT e.V.), Erlangen, since 4/2017
- Board of German Society of Applied Optics - The German Branch of EOS, Ilmenau, 6/2016 to 9/2022
- Director of Institute of Circuits and Systems of TUD, since 1/2016
- Elected Member of Board of German Association of Laser Anemometry (GALA), Karlsruhe, since 9/2015
- Senior Member, IEEE (Institute of Electrical and Electronics Engineers), New York City, USA, 6/2015
- Founding the Key Laboratory of Computational Interferometry and Holography, TUD, since 1/2010
- Full Professor (C4) at Faculty Electrical and Computer Engineering, TUD, since 12/2004
- Industry-relationship: LZH e. V. (Laser Center Hannover, private research institute); last position: head of department of measurement technique, Hannover, 10/1995 - 12/2004
- Promotion to Professor, *venia legendi* in measurement systems, Leibniz University, 10/2003
- Visiting Scholar with short-term missions in Japan and USA: NTT Labs, Nippon Telegraph and Telephone Corporation, Ibaraki-ken, JP; Bell Labs, Holmdel, NJ; MIT, Cambridge, MA; NASA Research, Langley, VA; Caltech, Pasadena, CA; Stanford, Palo Alto, CA; Virginia Tech, Blacksburg, VA; part time, 1996 - 2001
- Prize of the Leibniz University for an outstanding doctorate with *scl*, Hannover, 12/1995
- Ph.D. degree in engineering with distinction (*summa cum laude*, F. Hock, H. Welling), Leibniz University, 2/1995
- Leibniz University, Assistant of Professor, Institute of Measurement Systems, 10/1991 - 5/1996
- Siemens AG, Munich (part time work, consultant and Siemens Scholarship), 1986-1991
- Study of electrical engineering and physics, Leibniz University of Hannover, Germany, until 9/1991
- Study, Open University Hagen, Electrical Engineering/Photonics, until 1987
- AEG Telefunken AG/Deutsche Bahn AG, Neumünster (part time), 1983-1985

AWARDS, PRIZES AND HONORS INCLUDE (PARTIAL LIST)

- ***SPIE Chandra S Vikram Award in Optical Metrology, awarded in San Diego, CA, USA, 8/2022***
- Fellow Award (FInstP) of Institute of Physics (IOP), London, UK, 7/2022
- Fellow Award of Institution of Engineering and Technology (IET), formerly IEE, London, UK, 7/2021
- SPIE Community Champion 2020, highlighted by SPIE Director Nelufar Mohajeri, WA, USA, 5/2021
- ***Inaugural Laser Instrumentation Award of IEEE Photonics Society, IEEE, New York City, USA, 7/2020***
- SPIE Community Champion 2019 for outstanding volunteerism, awarded by SPIE President, Arizona/USA, 1/2020
- ***OPTICA Joseph Fraunhofer Award / Robert M. Burley Prize, awarded in Washington DC, USA, 9/2019***
- Best Paper Awards, 2nd and 3rd, Imaging and Applied Optics Congress of OSA, Orlando, FL, USA, 6/2018
- Best Paper Prize of the 118th Annual Conference of DGaO-German Branch of EOS, 6/2017

- Fellow Award, EOS (European Optical Society), Joensuu, Finland, awarded in Berlin, 8/2016
- Best Paper Prize of the 18th VDI / ITG Symposium Sensors and Measuring Systems, Nuremberg, 5/2016
- Fellow Award, SPIE - The International Society for Optics and Photonics, San Francisco, USA, 12/2015
- Fellow Award, OSA (The Optical Society), Washington, DC, awarded in San Jose, USA, 10/2015
- Award on Precision Measurement of Institute of Physics - IOP, London, UK, 6/2015
- Reinhart Koselleck-Project in systems engineering, German Research Foundation, Bonn, 7/2014
- Selected paper - Highlights of 2013, Journal of Physics D - Applied Physics, IOP, Bristol, UK, 1/2014
- Excellent paper, awarded at 33. Annual meeting of the Japan Laser Society, Tokyo, Japan, 5/2013
- Best Paper Award Instrumentation of American Soc. of Mech. Engineers, Vancouver/Canada, 6/2011
- Nomination Award for Kaiser-Friedrich-Research-Prize-2009 (final three), Goslar, 9/2009
- **International Berthold Leibinger Innovation Prize, awarded at Trumpf Laser, Ditzingen, 9/2008**
- Highly commended article of Measurement Science and Technology (MST), IOP, Bristol, UK, 12/2001
- **Measurement Technique Prize of Association of University Professors (AHMT), awarded at TU Munich, 9/1996**
- Young Researcher Prize, awarded by the education minister Peter Bendixen, Kiel Castle, Kiel, 4/1984

ORGANIZATION OF CONFERENCES INCLUDE (PARTIAL LIST)

World General Congress ICO-25-OWLS-16-2022, International Commission for Optics (ICO), Umbrella Organization for Optics and Photonics, Dresden, 2022 (2 postponements), 118th Annual Meeting Society of Applied Optics, Dresden, 2017. Memberships of advisory boards or program committee include: Photonics Europe, SPIE, Strasbourg, France; Photonics West, SPIE, San Francisco, USA; Iberoamerican Optics Meeting (RIAO), Cancún, México; ICO-Meeting on Optics & Applications, Carthage, Tunisia; Information Photonics, Japan; Optical Technology and Measurement, Yokohama, Japan; Optical Methods for Inspection, Characterization, and Imaging of Biomaterials; European Optical Society, Delft, NL; Symp. Appl. of Laser Techn. Fluid Mechanics, Lisbon, Portugal; icOPEN, Singapore; OSA Opt. Sensors, Barcelona, Spain; Optomechatronic, Seattle, USA; Optoelectronic Technology, Beijing, China, etc

ELECTED MEMBERSHIPS INCLUDE (PARTIAL LIST)

BioBrillouin (COST, EU Brussels), Faculty Council, Study and PhD committee and Senate of TU Dresden

TEACHING INCLUDES (PARTIAL LIST)

Metrology, Laser Measurement Technique, Biophotonics, etc. (over 15 000 exams within last 15 years)

ORGANIZATION OF JOINT PROJECTS INCLUDES (PARTIAL LIST)

DACH Projects with TU Graz, AIF Projects with Fuel Center Duisburg, Joint Projects with HZDR, DLR, CRTD, Biotec, MPI, TU Berlin, PTB - Physikalisch-Technische Bundesanstalt, Keio University, Tsinghua University, etc

EDITORIAL BOARDS INCLUDE (PARTIAL LIST)

Technical Measurements (Walter de Gruyter); Photonics; Light: Advanced Manufacturing (Nature Publishing, China); Journal of Fluid Dynamics; Journal of the European Optical Society - Rapid publications

SERVICE AS REVIEWER FOR SCIENTIFIC JOURNALS INCLUDES (PARTIAL LIST)

Light Science and Applications of Nature, IEEE Transactions, Biomedical Optics Express, Optica, Nature Communications, etc

SERVICE AS CONSULTANT AND ADVISOR INCLUDES (PARTIAL LIST)

Review Board of DFG, Systems Engineering 2012-20; Nanyang Techn. Univ, Singapore; Dev. Bank Thüringen, Netherlands Scientific Org., Israel Science Foundation, Foundation Saudi Arabia, Imperial College UK, NSF

RESEARCH

The Czarske Lab aims on computational adaptive metrology to take advantage with the universal control of coherent waves towards real-world applications including: “Information technologies” (quantum technology and physical layer security with multimode fibers), “energy and process technique/industry 4.0” and “digital health, deep learning and biophotonics” (optogenetics, paradigm-shifting imaging of micro-robots and stem-cell-derived organoids (cardiomyocytes, retina, neurons), ultrathin lensless fiber endoscopy in neurosurgery). Project funding over 1 MEUR per year, 13 running DFG projects, projects of AIF, SAB, BMBF and industry. Early Career Support of young talents includes Student Chapters, prizes to students such as Meyer-Struckmann-Prize (15 000 €), Bertha Benz-Prize of the Daimler & Benz foundation for female students (10 000 € donation), over 80 prizes were won by the Lab members.

PUBLICATIONS AND TALKS

In total, over 1000 publications and talks, including over 150 invited talks, over 30 patents, over 500 reviewed papers with over 250 papers in renowned journals: Biomedical Optics Express, Scientific Reports, Light: Advanced Manufacturing of Nature, Advanced Functional Materials, Optics and Lasers in Engineering, Light: Science and Applications, IEEE Industrial Electronics, IEEE/OSA Journal Lightwave Technology, etc.

SELECTION OF 10 ARTICLES AS SENIOR AUTHOR, RECENTLY PUBLISHED IN PEER REVIEWED INTERNATIONAL SCI JOURNALS (TOTAL OVER 225)

- J Sun, ..., L Cao, R Kuschmierz, **J Czarske**, "Real-time complex light field generation through a multi-core fiber with deep learning", *Scientific Reports - nature.com*, (2022)
- Jiawei Sun, Jiachen Wu, Song Wu, Ruchi Goswami, Salvatore Girardo, Jochen Guck, Liangcai Cao, and Nektarios Koukourakis, **Jürgen Czarske**, "Quantitative phase imaging through an ultra-thin lensless fiber endoscope", *Light: Science and Applications of Nature Publishing* (2022)
- Qian Zhang, Stefan Rothe, Nektarios Koukourakis, **Juergen Czarske**, "Learning the matrix of few-mode fibers for high-fidelity spatial mode transmission", *APL Photonics*, (2022)
- N Koukourakis, F Wagner, S Rothe, MO Karl, **JW Czarske**, "Investigation of human organoid retina with digital holographic transmission matrix measurements," *Light: Advanced Manufacturing* 3 (1), 1-15, (2022)
- Schmieder, F., Busskamp, V, **Czarske, J.**, "Tracking connectivity maps in human stem cell-derived neuronal networks by holographic optogenetics", *Life Sci. Alliance* 5, e202101268 (2022).
- S. Rothe, Q. Zhang, N. Koukourakis, **J. Czarske**, "Intensity-only Mode Decomposition on Multimode Fibers using a Densely Connected Convolutional Network", *IEEE/OSA Journal of Lightwave Technology*, DOI: 10.1109/JLT.2020.3041374 (2021)
- R. Kuschmierz, E. Scharf, D. F. Ortégón-González, T. Glosemeyer, and **J. W. Czarske**, "Ultra-thin 3D lensless fiber endoscopy using diffractive optical elements and deep neural networks", *Light: Advanced Manufacturing of Nature* (2021)
- H. Radner, J. Stange, L. Büttner, **J. Czarske**, „Field programmable system-on-chip based control system for real-time distortion correction in optical imaging“, *Transactions on Industrial Electronics of IEEE* (2021)
- Azaam Aziz, ..., **J.W. Czarske** and Oliver G. Schmidt, "Real-time IR tracking of single reflective micromotors through scattering tissues," *Advanced Functional Materials* (2019)
- R. Schlüßler, ..., **J. Czarske**, J. Guck, "Mechanical Mapping of Spinal Cord Growth and Repair in Living Zebrafish Larvae by Brillouin Imaging", *Biophysical Journal* (2018)

SELECTION OF PATENTS (GRANTED OR SUBMITTED, TOTAL OVER 30)

- Stefan Rothe, Qian Zhang, Nektarios Koukourakis, Robert Kuschmierz, **Jürgen Czarske**, „Reference-free mode decomposition with a neural network with multimode fibers based on real-valued intensity distributions“, *Granted Patent*, 2020
- Richard Nauber, **J. Czarske**: "Calibration method of multimode waveguides for imaging with ultrasound endoscopes", *Patent*, 2019
- R. Kuschmierz, **J. Czarske**: "Method and endoscopic fiber optic system for illuminating and detecting an object with light", *European Patent, Granted Patent in Japan and USA*, 2018
- L. Büttner, **J. Czarske**, M. Teich, N. Koukourakis, „Arrangement and method for disturbance correction for imaging flow measurement methods“, *Granted EU Patent, US Patent App. 16/628,391*, 2017
- **Jürgen Czarske**, Nektarios Koukourakis, „Method for determining the position of micro- or nanorobots in a biological tissue, micro- or nanorobots as well as measuring arrangement“, *Patent Application*, 10 2021 118 082.1, 2021