

# CURRICULUM VITAE

## PROF. JUERGEN CZARSKIE

Full Chair Professor for Electrical Engineering and Physics, Head and Founder of Laboratory for Measurement and Sensor Systems (MST) / CzarskeLab, Director of Institute for Circuits and Systems, Director 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



Photo from Award Ceremony, San Diego 2022, SPIE-The International Society for Optics and Photonics, Washington, USA

### PROFESSIONAL CAREER AND PROFESSIONAL ACTIVITIES

- Co-Chair of SPIE Digital Optical Technology (together with Google director Dr B. Kress), Munich, 6/2023
- 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
- LZH e. V. (Laser Center Hannover, private research institute, Industry-relationship, under supervision of Andreas Tuennermann et al.); 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, 2<sup>nd</sup> and 3<sup>rd</sup>, 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 Excellence Project (1.2 Mio €), German Research Foundation, DFG, 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), 118<sup>th</sup> 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, etc

### **SERVICE AS REVIEWER FOR SCIENTIFIC JOURNALS INCLUDES (PARTIAL LIST)**

Light Science and Applications of Nature, 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, etc

### **RESEARCH**

The CzarskeLab aims on computational adaptive metrology to take advantage with the universal control of coherent waves towards real-world applications including: “Information technologies” (quantum technology, multimode fibers, topological states), “energy and process technique/industry 4.0” and “digital health and biophotonics” (optogenetics, micro-robots, stem-cell-derived organoids (cardiomyocytes, retina, neurons), ultrathin lensless fiber endoscopy in neurosurgery, wavefront shaping for microscopy, deep learning, physics-informed neural networks). Project funding over 1 MEUR/year (DFG, AIF, SAB, BMBF, industry). Early Career Support of young talents includes Student Chapter of SPIE+OPTICA (talent cultivation), student awards such as Meyer-Struckmann-Prize (15 k€), Bertha Benz-Prize of the Daimler & Benz foundation for female students (10 k€), 105 prizes were won by the Czarske 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 250)

- Jiawei Sun, Juergen W. Czarske, "Compressive holographic sensing simplifies quantitative phase imaging", *Light: Science & Applications*, (2023)
- J Sun, ..., L Cao, R Kuszmierz, **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)
- J. Wu, T. Wang, O. Uckermann, R. Galli, G. Schackert, L. Cao, **J. Czarske**, and R. Kuszmierz, "Learned end-to-end high-resolution lensless fiber imaging towards real-time cancer diagnosis," *Sci Rep* 12(1), 18846 (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. Kuszmierz, E. Scharf, D. F. Ortegón-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)
- Azaam Aziz, ..., **J.W. Czarske** and Oliver G. Schmidt, "Real-time IR tracking of single reflective micromotors through scattering tissues," *Advanced Functional Materials* (2019)

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

- Stefan Rothe, Qian Zhang, Nektarios Koukourakis, Robert Kuszmierz, **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. Kuszmierz, **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

April, 29, 2023