

# CURRICULUM VITAE

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## PROF. JUERGEN CZARSKÉ

Full Professor and Head of Laboratory of Measurement and Sensor Systems Engineering (MST), Faculty of Electrical and Computer Engineering, School of Engineering, TU Dresden, Helmholtz Str. 18, 01069 Dresden, Germany

Born: December 20, 1962 in Bad Segeberg, Germany

Married, one daughter



## PROFESSIONAL CAREER

- Affiliated Investigator of the Excellence Cluster “Physics of Life”, Dresden: since 1/2019
- General Chair of the world congress of International Society on Optics Within Life Sciences (OWLS) and International Commission for Optics (ICO), [www.ico25.org](http://www.ico25.org), since 8/2017
- Director of Institute of Circuits and Systems at TU Dresden: since 1/2016
- Founding of a MST Key Lab of Computational Adaptive Metrology: 1/2012
- Founding of a MST Key Lab of Digital Metrology in Harsh Environments: 1/2008
- Full Professor of measurement systems engineering, MST Laboratory, TU Dresden: since 12/2004
- Laser Zentrum Hannover e. V. (industry-oriented private research institute); Last position: Head of department of measurement technique and Lecturer, Hannover: 10/1995 - 12/2004
- Dr.-Ing. habil., *venia legendi* in measurement systems engineering, Leibniz University: 10/2003
- Visiting Scholar in Japan (NTT Labs, Nippon Telegraph and Telephone Corporation, Ibaraki-ken) and USA (Bell Labs, Holmdel, New Jersey / MIT, Cambridge, Massachusetts / NASA Research, Langley, Virginia / Caltech, Pasadena, California / Stanford, Palo Alto, California / Virginia Tech, Blacksburg, Virginia), part time: 1996 - 2001
- Leibniz University, Scientific Member and Assistant of the Professor at the Institute of Measurement Systems: 10/1991 – 5/1996
- Ph.D. degree in engineering with distinction (*summa cum laude*), Leibniz University: 2/1995
- Siemens AG, Munich (partial employment, consultant and Siemens Scholarship): 1986-1991
- Study electrical engineering and physics at Leibniz University of Hannover: until 9/1991
- AEG Telefunken AG & Deutsche Bahn AG, Neumünster (partial employment): 1983-1985

## AWARDS, PRIZES AND HONORS INCLUDE (PARTIAL LIST)

- *Joseph Fraunhofer Award and Robert M. Burley Prize of the Optical Society (OSA)*, recognizing research accomplishments in optical engineering, [www.osa.org](http://www.osa.org), Washington, DC, USA, 2/2019
- Best Paper Awards, 2<sup>nd</sup> and 3<sup>rd</sup>, OSA Imaging and Applied Optics Congress, Orlando, FL, USA, 6/2018
- Member of Saxon Academy of Science, Leipzig, 3/2018
- Fellow, EOS (European Optical Society), Joensuu, Finland (awarded in Berlin), 8/2016
- Fellow, SPIE (Society for Optics and Photonics), Bellingham, USA (awarded in San Francisco), 12/2015
- Fellow, OSA (The Optical Society), Washington, DC, USA (awarded in San Jose), 10/2015
- Outstanding Paper Award: Precision Measurement, Meas. Sci. Technol., IOP, Bristol, UK, 6/2015
- Senior Member, IEEE (Institute of Electrical and Electronics Engineers), New York City, USA, 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, UK, 1/2014
- Excellent paper, awarded at 33. Annual meeting of the Japan Laser Society, Tokyo, Japan, 5/2013
- ASME Turbo Expo, Award of Controls, Diagnostics and Instrumentation, Vancouver, Canada, 6/2011
- *Berthold Leibinger Innovation Prize*, see [wikipedia](http://wikipedia), awarded in Ditzingen, 9/2008
- Highly commended article of Measurement Science and Technology (MST), Bristol, UK, 12/2001
- Measurement Technique Prize of AHMT, TU Munich, 9/1996, see [wikipedia](http://wikipedia)
- Honor of the Leibniz University for an outstanding doctorate, Hannover, 12/1995
- Scholarship and Stipend of Siemens AG, Munich, 1986-1991, Young Researcher Prize, Kiel, 4/1984

#### **ORGANIZATION OF CONFERENCES INCLUDE (PARTIAL LIST)**

- Planned conference in Dresden: ICO-25-OWLS-16, “Progress for society with light”, International Commission for Optics, ICO (“Umbrella Organization” of Optics and Photonics), 2020
- Recently organized conference: 118<sup>th</sup> Annual Meeting Society of Applied Optics, Dresden, June 2017
- Memberships of advisory boards or program committee include: Photonics Europe, SPIE, Strasbourg, France, 2020; Photonics West, SPIE, San Francisco, USA, 2020; Iberoamerican Optics Meeting (RIO), Cancún, México, 2019; ICO-Meeting on Optics & Applications to Sustainable Development, Carthage, Tunisia, 2019; Information Photonics, Japan, 2019; Optical Technology and Measurement for Industrial Appl., SPIE, Yokohama, Japan, 2019; Opt. Meas. Syst. for Inspection SPIE, 2019; European Optical Society, Delft, NL, 2018; Symp. Appl. of Laser Techn. Fluid Mechanics, Lisbon, Portugal, 2018; icOPEN, Singapore, 2015; OSA, Opt. Sensors, Barcelona, Spain, 2014; Optomechatronic Technologies, Seattle, USA, 2014; Optoelectronic Technology and Application, Beijing, China, 2014, etc.

#### **ELECTED MEMBERSHIPS INCLUDE (PARTIAL LIST)**

Scientific Society for Laser Technology (WLT e.V.); Board of German Society of Applied Optics (DGaO) - The German Branch of the European Optical Society (EOS); Board of German Association of Laser Anemometry (GALA); Elected Member of Management Committee of COST BioBrillouin (European Cooperation in Science and Technology, Brussels); Supervisor of Student Chapter Dresden of SPIE, etc.

#### **TEACHING INCLUDES (PARTIAL LIST)**

Measurement and Sensor Technique, Laser Technique, etc. (over 15 000 exams within last 14 years)

#### **ORGANIZATION OF JOINT PROJECTS INCLUDES (PARTIAL LIST)**

DACH Project with TU Graz, AIF Project with Fuel Center Duisburg, Joint Projects with HZDR, DLR, CRTD, Biotec, MPI, TU Berlin, PTB, Keio University, Tsinghua University, etc.

#### **EDITORIAL BOARDS INCLUDE (PARTIAL LIST)**

Technical Measurement (Walter de Gruyter); Open Journal of Fluid Dynamics (Scientific Research Publishing); Journal of the European Optical Society (EOS) - Rapid publications, etc.

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

Optics Express, Optics Letters, IEEE Trans. on Instrumentation and Measurement, JEOS:RP, Optica, etc

#### **SERVICE AS CONSULTANT AND ADVISOR INCLUDES INCLUDES (PARTIAL LIST)**

Review Board of German Research Foundation (DFG); Committee of Nanyang Techn. University Singapore; Development Bank Thüringen, The Netherlands Organization for Scientific Research, Israel Science Foundation, King Faisal Foundation Saudi Arabia, National Science Foundation US, etc

#### **RESEARCH**

The research aims on the universal control and application of coherent waves (light and ultrasound) using adaptive digital systems. He is known for unconventional optical imaging with wavefront shaping, real-time holography, advanced biomedical imaging and non-intrusive precision measurements at harsh environments. His research is focused on advances in application areas including: “Information technologies and internet” (deep learning, physical layer security, multimode fiber transmission), “energy and process technique” (optical measurements of sound waves, in situ real time quality monitoring with Doppler sensors), and “health and biophotonics” (lensless needle-size fiber endoscopes, mechanical mapping of biological tissues using spontaneous and stimulated Brillouin microscopy, digital holography in optogenetics for iPSC-derived neural networks, zebrafish studies with smart microscopes using adaptive lenses). Over 50 prizes and honors were awarded to the students and members of his laboratory MST within the last 10 years.

#### **PUBLICATIONS AND TALKS**

In total over 700 publications and talks, including more than 100 invited talks, more than 20 patents and more than 200 papers in renowned peer reviewed journals: Optics Express, Optics Letters, Optics and Lasers in Engineering, Mechanical Systems and Signal Processing, IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control, and Journal of Visualized Experiments – JoVE, etc.

## SELECTION OF 12 ARTICLES, RECENTLY PUBLISHED IN PEER REVIEWED INTERNATIONAL SCI JOURNALS

- Azaam Aziz, Mariana Medina-Sánchez\*, Nektarios Koukourakis, Jiawei Wang, Robert Kuschmierz, Hannes Radner, Jürgen W. Czarske and Oliver G. Schmidt, "Real-time IR tracking of single reflective micromotors through scattering tissues," *Advanced Functional Materials* (2019)
- K. Philipp, F. Lemke, S. Scholz, U. Wallrabe, M.C. Wapler, N. Koukourakis, J.W. Czarske, "Diffraction-limited axial scanning in thick biological tissue employing an aberration correcting adaptive lens", *Nature Scientific Reports* 9, 9532, (2019) <https://rdcu.be/blkp6>
- S. Shi, H. Zhang, J. Qu, G. Jin, R. Kuschmierz, Jürgen Czarske, "Measurement uncertainty propagation in spindle error separation techniques - Investigation by means of stochastic spectral method", *International Journal of Machine Tools and Manufacture*, Volume 141, 2019, Pages 36-45, <https://doi.org/10.1016/j.ijmachtools.2019.03.006> (2019)
- Benedikt Krug, Nektarios Koukourakis, and Juergen W. Czarske, "Impulsive stimulated Brillouin microscopy for non-contact, fast mechanical investigations of hydrogels," *Opt. Express* 27, 26910-26923 (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)
- R. Kuschmierz, E. Scharf, N. Koukourakis, J. Czarske, "Self-calibration of a lensless holographic endoscope using programmable guide stars", *Optics Letters* (2018)
- F. Schmieder, ..., J. Czarske, "Optogenetic Stimulation of Human Neural Networks Using Fast Ferroelectric Spatial Light Modulator-Based Holographic Illumination", *Appl. Sciences* (2018)
- R. Nauber, L. Büttner, K. Eckert, J. Fröhlich, J. Czarske, and S. Heitkam, "Ultrasonic measurements of the bulk flow field in foams," *Phys. Rev. E* 97(1), 013113 (2018)
- D. Haufe, N. Koukourakis, L. Büttner, J. Czarske, "Transmission of multiple signals through an optical fiber using wavefront shaping", *Journal of Visualized Experiments*, e55407 (2017)
- K. Mantvydas; R. Nauber; C. Kupsch; J. Czarske, „Flow Field Imaging with Ultrasonic Guided Waves for Exploring Metallic Melts”, *IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control*, Issue: 99 (2017)
- F. Schmieder, M. E. Kinaci, J. Wartmann, J. König, L. Büttner, J. Czarske, S. Burgmann, A. Heinzl, "Investigation of the flow field inside the manifold of a real operated fuel cell stack using optical measurements and Computational Fluid Mechanics", *Journal of Power Sources* 304C: 155-163 (2016)
- J. König, K. Tschulik, L. Büttner, M. Uhlemann, J. Czarske, „Analysis of the Electrolyte Convection inside the Concentration Boundary Layer during Structured Electrodeposition of Copper in High Magnetic Gradient Fields”, *Analytical Chemistry*, 85(6):3087-3094 (2013)

## SELECTION OF 2 PATENTS

- R. Kuschmierz, J. Czarske, "Method and fiber optic system for illuminating and detecting an object with light", *European Patent, Japan and USA*, 2018
- L. Büttner, J. Czarske, M. Teich, N. Koukourakis, „Arrangement and method for disturbance correction for imaging flow measurement methods“, 2017

September 30, 2019