

Publications and talks 2019

Publications in journals with peer review process

E. Scharf, R. Kuschmierz, J. Czarske, "Holographic lensless fiber endoscope with needle size using self-calibration", *Technisches Messen*, 2019, DOI: <https://doi.org/10.1515/teme-2018-0087>

J. Lich, T. Wollmann, A. Filippatos, M. Gude, R. Kuschmierz, J. Czarske, „Optical strain measurements on fast moving fiber reinforced polymer rotors using diffraction gratings“, *Technisches Messen*, 2019, DOI: <https://doi.org/10.1515/teme-2019-0010>

S. Rothe, H. Radner, N. Koukourakis, J. Czarske, "Transmission matrix measurement of multimode optical fibers by mode-selective excitation using one spatial light modulator", *Issue on Liquid Crystal on Silicon Devices: Modeling and Advanced Spatial Light Modulation Applications; Applied Sciences*, 2019

C. Kupsch, D. Weik, L. Feierabend, R. Nauber, L. Büttner, J. Czarske, "Vector Flow Imaging of a Highly Laden Suspension in a Zinc-Air Flow Battery Model," in *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, vol. 66, no. 4, pp. 761-771, April 2019

F. Greiffenhagen, J. Peterleithner, J. Woisetschläger, A. Fischer, J. Gürtler, J. Czarske, „Discussion of laser interferometric vibrometry for the determination of heat release fluctuations in an unconfined swirl-stabilized flame“; *Combustion and Flame*, 2019

K. Philipp, J. Czarske, "Axial scanning employing tunable lenses: Fourier optics based system design," *OSA Continuum* 2, 1318-1327 (2019)

F. Lemke, Y. Frey, B. Poyyathuruthy Bruno, K. Philipp, N. Koukourakis, J. Czarske, U. Wallrabe, M. Wapler, "Multiphysics simulation of the aspherical deformation of piezo-glass membrane lenses including hysteresis, fabrication and non-linear effects", *Smart Materials and Structures* **28**, 055024, 2019

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>

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>

N. Thieme, M. Keil, D. Meier, P. Bönisch, K. Dadzis, O. Pätzold, M. Stelter, L. Büttner, J. Czarske, "Directional solidification of gallium under time-dependent magnetic fields with in situ measurements of the melt flow and the solid-liquid interface", *Journal of Crystal Growth* **522**, 221-229, 2019

<https://www.sciencedirect.com/science/article/pii/S0022024819303550>

Christian Kupsch, Lukas Feierabend, Richard Nauber, Lars Büttner, Jürgen Czarske, “Flow investigation of complex suspension electrodes for battery applications using ultrasound imaging velocimetry”, *Experimental Thermal and Fluid Science*, Volume 109, 2019, 109886, ISSN 0894-1777, <https://doi.org/10.1016/j.expthermflusci.2019.109886>.

Julian Lich, Tino Wollmann, Angelos Filippatos, Maik Gude, Jürgen Czarske, Robert Kuschmierz, “Diffraction grating based in-situ displacement, tilt and strain measurements on high-speed composite rotors”, *Applied Optics*, accepted, 2019

Editorials

J. Czarske (Editor), Issue “Mechatronic Laser Measurement Systems”, *TM-Technical Measurement*, 2019

Invited talks at conferences (with proceedings)

J. Czarske, “Digital Holography in Optogenetics: A New Window to the Brain”, invited by Pietro Ferraro, *SPIE Optical Metrology, World of Photonics: Optical Methods for Inspection, Characterization, and Imaging of Biomaterials IV*, 24-27 June 2019, Munich, Invited Talk

R. Nauber, J. Czarske, „Modern Ultrasound Flow Metrology using Time Reversal Virtual Arrays“, invited by Erdal Oruklu, *IEEE Int. Ultr. Symp. (IUS): Sensors, NDE and Industrial Application*, 06-09 October 2019, Glasgow, UK, Invited Talk

J. Czarske, “Paradigm Change of Dynamic Digital Holography in Biomedical Microscopy”, *International Conference on Optical and Photonic Engineering, icOPEN*, 16 - 20 July 2019, Phuket, Thailand (invited by Prof. Anand Asundi and Prof. Qian Kemao, School of Computer Science and Engineering at Nanyang Technological University, NTU, Singapore), Opening Lecture of the Conference and Plenary Talk

Juergen Czarske, Benedikt Krug, Andrés Lasagni and Nektarios Koukourakis, “Perspectives of Stimulated Brillouin Scattering for Biomedical Applications”, *ICO & IUPAP-C17 Topical Meeting on OPTics and Applications to SUsustainable Development (OPTISUD)*, invited by Mourad ZGHAL, University of Carthage - Engineering School of Communications of Tunis, Tunisia, 4-7 September 2019, Keynote Talk

International conferences (reviewed, with proceedings)

F. Schmieder, R. Habibey, L. Büttner, J. Czarske, V. Busskamp, „Optogenetic investigation of in vitro human iPSC-derived neuronal networks,” *Proceeding Paper 10866-19, Optogenetics and Optical Manipulation 2019, SPIE Photonics West*, 2 – 7 February 2019, San Francisco, USA

J. Czarske, B. Krug, N. Koukourakis, J. Guck, "Investigation of impulsive stimulated Brillouin micro-elastography," Proceeding Paper 10880-45, Optical Elastography and Tissue Biomechanics VI, SPIE Photonics West, 2 – 7 February 2019, San Francisco, USA

J. Czarske, F. Lemke, M. Wapler, U. Wallrabe, N. Koukourakis, K. Philipp, "Axial scanning and spherical aberration correction in confocal microscopy employing an adaptive lens, Proceeding paper 10886-13, Adaptive Optics and Wavefront Control for Biological Systems V, SPIE Photonics West, 2 – 7 February 2019, San Francisco, USA

R. Kuschmierz, E. Scharf, J. Czarske, "Fresnel guide star based self-calibration of holographic multicore-fiber endoscopy", Proceeding paper 10886-15, Adaptive Optics and Wavefront Control for Biological Systems V, SPIE Photonics West, 2 – 7 February 2019, San Francisco, USA

R. Schlüßler, S. Möllmert, S. Abuhattum, G. Cojoc, K. Kim, P. Müller, J. Czarske, J. Guck, "Viscoelastic mapping of biological samples using Brillouin microscopy," Proceeding paper 10890-53, Quantitative Phase Imaging V, SPIE Photonics West, 2 – 7 February 2019, San Francisco, USA

J. Czarske; E. Scharf; R. Kuschmierz, „Ultrathin Lensless Fiber Endoscope with in Situ Calibration for 3D Imaging”, OSA Biophotonics Congress: Optics in the Life Sciences, 15.-17. April 2019, Tucson, USA

N. Koukourakis, J.W. Czarske; "Adaptive Hybrid Illumination Microscopy for Zebrafish Screening", OSA Biophotonics Congress: Optics in the Life Sciences, 15.-17. April 2019, Tucson, USA

K. Forouhesh Tehrani, N. Koukourakis, J.W. Czarske, I. Mortensen, "Characterization of memory effect in juvenile mouse skull for imaging through intact bone", OSA Biophotonics Congress: Optics in the Life Sciences, 15.-17. April 2019, Tucson, USA

H. Zhang, R. Kuschmierz, M. Löser, S. Ihlenfeldt, S. Shi, J. Czarske, "Optical tip vibration measurement in CNC milling machines", euspen's 19th International Conference & Exhibition, Bilbao, ES, June 2019

N. Koukourakis, W. Wang, K. Philipp, J. Czarske, "Quantitative phase imaging for in-situ monitoring of adaptive lenses", OSA Digital Holography and Three-Dimensional Imaging, M4B. 5, Bordeaux, France, 19.5.-23.5.2019

L. Büttner, M. Thümmeler, N. Koukourakis, J. Czarske, "Transmission of Structured Light Through a Multimode Fiber Using Digital Optical Phase Conjugation", OSA Digital Holography and Three-Dimensional Imaging, Poster Th3A.33, Bordeaux, France, 19.5.-23.5.2019

S. Rothe, H. Radner, N. Koukourakis, and J. W. Czarske, "Fast Transmission Matrix Measurement System for Multimode Optical Networks", OSA Imaging and Applied Optics CTh2C.3, Munich, Germany (2019)

Shengyu Shi, Hao Zhang, Jinping Qu, Gang Jin, Robert Kuschmierz, Jürgen Czarske, “Roundness measurement by employing laser Doppler distance sensor and error separation techniques”, SPIE Optical Metrology, Optical Measurement Systems for Industrial Inspection XI, Munich, Germany (2019)

J.Lich, T. Wollmann, R.Kuschmierz, A.Filippatos, M. Gude, J.Czarske, „ Spatially resolved optical strain measurements on high-speed fiber reinforced polymer rotors“, SPIE Optical Metrology, Optical Measurement Systems for Industrial Inspection XI, Munich, Germany (2019)

J. Czarske, E. Scharf, R. Kuschmierz, “Fast 3D Imaging With Lensless Holographic Endoscopy Employing Coherent Fiber Bundles”, Spectral and Endoscopic Diagnosis on Cells and Tissues, Optics in Biology, Medicine, Vision, and Color, Fiber optic and endoscopic sensors in biology and medicine, OSA Conference Frontiers in Optics/Laser Science Conference (FiO/LS), Washington, D.C., 15.–19.9.2019

Newsroom OSA, Tiny Lensless Endoscope Captures 3D Images of Objects Smaller than a Cell: Researchers presenting at FiO + LS have developed a new self-calibrating endoscope that produces 3D images of objects smaller than a single cell.Added: 15 Aug 2019, https://www.osa.org/en-us/about_osa/newsroom/news_releases/2019/fio_tiny_lensless_endoscope/

C. Kupsch, L. Feierabend, R. Nauber, L. Büttner, J. Czarske “Super-resolution ultrasound flow imaging of suspensions in narrow channels”, International Congress on Ultrasonics, 3.9.-6.9.2019, Bruges, Belgium

F. Moyon, F. Bürkle, L. Feierabend, J. Wartmann, L. Büttner, J. Czarske, “Optimization of the flow distribution in a high temperature PEMFC Stack”, CARISMA, Duisburg, 27.-30. August 2019

National conferences (reviewed, with proceedings)

H. Radner, L. Büttner, J. Czarske “Flow measurements through fluctuating interfaces with dynamic wavefront correction” ISPIV, Munich, 2019

B. Krug, N. Koukourakis, J. Czarske, J. Guck, “Impulsive stimulierte Brillouin-Streuung zur Erfassung von mechanischen Messgrößen in der Biomedizin“, 120. Jahrestagung der DGaO, Darmstadt, 2019

J. Czarske, K. Philipp, N. Koukourakis, “Adaptive speckle illumination microscopy“, 120. Jahrestagung der DGaO, Darmstadt, 2019

J. Stange, H. Radner, L. Büttner, J. Czarske, „FPGA based wavefront correction for measurements through optical disturbances“, 120. Jahrestagung der DGaO, Darmstadt, 2019

C. Schober, L. Büttner, J. Czarske, „Kamerabasierte Messung durch gekrümmte Grenzflächen mit variabler Messebene und Aberrationskorrektur“, 120. Jahrestagung der DGaO, Darmstadt, 2019

M. Thümmeler, L. Büttner, N. Koukourakis, J. Czarske, „Übertragung und Nutzung von strukturierten Lichtmustern durch Multimodefasern“, 120. Jahrestagung der DGaO, Darmstadt, 2019

E. Scharf, R. Kuschmierz, J. Czarske, „Video rate scanning endomicroscopy through a coherent fiber bundle using a galvo scanner“, SPIE Optical Metrology, Munich, 24-27 June 2019

L. Büttner, M. Thümmeler, J. Czarske, „Laser Doppler measurements through a multimode fiber using digital optical phase Conjugation“, 27. Fachtagung „Experimentelle Strömungsmechanik“, Beitrag 2, Erlangen, 3.–5. September 2019

M. Dues, S. Burgmann, J. Kriegseis, L. Büttner, J. Czarske, U. Janoske, „Profilsensormessungen in einem Kanal mit poröser Wand, 27. Fachtagung „Experimentelle Strömungsmechanik“, Beitrag 6, Erlangen, 3.–5. September 2019

F. Bürkle, F. Moyon, L. Feierabend, M. Dues, L. Büttner, J. Czarske, „Strömungsverteilungsmessungen an einer Brennstoffzelle mit einem hochauflösenden Zeitmultiplex-Laser-Doppler-Profilsensor“, 27. Fachtagung „Experimentelle Strömungsmechanik“, Beitrag 47, Erlangen, 3.–5. September 2019

R. Nauber, A. Klass, J. Czarske, „Characterization of the imaging properties of an ultrasound-Doppler velocimeter using a multimode waveguide“, Sensoren und Messsysteme 2019, Nürnberg, 25-26th of June 2019

Workshops (without proceedings)

J. Czarske, „Computergenerierte Hologramme in der Hirnforschung - Computer Generated Holograms in Brain Research“, Vorlesung für Schülerinnen und Schüler der 9. Klasse - Lecture for Class 9, 14.01.2019

Johannes Stange, Hannes Radner, Lars Büttner, Juergen Czarske, „FPGA based closed loop wavefront control“, Tag der Fakultät, AMR-Leistungsschau, 8. November 2019

Lars Grüter, Richard Nauber, Juergen Czarske, "Adaptive Ultraschallsysteme für die Biomedizin", Tag der Fakultät, AMR-Leistungsschau, 8. November 2019

M. Thümmeler, L. Büttner, N. Koukourakis, J. Czarske, „Übertragung und Nutzung von strukturierten Lichtmustern durch Multimodefasern“, Tag der Fakultät, AMR-Leistungsschau, 8. November 2019

L. Büttner, J. Czarske, „Kamerabasierte Messung durch gekrümmte Grenzflächen mit Aberrationskorrektur“, Tag der Fakultät, AMR-Leistungsschau, 8. November 2019

Invited talks (at seminars/workshops)

J. Czarske, "Optogenetik: Computergenerierte Hologramme in der Hirnforschung - Optogenetics: Computer Generated Holograms in Brain Research", Dresdener Industriegespräche der Deutschen Physikalischen Gesellschaft, DPG, 17.01.2019, Max Planck Institut für Physik komplexer Systeme (invited by Dr. A. Ehrlich, Sick AG)

J. Czarske, "Holographic Optogenetics: A New Window to the Brain", Plenary Talk, Sächsische Akademie der Wissenschaften, 8.03.2019 (invited by Prof. H. Wiesmeth)

J. Czarske, "Novel Methods in Biomedicine: Holographic Optogenetics and Brillouin Microscopy - Neue Methoden für die Biomedizin: Holographische Optogenetik und Brillouin-Mikroskopie" Seminar Talk, KSI-Meinsberg, 14 August 2019 (invited by Dr. Caroline Murawski)

R. Kuszmierz, E. Scharf, J. Czarske, „Linsenlose Endoskopie-Lensless Endoscopy“, F.O.M.-Konferenz 2019, 06.11.2019, Berlin

C. Kupsch, L. Feierabend, R. Nauber, L. Büttner, J. Czarske, „Ultraschallbasierte Messung von Suspensionsströmungen in kleinen Geometrien“, Institutskolloquium, Fakultät für Maschinenbau Institut für Thermo- und Fluidodynamik, TU Ilmenau, 16.10.2019, Ilmenau (invited by Prof. Cierpka)

Patent Submissions

Richard Nauber, Jürgen Czarske: "Kalibrierverfahren von Multimode-Wellenleitern zur Bildgebung mit Ultraschall-Endoskopen - Calibration method of multimode waveguides for imaging with ultrasound endoscopes", 2019