



Aquarellstudie nach der Foto von Vogel Lübeck

ER

Sino-German Symposium Biomedical Photonics

28-29 August, 2023

Sino-German Mobility Programme

Grant Number: M-0063



Institute of Biomedical Optics



Institute of Biomedical Photonics and Sensors

Program

Monday, 28.08.2023 8:45 – 17:30

8:45 Opening

Session 1 (chaired by Alfred Vogel)

9:00	Zhenxi Zhang <i>Xi'an Jiaotong University</i>	20 years Sino-Germany cooperation and general introduction to the biophotonical research in China
9:30	Cuiping Yao <i>Xi'an Jiaotong University</i>	Combination of phototherapy with immunotherapy
9:55	Christoph Rehbock <i>University Duisburg-Essen</i>	Laser-generated noble metal nanoparticles as sensitizers in proton therapy
10:25		Coffee Tea break

Session 2 (chaired by Cuiping Yao)

11:00	Alexander Heisterkamp <i>Leibniz Univ. Hannover</i>	Fs laser-induced gold nanoparticle formation in hydrogels, and biophotonic applications
11:30	Ramtin Rahmanzadeh <i>University of Luebeck</i>	Light-induced drug release for tumor therapy
11:55	Jing Xin <i>Xi'an Jiaotong University</i>	Research on enhanced photodynamic therapy for gastric cancer
12:20		Lunch break

Session 3 (chaired by Robert Huber)

14:00	Sijia Wang <i>Xi'an Jiaotong University</i>	Phototherapies combined with natural killer cell-related immunotherapy for cancer via liposomal nanocarriers
14:25	Luwei Zhang <i>Xi'an Jiaotong University</i>	Quality control of gynostemma pentaphyllum ("immortality herb") by near infrared spectroscopy
14:50	Jing Wang <i>Xi'an Jiaotong University</i>	Hyperspectral imaging for dosimetry in photodynamic therapy
15:15		Coffee Tea break

Session 4 (chaired by Yoko Miura)

15:45	Liangyi Chen <i>Peking University</i>	Quantitative live-cell superresolution microscopy - a personal journey for the last ten years
16:25	Lu Zhang <i>Xi'an Jiaotong University</i>	3-D detection of label-free cells <i>in vivo</i>
16:50	Thorsten Buzug <i>University of Luebeck Fraunhofer IMTE</i>	Magnetic particle imaging - More than just imaging
17:20		Group photo
17:30		Closing of the day

19:30 Gala dinner, The Newport Restaurant & Marina, Willy-Brandt-Allee 31A, 23554 Lübeck

Tuesday, 29.08.2023 9:00 – 17:30

9:00 Opening for the day

Session 5 (chaired by Alexander Heisterkamp)

9:05	Alfred Vogel <i>University of Luebeck</i>	Dissection of DNA damage and repair pathways in live cells by fs laser microirradiation and free-electron modeling
9:40	Jonas Jurkevicius, Sebastian Karpf <i>University of Luebeck</i>	High-speed nonlinear microscopy and imaging flow cytometry at kHz frame rates
10:10	Xiao-Xuan Liang <i>University of Luebeck</i>	Cavitation around gold nanoparticles: experimental and modeling advances
10:35	Lei Fu <i>Xi'an Jiaotong University & University of Luebeck</i>	Laser induced spherical bubble dynamics in partially confined geometry with acoustic feedback from container walls
11:00		Coffee Tea break

Session 6 (chaired by Liangyi Chen)

11:30	Madita Göb, Robert Huber <i>University of Luebeck</i>	New trends in Megahertz-OCT: 4D and robotically assisted in vivo imaging with functional contrast
12:00	Peter König <i>University of Luebeck</i>	High-speed OCT investigations of mucous transport in the airways
12:30	Awanish P. Singh <i>University of Luebeck</i>	The development of a sensorless, synchronous endoscopic probe for enhanced OCT imaging
12:55		Lunch break

Session 7 (chaired by Peter König)

14:00	Jianan Li, Rui Zhu <i>Vivolight Co., Ltd.</i>	Intracoronary OCT, cold laser atherectomy, and medical photonics in pan-vascular intervention
14:30	Hendrik Spahr <i>University of Luebeck</i>	From vascular pulsation to optoretinography: imaging of retinal micro-motion with holographic OCT
15:00	Yoko Miura <i>University of Luebeck</i>	Fluorescence lifetime imaging of degenerative retinal disease
15:25		Coffee Tea break

Session 8 (chaired by Jianan Li)

16:00	Sebastian Freidank <i>University of Luebeck</i>	Advances in fs laser refractive eye surgery
16:25	Zhipeng Huang <i>University Duisburg-Essen</i>	Atomic-resolution imaging of ps infrared laser-driven thin liquid films using fs electron diffraction
16:50	Norbert Linz <i>University of Luebeck</i>	Ultrafast speckle-free high resolution imaging of laser induced shock waves and cavitation
17:20	Alfred Vogel, Zhenxi Zhang	Closing of the symposium

17:30 End of Symposium

18:30 Dinner

Conference Venue, and Locations of Hotel and Conference Dinner

Conference Venue: Lecture hall of the Institute of Biomedical Optics,
University of Luebeck, Peter-Monnik-Weg 4, 23562 Lübeck.

Conference Hotel: Park Inn by Radisson Lübeck, Willy-Brandt-Allee 1-5, 23554 Lübeck.

Conference Dinner: Newport Restaurant, Willy-Brandt-Allee 31A, 23554 Lübeck.



University of Luebeck



Trave River and Old Town Luebeck from Newport Restaurant

Short Biographies of Speakers

Co-chair of the symposium

Prof. Dr. Alfred Vogel

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Alfred Vogel is Senior Professor at the Institute of Biomedical Optics (BMO), University of Luebeck, Germany. From 2010 to 2019 he served as Director of the BMO and Deputy CEO of the Medical Laser Center Luebeck GmbH. Dr. Vogel is fellow of Optica (formerly OSA) and of SPIE. He published 102 peer-reviewed papers, 7 book chapters, and 52 proceedings papers (>16000 citations, h = 52 according to Google Scholar, and reviewed for 62 international journals and 32 institutions. He holds 15 patents and has filed another 7 patent applications. He has delivered more than 200 plenary, key note, and invited talks. Dr. Vogel was editorial board member for the *Journal of Biomedical Optics* from 2002-2019, served as associate editor of *Optics Express* from 2006-2009, and is advisory editor of *Biomedical Optics Express* since its launching in 2010. Dr. Vogel has made major experimental and theoretical contributions to linear and nonlinear pulsed laser interactions with water, biomolecules, cells and biological tissues. They range from free-electron-mediated photochemical modifications through photothermal alterations to laser-induced breakdown. He invented new technologies for stroboscopic and ultra-high-speed imaging and schlieren photography of laser-induced cavitation and ablation, as well as interferometric techniques to characterize these processes with a few nanometer resolution. Insights gained on laser tissue interactions were applied to improve pulsed laser tissue ablation, plasma-mediated intraocular and refractive surgery, molecular modifications within ocular tissues and cells, and nonlinear microscopy.

Co-chair of the symposium

Prof. Dr. Zhenxi Zhang

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Zhenxi Zhang is Senior Professor at the Institute of Biomedical Photonics and Sensors, School of Life Science and Technology, Xi'an Jiaotong University, China. He received his Ph.D. in Biomedical Engineering and Instrumentation from Xi'an Jiaotong University, China in 1990. He was the associate dean of School of Life Science and Technology and the director of the Institute of Biomedical Analytical Technology and Instrumentation from 2008 to 2018 at Xi'an

Jiaotong University. He has conducted researches in several Germany Universities including University of Stuttgart, the GSF-National Research Center for Environment and Health (Muenich), Robert Roessle Cancer Clinic of the Virchow, University Clinic of the Humboldt University in Berlin, Wilhelmshaven University of Applied Sciences, University of Lübeck and Lübeck University of Applied Sciences. His research interests are mainly in biomedical optics, optical biophysics, biomedical optical imaging and spectral analysis method. He published more than 80 peer-reviewed papers and 4 books on Biomedical Photonics and Nanomedicine. He has been a member of the University Teaching Instruction Committee of the Chinese Education Ministry for Biomedical Engineering (2006-2010), the deputy director of the Internet Cooperative Research Center of the Education Ministry, consultant expert of the Chinese Technology Association, the vice-chairman and member of the Committee for Biomedical Optics of Chinese Optical Society, and associate chief editor of *Chinese Journal of Lasers*.

Director of the host institute

Prof. Dr. Robert Huber

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Robert Huber studied general physics with major in astrophysics and applied nuclear physics at the Ludwig-Maximilians-Universität (LMU) in Munich, Germany, where he received his Diplom for work on laser assisted nano-structuring with scanning tunneling- and atomic force microscopes at the chair of Prof. J. Feldmann. In 2002 he received his PhD (Dr. rer. nat.) for work on novel non-collinear optical parametric amplifiers and ultrafast electron transfer processes at dye-semiconductor surfaces in 2002 at the Institute of Medical Optics of Prof. Zinth in the group of Prof. Wachtveitl. Robert Huber then worked for one year as Postdoc at the Institute of Physical and Theoretical Chemistry at the J. W. Goethe University in Frankfurt in the group of Prof. J. Wachtveit. From 2003 through 2007, he joined the group of Prof. J. G. Fujimoto at the Massachusetts Institute of Technology as postdoc and developed various new wavelength swept lasers for optical coherence tomography (OCT). From 2007 to 2013 he led an independent research group at the LMU Munich in the Emmy Noether program of the German Research Foundation (DFG) and as an ERC Starting grant group leader. His group was partner in the European consortium "FUN-OCT" in FP7. The current research of Huber's group focuses on the development and the application of new fiber based laser light sources for OCT, multi-photon and Raman imaging. He is the inventor of the Fourier Domain Mode Locked (FDML) laser and pioneered the field of Megahertz Optical coherence tomography (MHz-OCT), which he successfully commercialized by cofounding the company Optores GmbH. Robert Huber received for his group a total of 11M€ funding from DFG (Emmy Noether Sachbeihilfe), BMWI (EXIST), BMBF, European Union (ERC STG, ERC, CoG, FP7, Horizon 2020, ETN, Interreg), Thorlabs GmbH, and Freunde und Förderer der Augenklinik München.

Robert Huber coauthored more than 150 peer reviewed publications, gave more than 60 invited talks and holds 19 patents. His papers received 12845 citations and he has an h-index of 56. He received two ERC grants (StG 2010 and CoG 2014) by the European Union. In 2011 and again in 2012 he was ranked amongst the top 40 young talents in the field of science in Germany by the business magazine "Capital". He received the Albert-Weller award 2003, the Rudolf-Kaiser Preis 2008, the Klung-Wilhelmy-Weberbank award 2013. In 2016 he was awarded the title "Schleswig Holstein Excellence Chair" and in 2017 he received the European Inventor award 2017 jointly with James Fujimoto and Eric Swanson. In 2021 Robert Huber became fellow of OPTICS (formerly OSA).

Biographies of speakers in sequence of talks

Prof. Dr. Cuiping Yao

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Cuiping Yao is Professor at Xi'an Jiaotong University. She received Ph.D in Biomedical Engineering from Xi'an Jiaotong University in 2005. She was a visiting scientist at the Institute of Biomedical Optics, University of Luebeck in 2005 and 2013 with collaboration of Prof. Dr. Gereon Hüttmann, and a visiting scientist at the University of Dartmouth, U.S.A. in 2018-2019 with collaboration of Prof. Dr. Brian W. Pogue. She has been the Deputy Director of the Institute of Biomedical Photonics and Sensing, Xi'an Jiaotong University. She has been awarded six times the National Natural Science Foundation of China funded research programs in the area of nanoparticles aided cancer therapy and Cherenkov radiation-activated cancer photodynamic therapy. These projects have resulted in a number of high impact publications in Optics Letters, Journal of Biophotonics, ACS Materials & Interfaces, Advanced Healthcare Materials, Nanoscale and Nanotechnology et. al. Her research focuses on nanoparticles aided cancer diagnosis and therapy, especially on effects of the interaction between laser and gold nanoparticles and their biomedical applications. Her major contribution to science is as following: 1) Development of inorganic nanoparticles aided photodynamic therapy of cancer; 2) Combination of PDT and immunotherapy; 3) Systematic study of cell optoporation with laser activated gold nanoparticles.

Dr. Christoph Rehbock

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Christoph Rehbock studied chemistry in Hannover and made his PhD in the group of Prof. Scheper in Hannover in the field of biotechnology. Following a short period of postdoctoral work at the Laser Zentrum Hannover he went to the University of Duisburg-Essen and joined the group of Prof. Barcikowski in 2011. Since then, he has been working as a postdoctoral researcher in the field of nanoparticle generation by pulsed laser ablation in liquids. His main research topics entailed the fundamental understanding of the particle formation process in the presence of different electrolytes as well as the bioconjugation of laser-fabricated nanoparticles. Since 2014, he has been appointed senior scientist with tenure and group leader of the newly-founded “NanoBio” group with focus on the fabrication and nanointegration of nanoparticles by laser synthesis and processing of colloids in liquids. His research focuses on the one hand on fundamental aspects tuning particle composition (alloy nanoparticles) and particle size (few atom nanoclusters) with emphasis on optical properties. On the other hand, he also explores utilization of laser-generated nanomaterials in biomedicine working on sensitizers for proton therapy, antimicrobial materials and nano-bio-conjugates for cellular targeting and imaging. Recently, he has also been working on laser processing of organic particles with focus on drugs and food ingredients.

Prof. Dr. Alexander Heisterkamp

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Alexander Heisterkamp is Professor at Leibniz Universität Hannover. Since his studies in Physics (1993-1998), Mr. Heisterkamp has been involved in the use of lasers in medicine. During his doctoral studies (2002) at the Laser Zentrum Hannover, he used fs-pulses to improve refractive corneal surgery on the eye. Subsequently, Mr. Heisterkamp went to Harvard University, USA, on a DFG postdoctoral fellowship in the group of Eric Mazur to apply fs-pulses on a cellular level. In 2006, he took a junior professorship in Biophotonics at Leibniz Universität Hannover and was appointed full professor of Biophotonics in 2009. In 2010-2011, he was department head at the Laser Zentrum Hannover and followed a W2 call to Friedrich Schiller University Jena in 2011. In February 2014, he accepted a W3 call from Leibniz Universität Hannover, where he is currently professor of biophotonics at the Institute of Quantum Optics and scientific director at Laser Zentrum Hannover. In 2019, he was a visiting professor at Keio

University Tokyo, Japan. Since 2023 he is dean of the Faculty for Mathematics and Physics at Leibniz University Hannover. In his research, he uses photonic technologies for imaging and manipulation of cells and tissues in various fields of medicine and biology.

PD. Dr. Ramtin Rahmzadeh

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Ramtin Rahmzadeh is a Group Leader at the Institute of Biomedical Optics (BMO), University of Luebeck, Germany. He received his biology diploma in 2002 by the Rheinische-Friedrich-Wilhelms-University in Bonn. During his doctoral research at the Leibniz Research Center Borstel, he made important contributions to cell manipulation with lasers by inactivating proteins and cells with light. During a three-year post doctorate at the Wellman Center for Photomedicine, Harvard Medical School in Boston he developed this work further in the direction of tumor therapy. With his research group at the University of Lübeck, he investigates tumor therapies in which antibodies or antibody fragments, e.g. in light-sensitive liposomes, are introduced into cells. He also works with industrial partners on the development of antimicrobial surfaces and optical biosensors.

Assoc. Prof. Dr. Jing Xin

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Jing Xin is Associate Professor at the Institute of Biomedical Photonics and Sensors, Xi'an Jiaotong University, China. She received Ph.D. in Pattern Recognition and Intelligent System from Xidian University in 2014. She was a visiting scientist at the University of Dartmouth, U.S.A. in 2019-2020 with collaboration of Prof. Dr. Brian W. Pogue. She has been awarded twice the National Natural Science Foundation of China (NSFC) funded research programs and published more than 12 papers in the area. Currently, her research interests are nanomaterials mediated photodynamic therapy for gastric cancer.

Assoc. Prof. Dr. Sijia Wang

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Sijia Wang is Associate Professor at the Institute of Biomedical Photonics and Sensors, Xi'an Jiaotong University, China. He received Ph.D. in Biomedical Engineering from Xi'an Jiaotong University in 2016. He was a joint doctoral student at the Institute of Biomedical Optics, University of Luebeck supervised by Prof. Alfred Vogel and PD. Dr. Ramtin Rahmzadeh from 2013 to 2015. Currently, his research interests are optical theranostic and multifunctional nanomedicine. He has been awarded two National Natural Science Foundation of China funded research programs in the area and published more than 10 peer-reviewed papers on anti-tumor photo-nanomedicine in Nano-Micro Letters, ACS Materials & Interfaces, Nanotechnology, et. al. He is the member of the Chinese Society of Optical Engineering and the Chinese Society of Biomedical Engineering. He is the youth editorial board member of Chinese Journal of Lasers.

Dipl. Luwei Zhang

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Luwei Zhang received Bachelor's degree in Chemical Engineering from Xi'an Jiaotong University in 2003 and Dipl.-Ing. in Environmental Protection Technology (Umweltschutz-technik) from Stuttgart University, Germany in 2013. From 2015, Luwei Zhang joined the School of Instrument Science and Technology, Xi'an Jiaotong University as a full position engineer. Meanwhile, she is pursuing Ph.D in the institute of Biomedical Photonics and Sensor. Her research interests are nano-materials assisted food safety and inspection, and food microbiology.

Assoc. Prof. Dr. Jing Wang

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Jing Wang is Associate Professor at the Institute of Biomedical Photonics and Sensors, Xi'an Jiaotong University, China. He received Ph.D. in Biomedical Engineering from Xi'an Jiaotong University in 2010. He was a visiting scientist at the Institute of Biomedical Optics, University

of Luebeck in 2006 and 2007 with collaboration with Prof. Dr. Gereon Hüttmann. Currently, his research interests are hyper-spectral and endoscopic optical imaging for disease diagnosis. He has been awarded twice the National Natural Science Foundation of China (NSFC) funded research programs in the area and published more than 10 peer-reviewed papers in Optical Express, Journal of Biomedical Optics, et. al. He is the member of the Chinese society of Optical Engineering and the Chinese society of Biomedical Engineering.

Prof. Dr. Liangyi Chen

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Liangyi Chen is Boya Distinguished Professor at Peking University and serves as the Deputy Director of the National Biomedical Imaging Science Center at Peking University. He obtained Bachelor's degree in Bioengineering and Medical Instruments from Xi'an Jiaotong University in 1995 and Master's degree in Bioelectronics (1998) and Ph.D. in Biomedical Engineering (2001) from Huazhong University of Science and Technology. From 2001-2004, he was a postdoctoral fellow in the Department of Physiology and Biophysics at the University of Washington, USA. He later held the position of Associate Researcher at the Institute of Biophysics, Chinese Academy of Sciences from 2004-2010. Since 2010, Dr. Chen has been a researcher at the Institute of Molecular Medicine at Peking University. In 2019, he was appointed to the Long-Term Professorship at Peking University, and in 2021, he joined the Peking University-Tsinghua University Center for Life Sciences. He is the recipient of the National Natural Science Foundation of China's Outstanding Youth Fund and Excellent Youth Fund. He also serves as the Chief Scientist for the Ministry of Science and Technology's Key R&D Project and the National Science Foundation's Major Research Program. Dr. Chen has developed a range of high spatiotemporal resolution biomedical imaging techniques to study diabetes-related insulin secretion regulation across different time scales and spatial dimensions. Dr. Chen's work has been recognized with the "2021 China Optical Society Annual Top Ten Social Impact Events (Light10)," "2022 China Top Ten Optical Advances" nomination award, and the "First National Disruptive Technology Innovation Competition" grand final highest merit award. Technologies originating from fundamental research have successfully addressed the bottleneck problem in high-end microscopy. Commercialized super-resolution microscopes and miniaturized two-photon imaging devices have been sold to top domestic research institutions, including Zhejiang University, Xiamen University, Wuhan University, and etc. In 2022, sales exceeded 100 million Chinese yuan (\approx 12.5 million Euro). A total of 26 user articles based on these instruments have been published, covering various fields such as life sciences, cell sciences, plant sciences, chemistry, medicine, and imaging algorithms. All these work have completed a full cycle from fundamental research innovation, new technology development, biomedical applications, to the commercialization and social value creation.

Assoc. Prof. Dr. Lu Zhang

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Lu Zhang is Associate Professor at the State Key Laboratory for Manufacturing Systems Engineering, Xi 'an Jiaotong University, China. In 2010, she received Ph.D. in Instrument Science and Technology from Xi 'an Jiaotong University. After that she did postdoctoral research in clinical medicine and biomedical engineering. She conducted research as a visiting scholar at the National University of Singapore and carried out short-term academic exchanges with several universities, such as Chung-Ang University of Korea, University of Adelaide, University of Zurich, University of Auckland, etc. At present, her research interests are biomedical optical imaging and micro-nano control, optical artificial intelligence detection, port food intelligent detection and instruments, and three-dimensional optical detection of space targets. She has published more than 40 peer-reviewed papers in the field of biomedical optics, and granted 5 invention patents. She is senior member of the International Society of Photo-Optical Instrumentation Engineers (SPIE) and the Optical Society of America (OSA). She won the "highly cited female scientist" in the field of optics in China in 2022.

Prof. Dr. Thorsten Buzug

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Thorsten M. Buzug was born in Lübeck. He received his PhD in 1993 in applied physics at the Christian-Albrecht-University in Kiel in the field of analysis of nonlinear dynamical systems. From 1993 to 1994 he was a research associate at the Research Institute of the German Armed Forces for Waterborne Sound and Geophysics (FWG) in Kiel. There he was involved in the signal processing of underwater sound systems especially for sonar applications. At the end of 1994 he moved to Philips Research Laboratories in Hamburg. There he was head of the research cluster for medical image processing and managed several projects in this field. In October 1998 he was appointed Professor of Physics and Medical Technology at the RheinAhrCampus Remagen. There he was also chairman of the Academic Development Committee from 2000 to 2004 and chairman of the joint Scientific Council of the departments from 2004 to 2006. In December 2006 he became director of the Institute for Medical Engineering at the University of Lübeck. There he also served as Vice President of the University of Lübeck from 2011 to 2016. In 2020, he was additionally appointed by the Executive Board of the Fraunhofer-

Gesellschaft as executive director (acting) of the Fraunhofer Research Institution for Individualized and Cell-Based Medical Engineering IMTE. He has published numerous articles in scientific journals, conference proceedings and books. He is a member of the National Academy of Science and Engineering (acatech).

Dr. Jonas Jurkevicius

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Jonas Jurkevičius is a postdoctoral researcher at the Institute of Biomedical Optics (BMO), University of Lübeck, Germany. His PhD thesis (2016, Vilnius University) was focused on the problem of efficiency drop in wide-bandgap semiconductors, investigating via optical methods the carrier localization conditions and role of stimulated emission in III-nitride systems. While subsequently working as a research fellow in the Institute of Photonics and Nanotechnology, he became interested in the application of nonlinear optics in bio-imaging and the development of novel methods for investigating biological objects – it is this very interest that led him to join the BMO as a postdoc in 2022, in order to work with the emerging spectro-temporal laser imaging by diffracted excitation (SLIDE) technology. Currently he is working on the development of adaptive capabilities of SLIDE microscopy in an effort to bring SLIDE a step closer towards sample-responsive, smart microscopy.

Junior Prof. Dr. Sebastian Karpf

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Sebastian Karpf, nickname “Nino”, obtained his Ph.D in 2015 working on stimulated Raman microscopy in the group of Prof. Robert Huber at the Ludwig-Maximilians-University in Munich, Germany. He then joined the Photonics Lab of Prof. Bahram Jalali at the University of California, Los Angeles (UCLA) where he developed the SLIDE technology for high-speed Two-Photon microscopy, FLIM and inertia-free LiDAR. Since 2018 he is a Juniorprofessor at the Institute of Biomedical Optics (BMO) at the University of Luebeck. He continues to work on high-speed multi-photon microscopy, imaging flow cytometry, volumetric imaging and biomedical optics application in biology and medicine.

Dr. Xiao-Xuan Liang

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Xiao-Xuan Liang, nickname “Joe”, is Senior Scientist at the Institute of Biomedical Optics, University of Luebeck, Germany. He received Ph.D. degree in Biophysics from Xi’an Jiaotong University, China in 2019. He was a visiting student in Prof. Alfred Vogel’s group at the Institute of Biomedical Optics, University of Luebeck from 2007 to 2010. He has published 2 book chapters and 9 scientific articles in peer-reviews journals, such as *PNAS*, *Optica* and *Journal of Fluid Mechanics*. He has delivered 8 scientific talks including 2 invited. Dr. Liang is youth editorial board member of *Chinese Journal of Lasers*, member of *Optica* (formerly OSA), member of SPIE and member of Society of Chinese Physicists in Germany. He is reviewer for multiple reputed journals such as *Optics Express*, *Physics of Fluids* and *Applied Optics*. His research focuses on theoretical modeling of laser-induced optical breakdown events in water, covering plasma generation, bubble formation and shockwave emission; modeling of photodamage in nonlinear microscopy; and modeling of thermoplasmonics and off-resonance effects around metallic nanoparticles. The insights gained from modeling were applied to improve the cellular and tissue surgery, and to understanding laser-induced molecular modifications.

Dr. Lei Fu

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Lei Fu is currently working as a visiting scientist and post-doctor in Prof. Vogel’s group at the Institute of Biomedical Optics, University of Luebeck, which is sponsored jointly by DAAD and CSC. He is meanwhile assistant professor at the Institute of Biomedical Photonics and Sensing, Xi’an Jiaotong University, China. He received Ph.D. in Biomedical Engineering from Xi’an Jiaotong University in 2020. His research interests are laser-induced cavitation in liquid and its applications in the biomedical field. He has been awarded one National Natural Science Foundation of China funded research program and published several peer-reviewed papers in high ranging journals such as *Optical Express*, *Journal of Biomedical Optics*.

M.Sc. Madita Göb

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Madita Göb completed her Bachelor and Master of Science in Medical Engineering at the University of Lübeck, Germany (2013-2019). During both of her thesis research projects she already gained experience in the field of MHz-OCT in the group of Robert Huber. In 2017, she spent 6 months in Singapore for a research internship at the Institute of Medical Biology, Agency for Science, Technology and Research focusing on epidermal skin imaging. In 2019, she joined the Institute of Biomedical Optics at the University of Lübeck as a doctoral student. Her research focus is on advanced optical coherence tomography for skin tissue imaging.

Prof. Dr. Peter König

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Peter König is currently Professor and Associate Director of the Institute of Anatomy, University of Lübeck, Germany. He studied medicine at the Universities of Marburg and Giessen from 1992 to 1999. In 2003 he completed his medical thesis and obtained doctorate in medicine (Dr. med.) at the University of Giessen. From 2003, he worked as a postdoctoral fellow at the Institute of Anatomy and Cell Biology, University of Giessen and later lead a group at the Institute of Anatomy, University of Lübeck. In 2011 he was appointed Adjunct Professor and since 2012 became full Professor at the University of Lübeck. His research interests are allergic airway inflammation, mucus transport, intravital imaging and development and application of new imaging modalities. He is a member of two Excellence Cluster projects sponsored by German Research Foundation (DFG). He has been awarded funds from the German Center for Lung Research (DZL), and now serves as board member of the Airway Research Center North at DZL.

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Awanish Pratap Singh is a researcher with extensive expertise spanning fluid dynamics, laser-induced plasma ignition, and biomedical optics. Having earned both a bachelor's and master's

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Rui Zhu is the Chief Executive Officer of Shenzhen Vivolight Medical Device & Technology Co., Ltd. In 2002, he was admitted to the Department of Physics, Tsinghua University, where he received his bachelor's degree and master's degree. In 2009, he studied in the Department of Electrical Engineering of the University of Hong Kong for his doctoral degree. He is mainly engaged in the design of medical optical systems and clinical application research. He was the leader in developing the first 3D optical coherence tomography (OCT) system in China and fabricated a medical ophthalmology prototype. While working in Hong Kong, he set up his personal laboratory to continue research and development, and successfully developed the first handheld surgical OCT system and the first commercialized endoscopic imaging OCT system in China. In 2011, he won the champion of Shenzhen "Entrepreneurial Star"

competition. In 2012, he returned to China and founded the first domestic interventional medical imaging equipment company - Vivolight Medical Device & Technology, with a total of 120 million Yuan (\approx 15 million Euro) of venture capital investment. He is committed to promoting the industrialization of OCT imaging technology in the field of interventional medicine. The first domestic cardiovascular 3D-OCT system developed by the company has been approved by the National Medical Products Administration and are used clinically by many cardiovascular hospitals in China. The scientific and technological achievements have been highlighted by the national news broadcast – “Approaching Science”.

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Hendrik Spahr is currently Senior Scientist at the Institute of Biomedical Optics (BMO), University of Luebeck, Germany. He studied physics at the University of Hamburg from 2004 to 2010. From 2011 until today he is Research Fellow/Postdoc at the Institute of Biomedical Optics at the University of Lübeck. In 2017, he obtained his PhD with the thesis titled "Detection of retinal micro-motion using phase-sensitive optical coherence tomography".

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Yoko Miura studied medicine in Osaka, Japan. She received medical license in 1997 and her PhD in 2002. After working as an assistant professor in the Department of Ophthalmology at Osaka City University till 2006, she moved to Germany. She first carried out basic research on retinal cell biology and retinal laser therapies at the University Eye Clinic in Kiel, then moved to the Institute of Biomedical Optics at University of Lübeck in 2009. She received German medical license in 2012, and is currently a faculty at the Institute of Biomedical Optics and senior Ophthalmologist in the Department of Ophthalmology. She is engaged in basic/clinical research as well as clinical works. Her main research topics are minimally-invasive retinal laser treatment and new retinal diagnostics, including optical coherence tomography and fluorescence lifetime imaging ophthalmoscopy.

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Sebastian Freidank is Senior Engineer at the Institute of Biomedical Optics (BMO), University of Luebeck, Germany. During the past 18 years, he contributed to various highly interesting and successful research projects and acquired experimental and theoretical skills in the field of optics, laser physics, laser-tissue interaction, cell biology and in the time-resolved study of laser-induced cavitation bubbles. His particular ability and expertise lies in the development of sophisticated experimental arrangements and the performance of challenging experiments. Furthermore, he is a Co-Investigator in several federal and industrial R&D projects exploring plasma-mediated corneal surgery, and material processing in transparent dielectrics.

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Zhipeng Huang is currently a research associate working at the University of Duisburg-Essen and a guest scientist at the Max-Planck Institute for the Structure and Dynamics of Matter. He received his Bachelor of Science degree in physics from Shandong University in 2011. After completing his bachelor's studies, he joined the research group of Prof. Junhao Chu (Academician of the Chinese Academy of Sciences) at the Shanghai Center for Photovoltaics as a graduate student with exempting from the admission exam. During his graduate studies, he also worked in Prof. James R. Sites's group at Colorado State University as a visiting scholar from 2013 to 2014. In November 2013, he received a Doctoral fellowship supported by the Joachim Herz Foundation and the PIER Helmholtz Graduate School and joined the research group of Prof. Jochen Küpper and Prof. Henry N. Chapman (Fellow of the Royal Society) at Deutsches Elektronen-Synchrotron (DESY) as a PhD student. He obtained his Doctoral degree (Dr. rer. nat.) from the PIER Helmholtz Graduate School and the University of Hamburg in May 2019. After submitting his dissertation, he worked in the research group of Prof. R. J. Dwayne Miller (Fellow of the Royal Society of Canada) at the Max-Planck Institute for the Structure and Dynamics of Matter as a postdoc from 2018 to 2020. In July 2020, he joined Prof. R. Kramer Campen's research group at the University of Duisburg-Essen, initially as a postdoc from 2020 to 2022 and later as a senior research associate. His research interests focus on imaging the ultrafast electron and nuclear/lattice dynamics of samples under ultrashort optical excitation using ultrafast electron/X-ray imaging and spectroscopy techniques. He is an experienced experimental physicist with expertise in ultra-high vacuum apparatus development, device

control, data acquisition/analysis automation, laser-driven molecular source development, ultrafast electron diffraction, mass spectrometry, non-linear optics/spectroscopies, etc., and has successfully developed/constructed several state-of-the-art scientific instruments to perform cutting-edge researches.

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Norbert Linz is Senior Scientist and Group Leader at the Institute of Biomedical Optics (BMO), University of Luebeck, Germany. He obtained his physics diploma in 2004 at the Technical University Kaiserslautern, where he had built a femtosecond laser system. He studied for the Ph.D. degree at the University of Luebeck under the tutelage of Prof. Alfred Vogel and obtained his doctorate in 2010 with distinction “summa cum laude”. His contributions as postdoctoral researcher in Prof. Vogels group has led to innovative strategies for improving cell surgery and refractive surgery, as well as to advances in optical breakdown threshold spectroscopy of aqueous media. During the last years, he worked as Co-PI on the experimental and theoretical investigation of the mechanisms of free-electron-mediated modifications of biomolecules in nonlinear microscopy. He published 13 peer-reviewed papers, 1 book chapter, and 4 proceedings papers (1022 citations, h = 11 according to Google Scholar) and has delivered 14 invited and 13 regular talks at international conferences. Dr. Linz is a member of The International Society for Optics and Photonics (SPIE) and since 2019 he chairs the SPIE BiOS conference “Optical Interactions with Tissue and Cells” at Photonics West.