

25-29 June 2023
Munich, Germany



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June 25-30, 2023 | ICM—International Congress Center Messe München

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Welcome Reception

25 June 2023 • 19:00 - 21:30 | Augustiner Stammhaus • Dress is casual.

All registered Digital Optical Technologies attendees are invited to relax, socialise, and enjoy a “Spanferkel”. Please remember to wear your conference registration badges.

Digital Optical Technologies Plenary Session

26 June 2023 • 09:05 - 09:55 | ICM Room 21

Join us for an exciting plenary on the end-to-end simulation in propelling the new wave of optics and photonics innovation by **Sanjay Gangadhara**, Ansys Inc.

World of Photonics Plenary

27 June 2023 • 14:00 - 15:30 | ICM, Saal 1

This plenary session features a presentation by **Tammy Ma**, LLNL (USA), and **Constantin Haefner**, Fraunhofer-Institute for Laser Technology (Germany), on laser-driven inertial confinement fusion.

Lunch and Learn: Beaded Privilege

27 June 2023 • 12:30 - 13:30 | ICM Main Foyer

Held as part of the World of Photonics Diversity, equity and inclusion programme, conference attendees are invited to join this free workshop. Please register on arrival at the SPIE registration desk, as numbers are limited.

Bier & Brezel Reception

27 June 2023 • 17:45 - 19:45 | ICM Main Foyer • Dress is casual.

SPIE invites all attendees to a Bier & Brezel reception. All registered congress attendees are welcome; please remember to wear your conference registration badges.

Co-located: Optical Metrology Plenary Session

28 June 2023 • 10:30 - 11:25 CEST | ICM, Saal 1

Join us for the Symposium welcome and plenary talk on the newest research in remote photonic medicine by **Zeev Zalevsky**, Bar-Ilan Univ.

Poster Session

28 June 2023 • 13:10 - 14:10 | ICM, Hall B0

Symposium attendees are invited to attend the poster session on Wednesday afternoon. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Remember to wear your registration badge.

Poster Setup: Wednesday 9:00 - 13:00

Poster authors, view poster presentation guidelines and set-up instructions at: <https://spie.org/EOMPosterGuidelines>.

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Design, Modeling and Fabrication Techniques for Micro-optics: Applications to Display, Imaging, Sensing and Metrology

SC1217 • Level: Intermediate • Sunday, 25 June 2023 • 08:30 - 12:30

Member: €430/\$455; Non-member: €500/\$525; Student member: €275/\$285

Instructor: **Bernard C. Kress** - Google (USA)

Optical Technologies and Architectures for Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR) Head-Mounted Displays (HMDs)

SC1218 • Level: Intermediate • Sunday, 25 June 2023 • 13:30 - 17:30

Member: €430/\$455; Non-member: €500/\$525; Student member: €275/\$285

Instructor: **Bernard C. Kress** - Google (USA)

Waveguides for Mixed Reality: Principles and Applications

SC1317 • Level: Intermediate * Sunday, 25 June 2023 • 08:30 - 12:30

Member: €430/\$455; Non-member: €500/\$525; Student member: €275/\$285

Instructor: **Andreas Georgiou** - Reality Optics (United Kingdom)

SPIE. DIGITAL OPTICAL TECHNOLOGIES

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Welcome to Digital Optical Technologies

Get ready to enjoy real conversations and hear the latest breakthroughs that address the central role photonics plays in digital optic and photonic systems, including design and fabrication using digital means, as well as components application. Attend technical presentations, invited talks, poster session, and a variety of networking activities for learning and professional advancement opportunities.

TIME	26 JUNE 2023
08:45 - 09:05 ICM Room 21	Welcome and Introduction Opening Presentation , Bernard C. Kress, Jürgen Czarske
09:05 - 09:55	Digital Optical Technologies Plenary Session Welcome Address and Plenary Speaker Introduction , Bernard C. Kress, Google (USA), Jürgen Czarske, TU Dresden (Germany) 12624-500 • Plenary Presentation Quantum networks: from the quantum internet to the brain , Sanjay Gangadhara, Ansys, Inc. (USA)
10:00	Coffee Break
10:30 - 12:50	SESSION 1: Digital Optics in AR/VR Session Chairs: Leander Zickler, Private Investor (USA); Angus Wu, Goertek Inc. (USA) 12624-1 • Invited Paper Light-field AR combiner enabling prescription correction and aesthetic lenses , Tomas Sluka 12624-2 • Invited Paper Wearable adaptive optics for visual applications , Pablo Artal 12624-3 • A hybrid head mounted display with small total track length and large field of view , Andreas Georgiou, Maria Pace, Bernard Kress, Ishan Chatterjee, Charlie Hewitt, Jacob Hadnett-Hunter, Joel Kollin, Brian Guenter, Mario Possiwan 12624-4 • A novel display solution for metaverse AR glasses , Angus Wu 12624-5 • A holographic near-eye display with glass form factor and spectacle-free operation , Andreas Georgiou, Joel Kollin, Jia Jia, Changwon Jang, Jinsoo Jeong, Charlie Hewitt, Jacob Hadnett-Hunter 12624-16 • Field-of-view extension in projection-type holographic display with full-depth range using a waveguide , Woonchan Moon, Seongju Lee, Joonku Hahn
12:50	Lunch Break
13:50 - 15:30	SESSION 2: Wafer Scale Fabrication Techniques and Technologies Session Chairs: Peter J. de Groot, Zygo Corporation (USA); John Freiermuth, SCHOTT AG (Germany) 12624-7 • Additive diffractive optical elements fabrication by PECD deposition of SiO₂ and lift-off process , Hadi Amata, Qiang Fu, Wolfgang Heidrich 12624-8 • Highly precise and flexible manufacturing of integrated optical structures in fused silica using selective laser etching , Axel Günther, Sai Charan Ramadas, Wolfgang Kowalsky, Lei Zheng, Bernhard Roth 12624-9 • Focus-based automated alignment for laser direct writing , Reinhard Caspary, Lei Zheng, Axel Günther, Bernhard Roth 12624-10 • Fabrication and effects of silicon grass on the surface of diffractive/meta lenses for the infrared imaging , Angelos Bouchouri 12624-11 • Nanoimprint-based pattern transfer to 300 mm substrates , Matthew Traub, Myriam Willegms, Sundararajan Thirumalai, Steve Smout, Mohamed Asbahi, Bogumila Kutrzeba-Kotowska, Silvia Lenci, Eleonora Storace
15:30	Coffee Break
16:00 - 18:00	SESSION 3: Holography Session Chairs: Andreas Georgiou, Reality Optics (United Kingdom); Aydogan Ozcan, UCLA Samueli School of Engineering (USA) 12624-12 • Invited Paper Next-generation computational approaches for holographic displays , Kaan Akşit 12624-13 • Invited Paper Optical scanning approach to image processing and holography , Ting-Chung Poon, Yaping Zhang 12624-14 • High density holographic data storage that is modulated by polarization holography , Xiaodi Tan, Jinyu Wang, Xianmiao Xu, Peiliang Qi, Shenghui Ke, Shujun Zheng, Tian Ye, Xinyi Yuan, Yi Yang, Xiao Lin, Zhiyun Huang, Yuhong Ren 12624-15 • Wide viewing angle holographic augmented reality near-eye display with holographic optical element , Seongju Lee, Hosung Jeon, Woonchan Moon, Minwoo Jung, Joonku Hahn 12624-17 • Simultaneous optogenetic stimulation and inhibition using fast ferroelectric spatial light modulators and digital holograms , Felix Schmieder, Lars Büttner, Wouter Derks, Olaf Bergmann, Jürgen W. Czarske

TIME	27 JUNE 2023
08:20 - 10:10 ICM Room 21	SESSION 4: Digital Optics in Sensing Session Chairs: Stephan Marauska, OQmented GmbH (Germany); Leander Zickler, Private Investor (USA) 12624-18 • Robust Mueller polarimetry of spatial light modulators , Jesus del Hoyo, Angela Soria-Garcia, Joaquin Andres-Porras, Luis Miguel Sanchez-Brea, Veronica Pastor-Villarrubia, Mahmoud H. Elshorbagy, Javier Alda 12624-19 • Laser beam scanning-based 3D structured light scanner combining a biresonant MEMS mirror with low-cost imaging sensor , Berkan Zorlubas, Peter Blicharski, Mohd Saquib Khan, Sudheer Reddy Akki 12624-21 • Parallelized computed tomography imaging spectrometer , Simon Amann, Tobias Haist, Alexander Gatto, Markus Kamm, Stephan Reichelt 12624-22 • Utilizing machine learning and AI algorithms for inspection of airbags manufacturing processes , Bogdan Negrei, Virgil-Florin Duma 12624-23 • Invited Paper Solid-state lidar and all-day-wearable AR display with MEMS SLM , Yuzuru Takashima
10:10	Coffee Break
10:40 - 11:40	SESSION 5: Freeform Optics Fab and Metrology Session Chairs: Maria Pace, Microsoft Corp. (USA); Zeev Zalevsky, Bar-Ilan Univ. (Israel) 12624-24 • CSEM-PHABULO_{PS}: manufacturing of large surfaces with free-form micro-optics , Ton Offermans, Frédéric Zanella, Guillaume Basset 12624-25 • Scalable and energy-saving manufacturing approach for monolithic polymer components , Frank C. Wippermann, Jacques W. Duparré, Nico Hagen 12624-26 • Generative design for additively manufactured freeform lenses , Simon Teves, Arved Ziebell, Panpan Xia, Tobias Grabe, Tobias Biermann, Roland Lachmayer
11:40 - 13:00	SESSION 6: Digital Optics Modelling and Simulation Session Chairs: I Jan Chen, Southport Co. (Taiwan); Scott McElDowney, Meta (USA) 12624-28 • Deep achromatizing diffractive lens with MTF-informed optics and neural network reconstruction , Qiang Fu, Wolfgang Heidrich 12624-29 • Predicting a diverse set of high-quality Cooke triplet designs using Gaussian process classifier , Kirill Antonov, Tiago Botari, Teus Tukker, Anna V. Kononova, Bas van Stein, Thomas Bäck 12624-30 • Design algorithm for single phase masks for laser beam shaping based on machine learning techniques , Paul Buske, Annika Völl, Jochen Stollenwerk, Carlo Holly 12624-20 • Single-shot structured light with diffractive optic elements for real-time 3D imaging in collaborative logistic scenarios , Darko Vehar, Andreas Hermerschmidt, Rico Nestler, Karl-Heinz Franke
13:00	Lunch Break
14:00 - 15:30 ICM, Saal 1	WORLD OF PHOTONICS PLENARY Laser-driven inertial confinement fusion, power source of the future? Tammy Ma, Livermore National Lab. (USA); Constantin L. Haefner, Fraunhofer-Institute for Laser Technology (Germany)
15:30	Coffee Break
16:00 - 18:00 ICM Room 21	SESSION 7: Design Algorithms Session Chairs: Reinhard Völkel, SUSS MicroOptics SA (Switzerland); Peter Schelkens, Vrije Univ. Brussel (Belgium) 12624-31 • Increased Degrees of Freedom Afforded by 3D Freeform Gradient Index Optics , George M. Williams 12624-32 • Integrated phase-adjustable beam couplers via inverse design , Abhishek Nanda, Michael Kues, Antonio Calà Lesina 12624-33 • Coupled dipole approach for designing dynamic metasurfaces in inhomogeneous environment , Izzatjon Allayarov, Andrey Evlyukhin, Diane J. Roth, Boris Chichkov, Anatoly Zayats, Antonio Calà Lesina 12624-34 • Inverse design of meta-atoms for multipole engineering based on the adjoint method , Sadeq Bahmani, Antonio Cala Lesina 12624-35 • Polarization Fourier filtering with a 4f system using geometric phase lenses , Pascuala García-Martínez, Ignacio Moreno 12624-36 • Holographic optical engine (HoOE) for high quality beam shaping , Yoshio Hayasaki, Satoshi Hasegawa

2023 SYMPOSIUM
CHAIRS



Bernard C. Kress
Google
(USA)



Jürgen Czarske
TU Dresden
(Germany)

TIME	28 JUNE 2023
08:00 - 10:00 ICM Room 21	SESSION 8: Digital Optics for Display Session Chairs: Uwe Vogel, Fraunhofer-Institut für Organische Elektronik, Elektronenstrahl-und Plasmatechnik FEP (Germany); Yoshio Hayasaki, Utsunomiya Univ. Ctr. for Optical Research & Education (Japan) 12624-37 • Advanced multilayer holographic technology for the realization of compact AR-HUDs , Yi Zhong, Christoph Erler, Roman Kleindienst 12624-38 • Opportunities and challenges of micro-optics-based flat microprojectors , Wilfried Noell, Toralf Scharf, Giorgio Quaranta, Michela Gazzetto, Reinhard Völkel 12624-39 • Two-dimensional LIV and beam quality characterization of individual emitters in a VCSEL array , Amir Sharghi 12624-40 • Ultracompact RGB hybrid LD-SLED module based on micro-optics , Marcus Duellk, Nikolay Primerov, Callan Jobson, José Rios, Stefan Gloor, Tim von Niederhäusern, Nicolai Matuschek, Marco Rossetti, Antonino Castiglia, Marco Malinverni, Christian Vélez 12624-41 • High-brightness OLED-on-silicon on semitransparent CMOS backplane for advanced near-to-eye microdisplays , Philipp Wartenberg, Bernd Richter, Stephan Brenner, Johannes Zeltner, Judith Baumgarten, Andreas Fritscher, Simone Lenk, Martin Rolle, Michael Törker, Christian Schmidt, Uwe Vogel 12624-42 • MaMeK: a wide-angle dynamic holographic projection system for human-vehicle communication , Michael Flachhuber, Johannes Scheuchepflug, Thomas Hilbert, Norbert Danz, Peter Schreiber, Leo M. Wilhelm, Markus Metz, Jean-Christophe Olaya, Tobias Reusch
10:00	Coffee Break
10:30 - 13:00	SESSION 9: Digital Optics in Imaging Session Chairs: Yuzuru Takashima, Wyant College of Optical Sciences (USA), Ting-Chung Poon, Virginia Polytechnic Institute and State Univ. (USA) 12624-43 • Invited Paper Roadmap for metasurface integration in optical systems , Daniel K. Nikolov 12624-44 • Versatile modulation transfert function and direct point spread function measurement with a random target method , Franck Michaud 12624-45 • Second harmonic generation-based digital wavefront shaping for deep-tissue imaging , David Krause, Nektarios Koukourakis, Jürgen W. Czarske 12624-46 • High-quality reconstruction and autofocusing method for Fresnel zone aperture lensless imaging , Jiachen Wu, Fangyu Liu, Liangcai Cao 12624-47 • Model predictive control-based adaptive optics system with deep-learning Shack-Hartmann wavefront sensor , Wei-Shiuan Huang, Chia-Wei Hsu, Feng-Chun Hsu, Chun-Yu Lin, Shean-Jen Chen 12624-48 • Parallel single-pixel imaging based on the Talbot effect , Erick F. Ipus Bados, Armin J. M. Lenz, Luis Ordóñez, Lluís Matínez León, Jesús Lancis, Enrique Tajahuerce 12624-49 • Intelligent self-calibration tool for digital few-mode fiber multiplexers based on multiplane light conversion , Dennis Pohle, Fabio Aparecido Barbosa, Filipe M. Ferreira, Jürgen W. Czarske, Stefan Rothe
13:00 - 13:05	CLOSING REMARKS , Bernard C. Kress, Google (USA), Jürgen Czarske, TU Dresden (Germany)
13:10 - 14:10 ICM, Hall B0	POSTERS-WEDNESDAY Poster authors, please set up posters between 9:00 and 13:00 hrs on Wednesday. Plan to stand by your poster to discuss it with session attendees during the poster session. Remove your poster following the poster session conclusion as posters left on the boards after 14:30 hrs will be discarded. See full list of poster paper online or on the SPIE App.



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CONFERENCE 12624

Digital Optical Technologies 2023

26 - 28 June 2023 | ICM Room 21

Conference Chairs: **Bernard C. Kress**, Google (United States); **Jürgen W. Czarske**, TU Dresden (Germany)

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MONDAY 26 JUNE

WELCOME AND INTRODUCTION

26 June 2023 • 08:45 - 09:05 | ICM Room 21
Introductory Remarks
Bernard C. Kress, Google, United States
Jürgen Czarske, TU Dresden, Germany
2023 Symposium Chairs

12624-100 • 08:45 - 09:05 | ICM Room 21
Opening Presentation
Author(s): Bernard C. Kress, Google (United States)

DIGITAL OPTICAL TECHNOLOGIES PLENARY SESSION

26 June 2023 • 09:05 - 09:55 | ICM Room 21
9:05 to 9:10 hrs
Welcome Address and Plenary Speaker Introduction
Bernard C. KressGoogle (United States)
Jürgen Czarske, TU Dresden (Germany)
2023 Symposium Chairs

12624-500 • 09:10 - 09:55

End-to-end simulation in propelling the new wave of optics and photonics innovation (Plenary Presentation)

Author(s): Sanjay Gangadhara, Ansys, Inc. (United States)

Coffee Break 10:00 - 10:30

SESSION 1: DIGITAL OPTICS IN AR/VR

26 June 2023 • 10:30 - 12:50 | ICM Room 21
Session Chairs: Leander Zickler, Private Investor (United States), Angus Wu, Goertek Inc. (United States)

12624-1 • 10:30 - 11:00 | ICM Room 21

Light-field AR combiner enabling prescription correction and aesthetic lenses (*Invited Paper*)

Author(s): Tomas Sluka, CREAL SA (Switzerland)

12624-2 • 11:00 - 11:30 | ICM Room 21

Wearable adaptive optics for visual applications (*Invited Paper*)

Author(s): Pablo Artal, Univ. de Murcia (Spain)

12624-3 • 11:30 - 11:50 | ICM Room 21

A hybrid head mounded display with small total track length and large field of view

Author(s): Andreas Georgiou, Microsoft Research Cambridge (United Kingdom); Jacob Hadnett-Hunter, Microsoft Corp. (United States); Charlie Hewitt, Microsoft Research Ltd. (United Kingdom); Mario Possiwan, Microsoft Corp. (United Kingdom); Brian Guenter, Maria Pace, Ishan Chatterjee, Joel Kollin, Bernard Kress, Microsoft Corp. (United States)

12624-4 • 11:50 - 12:10 | ICM Room 21

A novel display solution for metaverse AR glasses

Author(s): Angus Wu, Goertek Inc. (United States)

12624-5 • 12:10 - 12:30 | ICM Room 21

A holographic near-eye display with glass form factor and spectacle-free operation

Author(s): Andreas Georgiou, Microsoft Research Cambridge (United Kingdom); Joel Kollin, Microsoft Corp. (United States); Jia Jia, Changwon Jang, Jinsoo Jeong, Microsoft Research Cambridge (United Kingdom); Charlie Hewitt, Microsoft Research Ltd. (United Kingdom); Jacob Hadnett-Hunter, Microsoft Corp. (United Kingdom)

12624-16 • 12:30 - 12:50 | ICM Room 21

Field-of-view extension in projection-type holographic display with full-depth range using a waveguide

Author(s): Woonchan Moon, Hosung Jeon, Seongju Lee, Joonku Hahn, Kyungpook National Univ. (Korea, Republic of)

Lunch Break 12:50 - 13:50

SESSION 2: WAFER SCALE FABRICATION TECHNIQUES AND TECHNOLOGIES

26 June 2023 • 13:50 - 15:35 | ICM Room 21
Session Chair: Peter J. de Groot, Zygo Corporation (United States)

12624-7 • 13:50 - 14:10 | ICM Room 21

Additive diffractive optical elements fabrication by PECVD deposition of SiO2 and lift-off process

Author(s): Hadi Amata, Qiang Fu, Wolfgang Heidrich, King Abdullah Univ. of Science and Technology (Saudi Arabia)

12624-8 • 14:10 - 14:30 | ICM Room 21

Highly precise and flexible manufacturing of integrated optical structures in fused silica using selective laser etching

Author(s): Axel Günther, Technische Univ. Braunschweig (Germany); Sai Charan Ramadas, Hannoversches Zentrum für Optische Technologien (Germany); Wolfgang Kowalsky, Technische Univ. Braunschweig (Germany); Bernhard Roth, Lei Zheng, Hannoversches Zentrum für Optische Technologien (Germany)

12624-9 • 14:30 - 14:50 | ICM Room 21

Focus-based automated alignment for laser direct writing

Author(s): Reinhard Caspary, Lei Zheng, Leibniz Univ. Hannover (Germany); Axel Günther, Leibniz Univ. Hannover (Germany), Technische Univ. Braunschweig (Germany); Bernhard Roth, Leibniz Univ. Hannover (Germany)

12624-65 • 14:50 - 15:15 | ICM Room 21

High efficiency OLED microdisplays and the AR paradigm (*Invited Paper*)

Author(s): Eric Marcellin-Dibon, MicroOLED (France)

12624-11 • 15:15 - 15:35 | ICM Room 21

Nanoimprint-based pattern transfer to 300 mm substrates

Author(s): Matthew Traub, Myriam Willegms, Sundararajan Thirumalai, Steve Smout, Mohamed Asbahi, Bogumila Kutrzeba-Kotowska, Silvia Lenci, Eleonora Storace, imec (Belgium)

Coffee Break 15:35 - 16:00

SESSION 3: HOLOGRAPHY

26 June 2023 • 16:00 - 18:00 | ICM Room 21
Session Chairs: Andreas Georgiou, Reality Optics (United Kingdom), Aydogan Ozcan, UCLA Samueli School of Engineering (United States)

12624-12 • 16:00 - 16:30 | ICM Room 21

Next-generation computational approaches for holographic displays (*Invited Paper*)

Author(s): Kaan Akşit, Univ. College London (United Kingdom)

12624-13 • 16:30 - 17:00 | ICM Room 21

Optical scanning approach to image processing and holography (*Invited Paper*)

Author(s): Ting-Chung Poon, Virginia Polytechnic Institute and State Univ. (United States), Kunming Univ. of Science and Technology (China); Yaping Zhang, Kunming Univ. of Science and Technology (China)

12624-14 • 17:00 - 17:20 | ICM Room 21

High density holographic data storage that is modulated by polarization holography

Author(s): Xiaodi Tan, Jinyu Wang, Xianmiao Xu, Peiliang Qi, Shenghui Ke, Shujun Zheng, Tian Ye, Xinyi Yuan, Yi Yang, Xiao Lin, Zhiyun Huang, Yuhong Ren, Fujian Normal Univ. (China)

12624-15 • 17:20 - 17:40 | ICM Room 21

Wide viewing angle holographic augmented reality near-eye display with holographic optical element

Author(s): Seongju Lee, Hosung Jeon, Woonchan Moon, Minwoo Jung, Joonku Hahn, Kyungpook National Univ. (Korea, Republic of)

12624-17 • 17:40 - 18:00 | ICM Room 21

Simultaneous optogenetic stimulation and inhibition using fast ferroelectric spatial light modulators and digital holograms

Author(s): Felix Schmieder, Lars Büttner, TU Dresden (Germany); Wouter Derks, Ctr. for Regenerative Therapies Dresden, TU Dresden (Germany); Olaf Bergmann, DFG-Ctr. for Regenerative Therapies Dresden, TU Dresden (Germany), Karolinska Institute (Sweden); Jürgen W. Czarske, TU Dresden (Germany)

TUESDAY 27 JUNE

SESSION 4: DIGITAL OPTICS IN SENSING

27 June 2023 • 08:20 - 10:10 | ICM Room 21
Session Chairs: Stephan Marauska, OQmented GmbH (Germany), Leander Zickler, Private Investor (United States)

12624-18 • 08:20 - 08:40 | ICM Room 21

Robust Mueller polarimetry of spatial light modulators

Author(s): Jesus del Hoyo, Angela Soria-Garcia, Joaquin Andres-Porras, Luis Miguel Sanchez-Brea, Veronica Pastor-Villarrubia, Univ. Complutense de Madrid (Spain); Mahmoud H. Elshorbagy, Minia Univ. (Egypt); Javier Alda, Univ. Complutense de Madrid (Spain)

12624-19 • 08:40 - 09:00 | ICM Room 21

Laser beam scanning-based 3D structured light scanner combining a bi-resonant MEMS mirror with low-cost imaging sensor

Author(s): Berkan Zorlubas, Sudheer Reddy Akki, Mohd Saquib Khan, Peter Blicharski, OQmented GmbH (Germany)

12624-21 • 09:00 - 09:20 | ICM Room 21

Parallelized computed tomography imaging spectrometer

Author(s): Simon Amann, Tobias Haist, Univ. Stuttgart (Germany); Alexander Gatto, Markus Kamm, Sony Europe B.V. (Germany); Stephan Reichelt, Univ. Stuttgart (Germany)

12624-22 • 09:20 - 09:40 | ICM Room 21

Utilizing machine learning and AI algorithms for inspection of airbags manufacturing processes

Author(s): Bogdan Negrei, Autoliv Inc. (Romania), Univ. Politehnica Timisoara (Romania); Virgil-Florin Duma, Univ. "Aurel Vlaicu" din Arad (Romania), Univ. Politehnica Timisoara (Romania)

12624-23 • 09:40 - 10:10 | ICM Room 21

Solid-state lidar and all-day-wearable AR display with MEMS SLM (*Invited Paper*)

Author(s): Yuzuru Takashima, Xianyue Deng, Jeff Ching-wen Chan, Chin-I Tang, Parker Liu, Gregory Michael Nero, Yexin Pei, Tianyao Zhang, Brandon Friedman, Wyant College of Optical Sciences (United States)

Coffee Break 10:10 - 10:40

SESSION 5: FREEFORM OPTICS FAB AND METROLOGY

27 June 2023 • 10:40 - 11:40 | ICM Room 21
Session Chair: Maria Pace, Microsoft Corp. (United States)

12624-24 • 10:40 - 11:00 | ICM Room 21

CSEM-PHABULOµS: manufacturing of large surfaces with free-form micro-optics

Author(s): Ton Offermans, Frédéric Zanella, Guillaume Basset, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland)

12624-25 • 11:00 - 11:20 | ICM Room 21

Scalable and energy-saving manufacturing approach for monolithic polymer components

Author(s): Frank C. Wippermann, Jacques W. Duparré, Nico Hagen, mcd - modern camera designs GmbH (Germany)

12624-66 • 11:20 - 11:40 | ICM Room 21

Digital optics as key technologies to achieve smaller form factor display, imaging and sensing systems

Author(s): Bernard C. Kress, Google (United States)

CONFERENCE 12624

SESSION 6: DIGITAL OPTICS MODELLING AND SIMULATION
27 June 2023 • 11:40 - 13:00 ICM Room 21 Session Chairs: I Jan Chen, Southport Co. (Taiwan), Scott McEldowney, Meta (United States)

12624-53 • 11:40 - 12:00 | ICM Room 21
Design of multi-aperture beam integrators for homogenization and local controllability of irradiance distributions from high power VCSEL systems
Author(s): Jacqueline Dahlmanns, Thomas Bussek, Annika Völl, RWTH Aachen Univ. (Germany); Jochen Stollenwerk, Carlo Holly, RWTH Aachen Univ. (Germany), Fraunhofer-Institut für Lasertechnik ILT (Germany); Günther Derra, Markus Herper, Ralf Conrads, Holger Mönch, Felix Ogiewa, TRUMPF Photonic Components GmbH (Germany)

12624-29 • 12:00 - 12:20 | ICM Room 21
New solutions to Cooke triplet problem via analysis of attraction basins
Author(s): Kirill Antonov, Leiden Univ. (Netherlands); Tiago Botari, Teus Tukker, ASML Netherlands B.V. (Netherlands); Thomas Bäck, Niki van Stein, Anna V. Kononova, Leiden Univ. (Netherlands)

12624-30 • 12:20 - 12:40 | ICM Room 21
Design algorithm for single phase masks for laser beam shaping based on machine learning techniques
Author(s): Paul Buske, Annika Völl, RWTH Aachen Univ. (Germany); Jochen Stollenwerk, Fraunhofer-Institut für Lasertechnik ILT (Germany); Carlo Holly, RWTH Aachen Univ. (Germany), Fraunhofer-Institut für Lasertechnik IL (Germany)

12624-20 • 12:40 - 13:00 | ICM Room 21
Single-shot structured light with diffractive optic elements for real-time 3D imaging in collaborative logistic scenarios
Author(s): Darko Vehar, Zentrum für Bild- und Signalverarbeitung e.V. (Germany); Andreas Hermerschmidt, HOLOEYE Photonics AG (Germany); Rico Nestler, Karl-Heinz Franke, Zentrum für Bild- und Signalverarbeitung e.V. (Germany)

Lunch Break 13:00 - 14:00

WORLD OF PHOTONICS PLENARY
27 June 2023 • 14:00 - 15:30 ICM, Saal 1 This plenary session features a presentation by Tammy Ma , Lawrence Livermore National Lab. (United States), and Constantin Haefner , Fraunhofer-Institute for Laser Technology (Germany), on laser-driven inertial confinement fusion.

Coffee Break 15:30 - 16:00

SESSION 7: DESIGN ALGORITHMS
27 June 2023 • 16:00 - 18:00 ICM Room 21 Session Chair: Reinhard Völkel, SUSS MicroOptics SA (Switzerland)

12624-31 • 16:00 - 16:20 | ICM Room 21
Increased Degrees of Freedom Afforded by 3D Freeform Gradient Index Optics
Author(s): George M. Williams, Vadiant Optics LLC (United States)

12624-32 • 16:20 - 16:40 | ICM Room 21
Integrated phase-adjustable beam couplers via inverse design
Author(s): Abhishek Nanda, Hannoversches Zentrum für Optische Technologien (Germany); Michael Kues, Leibniz Univ. Hannover (Germany); Antonio Calà Lesina, Hannoversches Zentrum für Optische Technologien (Germany)

12624-33 • 16:40 - 17:00 | ICM Room 21
Coupled dipole approach for designing dynamic metasurfaces in inhomogeneous environment
Author(s): Izzatjon Allayarov, Andrey Evlyukhin, Leibniz Univ. Hannover (Germany); Diane J. Roth, King’s College London (United Kingdom); Boris Chichkov, Leibniz Univ. Hannover (Germany); Anatoly Zayats, King’s College London (United Kingdom); Antonio Calà Lesina, Leibniz Univ. Hannover (Germany)

12624-34 • 17:00 - 17:20 | ICM Room 21
Inverse design of meta-atoms for multipole engineering based on the adjoint method
Author(s): Sadeq Bahmani, Antonio Cala Lesina, Leibniz Univ. Hannover (Germany)

12624-35 • 17:20 - 17:40 | ICM Room 21
Polarization Fourier filtering with a 4f system using geometric phase lenses
Author(s): Pascuala García-Martínez, Univ. de València (Spain); Ignacio Moreno, Univ. Miguel Hernández (Spain)

12624-36 • 17:40 - 18:00 | ICM Room 21
Holographic optical engine (HoOE) for high quality beam shaping
Author(s): Yoshio Hayasaki, Satoshi Hasegawa, Utsunomiya Univ. Ctr. for Optical Research & Education (Japan)

WEDNESDAY 28 JUNE
SESSION 8: DIGITAL OPTICS FOR DISPLAY
28 June 2023 • 08:00 - 10:00 ICM Room 21 Session Chairs: Uwe Vogel, Fraunhofer-Institut für Organische Elektronik, Elektronenstrahl-und Plasmatechnik FEP (Germany), Yoshio Hayasaki, Utsunomiya Univ. Ctr. for Optical Research & Education (Japan)

12624-37 • 08:00 - 08:20 | ICM Room 21
Advanced multilayer holographic technology for the realization of compact AR-HUDs
Author(s): Yi Zhong, Christoph Erler, Roman Kleindienst, Carl Zeiss Jena GmbH (Germany)

12624-42 • 09:40 - 10:00 | ICM Room 21
MaMeK: a wide-angle dynamic holographic projection system for human-vehicle communication
Author(s): Michael Flachhuber, Johannes Scheuchenpflug, AUDI AG (Germany); Thomas Hilbert, Docter Optics SE (Germany); Norbert Danz, Peter Schreiber, Leo M. Wilhelm, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Markus Metz, Jean-Christophe Olaya, Tobias Reusch, HOLOEYE Photonics AG (Germany)

12624-383 • 08:20 - 08:40 | ICM Room 21
Opportunities and challenges of micro-optics-based flat microprojectors
Author(s): Wilfried Noell, Toralf Scharf, Giorgio Quaranta, Michela Gazzetto, Reinhard Völkel, SUSS MicroOptics SA (Switzerland)

12624-39 • 08:40 - 09:00 | ICM Room 21
Two-dimensional LIV, spectrum and beam characterization of individual emitters in a VCSEL array
Author(s): Amir Sharghi, Frank Münchow, Thomas Limmer, Instrument Systems GmbH (Germany)

12624-40 • 09:00 - 09:20 | ICM Room 21
Ultracompact RGB hybrid LD-SLED module based on micro-optics
Author(s): Marcus Duelk, Nikolay Primerov, Callan Jobson, José Rios, Stefan Gloor, Nicolai Matuschek, Tim von Niederhäusern, Marco Rossetti, Antonino Castiglia, Marco Malinverni, Christian Vélez, EXALOS AG (Switzerland)

12624-41 • 09:20 - 09:40 | ICM Room 21

High-brightness OLED-on-silicon on semitransparent CMOS backplane for advanced near-to-eye microdisplays
Author(s): Philipp Wartenberg, Fraunhofer-Institut für Organische Elektronik, Elektronenstrahl- und Plasmatechnik FEP (Germany); Bernd Richter, Fraunhofer-Institut für Organische Elektronik, Elektronenstrahl- und Plasmatechnik FEP (Germany); Stephan Brenner, Johannes Zeltner, Christian Schmidt, Judith Baumgarten, Andreas Fritscher, Fraunhofer-Institut für Organische Elektronik,

Elektronenstrahl- und Plasmatechnik FEP (Germany); Simone Lenk, Fraunhofer-Institut für Organische Elektronik, Elektronenstrahl- und Plasmatechnik FEP (Germany), TU Dresden (Germany); Martin Rolle, Fraunhofer-Institut für Organische Elektronik, Elektronenstrahl- und Plasmatechnik FEP (Germany); Michael Törker, Fraunhofer-Institut für Organische Elektronik, Elektronenstrahl- und Plasmatechnik FEP (Germany); Uwe Vogel, Fraunhofer-Institut für Organische Elektronik, Elektronenstrahl-und Plasmatechnik FEP (Germany), TU Dresden (Germany)

12624-44 • 11:00 - 11:20 | ICM Room 2
Versatile modulation transfert function and direct point spread function measurement with a random target method
Author(s): Franck Michaud, Safran Electronics & Defense (France)

SESSION 9: DIGITAL OPTICS IN IMAGING
28 June 2023 • 10:30 - 13:00 ICM Room 21 Session Chairs: Yuzuru Takashima, Wyant College of Optical Sciences (United States), Ting-Chung Poon, Virginia Polytechnic Institute and State Univ. (United States)

12624-43 • 10:30 - 11:00 | ICM Room 21
Roadmap for metasurface integration in optical systems (*Invited Paper*)
Author(s): Daniel K. Nikolov, Aaron Bauer, A. Nick Vamivakas, Jannick P. Rolland, Univ. of Rochester (United States)

12624-44 • 11:00 - 11:20 | ICM Room 2
Versatile modulation transfert function and direct point spread function measurement with a random target method
Author(s): Franck Michaud, Safran Electronics & Defense (France)

12624-45 • 11:20 - 11:40 | ICM Room 21
Second harmonic generation-based digital wavefront shaping for deep-tissue imaging
Author(s): David Krause, Nektarios Koukourakis, Jürgen W. Czarske, TU Dresden (Germany)

12624-46 • 11:40 - 12:00 | ICM Room 21
High-quality reconstruction and autofocusing method for Fresnel zone aperture lensless imaging
Author(s): Jiachen Wu, Fangyu Liu, Liangcai Cao, Tsinghua Univ. (China)

12624-47 • 12:00 - 12:20 | ICM Room 21
Model predictive control-based adaptive optics system with deep-learning Shack-Hartmann wavefront sensor

Author(s): Wei-Shiuan Huang, Chia-Wei Hsu, Feng-Chun Hsu, Chun-Yu Lin, Shean-Jen Chen, National Yang Ming Chiao Tung Univ. (Taiwan)

12624-48 • 12:20 - 12:40 | ICM Room 21
Parallel single-pixel imaging based on the self-imaging effect
Author(s): Erick F. Ipus Bados, Armin J. M. Lenz, Lluís Matínez León, Jesús Lancis, Enrique Tajahuerce, Univ. Jaume I (Spain)

12624-49 • 12:40 - 13:00 | ICM Room 21
Intelligent self-calibration tool for digital few-mode fiber multiplexers based on multiplane light conversion
Author(s): Dennis Pohle, TU Dresden (Germany); Fabio Aparecido Barbosa, Filipe M. Ferreira, Univ. College London (United Kingdom); Jürgen W. Czarske, Stefan Rothe, TU Dresden (Germany)

CLOSING REMARKS
28 June 2023 • 13:00 - 13:05 ICM Room 21 Jürgen W. Czarske, TU Dresden, Germany Bernard C. Kress, Google, United States

POSTERS-WEDNESDAY
28 June 2023 • 13:10 - 14:10 ICM, Hall B0 Poster authors, please set up posters between 9:00 and 13:00 hrs on Wednesday. Plan to stand by your poster to discuss it with session attendees during the poster session. Remove your poster following the poster session conclusion as posters left on the boards after 14:30 hrs will be discarded.

12624-6 • 13:10 - 14:10 | ICM, Hall B0
The effect of fixation stability on stereopsis in school-age children
Author(s): Evita Serpa, Madara Alecka, Asnate Berzina, Viktorija Goliskina, Evita Kassaliete, Anete Klavinska, Marija Koleda, Rita Mikelsone, Elizabete Ozola, Tomass Ruza, Aiga Svede, Daniela Toloka, Sofija Vasiljeva, Liva Volberga, Ilze Ceple, Gunta Krumina, Univ. of Latvia (Latvia)

12624-27 • 13:10 - 14:10 | ICM, Hall B0
Digital simulation environment for wavefront-based alignment process of molded aspheric glass lenses
Author(s): Aki P. Mäyrä, Vili Kellokumpu, VTT Technical Research Ctr. of Finland Ltd. (Finland); Alfredo Velazquez Iturbide, Fraunhofer-Institut für Produktionstechnologie IPT (Germany); Alexey Popov, Juha Sumen, VTT Technical Research Ctr. of Finland Ltd. (Finland)

12624-50 • 13:10 - 14:10 | ICM, Hall B0
Angular extended depth-of-focus diffractive lens based on Fourier series
Author(s): Angela Soria-Garcia, Luis Miguel Sanchez-Brea, Jesus del Hoyo, Univ. Complutense de Madrid (Spain); Francisco Jose Torcal-Milla, Univ. de Zaragoza (Spain); Jose A. Gomez-Pedrero, Veronica Pastor-Villarrubia, Joaquin Andres-Porras, Univ. Complutense de Madrid (Spain); Mahmoud H. Elshorbagy, Minia Univ. (Egypt); Javier Alda, Univ. Complutense de Madrid (Spain)

12624-51 • 13:10 - 14:10 | ICM, Hall B0
MEMS-based laser scanning patterns: Programming and experiments
Author(s): Andrei Maldar, Univ. Politehnica Timisoara (Romania); Virgil-Florin Duma, Univ. “Aurel Vlaicu” din Arad (Romania), Univ. Politehnica Timisoara (Romania)

12624-54• 13:10 - 14:10 | ICM, Hall B0
Optimized pattern design of a light guide using 2D ray-tracing simulation
Author(s): Mario Medrano, Unai Jimenez, Santiago Tainta, María J. Erro, Israel Arnedo, Juan J. Beato, Univ. Pública de Navarra (Spain); Joaquin Izura, EMBEGA, S. COOP. (Spain); Silvia Zabala, CS Centro Stirling (Spain)

12624-55 • 13:10 - 14:10 | ICM, Hall B0
Analysing self-written waveguides with three wavelengths for digital sensing
Author(s): Derek J. Cassidy, John Healy, John Sheridan, Univ. College Dublin (Ireland)

12624-56 • 13:10 - 14:10 | ICM, Hall B0
Simulation of plasmonic absorption complexities in the hybridized highly p-doped semiconductor/metal nanostructures
Author(s): Atefeh Habibpourmoghadam, Hannoversches Zentrum für Optische Technologien (Germany); Wenyong Xie, Antonio Calà Lesina, Leibniz Univ. Hannover (Germany)

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12624-57 • 13:10 - 14:10 | ICM, Hall BO

Ellipsometer development for process monitoring

Author(s): Emil Agocs, Soraya Zangenehzadeh, Technische Univ. Braunschweig (Germany); Axel Günther, Technische Universität Braunschweig (Germany); Hans-Hermann Johannes, Technische Univ. Braunschweig (Germany); Bernhard Roth, Hannoversches Zentrum für Optische Technologien (Germany); Wolfgang Kowalsky, Technische Univ. Braunschweig (Germany)

12624-58 • 13:10 - 14:10 | ICM, Hall BO

Education optical kits Injection molded from engineering glass filled polymers

Author(s): Simcha Kilim, Ishy Shalomov, Kilim Plastics (Israel)

12624-59 • 13:10 - 14:10 | ICM, Hall BO

Design of real-time transmission of 4K YUV/H.265 digital microscopy images based on USB3.0

Author(s): Mengwei Zhai, Feihong Yu, Zhejiang Univ. (China)

12624-60 • 13:10 - 14:10 | ICM, Hall BO

An innovative approach to measuring radius of curvature and form error of spherical optics with an interferometer

Author(s): Ravi P. Singh, Yaolong Chen, Xi'an Jiaotong Univ. (China)

12624-63 • 13:10 - 14:10 | ICM, Hall BO

Deep learning-based image defect detection and removal in manufacturing

Author(s): Nikolay Gapon, Moscow State Univ of Technology “STANKIN” (Russian Federation); Viacheslav Voronin, Moscow State Univ. of Technology “STANKIN” (Russian Federation); Marina Zhdanova, Roman Sizyakin, Moscow State Univ. of Technology (Russian Federation); Evgeny A. Semenishchev, Moscow State Univ. of Technology “STANKIN” (Russian Federation); Yurii Ilyukhin, Moscow State Univ. of Technology (Russian Federation)

12624-64 • 13:10 - 14:10 | ICM, Hall BO

The algorithm for improving the accuracy of positioning and recognition of objects on a machine vision system used for direct control of a joint manipulator on flexible cells

Author(s): Andrey Alepko, Moscow State Univ. of Technology “STANKIN” (Russian Federation); Yury Valukevich, Institute of Service and Entrepreneurship (branch) Don State Technical University (Russian Federation); Aleksandr Shaldov, Tagir Abdullin, Moscow State Univ. of Technology (Russian Federation); Evgeny A. Semenishchev, Moscow State Univ. of Technology “STANKIN” (Russian Federation)