

EVENT OVERVIEW | EXHIBITION GUIDE

# SPIE.OPTIFAB

16-19 OCTOBER 2023 | JOSEPH A. FLOREANO ROCHESTER RIVERSIDE CONVENTION CENTER  
ROCHESTER, NEW YORK, USA

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# SPIE.OPTIFAB

The largest optical manufacturing conference and exhibition in North America

Technical program: 16-19 October 2023

Exhibition: 17-19 October 2023

Joseph A. Floreano Rochester Riverside Convention Center  
Rochester, New York, USA

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#### SYMPOSIUM CHAIRS

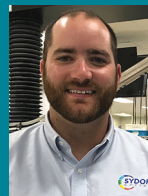


**Jessica DeGroot  
Nelson**  
Edmund Optics  
(United States)



**Blair Unger**  
N2 Imaging Systems,  
LLC. (United States)

#### EXHIBITION CHAIRS



**Jonathan Sydor**  
Sydor Optics, Inc.  
(United States)



**Michael DeMarco**  
QED Optics  
(United States)



**Justin Mahanna**  
Universal Photonics,  
Inc. (United States)



## Experience the energy of SPIE Optifab

Get ready to enjoy engaging conversations, hear leading experts from around the globe report on cutting-edge research in optical manufacturing, connect with companies at the three-day exhibition, and attend the special plenary session.



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SPIE.org

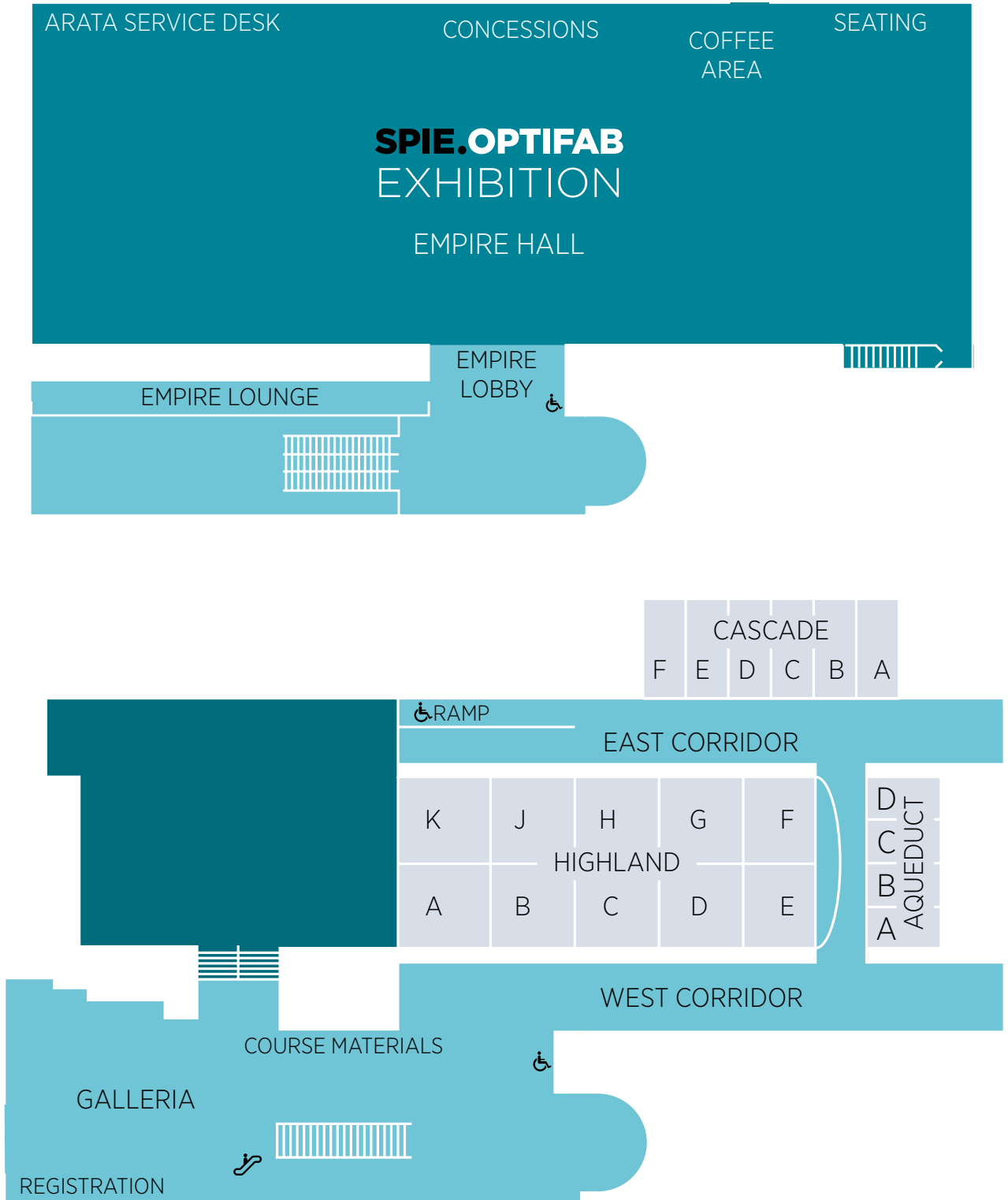
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The American Precision Optics Manufacturers Association represents a broad constituency of precision optics manufacturers, and the supporting industry along with academic associates, whose mutual interest is the advancement and expansion of optics manufacturing and technology.  
APOMA.org

See full details and updates at [spie.org/ofb](http://spie.org/ofb) or on the SPIE App

# JOSEPH A. FLOREANO ROCHESTER RIVERSIDE CONVENTION CENTER





# GENERAL INFORMATION

## Badge pickup and registration hours

Joseph A. Floreano Rochester Riverside Convention Center

Monday 16 October	7:30 AM–5:00 PM
Tuesday 17 October	7:30 AM–5:00 PM
Wednesday 18 October	7:30 AM–5:00 PM
Thursday 19 October	7:30 AM–3:00 PM

## SPIE Cashier

Joseph A. Floreano Rochester Riverside Convention Center, Empire Lobby (exhibition level) registration area; open during registration hours

### Registration payments

If you are planning to register onsite, your credit card payment will be processed during registration. If you wish to pay with cash or check, register at the “Need to Register” stations; you will be directed to the Cashier once you have completed registration except for final payment.

If you have already registered and wish to add a course, workshop or special event, you may do this online by signing into your SPIE account.

### Receipt and Certificate of Attendance

Preregistered attendees who need an SPIE-stamped receipt or attendees who need a Certificate of Attendance may obtain those at Cashier.

### Badge corrections

Badge corrections can be made at the Cashier. Please have your badge removed from the badge holder and marked with your changes before approaching the counter.

## Internet access

Lobbies, meeting rooms, Exhibition Hall, and Registration area

Complimentary wireless internet access provided in meeting rooms and lobbies on the conference room level and in the exhibition hall. Instructions will be posted onsite.

## SPIE Conference app

This useful tool allows you to search and browse the program, special events, participants, exhibitors, courses, and more. It is free and available for iPhone and Android phones.

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## SPIE Bookstore

Joseph A. Floreano Rochester Riverside Convention Center, Empire Lobby (exhibition level) registration area

Stop by the SPIE Bookstore to browse the latest SPIE Press Books and educational materials.

## SPIE Course Materials

Joseph A. Floreano Rochester Riverside Convention Center, Galleria Lobby (ground level) registration area - open during registration hours

Browse course offerings or learn more about SPIE courses available in portable formats such as online and customizable, in-company courses.

## Mothers' Lounge

Joseph A. Floreano Rochester Riverside Convention Center, Galleria Lobby (ground level); open during registration hours

The Mothers' Lounge is a lockable room intended for nursing mothers. There is no storage, running water, or refrigeration available in this space. Check in with SPIE Cashier for access.

## Urgent message line

An urgent message line is available during registration hours: 360.961.4347

## Lost and found

SPIE Cashier - open during registration hours

Found items will be kept at SPIE Cashier in the Registration area during the meeting and available only during registration hours. At the end of the meeting, all found items will be turned over to the Joseph A. Floreano Rochester Riverside Convention Center.

## Food and beverage services

### Coffee breaks

Monday	Riverside Court, ground floor
Tuesday through Thursday	Exhibition Hall

Complimentary coffee will be served twice daily, at 10:00 AM and 3:00 PM. Check individual conference listings for exact times and locations.

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### Food and refreshments for purchase

Café Express, back of the Exhibition Hall

Hours of operation are posted onsite

Hot and cold snacks, hamburgers, deli sandwiches, salads, and pastries are available for purchase. Cash and credit cards accepted.

### Food trucks

Food trucks will be available in the Exhibition Hall

Tuesday and Wednesday	11:00 AM–2:00 PM
Thursday	11:00 AM–1:00 PM

## SPECIAL EVENTS

This session will include a panel discussion with industry leaders discussing the current environment and steps necessary to lead the industry into the next decade.

[Open to all paid conference attendees.](#)



### PLENARY PRESENTATION

## It Takes an Ecosystem: Building the Precision Optics Industry, One Technician at a Time

Plenary Session: 17 October 2023  
8:30 AM - 9:30 AM | Highland A

The plenary session will focus on developing optics ecosystems and will include members from industry, optics technicians, and instructors and administrators from community colleges.

### MODERATORS:



**Jessica DeGroote Nelson**  
Edmund Optics (United States)



**Blair Unger**  
N2 Imaging Systems, LLC. (United States)

## Exhibition Opening Ceremony

17 October 2023 • 9:45 AM - 10:00 AM  
Exhibition Hall entrance

Optifab Exhibition Opening Day and Ribbon-Cutting Ceremony

## OEOSC ASCOP TF2 Surface Imperfections

17 October 2023 • 3:30 PM - 5:00 PM | Aqueduct CD

This is a technical meeting of the Accredited Standards Committee for Optics (ASCOP), Task Force 2, Surface Imperfections, which is managed by the Optics and Electro-Optics Standards Council (OEOSC). The primary item for discussion is the status of OP1.002, which is the American National Standard on Appearance Imperfections of optical surfaces and its relationship with the ISO standard on the same topic. This meeting is open to anyone with an interest in standards for the optics industry.

## 25th Annual Photonics Clambake

17 October 2023 • 5:30 PM - 9:30 PM | Hyatt Ballroom

Tickets sold separately. Attendees and Exhibitors are welcome, limited space available. Check the app or web program for more details and how to purchase tickets.

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## APOMA General Meeting

18 October 2023 • 8:30 AM - 9:30 AM EDT | Highland E

All stakeholders are welcome. Come learn the latest about APOMA initiatives and be informed about relevant information for optics manufacturers!

## Social Hour

18 October 2023 • 3:30 PM - 4:30 PM | Empire Hall

Visit the exhibition hall to enjoy some light refreshments and engage with the exhibitors. Wednesday 18 October 3:30 PM to 4:30 PM. Located in the 2nd level exhibition hall.

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## Poster Session and Networking Reception

18 October 2023 • 4:30 PM - 6:00 PM | Riverside Court

The reception provides an opportunity for attendees to meet with colleagues, network, view poster papers, and interact with the authors. Refreshments will be served.

Attendees are required to wear their conference registration badges.

**Poster authors:** Please set up your poster on Monday after 10AM for extended viewing. Posters may remain on the boards through the end of the poster session on Wednesday and must be removed at the end of the poster session. Posters remaining on the boards following the poster session will be discarded.

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# Make some noise at **PHOTONICS WEST 2024**

27 January - 1 February 2024

- over 20,000 attendees and 1,300 exhibiting companies

## **PHOTONICS WEST PREVIEW**

27 - 28 January 2024

- the official magazine incorporating BiOS Expo, LASE, OPTO, AV, VR, MR and BRAIN
- latest news pre Show

## **PHOTONICS WEST SHOW DAILY**

31 January - 1 February 2024

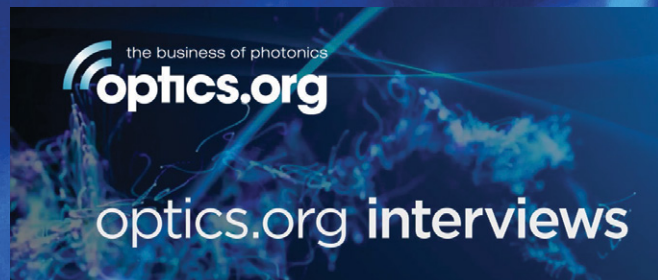
- extensive distribution during the Show
- published on site and printed overnight, each day, every day
- latest news from the Show floor

## **Exhibition Promotions**

- expand the exposure of your brand and products beyond the exhibition
- product demo video  
3 - 5 mins per video
- editor interview  
3 - 5 min Q&A with Editor In Chief Matt Peach

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consists of unwanted, unwelcomed, and uninvited behavior that demeans, threatens, or offends another.

To report harassment you have witnessed or experienced at this meeting, contact any SPIE staff member or use the SPIE reporting hotline at 1-888-818-6898 or [spie.ethicspoint.com](http://spie.ethicspoint.com).

More information:

[spie.org/conduct](http://spie.org/conduct)

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### Digital badges and certificates

SPIE awards digital badges and certificates to participants who attend courses and complete the evaluation and quiz. Digital credentials are always accessible, easily shareable, printable at any time, and verified. For more information visit [spie.org/digital-badges](https://spie.org/digital-badges)

SPIE reserves the right to cancel a course due to insufficient advance registration.

### In-Person courses

View course descriptions and register online.



#### SC690 **Optical System Design: Layout Principles and Practice**

Instructor: **Julie L. Bentley**, The Institute of Optics, Univ. of Rochester (USA)

16 October 2023 • 8:30 AM - 5:30 PM

Level: Introductory • \$770.00 / \$910.00 / \$439.00

#### SC700 **Understanding Scratch and Dig Specifications**

Instructor: **David M. Aikens**, Savvy Optics Corp. (USA)

16 October 2023 • 8:30 AM - 12:30 PM

Level: Introductory • \$455.00 / \$525.00 / \$285.00

#### SC848 **Fundamentals of Single Point Diamond Turning**

Instructor: **John P. Schaefer**, Raytheon EO Innovations (USA)

17 October 2023 • 1:30 PM - 5:30 PM

Level: Introductory • \$455.00 / \$525.00 / \$285.00

#### SC863 **Introduction to Modern Optical Drawings—the ISO 10110 Standard**

Instructor: **David M. Aikens**, Savvy Optics Corp. (USA)

18 October 2023 • 8:30 AM - 12:30 PM

Level: Introductory • \$505.00 / \$575.00 / \$305.00

#### SC1017 **Optics Surface Inspection Workshop**

Instructor: **David M. Aikens**, Savvy Optics Corp. (USA)

16 October 2023 • 1:30 PM - 5:30 PM

Level: Introductory • \$455.00 / \$525.00 / \$285.00

#### SC1169 **Optical Manufacturing Fundamentals**

Instructor: **Ray Williamson**, Ray Williamson Consulting (USA)

18 October 2023 • 8:30 AM - 5:30 PM

Level: Introductory • \$765.00 / \$905.00 / \$437.00

#### SC1171 **Seeing, Analyzing and Controlling Mid-Spatial Frequency (MSF) and Surface Roughness Errors on Optical Surfaces**

Instructor: **Jessica DeGroot Nelson**, Edmund Optics Inc. (USA)

16 October 2023 • 1:30 PM - 5:30 PM

Level: Introductory • \$455.00 / \$525.00 / \$285.00

#### SC1224 **Fundamentals of Optical Engineering**

Instructor: **Alexis K. S. Vogt**, Monroe Community College (USA)

17 October 2023 • 1:30 PM - 5:30 PM

Level: Introductory • \$455.00 / \$525.00 / \$285.00

#### SC1278 **Introduction to Freeform Optics: Design, Testing, and Applications**

Instructor: **Joseph M. Howard**, NASA Goddard Space Flight Ctr. (USA)

18 October 2023 • 1:30 PM - 5:30 PM

Level: Introductory • \$455.00 / \$525.00 / \$285.00

#### SC1315 **Precision Glass Molded Optics: Design Through Manufacturing**

Instructor: **Alan Symmons**, Vital Materials Co., Ltd. (USA)

16 October 2023 • 8:30 AM - 12:30 PM

Level: Intermediate • \$455.00 / \$525.00 / \$285.00

#### SC1332 **Computer Generated Holograms for Optical Testing**

Instructor: **Shelby D. V. Ament**, Arizona Optical Metrology LLC (USA)

17 October 2023 • 1:30 PM - 5:30 PM

Level: Intermediate • \$455.00 / \$525.00 / \$285.00

Pricing: Member / Non-member / Student member

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## Conference 12778

# Optifab 2023

Conference Chairs: **Jessica DeGroot Nelson**, Edmund Optics Inc. (United States); **Blair L. Unger**, N2 Imaging Systems, LLC (United States)

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## MONDAY 16 OCTOBER

### SESSION 1: OFF-AXIS AND FREEFORM OPTICS

16 October 2023 • 8:00 AM - 10:00 AM | Highland A

12778-1

#### Freeform processing from precision grinding up to ion-beam-figuring

Sebastian Stoebenau, Rafael Hild, OptoTech Optikmaschinen GmbH (Germany)

16 October 2023 • 8:00 AM - 8:20 AM | Highland A

12778-2

#### Manufacturing process flow for freeform optics

Franciscus L. Wolfs, James Ross, Kyle Wood, Joshua Hamel, OptiPro Systems, LLC (United States)

16 October 2023 • 8:20 AM - 8:40 AM | Highland A

12778-3

#### Optimized kinematics for efficient freeform polishing

Sebastian Stoebenau, Rafael Hild, OptoTech Optikmaschinen GmbH (Germany)

16 October 2023 • 8:40 AM - 9:00 AM | Highland A

12778-4

#### Robotic smoothing of silicon mirrors

Daniel R. Brooks, Jennifer Coniglio, Steve Murty, Optimax Systems, Inc. (United States)

16 October 2023 • 9:00 AM - 9:20 AM | Highland A

12778-5

#### Ultrasonic machining of optical and ceramic materials

Michael J. Cahill, Mike Bechtold, Rob Bechtold, OptiPro Systems, LLC (United States)

16 October 2023 • 9:20 AM - 9:40 AM | Highland A

12778-6

#### Curvature polishing for low-cost lightweight mirrors

Nikolas Romer, Univ. of Rochester (United States); Jeff R. Kuhn, Institute for Astronomy, Univ. of Hawai'i (United States), MorphOptic, Inc. (United States), Instituto de Astrofísica de Canarias (Spain); Jannick P. Rolland, Univ. of Rochester (United States)

16 October 2023 • 9:40 AM - 10:00 AM | Highland A

Coffee Break 10:00 AM - 10:30 AM

### SESSION 2: MATERIALS CONSIDERATIONS FOR HIGH-VOLUME/HIGH-PRECISION OPTICS

16 October 2023 • 10:30 AM - 12:10 PM | Highland A

12778-7

#### Rotative printing processes for polymer waveguide manufacturing

Andreas Evertz, Keno Pflieger, Birger Reitz, Ejvind Olsen, Ludger Overmeyer, Leibniz Univ. Hannover (Germany)

16 October 2023 • 10:30 AM - 10:50 AM | Highland A

12778-8

#### Integrated optical fluid sensor in glass

Birger Reitz, Sebastian Leineweber, Ludger Overmeyer, Leibniz Univ. Hannover (Germany)

16 October 2023 • 10:50 AM - 11:10 AM | Highland A

12778-9

#### Maximizing yield, throughput and quality of optical glass: two years later on-line laser inspection

Timothy A. Potts, Dark Field Technologies (United States)

16 October 2023 • 11:10 AM - 11:30 AM | Highland A

12778-10

#### Thermal consideration examples for precision diamond turning

John M. Tamkin, Imaging Insights, LLC (United States); Chris Rich, WaveFront Technology Inc. (United States); Alexandra Runyon, Greenlight Optics, LLC (United States); Quinn Y. Smithwick, Disney Research, Los Angeles (United States)

16 October 2023 • 11:30 AM - 11:50 AM | Highland A

12778-11

#### Effect of rake angle for diamond turning of tungsten carbide

Hassan Shirzadi Jahromi, Micro-LAM, Inc. (United States), Western Michigan Univ. (United States); Sai Kode, Rohit Sharma, Jonathan D. Ellis, Micro-LAM, Inc. (United States)

16 October 2023 • 11:50 AM - 12:10 PM | Highland A

Lunch Break 12:10 PM - 1:40 PM

**SESSION 3: MANUFACTURING CONSIDERATIONS HIGH-VOLUME/HIGH-PRECISION OPTICS**

16 October 2023 • 1:40 PM - 3:20 PM | Highland A

12778-12

**Decenter measurement of singlets and assembled optics containing cylindrical surfaces**

Patrik Langehanenberg, Josef Heinisch, Felix Jaeger, TRIOPTICS GmbH (Germany)

16 October 2023 • 1:40 PM - 2:00 PM | Highland A

12778-13

**Year one into ELT M1 segments manufacturing**

Camille Frapolli, Christophe Couteret, Dominique Bardon, Gilles Chaussat, Safran Reosc (France)

16 October 2023 • 2:00 PM - 2:20 PM | Highland A

12778-14

**The Satisloh plasma polisher: plasma surface figuring ultra precision optics**

Adam Bennett, Cranfield Plasma Solutions (United Kingdom); Katherine Gobey, Cranfield Plasma Solution (United Kingdom); Nan Yu, The Univ. of Edinburgh (United Kingdom); Marco Castellii, Univ. College Dublin (Ireland); Steffen Moos, Juergen Bode, Hans-Jörg Schlemper, Satisloh GmbH (Germany)

16 October 2023 • 2:20 PM - 2:40 PM | Highland A

12778-15

**Centration error of an aspheric surface based on different datum construct**

Jeff Pei Liang Low, Edmund Optics Singapore Pte. Ltd. (Singapore); Matthias Knobl, Edmund Optics GmbH (Germany); Ian Schwartz, Edmund Optics Inc. (United States)

16 October 2023 • 2:40 PM - 3:00 PM | Highland A

12778-16

**Computer controlled optical surfacing powered by a novel position-velocity-time motion scheduler**

Tianyi Wang, Lei Huang, Corey Austin, Mourad Idir, Brookhaven National Lab. (United States)

16 October 2023 • 3:00 PM - 3:20 PM | Highland A

**Coffee Break 3:20 PM - 3:50 PM****SESSION 4: FINISHING METHODS**

16 October 2023 • 3:50 PM - 5:30 PM | Highland A

12778-17

**Process optimization for high removal rates with magnetorheological finishing**

William Messner, Christopher A. Hall, QED Technologies, Inc. (United States)

16 October 2023 • 3:50 PM - 4:10 PM | Highland A

12778-18

**Advancements in cerium oxide slurry development for precision optics**

Keith Joye, Caroline Watt, Bryan Goddard, William Gemmill, Pureon Inc. (United States)

16 October 2023 • 4:10 PM - 4:30 PM | Highland A

12778-19

**Effect of polishing times for glass optics after laser-assisted single point diamond turning**

Sai Kode, Micro-LAM, Inc. (United States); Dalibor Mikulic, Frank Niehaus, Schneider Optical Machines Inc. (Germany); Jonathan D. Ellis, Micro-LAM, Inc. (United States)

16 October 2023 • 4:30 PM - 4:50 PM | Highland A

12778-20

**Femtosecond laser figuring and finishing of glass**

Gong Chen, Jie Qiao, Rochester Institute of Technology (United States)

16 October 2023 • 4:50 PM - 5:10 PM | Highland A

12778-22

**Next generation polishing consumables for silicon and polysilicon to achieve very low surface roughness with high throughput**

Floyd McClung, Universal Photonics Inc. (United States)

16 October 2023 • 5:10 PM - 5:30 PM | Highland A

**TUESDAY 17 OCTOBER****PLENARY SESSION****It Takes an Ecosystem: Building the Precision Optics Industry, One Technician at a Time**

17 October 2023 • 8:30 AM - 9:30 AM | Highland A

This Session will include a panel discussion with industry leaders discussing the current environment and steps necessary to lead the industry into the next decade.

**COFFEE BREAK AND EXHIBITION OPENING CEREMONY**

17 October 2023 • 9:45 AM - 10:25 AM | Highland A

Join us for the opening of the SPIE Optifab Exhibition, North America's largest optical fabrication exhibition. Come meet with top companies in Rochester. See precision optics machines, discuss optical manufacturing with leading experts, and build important relationships that benefit your work. Don't miss out. This event only happens every two years.

**SESSION 5: METHODS FOR NON-ROTATIONALLY SYMMETRIC OPTICS**

17 October 2023 • 10:30 AM - 12:10 PM | Highland A

12778-23

**Measurement of surface form of cylindrical optics using non-contact multiwavelength interferometry**

Jayesh Navare, Taylor Hobson (United Kingdom); Lei Ren, AMETEK Commercial Enterprise (Shanghai) Co., Ltd. (China); Marc Wendel, Nina Hennemann, AMETEK GmbH (Germany); Neil Fitzgibbon, Yang Yu, Taylor Hobson (United Kingdom)

17 October 2023 • 10:30 AM - 10:50 AM | Highland A

12778-24

**A multi-sensor optical coordinate measurement machine for measuring freeform optical surface form and reference fiducial position**

Rens Henselmans, Rogier Ellenbroek, Dutch United Instruments (Netherlands); Dirk-Jan Kroon, DEMCON Focal B.V. (Netherlands)

17 October 2023 • 10:50 AM - 11:10 AM | Highland A



12778-25

## Dual-probe measurement system of geometric form evaluation of cylindrical lenses

Aaron Brettin, Opto-Alignment Technology, Inc. (United States)  
17 October 2023 • 11:10 AM - 11:30 AM | Highland A

12778-26

## Efficient testing and analysis of off axis parabolas with high off axis angles

Stephen M. Watson, QED Optics (United States)  
17 October 2023 • 11:30 AM - 11:50 AM | Highland A

12778-27

## Benchmarking Shack-Hartmann measurements of spatial light modulator output for reconfigurable null of rectangular freeform optics

Renuka Manjula Narayanan, The Institute of Optics, Univ. of Rochester (United States); Romita Chaudhuri, ASML (United States); Jannick P. Rolland, The Institute of Optics, Univ. of Rochester (United States)  
17 October 2023 • 11:50 AM - 12:10 PM | Highland A

Lunch/Exhibition Break 12:10 PM - 1:40 PM

### SESSION 6: WAVEFRONT METROLOGY METHODS

17 October 2023 • 1:40 PM - 3:20 PM | Highland A

12778-28

## Wavefront testing of optical windows and mirrors

Christian Brock, Lucas Pfeifer, Johannes Pfund, OPTOCRAFT GmbH (Germany)  
17 October 2023 • 1:40 PM - 2:00 PM | Highland A

12778-29

## Determination of the numerical aperture for spectroscopic microscopy beyond the diffraction limit

Poul Erik Hansen, DFM A/S (Denmark); Lauryna Siaudinyte  
17 October 2023 • 2:00 PM - 2:20 PM | Highland A

12778-30

## Taking advantage of back reflections for full thin plane-parallel optics characterization

Rafael Porcar, Diego Ormaechea, Xavier Levecq, Nicolas Lefaudeux, Imagine Optic SA (France)  
17 October 2023 • 2:20 PM - 2:40 PM | Highland A

12778-31

## Low coherence interferometry for Mid-infrared precision optics manufacturing

Paul M. Thomas, Chris Cotton, Michael Marcus, Donald Gibson, John Hart, John Pietruszka, David Rigolo, Richard St. Louis, Lumetrics, Inc. (United States)  
17 October 2023 • 2:40 PM - 3:00 PM | Highland A

12778-32

## Measurement of radius of curvature with a low-coherence flatness interferometer

Klaus Freischlad, InterOptics, LLC (United States)  
17 October 2023 • 3:00 PM - 3:20 PM | Highland A

Coffee Break 3:20 PM - 3:50 PM

### SESSION 7: ILLUMINATION-DRIVEN METROLOGY

17 October 2023 • 3:50 PM - 5:10 PM | Highland A

12778-33

## High-precision 3D metrology for stacked diffractive augmented reality waveguides

Daniel Winters, TRIOPTICS GmbH (Germany); Masashi Mitsui, Masamichi Ueda, Cellid, Inc. (Japan); Sven Sassning, Mohit Yadav, Patrik Langehanenberg, Jan-Hinrich Eggers, TRIOPTICS GmbH (Germany)  
17 October 2023 • 3:50 PM - 4:10 PM | Highland A

12778-34

## Dynamic illumination in phase-shifting interferometry

Leslie L. Deck, Nathaniel S. Austin, Zygo Corporation (United States)  
17 October 2023 • 4:10 PM - 4:30 PM | Highland A

12778-35

## Transmission sphere calibration using a Fresnel zone CGH

Robert E. Parks, Optical Perspectives Group, LLC (United States); Chunyu Zhao, Logan Graves, Arizona Optical Metrology LLC (United States)  
17 October 2023 • 4:30 PM - 4:50 PM | Highland A

12778-36

## Absolute shape measurement with coaxial deflectometry: towards interferometric accuracy

Yves Surrel, Maxime Bordoux, Wyse Light (France)  
17 October 2023 • 4:50 PM - 5:10 PM | Highland A

## WEDNESDAY 18 OCTOBER

### SESSION 8: AUTOMATED OPTICAL MANUFACTURING AND METROLOGY

18 October 2023 • 8:00 AM - 10:00 AM | Highland A

12778-37

## Automation in optical manufacturing: beveling and part handling

Mitchell J. Sedore, OptiPro Systems, LLC (United States)  
18 October 2023 • 8:00 AM - 8:20 AM | Highland A

12778-38

## Quality prediction of thin glass products using machine learning based multi target regression for multi-stage non-isothermal glass forming

Saksham Kiroriwal, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); Hendrik Mende, Fraunhofer-Institut für Produktionstechnologie IPT (Germany); Robert H. Schmitt, WZL der RWTH Aachen Univ. (Germany), Fraunhofer-Institut für Produktionstechnologie IPT (Germany)  
18 October 2023 • 8:20 AM - 8:40 AM | Highland A

12778-39

## Automated manufacturing in precision optics

Rafael Hild, OptoTech Optikmaschinen GmbH (Germany)  
18 October 2023 • 8:40 AM - 9:00 AM | Highland A



12778-40

**Introduction of Industry 4.0 software solutions**

Patrick Debus, OptoTech Optikmaschinen GmbH (Germany)  
18 October 2023 • 9:00 AM - 9:20 AM | Highland A

12778-41

**Automation in metrology**

Patrick Debus, OptoTech Optikmaschinen GmbH (Germany)  
18 October 2023 • 9:20 AM - 9:40 AM | Highland A

12778-42

**Latest advancements in alignment turning of mounted optics**

Christian Wenzel, Gerrit Götzen, Innolite GmbH (Germany)  
18 October 2023 • 9:40 AM - 10:00 AM | Highland

Coffee Break 10:00 AM - 10:30 AM

**SESSION 9: MATERIALS AND THIN FILMS I**

18 October 2023 • 10:30 AM - 12:10 PM | Highland A

12778-43

**Advancements in thin-film coating metrology**

Jared Sittig, Optimax Systems, Inc. (United States)  
18 October 2023 • 10:30 AM - 10:50 AM | Highland A

12778-44

**Atomic layer deposition of gradient-index anti-reflective coatings: eliminating the performance limitations of traditional optical coatings**

John-Olof Rönn, Leevi Pesonen, Mikael Saarniheimo, Sami Sneck, Kalle Niiranen, Beneq Oy (Finland)  
18 October 2023 • 10:50 AM - 11:10 AM | Highland A

12778-45

**Crystallization in the TeO<sub>2</sub> - Ta<sub>2</sub>O<sub>5</sub> - Bi<sub>2</sub>O<sub>3</sub> system: from glass to anti-glass to transparent ceramic**

Hasnaa Benchorfi, Ctr. d'optique, photonique et laser, Univ. Laval (Canada), Institut de Recherche sur les Céramiques (France)  
18 October 2023 • 11:10 AM - 11:30 AM | Highland A

12778-46

**Ultra low (<1.25) refractive index materials**

Reuben Chacko, Brewer Science, Inc. (United States)  
18 October 2023 • 11:30 AM - 11:50 AM | Highland A

12778-47

**New chalcogenide glass development and optical property characterization by low-coherent interferometry**

Spencer Novak, William Moreshead, Sam Rubin, LightPath Technologies, Inc. (United States); Patrik Langehanenberg, Erik Stover, TRIOPTICS GmbH (Germany)  
18 October 2023 • 11:50 AM - 12:10 PM | Highland A

Lunch/Exhibition Break 12:10 PM - 1:30 PM

**SESSION 10: MATERIALS AND THIN FILMS II**

18 October 2023 • 1:30 PM - 2:10 PM | Highland A

12778-49

**Advanced coating equipment - Or how to sputter precise interference filters and dielectric mirrors even on larger substrate formats?**

Michael Schneider, VON ARDENNE GmbH (Germany)  
18 October 2023 • 1:30 PM - 1:50 PM | Highland A

12778-50

**Prism coupling Refractometry: Enhancing precision, Accuracy, and Repeatability in the Infrared**

Andrew W. Howe, Univ. of Central Florida (United States)  
18 October 2023 • 1:50 PM - 2:10 PM | Highland A

**SESSION 11: NEW PERSPECTIVES TO CLASSICAL PROBLEMS**

18 October 2023 • 2:10 PM - 3:30 PM | Highland A

12778-51

**Integrate Zemax ISO 10110 element drawing specification with the PanDao feature**

Xu Chen, Erin Elliot, Vladimir Smagley, David Vega, Ansys, Inc. (United States)  
18 October 2023 • 2:10 PM - 2:30 PM | Highland A

12778-52

**Training diamond turning technicians and changing lives**

Alexis Vogt, Monroe Community College (United States); Mark Webster, Bausch & Lomb Inc. (United States); Michael Pomerantz, Haya Maali, Monroe Community College (United States); Kyle Adams, Bausch & Lomb Inc. (United States)  
18 October 2023 • 2:30 PM - 2:50 PM | Highland A

12778-53

**Repositioning and locking method for off-axis optical system using mechanical measurement**

Pongpop Sukanunta, Thammasat Univ. (Thailand), National Astronomical Research Institute of Thailand (Thailand); Sarinya Jitklongsub, King Mongkut's Univ. of Technology Thonburi (Thailand), National Astronomical Research Institute of Thailand (Thailand); Maroay Phlernjai, Thammasat Univ. (Thailand); Apirat Prasit, Weerapot Wanajaroen, Pearachad Chartsiriwattana, National Astronomical Research Institute of Thailand (Thailand)  
18 October 2023 • 2:50 PM - 3:10 PM | Highland A

12778-54

**Updating the peak-to-valley (PV) irregularity specification for the modern world**

Paul E. Murphy, QED Technologies, Inc. (United States)  
18 October 2023 • 3:10 PM - 3:30 PM | Highland A

Coffee Break 3:30 PM - 3:50 PM



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# TECHNICAL CONFERENCE

## Conference 12778

### SESSION 12: NOVEL APPROACHES TO OPTICAL FABRICATION AND TESTING

18 October 2023 • 3:50 PM - 5:30 PM | Highland A

12778-55

#### Edge effects vs. edge profile in MRF finishing

James Mulherin, QED Optics (United States)

18 October 2023 • 3:50 PM - 4:10 PM | Highland A

12778-56

#### Total process solution for the grinding and polishing of precision optics

Caroline Watt, Pureon Inc. (United States); Michael Max, Christian Jentgens, Pureon AG (Switzerland); William R. Gemmill, Pureon Inc. (United States)

18 October 2023 • 4:10 PM - 4:30 PM | Highland A

12778-57

#### Subsurface damage assessment of femtosecond laser-processed surfaces

Jing Xu, Univ. of Rochester (United States); Gong Chen, Jie Qiao, Rochester Institute of Technology (United States); John C. Lambropoulos, Univ. of Rochester (United States)

18 October 2023 • 4:30 PM - 4:50 PM | Highland A

12778-58

#### Development of a novel beam profiling prototype with laser self-mixing via the knife-edge approach

Yuanfu Tan, The Chinese Univ. of Hong Kong (Hong Kong, China)

18 October 2023 • 4:50 PM - 5:10 PM | Highland A

12778-59

#### Integrated photonics and miniaturized optics produced with 3D printing in glass

Andrea Lovera, Pietro Bernasconi, Marco Giaccone, Enrico Casamenti, Cesare Alfieri, Rolando Ferrini, FEMTOprint SA (Switzerland)

18 October 2023 • 5:10 PM - 5:30 PM | Highland A

### POSTER SESSION AND NETWORKING RECEPTION

18 October 2023 • 5:30 PM - 7:00 PM | Riverside Court

Symposium attendees are invited to attend the Poster/Networking Reception on Wednesday evening. The reception provides an opportunity for attendees to meet with colleagues, network, view poster papers, and interact with the authors. Refreshments will be served.

Attendees are required to wear their conference registration badges.

**Poster authors:** Please set up your poster on Monday after 10AM for extended viewing. Posters may remain on the boards through the end of the poster Session on Wednesday and must be removed at the end of the poster session. Posters remaining on the boards following the poster Session will be discarded.

12778-60

#### Diffraction efficiencies of three types of bioplastic gratings based on chitosan from seafood waste

Efren G. Gumayan, Ian Ken D. Dimzon, Raphael A. Guerrero, Ateneo de Manila Univ. (Philippines)

18 October 2023 • 5:30 PM - 7:00 PM | Riverside Court

12778-61

#### Optical properties of InAlN films for infrared applications

Wei-Chun Chen, Taiwan Instrument Research Institute, National Applied Research Labs. (Taiwan); Hung-Pin Chen, Che-Chin Chen, Yu-Wei Lin, Fong-Zhi Chen, Taiwan Instrument Research Institute (Taiwan)

18 October 2023 • 5:30 PM - 7:00 PM | Riverside Court

12778-62

#### Analysis of low-spatial frequency response in magnetorheological finishing process

Minwoo Jeon, Woo-Jong Yeo, Hwan-Jin Choi, Korea Basic Science Institute (Republic of Korea), Chungnam National Univ. (Republic of Korea); Mincheol Kim, Korea Basic Science Institute (Republic of Korea); Min-Gab Bog, Young-Jae Kim, Y&DK Co., Ltd. (Republic of Korea); Wonkyun Lee, Chungnam National Univ. (Republic of Korea)

18 October 2023 • 5:30 PM - 7:00 PM | Riverside Court

12778-63

#### Comparison of nano meter surface roughness on aluminum mirrors using diamond turning for accelerator

Hwan-Jin Choi, Korea Basic Science Institute (Republic of Korea); Wonkyun Lee, Chungnam National Univ. (Republic of Korea); Woo-Jong Yeo, Mincheol Kim, Minwoo Jeon, Korea Basic Science Institute (Republic of Korea); Min-Gab Bog, Y&DK Co., Ltd. (Republic of Korea)

18 October 2023 • 5:30 PM - 7:00 PM | Riverside Court

12778-64

#### Crystallographic effect of elastic recovery on surface roughness of ultra-precision diamond turning machined polycrystalline ZnS

Mincheol Kim, Woo-Jong Yeo, Hwan-Jin Choi, Minwoo Jeon, I. Jong Kim, Korea Basic Science Institute (Republic of Korea)

18 October 2023 • 5:30 PM - 7:00 PM | Riverside Court

12778-66

#### Effect of ultrasonic vibration on ultra precision diamond turning of polycrystalline zinc sulfide

Woo-Jong Yeo, Hwan-Jin Choi, Mincheol Kim, Minwoo Jeon, I. Jong Kim, Korea Basic Science Institute (Republic of Korea); Min-Gab Bog, Young-Jae Kim, Y&DK Co., Ltd. (Republic of Korea); Wonkyun Lee, Chungnam National Univ. (Republic of Korea)

18 October 2023 • 5:30 PM - 7:00 PM | Riverside Court

12778-65

#### Microwave-assisted hybrid perovskite single crystal with carbon nanotube for ultrafast carrier mobility

Runkai Liu, The Univ. of Sydney (Australia)

18 October 2023 • 5:30 PM - 7:00 PM | Riverside Court

12778-67

#### Electrospray deposited PEDOT:PSS thin film using an electrohydrodynamic jet printer for inverted quantum dots light-emitting diodes

Woon-Seop Choi, Hoseo Univ. (Republic of Korea)

18 October 2023 • 5:30 PM - 7:00 PM | Riverside Court



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Tuesday 17 October . . . . .10:00 AM - 5:00 PM  
 Wednesday 18 October . . . . .10:00 AM - 5:00 PM  
 Thursday 19 October . . . . .10:00 AM - 3:00 PM

Booth numbers provided in the Exhibition Guide may be cross-referenced with the floor plan below. The address of each exhibitor is also listed, making this Exhibition Guide an excellent reference tool.



# EXHIBITOR BOOTH LISTING

104	Conductive Containers Inc.	412	EVOCHEM Advanced Materials GmbH	915	Precizika Metrology
106	Safran Reosc	413	Hyperion Optics USA Inc.	916	G&H   GS Optics
112	Mahr	414	Angstrom Precision Optics Inc.	917	Reynard Corp.
114	Spectrum Thin Films Corp.	415	Filtertech/ US Centrifuge	921	Navitar Inc.
116	Epner Technology Inc.	416	XONOX Technology Inc.	921	Zygo Corporation
118	International OptoIndex	419	Archer OpTx, Inc.	1006	Evatec NA Inc.
122	Thin-Films Research, Inc.	423	Schneider Optical Machines Inc.	1007	FUJITOK Corp.
126	Santec USA Corp.	506	SCHOTT North America, Inc.	1008	son-x GmbH
128	Dioptic GmbH	507	ABTech, Inc.	1010	AOM - Arizona Optical Metrology LLC
130	ilis gmbh	509	VisiMax Technologies, Inc.	1012	Taylor Hobson
132	Metrology Concepts LLC	510	Imagine Optic Inc	1013	Precitech Inc.
134	Applied Image, Inc.	511	Valiant International, Inc.	1016	Photonic Cleaning Technologies
136	Glass Fab, Inc.	512	Heraeus Quartz North America LLC	1017	Precision Optical
144	UC Components, Inc.	513	Opto-Alignment Technology, Inc.	1021	OptoTech Optical Machinery Inc.
146	The Optronics Co., Ltd.	514	SCI Engineered Materials	1106	Valtech Corp.
152	Isuzu Glass, Inc.	516	Lattice Materials LLC	1107	Chardon Tool
154	asphericon	517	attocube systems Inc.	1108	NGL America Inc.
156	Infinite Optics Inc.	521	Satisloh North America Inc.	1109	ORAFOL Fresnel Optics GmbH
158	Inrad Optics	606	Optimax Systems, Inc.	1110	Nanosurf, Inc.
160	Avantier Inc.	607	Bristol Instruments, Inc.	1111	Intlvac Thin Film
162	Applied Surface Technologies	608	AccuCoat Inc.	1112	Advanced Glass Industries, Inc.
168	Electro Optics	609	Ralph W. Earl Co., Inc.	1114	Advance Reproductions Corp.
172	DataRay Inc.	610	MiniTec Framing Systems, LLC	1115	Micro-LAM, Inc.
174	Optical Perspectives Group, LLC	611	Corning Incorporated	1116	PHASICS Corp.
176	XL VAC Technologies, Inc.	612	Swift Glass, Inc.	1206	Somos IWT
178	CASIX, Inc.	613	Mildex, Inc.	1207	North American Coating Labs.
180	New Way Air Bearings	614	Xactra Technologies	1209	Photonics Online
182	Naked Optics Corp.	615	Vertex Optics, Inc.	1210	ComTec Solutions
184	Genco Ltd.	616	QED Optics	1211	Lumetrics, Inc.
186	Ansys, Inc.	617	Sydor Optics, Inc.	1212	Panasonic Connect North America
202	Gage-Line Technology, Inc.	621	QED Technologies International, LLC	1214	Beneq Oy
204	LightTrans USA LP	706	Ohara Corp.	1215	Lapmaster Wolters GmbH
204	PWY Service GmbH & Co. KG	707	Optikos Corp.	1215	Precision Surfacing Solutions GmbH & Co. KG
206	G5 Infrared, LLC	708	Spica Technologies, Inc.	1216	Spartan Felt Co.
207	4D Technology Corp.	710	scia Systems GmbH	1217	Vermont Photonics Technologies Corp.
208	IRD Glass	711	OPTIX Co.	1221	TRIOPTICS GmbH
210	Laser Focus World	712	LAYERTEC GmbH	1303	Syntec Optics
211	Zeeko Ltd.	713	OptoSigma Corp.	1305	Wyse Light
212	OPTOCRAFT GmbH	714	Pureon Inc.	1306	SPIE Membership
213	Edge Technologies Inc.	715	Photonics Media	1307	Advanced Dicing Technologies Inc.
214	DCM Tech, Corp.	717	LaCroix Precision Optics	1308	Empire Automation Systems, Inc.
216	Quartus Engineering Incorporated	806	PR Hoffman Machine Products, Inc.	1309	AdValue Photonics, Inc.
217	New Imaging Technologies	807	Precision Glass & Optics	1310	AGC Plasma Technology Solutions
218	VON ARDENNE GmbH	808	Diverse Optics Inc.	1311	NiCoForm, Inc.
219	Zhejiang Lante Optics Co., Ltd.	809	Tecport Optics, Inc.	1313	Roeders of America
223	Moore Nanotechnology Systems, LLC	810	Dutch United Instruments	1314	Vital Materials Co., Ltd.
306	Bühler Inc.	811	K&Y Diamond Ltd.	1315	AOTA VAC, LLC
307	Kaufman & Robinson, Inc.	812	American Ctr. for Optics Manufacturing, Inc.	1316	FHR Anlagenbau GmbH
308	Ferrotec (USA) Corp.	813	Levicron GmbH	1317	OEG Gesellschaft für Optik, Elektronik & Gerätetechnik mbH
309	dopa diamond tools	814,	Universal Photonics Inc.	1319	Global Superabrasives, LLC
310	Apollo Optical Systems, Inc.	815		1321	Static Clean International, Inc.
311	NTT Advanced Technology Corp.	821	OptiPro Systems, LLC	1322	Innolite GmbH
312	Singapore Dynamic Optronics Pte. Ltd.	906	Larsen Equipment Design, Inc.		
313	Technotrade International, Inc.	907	Teledyne FLIR LLC		
314	TOPTICA Photonics, Inc.	908	Blue Photon Technology & Workholding Systems LLC		
315	Wire Saw Solutions Group LLC	909	DynaVac		
316	TNO	910	SMC Corp. of America		
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## AGC Plasma Technology Solutions #1310

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cameron.gottlieb@agc.com; www.agc-plasma.com

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#414

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#1315

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## attocube systems Inc.

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## Blue Photon Technology & Workholding Systems LLC

#908

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## Bristol Instruments, Inc.

#607

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## Bühler Inc.

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leyboldoptics.cary@buhlergroup.com; www.buhlergroup.com



## CASIX, Inc.

#178

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marketing@casix.com; www.casix.com



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#### Metrology Concepts

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#### Optimax Systems, Inc.

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Booth #616

#### QED Technologies International, LLC

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#### Ralph W. Earl Co., Inc

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#### Swift Glass, Inc.

Booth #612

#### Sydor Optics, Inc.

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## Chardon Tool

#1107

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## ComTec Solutions

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Any public space where other people are present holds an inherent risk of exposure to COVID-19 and other communicable diseases. By attending this event, I agree to voluntarily assume all risk related to exposure and agree to not hold SPIE or any of their affiliates including partners and sponsors, directors, officers, employees, agents, contractors, volunteers, or sponsored venues liable for illness. I will take necessary precautions while at the event including, but not limited to, engaging in appropriate social distancing, wearing a mask in public areas when not consuming food or beverage if required, minimizing face touching, frequently washing hands, and avoiding risky environments such as overcrowded bars or restaurants. I agree to not attend any SPIE event if I feel ill or had recent exposure to a COVID-19 case.

## Anti-harassment policy

It is SPIE policy that all employees, volunteers, and participants are entitled to respectful treatment. Any form of bullying, discrimination, harassment, sexual or otherwise, is unacceptable and will not be tolerated. This policy applies to all locations and situations where SPIE business is conducted and to all SPIE-sponsored activities and events.

*Read complete policy: [spie.org/policies](https://spie.org/policies)*

## Attendee registration and admission policies

SPIE, or their officially designated event management, in their sole discretion, reserves the right to accept or decline an individual's registration for an event. Further, SPIE, or event management, reserves the right to prohibit entry of or to remove any individual whether registered or not, be they attendees, exhibitors, representatives, or vendors, whose conduct is not in keeping with the character and purpose of the event. Without limiting the foregoing, SPIE and event management reserve the right to remove or refuse entry to anyone who has registered or gained access under false pretenses, provided false information, or for any other reason whatsoever that they deem is cause under the circumstances.

## Capture and use of a person's image

By registering for an SPIE event, you grant full permission to SPIE to capture, store, use, and/or reproduce your image or likeness, including incidental capture of any individuals in your household or workplace, by any audio and/or visual recording technique and create derivative works of these images and recordings in any SPIE media now known or later developed, for any legitimate SPIE purpose. By registering for an SPIE event, you waive any right to inspect or approve the use of the images or recordings or of any written copy. You also waive any right to royalties or other compensation arising from or related to the use of the images, recordings, or materials. By registering, you release, defend, indemnify, and hold harmless SPIE from and against any claims, damages, or liability arising from or related to the use of the images, recordings or materials, including but not limited to claims of defamation, invasion of privacy, or rights of publicity or copyright infringement, or any misuse, distortion, blurring, alteration, optical illusion, or use in composite form that may occur or be produced in taking, processing, reduction, or production of the finished product, its publication or distribution.

## Code of conduct

SPIE is committed to providing a harassment- and discrimination-free experience for everyone at our events, an experience that embraces the richness of diversity where participants may exchange ideas, learn, network, and socialize in the company of colleagues in an environment of mutual respect.

*Read complete Code of Conduct: [spie.org/policies](https://spie.org/policies)*

## Event cancellation policy

If for some unforeseen reason SPIE should have to cancel an event, processed registration fees will be refunded to registrants. Registrants will be responsible for cancellation of travel arrangements or housing reservations and the applicable fees.

## Family-friendly policy

**Conference events:** All conference technical and networking events require a badge for admission. Registered attendees may bring children with them if they have been issued a badge. Registration badges for children under 18 are free and available at the SPIE registration desk onsite. Children under 14 years of age must be accompanied by an adult at all times, and guardians are asked to help maintain a professional, disturbance-free conference environment.

**Exhibition hall:** Everyone who attends the exhibition must be registered and have a badge. Badges for children are free and available onsite at the registration desk. Children under 14 years of age must be accompanied by an adult at all times. Guardians are asked to help maintain a professional, disturbance-free exhibition environment. Children under 18 are not allowed in the exhibition area during exhibition move-in and move-out.

## Identification requirement

To verify registered participants and provide a measure of security, SPIE will ask attendees to present a government-issued photo identification at registration to collect registration materials. Individuals are not allowed to pick up badges for other attendees. Further, attendees may not have some other person participate in their place at any conference-related activity. Such other individuals will be required to register on their own behalf to participate.

For online events, SPIE requires individuals to register with their legal identity.

## Laser-pointer safety policy

SPIE events are subject to the applicable laser safety rules and regulations of the host location. SPIE supplies industry standard Class 2 presentation laser pointers for all conference and other meeting rooms. For safety reasons, SPIE requests that presenters use provided laser pointers. Use of a personal laser pointer represents the user's acceptance of liability for any damage or injuries to presenter or others.

## No smoking policy

Attendees will observe all non-smoking regulations that are publicly posted by the facilities used by the event.

## Payment policy

Registrations must be fully paid before access to the conference is allowed. SPIE accepts VISA, MasterCard, American Express, Discover, Diner's Club, checks, and wire transfers. Onsite registrations can also be paid with cash.

## Recording policy

**Conferences, courses, and poster sessions:** For copyright reasons, recordings of any kind are prohibited without prior written consent of the presenter or instructor. Attendees may not capture or use materials presented in any meeting/course room or in course notes on display without written permission. Consent forms are available at speaker check-in, SPIE registration, or from SPIE online event hosts. Individuals not complying with this policy will be asked to leave a given session and/or asked to surrender their recording media. Refusal to comply with such requests is grounds for expulsion from the event.

**Exhibition hall:** Recordings of any kind are prohibited without explicit permission from on-site company representatives. Individuals not complying with this policy will be asked to surrender their recording media and to leave the exhibition hall. Refusal to comply with such requests is grounds for expulsion from the event.

## Unauthorized solicitation

Unauthorized solicitation in the exhibition hall is prohibited. Any non-exhibiting organization observed to be distributing information or soliciting business in the aisles, or in another company's booth, will be asked to leave immediately.

## Unsecured items

Personal belongings should not be left unattended in meeting rooms or public areas. Unattended items are subject to removal by security. SPIE is not responsible for items left unattended.

## Wireless internet service

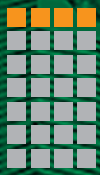
At most events, SPIE provides wireless access for attendees. Properly secure your computer before accessing the public wireless network. SPIE is not responsible for computer viruses or other kinds of computer damage.

**SPIE International Headquarters:** PO Box 10, Bellingham, WA 98227-0010 USA • Tel: +1 360 676 3290 • [help@spie.org](mailto:help@spie.org) • [www.SPIE.org](http://www.SPIE.org)

**SPIE Europe Offices:** 2 Alexandra Gate, Ffordd Pengam, Cardiff, CF24 2SA UK • Tel: +44 29 2089 4747 • [info@spieeurope.org](mailto:info@spieeurope.org) • [www.SPIE.org](http://www.SPIE.org)



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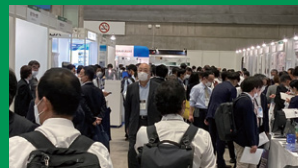
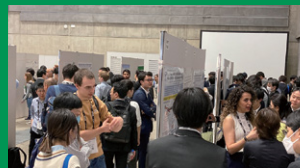
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## **SPIE.**

SPIE, the international society for optics and photonics, brings engineers, scientists, students, and business professionals together to advance light-based science and technology. The Society, founded in 1955, connects and engages with our global constituency through industry-leading conferences and exhibitions; publications of conference proceedings, books, and journals in the SPIE Digital Library; and career-building opportunities. Over the past five years, SPIE has contributed more than \$22 million to the international optics community through our advocacy and support, including scholarships, educational resources, travel grants, endowed gifts, and public-policy development.

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20-23 October 2025

**Exhibition:** 21-23 October 2025

Rochester, New York, USA

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