



# 2015 OPTICS + PHOTONICS EXHIBITION GUIDE.

---

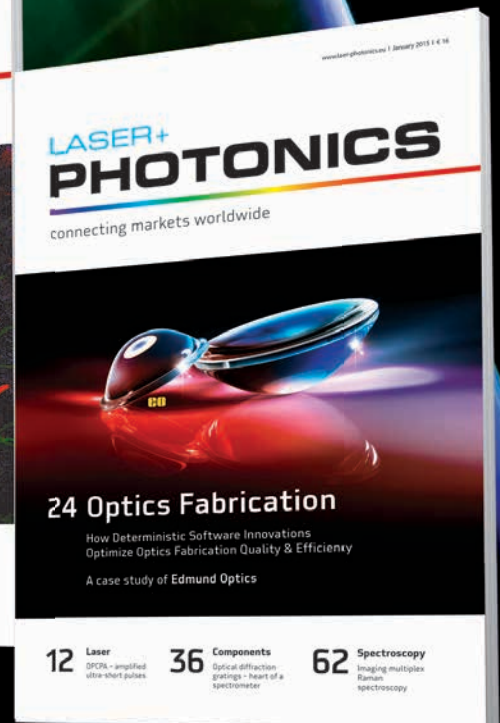
[WWW.SPIE.ORG/OP](http://WWW.SPIE.ORG/OP)

---

San Diego Convention Center  
San Diego, California, USA

Exhibition: 11-13 August 2015

# See the whole SPECTRUM of Photonik



Check out our website: [www.photonik.de](http://www.photonik.de)

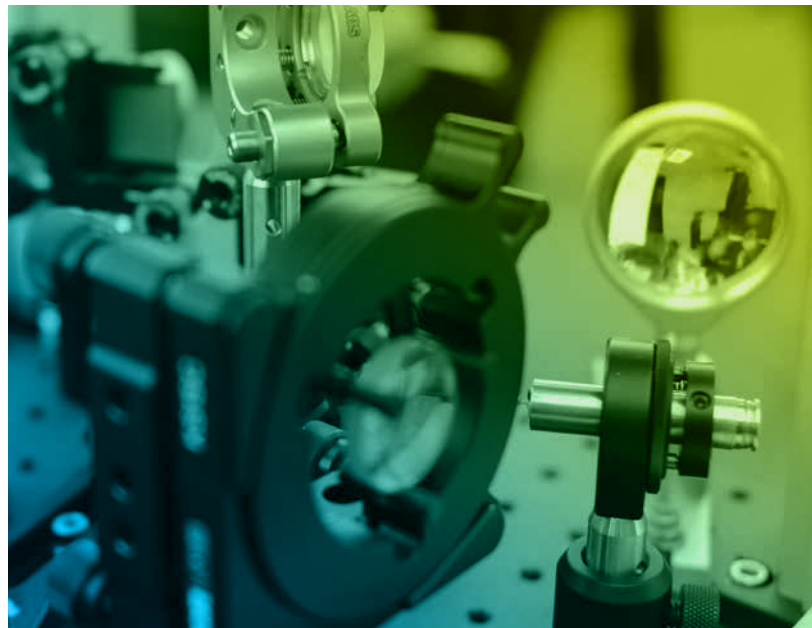
# E.

**EXHIBITION**

# SPIE. OPTICS+ PHOTONICS

Exhibition: 11-13 August 2015

San Diego Convention Center  
San Diego, California, USA



## EXHIBITION GUIDE.

Tuesday 11 August · 10:00 am to 5:00 pm  
Wednesday 12 August · 10:00 am to 5:00 pm  
Thursday 13 August · 10:00 am to 2:00 pm

### Contents

Sponsors.....	2	Product Categories .....	39-41
Exhibitor Index and Exhibition Floor Plan.....	6-7	Course Daily Schedule.....	42-47
Exhibitor Directory.....	8-33	Industry Events.....	48-49
Advertiser Index.....	33	General Information.....	51-53
Student Chapters .....	34-37	Corporate Members.....	54-56

**SPIE.** SPIE is the international society for optics and photonics, a not-for-profit organization founded in 1955 to advanced light-based technologies. The Society serves nearly 264,000 constituents from approximately 166 countries, offering conferences, continuing education, books, journals, and a digital library in support of interdisciplinary information exchange, professional growth, and patent precedent. SPIE provided over \$4 million in support of education and outreach programs in 2014.

# SPIE THANKS OUR SPONSORS

## Conference Bag Insert



Scratch Free Packaging

a division of Alliance Corporation

[www.scratchfreepackaging.com](http://www.scratchfreepackaging.com)

## Conference Bag Insert and Floor Graphics



[www.ozoptics.com](http://www.ozoptics.com) · Booth #315

## Coffee Break



[www.microsoft.com](http://www.microsoft.com)

## Exhibitor Lounge



[www.physicstoday.org](http://www.physicstoday.org) · Booth #333

## Lanyards



[www.trioptics.com](http://www.trioptics.com) · Booth #628

## Meter Board



[www.photonengr.com](http://www.photonengr.com) · Booth #313

## Onsite Directory



[www.rpo.com](http://www.rpo.com) · Booth #724

## Wi-Fi

PERKINScoie

COUNSEL TO GREAT COMPANIES

[www.perkinscoie.com](http://www.perkinscoie.com)

## Featured Exhibitors

Enable, Inc.  
imaging innovations

[www.enableimaging.com](http://www.enableimaging.com) · Booth #527



SUTTER INSTRUMENT

[www.sutter.com](http://www.sutter.com) · Booth #528

## General Sponsors

Heraeus



## PROMOTIONAL PARTNERS

AT-Fachverlag GmbH

Electro Optics Magazine

IOP Publishing

Laser Focus World

[optics.org](http://optics.org)

Photonics Media

Photonics Online

Physics Today

Society of Vacuum Coaters (SVC)

# LaserFocusWorld

[www.laserfocusworld.com](http://www.laserfocusworld.com)

Magazine

Website

e-Newsletters

Buyer's Guide

Videos

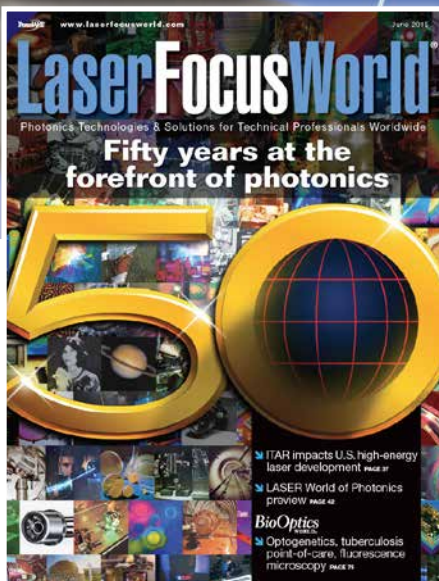
Webcasts

Technical Digests

Whitepapers

Events

Mobile App



## Photonics Technologies & Solutions for Technical Professionals Worldwide

Published since 1965, Laser Focus World has become the most trusted global resource for engineers, researchers, scientists and technical professionals by providing comprehensive coverage of photonics technologies, applications, and markets.

Laser Focus World reports on and analyzes the latest developments and significant trends in both the technology and business of photonics worldwide — and offers greater technical depth than any other publication in the field.

Subscribe Today!



[www.lfw-subscribe.com](http://www.lfw-subscribe.com)

A limited number of  
FREE subscriptions  
are available for  
SPIE O+P Attendees

Come See Us  
@ Booth # 816

PennWell®

---

**SPIE.** OPTICS+  
PHOTONICS

# JOB FAIR

*Sponsored by SPIE Career Center*

---

# GET A JOB.

Visit the Job Fair in the Exhibition Hall.

— **FREE ADMISSION** —

Tuesday 11 August · 10:00 am to 5:00 pm  
Wednesday 12 August · 10:00 am to 5:00 pm

---

See participating companies like these, and more.



**APPLE**



---

For more information visit the  
SPIE Career Center Booth #235

**SPIE.** CAREER  
CENTER

---

# physicsconnect

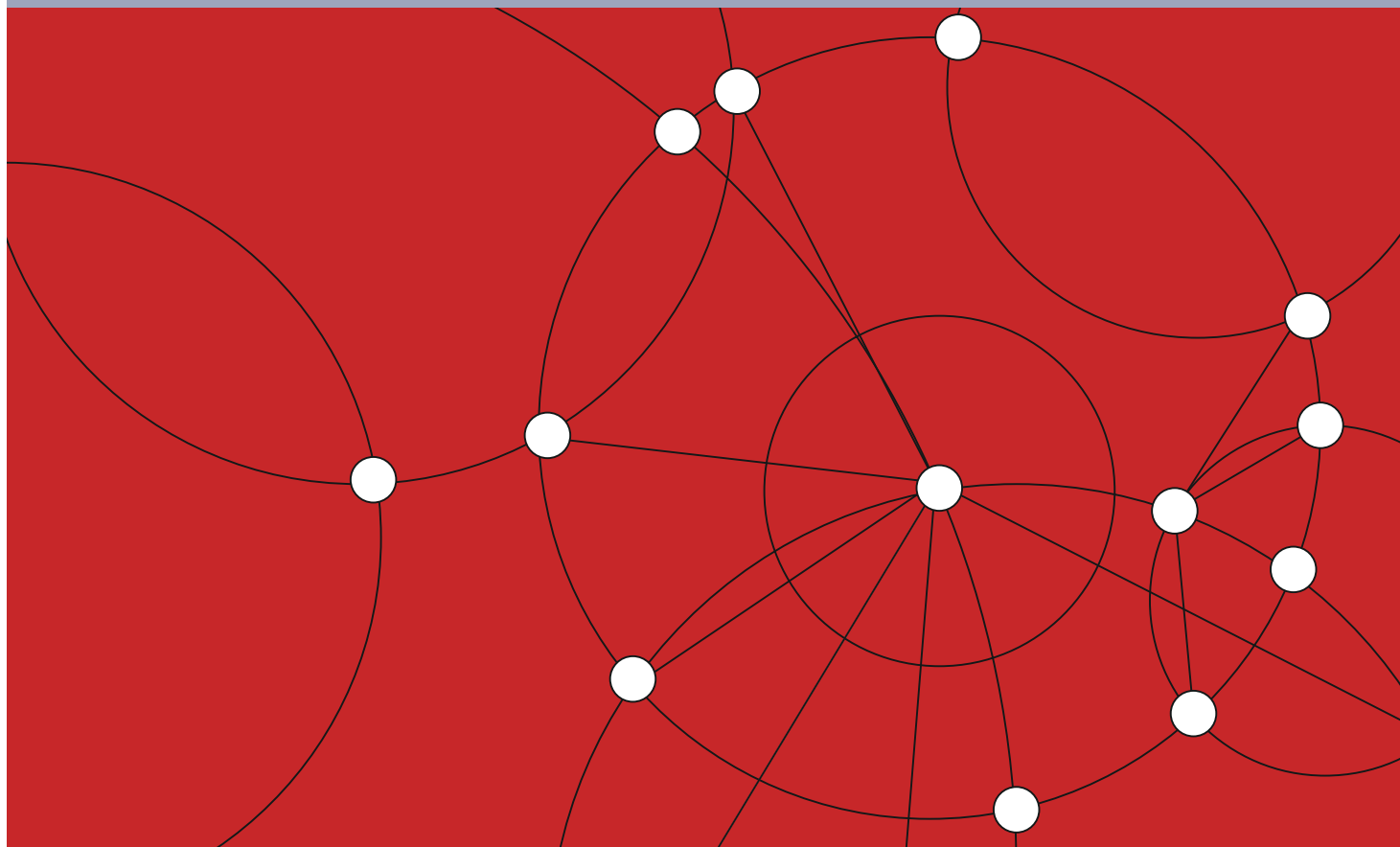
The online guide to products, services and expertise

Find optical components and measurement systems, as well as different types of lasers for a full range of research and commercial applications.

**Categories include:**

- Diode lasers
- Fibre components
- Fibre lasers
- Gas lasers
- Interferometers
- Laser control
- Laser measurement
- Optical components
- Safety eyewear
- Solid-state lasers
- Telecoms equipment

Start your search today at [connect.physicsworld.com](http://connect.physicsworld.com)

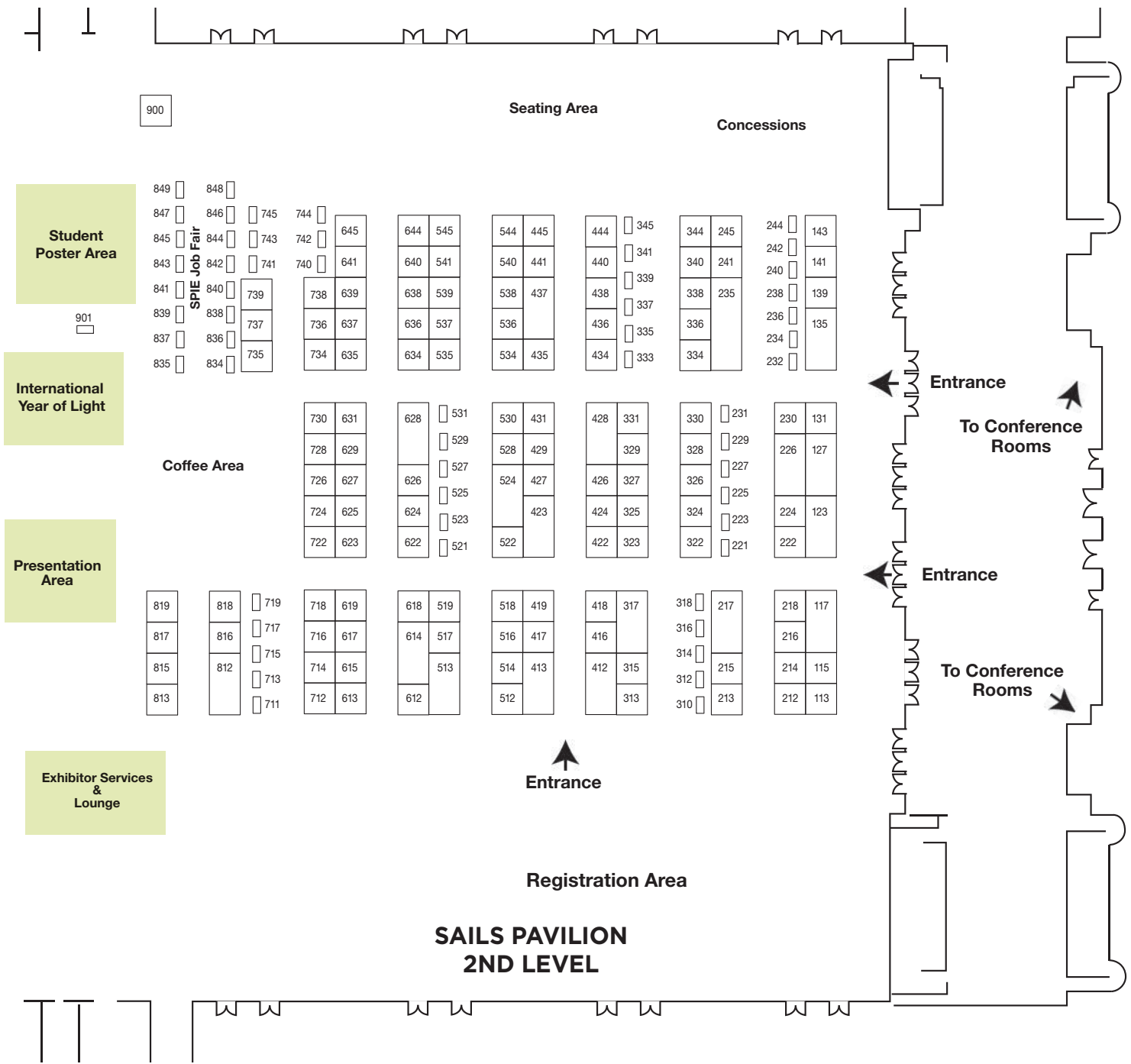


# EXHIBITOR BOOTH INDEX

113	Precision Optical	335	University of California, Irvine Extension	614	J.A. Woollam Co.
115	OptiPro Systems	336	Quartus Engineering Inc.	615	Elite Engineering
117	Synopsys, Inc.	337	Photon Design	617	PLX Inc.
123	Edmund Optics	338	INO	618	UTC Aerospace Systems - Sensors Unlimited Products
127	Photonics Spectra, a Photonics Media Publication	339	Molecular Vista, Inc.	619	OptoSigma Corporation
131	Thermo Scientific - CIDTEC	340	Fianium Inc.	622	G-S Plastic Optics
135	IDEX Optics & Photonics	341	Apre Instruments, LLC	623	Mindrum Precision, Inc.
139	Empire West Inc.	344	Spectral Instruments	624	Isuzu Glass, Inc.
141	AccuCoat Inc.	345	Dynamic Structures - Optics	625	Luxel Corp.
143	Inrad Optics	412	Newport Corporation	626	Naked Optics Corp.
212	attocube systems Inc.	413	Ocean Optics, Inc.	626	Precision Optics Gera Corp.
213	Optiforms Inc.	416	Hinds Instruments, Inc.	627	Vital Materials Co., Limited
214	Harris	417	Micro Laser Systems, Inc.	628	TRIOPTICS GmbH
215	Lake Shore Cryotronics, Inc.	418	Ohara Corporation	629	Natsume Optical Corporation
216	Sydor Optics, Inc.	419	ESDI	631	Precision Asphere, Inc.
217	Jenoptik Optical Systems, LLC	422	StellarNet, Inc.	634	PerkinElmer
218	Agilent Technologies	423	Zemax, LLC	635	Navitar
221	Epner Technology Inc.	424	Piezosystem Jena	635	Special Optics, A Navitar Company
222	Andover Corporation	426	Diverse Optics Inc.	636	University of Southern California Viterbi School of Engineering
223	Photonics Online	427	JML Optical Industries, LLC	638	Surface Optics Corporation
224	Energetiq Technology, Inc.	428	Thorlabs	639	Qubitekk, Inc.
225	Hofstadter Analytical Services, LLC	429	asphericon Inc.	644	Labsphere, Inc.
226	Syntec Optics	431	Heraeus Quartz America LLC	645	AIST-NT Inc.
227	OPTIDA	434	Hellma USA	711	PHASICS Corp.
229	Vincent Associates	435	4D Technology	712	Princeton Instruments
230	Lambda Research Corporation	436	AIP Publishing	713	Imperial College London
231	GPD Optoelectronics Corp.	437	MOXTEK, Inc.	714	Fiberguide Industries
232	Kaufman & Robinson	438	Quantum Design	715	AT-Fachverlag GmbH
234	Pure Photonics LLC	440	CeramOptec GmbH	716	NKT Photonics Inc.
235	optics.org	441	EPIR Technologies, Inc.	717	DataRay Inc.
235	SPIE Career Center	444	Chroma Technology	718	Photonic Cleaning Technologies
236	HOYA Corp. USA - Optics Division	445	Teledyne Judson Technologies	719	Electro Optics
238	LightTrans GmbH	512	CoorsTek Engineered Ceramics	722	Accumold
241	SPIE Digital Library	513	Hamamatsu Corporation	724	ASE Optics
242	Benchmark Technologies	514	Newport Thin Film Lab., Inc.	724	Rochester Precision Optics
244	EVERIX Optical Filters	516	RPMC Lasers, Inc.	726	United Lens Company, Inc.
245	Meadowlark Optics, Inc.	517	CryLight Photonics, Inc.	728	University of Arizona College of Optical Sciences
310	Avantes, Inc.	518	Xenics	730	B&W Tek, Inc.
312	Sierra Precision Optics	519	PI	734	Mad City Labs Inc.
313	Photon Engineering LLC	521	Rayleigh Optical Corp.	735	Minus K Technology Inc.
314	ADIT Electron Tubes	522	Zygo Corporation	736	SODERN
315	OZ Optics Ltd.	523	Applied Surface Technologies	737	Raytheon ELCAN Optical Technologies
316	Z & Z Optoelectronics Tech. Co., Ltd.	524	SCHOTT North America, Inc.	738	Ferrotec (USA) Corp.
317	Optikos Corporation	525	MaxEmil Photonics Corporation	740	Ruda-Cardinal, Inc.
318	Spectrogon US, Inc.	527	Enable Inc.	741	Ontar Corporation
322	Fotofab	528	Sutter Instrument Corp.	742	Davidson Optronics
323	CRC Press/Taylor & Francis Group	529	Lincoln Laser Co.	744	Imaging Solutions Group
324	TDK-Lambda Americas-High Power Div.	530	Tec 5 USA	745	Society of Vacuum Coaters
325	National Instrument Technology Research Center	531	AdIOptica Optical Systems GmbH	812	HIWIN Corp.
326	FIFO Optics Co., Ltd.	534	Optimax	813	Advanced Abrasives Corporation
327	Osela Inc.	535	Zurich Instruments AG	815	Tecnisco Ltd.
328	Siskiyou Corporation	536	Optical Support, Inc.	816	Pennwell/Laser Focus World
329	Gamma Scientific	537	FISBA AG	817	National Reconnaissance Office
330	Laser Quantum Inc.	538	NiPro Optics, Inc.	818	Precision Glass & Optics
331	nPoint, Inc.	539	IOP Publishing	819	FJW Optical Systems, Inc.
333	Physics Today	540	Canon U.S.A., Inc.	819	Midwest Optical Systems, Inc. (MidOpt)
334	Schrodinger	544	Breault Research Organization, Inc.		
		545	Abet Technologies, Inc.		
		612	Aerotech, Inc.		
		613	Fresnel Technologies Inc.		



# EXHIBITION FLOORPLAN



## PRODUCT DEMO

Thursday, 13 August, 2015 - Presentation Area

11:30:

### The new PLX Act-25, all in one Electronic Autocollimator and Telescope

*Presenter:* Itai Vishnia, PLX Inc.

Description: A unique, high-accuracy measurement instrument capable of resolution down to fractions of an arc-second. Applications include machinery alignment, optical testing and Boresighting.



# E.

## EXHIBITION



### HOW TO USE THIS GUIDE

SPIE Optics + Photonics exhibitors are listed in alphabetical order with details about products or services each is exhibiting. Companies are additionally cross indexed by technology areas in the Product Category Index on pages 39-41, to allow you to quickly shop for products for your engineering and business needs.

Booth numbers are provided in the Exhibition Guide, and may be cross-referenced with the floor plan on page 7. The address of each exhibitor is also listed, making this Exhibition Guide an excellent reference tool.

### EXHIBITION HOURS

Tuesday 11 August · 10:00 am to 5:00 pm  
Wednesday 12 August · 10:00 am to 5:00 pm  
Thursday 13 August · 10:00 am to 2:00 pm

San Diego Convention Center, Sails Pavilion, 2nd Level  
San Diego, California, USA



### 4D Technology

#435

SPIE Corporate Member

3280 E Hemisphere Loop Ste 146, Tucson, AZ, 85706-5024 (USA)  
+1 520 294 5600; fax +1 520 294 5601  
info@4dtechnology.com; www.4dtechnology.com

**Featured Product: AccuFiz Interferometer with Surface Isolation Source for measuring, plane parallel optics and more**

4D Technology designs and manufactures dynamic laser interferometers, optical profilers and polarization cameras for non-contact metrology of optical quality surfaces, even in the presence of vibration and turbulence. 4D systems provide high resolution acquisition of phase data in as little as 1 microsecond, at wavelengths from DUV through NIR. Applications include astronomy, aerospace, general optics, flexible electronics, displays and more. Contact: Jack Latchinian, West Coast Regional Manager, jack.latchinian@4dtechnology.com; Stephen Martinek, Director of Sales and Marketing, steve.martinek@4dtechnology.com

### Abet Technologies, Inc.

#545

SPIE Corporate Member

168 Old Gate Ln, Milford, CT, 06460 (USA)  
+1 203 540 9990; fax +1 203 301 0059  
sales@abet-technologies.com; www.abet-technologies.com

**Featured Product: AB6000 QE Measurement System**

Abet Technologies manufactures a broad range of standard and custom solar cell PV-IV test and measurement systems LED powered QE measurement systems. These systems include ASTM and IEC compliant steady state solar simulators with illuminated fields from 35 mm to 400 mm, vacuum chuck temperature controlled test stations, comprehensive software, calibrated reference cells and a range of electronic loads for low and high current cells Contact: Allen Smith, President, asmith@abet-technologies.com

## AccuCoat Inc.

#141

111 Humboldt St Ste 8, Rochester, NY, 14609 (USA)  
+1 585 288 2330; fax +1 585 288 2331  
alan@accucoatinc.com; www.accucoatinc.com

AccuCoat Inc. is a supplier of thin film coatings on plastic, metal, glass and a variety of other components. Producing a wide variety of antireflective, beamsplitter, hot and cold mirror, ITO, filter and metallic coatings as well as custom coatings to meet your dynamic applications. Experienced in handling prototype thru OEM volumes. Coatings available from the UV to the NIR. Over 60 years combined engineering experience can provide custom designed solutions. Contact: Alan Parsons, Sales Manager, alan@accucoatinc.com

## Accumold

#722

1711 SE Oralabor Rd, Ankeny, IA, 50021 (USA)  
+1 515 964 5741  
micromolding@accu-mold.com; www.accu-mold.com

### Featured Product: Micro Molding Services: Micro Optics, Medical or Micro Electronic Applications

Accumold® is a high-tech manufacturer of precision micro, small and lead frame injection molded plastic components. Utilizing processes developed from our Micro-Mold® technology, we design, build and produce unique molds and parts efficiently for markets that include Micro Electronics, Medical, Micro Optics, Automotive, and Military Applications. Contact: Aaron Johnson, VP Marketing, ajohnson@accu-mold.com; Rick Brown, Sr. Sales Engineer - Optics, rbrown@accu-mold.com

## ADIT Electron Tubes

#314

300 Crane St, Sweetwater, TX, 79556-0870 (USA)  
+1 325 235 1418; fax +1 325 235 2872  
sales@electrontubes.com; www.electrontubes.com

### Featured Product: New photodetector modules and assemblies featuring pm tube, power supply and digital electronics.

ADIT Electron Tubes designs and manufactures photomultiplier tubes, housings, voltage dividers and signal processing modules in Texas and the UK. Photomultipliers are available in diameters from 1/2" to 11". Special tubes are available for use at cryogenic temperatures and with ultra low radioactivity glass for HEP and cosmic ray physics experiments. Ruggedized tubes are available for oil well logging and space flight applications. New high QE tubes are now available in various diameters. Contact: Paul Davison, Sales Manager, paul@electrontubes.com; Thushari Gomes, Electronics Applications Manager, tgomes@et-enterprises.com

## AdlOptica Optical Systems GmbH

#531

**SPIE** Corporate Member

Rudower Chaussee 29, Berlin, 12489 Germany  
+49 30 565908880  
info@adloptica.com; www.pishaper.com

### Featured Product: Collimating beam shaper piShaper® for fiber and fiber-coupled lasers

AdlOptica works in field of Laser Beam Shaping Optics transforming Gaussian to flattop beams and finding numerous industrial and scientific applications. Multi year developments are realized in family of piShaper systems, > 50 models: almost 100% efficiency, spectrum from UV to IR, power from mW to kW, CW or pulse lasers, achromatic design, variety of flattop spot sizes, low sensitivity to misalignment. AdlOptica is locating in Adlershof, Berlin, Germany's leading science and technology park.

## Advanced Abrasives Corporation

#813

**SPIE** Corporate Member

7980 National Hwy, Pennsauken, NJ, 08110 (USA)  
+1 856 665 9300; fax +1 856 488 1815  
www.advancedabrasives.com

## Aerotech, Inc.

#612

**SPIE** Corporate Member

101 Zeta Dr, Pittsburgh, PA, 15238-2811 (USA)  
+1 412 963 7470; fax +1 412 963 7459  
sales@aerotech.com; www.aerotech.com

Aerotech manufactures automated alignment, positioning, and motion control systems and components. Our products include optical mounts and gimbals; complete lines of single- and multi-axis direct-drive and piezo nanopositioners; gantry systems; goniometers; galvanometers; air-bearing and mechanical-bearing linear and rotary stages; lift stages; a full line of single- and multi-axis motion controllers; PWM and linear drives; linear and rotary brushless motors; and custom motion systems. Contact: Tom Markel, Applications Manager, tmarkel@aerotech.com

## Agilent Technologies

#218

**SPIE** Corporate Member

2850 Centerville Rd, Wilmington, DE, 19808-1610 (USA)  
+1 800 227 9770  
www.agilent.com

Agilent manufactures and distributes a complete line of instrumentation serving the clinical, analytical, biotech, environmental, pharmaceutical, forensic science, food and flavor, academia, and all other laboratory markets that have needs for the best in quality, performance, and serviceability in the instruments they purchase.

## AIP Publishing

#436

1305 Walt Whitman Rd Ste 300, Publishing Ctr, Melville, NY, 11747 (USA)

+1 516 576 2200  
journals@aip.org; www.journals.aip.org

AIP Publishing LLC is a scholarly publisher in the physical and related sciences, providing the global science community with a comprehensive collection of highly cited peer reviewed scientific information. Accessed by researchers at nearly 4,000 institutions worldwide, AIP Publishing's portfolio of 18 journals includes prestigious titles such as Applied Physics Letters, Journal of Applied Physics and The Journal of Chemical Physics, and the AIP Conference Proceedings. <http://journals.aip.org> Contact: Benedetta Camarota, Journal Manager, bcamarota@aip.org; Arlene Gonzalez, Sales Support Manager, agonzalez@aip.org

## AIST-NT Inc.

#645

359 Bel Marin Keys Blvd Ste 20, Novato, CA, 94949 (USA)  
+1 415 884 9500; fax +1 415 884 9500  
info@aist-nt.com; www.aist-nt.com/

# EXHIBITOR DIRECTORY

## Andover Corporation

#222

**SPIE** Corporate Member

4 Commercial Dr, Salem, NH, 03079-2800 (USA)  
+1 603 893 6888; fax +1 603 893 6508  
info@andcorp.com; www.andcorp.com

Andover Corporation manufactures high-quality optical filters and coatings from 193nm-14µm, in sizes up to 300mm on a wide variety of substrate materials. Coating technologies include magnetron sputtering, ion-assisted electron beam deposition and thermal evaporation. In-house engineering assistance is available to ensure the success of your project. Over 1,500 in-stock products and a large selection of surplus filters available. AS9100 Certified. Contact: Rob Pursel, Senior Optical Coating Engineer, rpursel@andovercorp.com; Phil Clark, Technical Sales, pclark@andovercorp.com

## Applied Surface Technologies

#523

**SPIE** Corporate Member

15 Hawthorne Dr, New Providence, NJ, 07974 (USA)  
+1 908 464 6675  
co2clean@co2clean.com; www.co2clean.com

### Featured Product: CO<sub>2</sub> Snow Jet for Optics and Telescopes

We demonstrate precision cleaning using a CO<sub>2</sub> Snow Jet, a quick and safe process. CO<sub>2</sub> snow cleaning is a simple process for removing particles of all sizes, (visible to below 0.01 micron), and hydrocarbons, even solvent stains and water spots. CO<sub>2</sub> Snow cleans substrates, optics, diamond turned optics, fiber-optics, wafers, AFM samples, mirrors, telescopes, including our unique 2" slot telescope unit, and many other applications. We show manual and semiautomated units for R&D & manufacturing. Contact: Robert Sherman, RobertS@co2clean.com

## Apre Instruments, LLC

#341

**SPIE** Corporate Member

3123 W Morgan Rd, Tucson, AZ, 85745 (USA)  
+1 860 398 5764; fax +1 860 347 6407  
inquire@apre-inst.com; www.apre-inst.com

### Featured Product: REVEAL Interferometer Software for Upgrades and OEM application

Apre Instruments upgrade interferometers, designs and develops OEM interferometer software and provides custom interferometer design and development services. Contact: Robert Smythe, President, rsmythe@apre-inst.com; Artur Olszak, VP Engineering, aolszak@apre-inst.com

## ASE Optics

#724

**SPIE** Corporate Member

850 John St, West Henrietta, NY, 14586 (USA)  
+1 585 303 1574; fax +1 585 292 5459  
sales@aseoptics.com; www.aseoptics.com

### Featured Product: ASE Optics: Design & Engineering Services

ASE Optics was founded in 1994 providing optical engineering support for companies who can't find, can't afford, or can't justify having an optical engineer on staff. They have provided optical engineering services to over 200 different clients, ranging from government agencies to Fortune 500 companies. Their focus is on innovative, cost-effective designs and they enjoy solving problems with creativity and collaboration. Contact: Rosalie Clemens, Director of Business Development, rclemens@rpoptics.com; Matthew Pembroke, Director of Sales, mpembroke@rpoptics.com

## asphericon Inc.

#429

**SPIE** Corporate Member

411 North Main St., Suite 2-A, Gainesville, FL, 32601 (USA)  
+1 941 564 0890  
sales@aspericon.com; www.asphericon.com

### Featured Product: aspheric components, optical design, optical coating, optical systems

As an independent specialist, asphericon is among the technological leaders in asphere manufacture. The basis for manufacture is a patented technology to control CNC grinding and polishing machines. Small runs right through to large series can be manufactured with high precision. asphericon assists its customers from the initial optic design, via manufacturing, coating, full-surface interferometric measuring, through to the assembly of optical modules and their optical characterization. Contact: Sabrina Matthias, President, s.matthias@asphericon.com; Steffen Schneider, Vice President, s.schneider@asphericon.com

### Promotional Partner

## AT-Fachverlag GmbH

#715

Wilhelm-Pfitzer-Straße 28, Fellbach, 70736 Germany  
+49 711 95 29 51 0; fax +49 711 95 29 51 99  
at@at-fachverlag.de; www.photonik.de

## attocube systems Inc.

#212

**SPIE** Corporate Member

2020 Stuart St, Berkeley, CA, 94703 (USA)  
+1 510 649 9245  
info@attocube.com; www.attocube.com

attocube offers highest precision piezo positioning systems and multi-axes interferometric displacement sensors. The recently introduced hexaCUBE is a sophisticated 6D multi-axes motion solution based on piezo stage technology with an innovative design of high precision ball joints combined with linear bearings. The extremely stiff design, its large travel ranges, highest accuracy and nanometer repeatability make it one of the most precise multi-axes motion systems available on the market.

## Avantes, Inc.

#310

**SPIE** Corporate Member

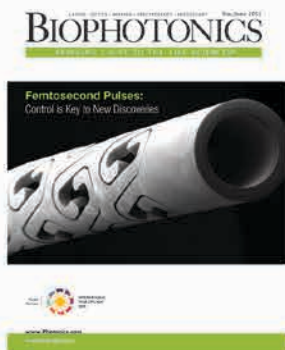
9769 W 119th Dr Ste 4, Broomfield, CO, 80021 (USA)  
+1 303 410 8668; fax +1 303 410 8669  
infousa@avantes.com; www.avantes.com

### Featured Product: We are taking the next step to EVolutionary spectroscopy! EVO Series launches!

Avantes is a leader in field of fiber optic spectroscopy offering a range of spectrometers, light sources, and fiber optics to support measurements in the range from 190-2500 nm. With an installed base of over 10,000 systems throughout the world and 20 years of experience in fiber optic spectroscopy, Avantes is equipped to meet the challenges presented by applications facing our customers. Avantes instruments and system configurations support fluorescence, UV/VIS absorbance, and many more. Contact: Greg Neece, President, gregn@avantes.com; Daren Ford, Application Sales Engineer, darenf@avantes.com

Read  
the industry's  
**LEADING** magazines

Because staying informed has never been so critical.



Photonics news from *your* industry  
and *your* part of the world.

To subscribe, visit: [photonics.com/subscribe](http://photonics.com/subscribe).

**Available in print and digital formats.**

To contribute to Photonics Media publications submit a 100-word abstract to [editorial@photonics.com](mailto:editorial@photonics.com) for consideration.

**PHOTONICS**  **MEDIA**  
THE PULSE OF THE INDUSTRY

# EXHIBITOR DIRECTORY

## B&W Tek, Inc.

**SPIE** Corporate Member

19 Shea Way, Newark, DE, 19713-3452 (USA)  
+1 302 368 7824; fax +1 302 368 7830  
marketing@bwtek.com; www.bwtek.com

### **Featured Product: Exemplar Plus LS utilizes an aberration corrected concave holographic grating to minimize straylight**

B&W Tek is an advanced instrumentation company producing optical spectroscopy, laser instrumentation and laboratory, portable and handheld Raman systems. B&W Tek provides solutions for the pharmaceutical, biomedical, physical, chemical, and research communities. Our commitment to innovative solutions has made B&W Tek a leader in Raman spectroscopy solutions worldwide. With a strong vertical integration capability, B&W Tek also provides custom product development, design and manufacturing. Contact: Sam Panariello, Application Sales Specialist, samp@bwtek.com; Parag Borgaonkar, Application Sales Manager, paragb@bwtek.com

## Benchmark Technologies

7 Kimball Ln, Lynnfield, MA, 01940-2654 (USA)

+1 781 246 3303; fax +1 781 246 0308

contact@benchmarktech.com; www.benchmarktech.com

### **Featured Product: Grayscale mask design and fabrication services. Imprint stamps for replication processes**

Benchmark is a leading provider of custom fabrication services utilizing micro and nanoscale lithography and advanced etching. Benchmark can provide micro- and nano structures for photonic and bio applications on a variety of substrates. The company also provides mask design and fabrication services, standard and custom lithography test masks, and imprint molds. Benchmark also offers grayscale mask design and fabrication services for customers wishing to implement grayscale lithography. Contact: Andrew Zanzal, Vice President of Sales, azanzal@benchmarktech.com; Patrick Reynolds, President, preynolds@benchmarktech.com

## Breault Research Organization, Inc.

**SPIE** Corporate Member

6400 E Grant Rd Ste 350, Tucson, AZ, 85715-3823 (USA)  
+1 800 882 5085; fax +1 520 721 9630  
sales@breault.com; www.breault.com

### **Featured Product: ASAP and APEX Optical System Design Software**

BRO is an optical engineering firm of global reach and reputation. BRO's APEX, ASAP, and ReflectorCAD optical software products help engineers turn creative visions into working prototypes, and BRO's own engineers work on state-of-the-art projects for enterprise companies, research institutions, and top government labs. In 30+ years of innovation, BRO has contributed to the success of engineering projects for thousands of clients. Contact: Robert Shroder, Technical Director of Sales and Marketing, rshroder@breault.com; Mary Turner, Director of Training, mturner@breault.com

## Canon U.S.A., Inc.

**SPIE** Corporate Member

One Canon Park, Melville, NY, 11747 United States  
+1 516 330 5000; fax +1 516 328 4639  
pr@cusa.canon.com; www.usa.canon.com

Contact: Noelyn Rodney

#730

## CeramOptec GmbH

Bruehler Str 30, Bonn, 53121 Germany  
+49 228 979 670; fax +49 228 979 6799  
sales@ceramoptec.de; www.ceramoptec.de

#440

## Chroma Technology

**SPIE** Corporate Member

10 Imtec Ln, Bellows Falls, VT, 05101 (USA)  
+1 800 824 7662; fax +1 802 428 2525  
sales@chroma.com; www.chroma.com

Precision optical filters and coatings designed/manufactured for a broad range of applications including fluorescence microscopy, forensics, material analysis, laser-based imaging, astronomy, absorption spectroscopy. Bandpass and edge filters, laser rejection filters, neutral density filters, polychroic beamsplitters and custom coatings for UV, visible and near-IR portions of the spectrum. Multiple coating methods offer flexibility in designs and turnaround for prototyping. (800) 824-7662 Contact: Kate Guerrina, Brand & Advertising Manager, kguerrina@chroma.com

#444

## CoorsTek Engineered Ceramics

555 NE 53rd Ave, Hillsboro, OR, 97124 (USA)

+1 503 648 3183; fax +1 503 648 1501

optical@coorstek.com; www.coorstek.com

### **Featured Product: Silicon Carbide Optical Mirror and Components**

With operations in 14 countries across four continents, CoorsTek is the world's manufacturer of engineered ceramics. CoorsTek offers vertically-integrated manufacturing, including advanced forming, sintering, grinding, lapping, and precision metrology. With vast manufacturing capacity and materials expertise, CoorsTek produces large monolithic components, lightweight structures, and large complex joined assemblies. To learn more about our optical component offerings, visit www.CoorsTek.com. Contact: Janet Kolen, Account Manager, jkolen@coorstek.com

#512

## CRC Press/Taylor & Francis Group

6000 Broken Sound Pkwy NW Ste 300, Boca Raton, FL, 33487-2713 (USA)

+1 561 998 2507; fax +1 561 998 2559

orders@taylorandfrancis.com; www.crcpress.com

CRC Press - Taylor & Francis is a premier publisher in optical sciences and engineering textbooks, professional manuals, reference works, journals, and electronic databases. Please visit our booth to review our new and bestselling publications including new editions of: Opto-Mechanical Systems Design, 4th Edition, Two Volume Set; and Biomedical Photonics Handbook, 3 Volume Set, 2nd edition. Receive a 20 -50% discount and pick up complimentary journals copies. Talk to us about being an author!

#323

## CryLight Photonics, Inc.

#517

**SPIE** Corporate Member

No 5 Dongling Rd, Jinshan Fuwan Industrial Park, Fuzhou Fujian, 350026 China

+86 591 83772101; fax +86 591 83772103

sales@crylight.com; www.crylight.com

### Featured Product: Precision optical components, crystals and optical assemblies

CryLight has produced a full series of optical components, beside of optical glass materials, we also use CaF<sub>2</sub>, MgF<sub>2</sub>, BaF<sub>2</sub>, Ge, ZnSe, Si, ZnSe, sapphire etc. crystal materials to produce lenses, prisms mirrors, windows etc.. In addition, we provide cylinder, waveplates, polariser, beamsplitters, light guide, lens assembly and crystals like LBO, BBO, KTP, LiNbO<sub>3</sub>, Nd:YVO<sub>4</sub> and Nd:YAG etc. All products correspond to ISO9001:2008 Management system. Contact: Gary Zhang, President, gary@crylight.com; Zero Huang, General Manager, zero@crylight.com

## DataRay Inc.

#717

**SPIE** Corporate Member

14505 Seaman Gulch Rd, Bella Vista, CA, 96008-9801 (USA)

+1 530 472 1716; fax +1 530 255 9062

sales@dataray.com; www.dataray.com

### Featured Product: WinCamD-LCM New 1" optical format CMOS camera. 2500:1 SNR, USB3.0 speeds, 4.2 MPixel, 5.5 um pixels

DataRay is in the business of developing standard and custom laser beam characterization solutions that exceed customer expectations. We can measure lasers with wavelengths from 1 nm to 16 um. We offer a variety of camera and scanning slit devices and the expertise to advise customers on which offers the best results for a given application. Our unique, patented BeamMap2 allows real-time M2 measurement, focus finding, and x-y profile measurements. Contact: John Wilson, VP of Sales, jwilson@dataray.com

## Davidson Optronics Inc.

#742

2223 W San Bernardino Rd, West Covina, CA, 91790-1008 United States

+1 626 962 5181; fax +1 626 962 5188

sales@davidsonoptronics.com; www.davidsonoptronics.com

## Diverse Optics Inc.

#426

**SPIE** Corporate Member

10310 Regis Ct, Rancho Cucamonga, CA, 91730 (USA)

+1 909 593 9330; fax +1 909 596 1452

info@diverseoptics.com; www.diverseoptics.com

Diverse Optics manufactures custom precision polymer optic components and assemblies. Core processes include injection molding, single point diamond turning (SPDT), opto-mechanical design, metrology, assembly, bonding, and thin-film coating. Transform your optical system from expensive, heavy, and complicated to commercially viable, light weight, and wonderfully simple. Contact: Erik Fleming, President/CEO, erik.fleming@diverseoptics.com; Letty Trevino, Sales Engineer, letty.trevino@diverseoptics.com

## Dynamic Structures - Optics

#345

**SPIE** Corporate Member

1515 Kingsway Ave, Port Coquitlam, BC, V3C 1S2 Canada

+1 604 813 5794; fax +1 604 294 4550

p.wangsness@outlook.com; www.dynamicstructures-optics.webs.com

### Featured Product: Lightweight glass mirrors to complete observatories

Designs and manufactures economical lightweight glass (primarily borosilicate) mirror substrates from 20mm to >2,400mm+ in diameter. Unusual shapes and dimensions are possible. Low mass and high stiffness complement, low inertia and rapid thermalization. Quantities range from single prototype to OEM. Areal densities as low as 8kg/m<sup>2</sup> have been fabricated. Complete systems available. Optical Telescopes, Lidar systems, scanners, active primary and secondary optics and airborne optical systems. Contact: Peter Wangsness, Astronomy Technologist, p.wangsness@outlook.com; Timothy Lee, MechTech Engineer, timothy.lee@empireds.com

## Edmund Optics

#123

**SPIE** Corporate Member

101 E Gloucester Pike, Barrington, NJ, 08007-1380 (USA)

+1 856 547 3488; fax +1 856 573 6272

sales@edmundoptics.com; www.edmundoptics.com

### Featured Product: TECHSPEC Imaging Filters are designed for the most demanding machine vision and imaging applications

Edmund Optics® (EO) is a leading producer of optics, imaging, and photonics technology for R&D, electronics, semiconductor, pharmaceutical, biomedical, and military markets around the globe. EO is the world's largest supplier of off-the-shelf optical components. Customers can purchase items by contacting EO at 1-800-363-1992, via the catalog, or via the website at www.edmundoptics.com Contact: Birgit Heinz, Global Director of Tradeshow, bheinz@edmundoptics.com

### Promotional Partner

## Electro Optics

#719

9 Clifton Ct, Cambridge, CB1 7BN United Kingdom

+44 1223 211 170

sales@europascience.com; www.electrooptics.com

## Elite Engineering

#615

**SPIE** Corporate Member

1270 Avenida Acaso Ste A, Camarillo, CA, 93012 (USA)

+1 805 338 7249

e-info@eliteeng.com; www.eliteeng.com

### Featured Product: Gain Real time auto focus control with Elite's line of Position Sensitive Detector (PSD) Modules.

Elite Engineering Corp is a consulting engineering company offering multi-disciplined full turn key product development, design, prototyping and low volume manufacturing. We specialize in custom instrumentation, automation and test equipment of Electro-optic systems. We offer a line of standard modules for OEM or new development applications such as Filter Wheels, PSD Controllers, Electrophoresis (SMU), TE cooler Driver, motor drivers to name a few. These enable us to quickly prototype systems. Contact: Pat Kay, Mkt, e-info@eliteeng.com

# EXHIBITOR DIRECTORY

## Empire West Inc.

#139

**SPIE** Corporate Member

PO Box 511, Graton, CA, 95444 (USA)

+1 707 823 1190; fax +1 707 823 8531

info@empirewest.com; www.opticspackaging.com

### Featured Product: PET-G Optics Packaging

Empire West designs and manufactures thermoformed PET-G optics packaging containers for the full range of today's optical lenses, filters, and mirrors. Our Safe-Guard line of unique, slip-fit, low outgassing optics containers are the industry standard for value and performance. Designed to contact optics on only the bevels, these versatile containers eliminate the need for lens paper and foam liners, and greatly reduce the opportunity for handling-generated surface degradation. Contact: Liz Faolain, info@empirewest.com

### Featured Exhibitor

## Enable Inc.

#527

610 Price Ave, Redwood City, CA, 94063-1413 (USA)

+1 650 363 1302; fax +1 650 395 6069

sales@enableimaging.com; www.enableimaging.com

## Energetiq Technology, Inc.

#224

**SPIE** Corporate Member

7 Constitution Way, Woburn, MA, 01801-1024 (USA)

+1 781 939 0763; fax +1 781 939 0769

info@energetiq.com; www.energetiq.com

### Featured Product: Laser-Driven Light Source

Energetiq Technology is the world's leading developer and manufacturer of ultra-bright broadband light sources for a wide variety of advanced applications in life and materials sciences, semiconductor manufacturing, and R&D. Energetiq's Laser-Driven Light Sources (LDLS™) are based on a revolutionary technology that generates high brightness across the spectrum, with high reliability and long life. Contact: Megan Echhoff, European Sales Manager, mechhoff@energetiq.com

## EPIR Technologies, Inc.

#441

**SPIE** Corporate Member

590 Territorial Dr Ste B, Bolingbrook, IL, 60440-4881 (USA)

+1 630 771 0203; fax +1 630 771 0204

jziesenhene@epir.com; www.epir.com

Contact: Jenna Ziesenhene

## Epner Technology Inc.

#221

**SPIE** Corporate Member

78 Kingsland Ave, Brooklyn, NY, 11222-5603 (USA)

+1 718 782 5948

info@epner.com; www.epner.com

## ESDI

#419

**SPIE** Corporate Member

150 N Tucson Blvd, Tucson, AZ, 85716-4740 (USA)

+1 520 296 3068; fax +1 520 296 2897

sales@esdimetrology.com; www.esdimetrology.com

## EVERIX OPTICAL FILTERS

#244

**SPIE** Corporate Member

2372 N Forsyth Rd, Orlando, FL, 32807 (USA)

+1 407 637 2987

info@everix.co; www.everix.co

Contact: Hooman Banaei, Founder/CEO, hooman@everix.co; Rachel Palenik, Business Development Assistant, rachel.palenik@everix.co

## Ferrotec (USA) Corp.

#738

3945 Freedom Cir Ste 450, Santa Clara, CA, 95054 (USA)

+1 408 964 7761; fax +1 408 964 7700

info@ferrotec.com; www.ferrotec.com

## Fianium Inc.

#340

**SPIE** Corporate Member

858 W Park St, Eugene, OR, 97401 (USA)

+1 541 343 6767; fax +1 541 610 1825

sales@fianium.com; www.fianium.com

Contact: Renee Isley, General Manager

## Fiberguide Industries

#714

**SPIE** Corporate Member

1 Bay St, Stirling, NJ, 07980-1529 (USA)

+1 908 647 6601; fax +1 908 647 8464

info@fiberguide.com; www.fiberguide.com

## FIFO Optics Co., Ltd.

#326

No 22 Jinrong N Rd., Cangshan District, Fuzhou, Fujian, 350000 China

+86 591 837 40386; fax +86 591 863 98642

sales8@fifooptics.com; www.fifooptics.com

## FISBA AG

#537

**SPIE** Corporate Member

Rorschacher Str 268, St. Gallen, 9016 Switzerland

+41 71 282 3131; fax +41 71 282 3130

info@fisba.com; www.fisba.com

### Featured Product: RGBeam™ with single-mode optical fiber, FAC/SAC, IR lenses and microlenses

FISBA is a world leader in customized optical components, systems and microsystems. The company is global market leader in the field of FAC for diode lasers and offers solutions also for specific applications. FISBA designs and manufactures products for medical applications and biophotonics as well as the machine, industrial image processing, sensor and laser industries. 350 highly qualified employees work at facilities in St. Gall Switzerland, Berlin Germany and Tucson USA. Contact: Birgit Rauch, Head of Marketing Communication, birgit.rauch@fisba.com; Dzelal Kura, Sales Director North America + Asia, dzelal.kura@fisba.com



## FJW Optical Systems, Inc.

#819

**SPIE** Corporate Member

322 N Woodwork Ln, Palatine, IL, 60067-4933 (USA)  
+1 847 358 2500; fax +1 847 358 2533  
irsales@findrscope.com; www.findrscope.com

**Featured Product: New Intensified UV Scope effective for seeing coronal discharges, forensics applications, etc.**

Hand-held viewers convert near-infrared and UV light to visible. FJW is world-leading manufacturer of Find-R-Scope® Infrared Viewers, UV Viewers, Infrared Cameras & Thermal Imagers. IR Viewers sensitive from 350-1550nm, UV Viewer 180-1550nm, Near-IR Cameras from 400-2200nm & Thermal Viewers 8-14 microns. Great for aligning/profiling laser systems, inspecting IR diodes, research, biotech, forensics & document analysis. Optional lenses, std. & custom filters, CCD camera, mtg. accessories, etc. Contact: Barry Durr, General Manager, bdurr@findrscope.com; Mary Scarlata, Inside Sales/Customer Support, irsales@findrscope.com

## Fotofab

#322

**SPIE** Corporate Member

3758 W Belmont Ave, Chicago, IL, 60618-5292 (USA)  
+1 773 463 6211  
sales@fotofab.com; www.fotofab.com

## Fresnel Technologies Inc.

#613

**SPIE** Corporate Member

101 W Morningside Dr, Ft Worth, TX, 76110-2708 (USA)  
+1 817 926 7474; fax +1 817 926 7146  
sales@fresneltech.com; www.fresneltech.com

Fresnel Technologies, Inc. manufactures molded plastics Fresnel lenses and related optical components, as well as infrared-transmitting materials and optics. Specialties include lens arrays for passive infrared applications, diffusers and microlens arrays for illumination and optics for environmental monitoring at 3.4 micrometers. Design assistance, tooling and production services, diamond machining for prototyping, and four-axis diamond machining of freeform optical surfaces are available. Contact: Linda Claytor, Vice President, lclaytor@fresneltech.com; Nelson Claytor, President, nclaytor@fresneltech.com

## Gamma Scientific

#329

9925 Carroll Canyon Rd, San Diego, CA, 92131 (USA)  
+1 858 279 8034; fax +1 858 576 9286  
contact@gamma-sci.com; www.gamma-sci.com

**Featured Product: Isolated First Surface Thin Film Measurement Systems**

With over 50 years of experience in developing light measurement instruments, Gamma Scientific is trusted by the world's leading organizations to provide accurate and reliable results. Based in San Diego, California, Gamma Scientific manufactures laboratory grade thin film measurement systems, spectroradiometers, integrating spheres and calibration light sources. Gamma Scientific also operates an ISO 17025 compliant, NVLAP accredited calibration and testing laboratory (NVLAP Lab code 200823-0). Contact: Anthony Zazo, Technical Marketing Manager

## GPD Optoelectronics Corp.

#231

**SPIE** Corporate Member

7 Manor Pkwy, Salem, NH, 03079-2842 (USA)  
+1 603 894 6865; fax +1 603 894 6866  
sales@gpd-ir.com; www.gpd-ir.com

**Featured Product: InGaAs VIS/NIR Photodiode**

GPD Optoelectronics Corp. manufactures germanium PN, PIN, APD and InGaAs PIN high-speed, large-area and extended wavelength photodetectors and APDs for near-infrared applications (800-2600 nm.) Custom submounts and packages including fiber pigtailed and cooled applications, and two-color detectors with sensitivity from visible through mid-IR are a GPD specialty. Rapid prototyping for new designs or package configurations is available. Contact: Dan Lapointe, Sales Manager, dlapointe@gpd-ir.com; George Gasparian, Sales Engineer, ggasparian@gpd-ir.com

## G-S Plastic Optics

#622

**SPIE** Corporate Member

408 St Paul Street, Rochester, NY, 14605-1788 (USA)  
+1 585 295 0200; fax +1 585 232 2314  
info@gsoptics.com; www.gsoptics.com

**Featured Product: Precision Polymer Optics**

G-S Plastic Optics has a rich tradition of producing high-performance injection molded polymer optics and has produced significant volumes for military and civilian night-vision and visible-range sighting industries in addition to the consumer, medical, LED lighting, biomedical and analytical instrument marketplaces. It has the advanced metrology equipment needed to control quality and offers a strong internal engineering team to work alongside clients' technical resources to optimize outcomes. Contact: Will Beich, Director of Sales and Marketing, wbeich@gsoptics.com; John Hultz, Applications Engineer, jhultz@gsoptics.com

## Hamamatsu Corporation

#513

**SPIE** Corporate Member

360 Foothill Rd, Bridgewater, NJ, 08807-2932 (USA)  
+1 908 231 0960; fax +1 908 231 1539  
usa@hamamatsu.com; www.hamamatsu.com

**Featured Product: Micro-spectrometer**

Hamamatsu Corporation is the North American subsidiary of Hamamatsu Photonics K.K. (Japan), a leading manufacturer of devices for the generation and measurement of infrared, visible, and ultraviolet light. These devices include micro-spectrometers, photodiodes, MPPC (silicon photomultipliers), infrared detectors, CCD and CMOS image sensors, photomultiplier tubes, cameras, and light sources. Hamamatsu products are used throughout the world in scientific, industrial, and commercial applications. Contact: Calvin Waller, Tradeshow Manager, cwaller@hamamatsu.com

# EXHIBITOR DIRECTORY

## Harris

#214

400 Initiative Dr, Rochester, NY, 14606 (USA)  
+1 585 269 5600  
lynn.allen@exelisinc.com; www.exelisinc.com

**Featured Product: High energy imaging optics: large fused silica lenses; diagnostic & transport optics; debris shields**

Exelis is a diversified, top-tier global aerospace, defense, information and technical services company that leverages a 50-year legacy of deep customer knowledge and technical expertise to deliver affordable, mission-critical solutions for global customers. We manufacture and deliver a full range of optics and optical systems including mirrors, mounts and metering structures for ground, sea, air and space-based platforms and systems for a variety of industries. Contact: Lynn Allen, Chief Engineer, lynn.allen@exelisinc.com

## Hellma USA

#434

**SPIE** Corporate Member

80 Skyline Dr, Plainview, NY, 11803-2518 (USA)  
+1 516 939 0888; fax +1 516 939 0555  
info.us@hellma.com; www.hellma.com

**Featured Product: Zeiss Spectrometers, Custom Cylindrical, Toric, Flat and Complex Optics with the highest tolerances**

Manufacturer of Custom Optics, Spectrometer Cells, Fiber Optic Immersion Probes, Photometric Calibration Standards, Quartz Microplates. Cylindrical/Flat Optics, Beam Splitters and Mirrors for Laser and other applications. Supplier of Heraeus Light Sources including D2, HCL, PID, Spectral Line; Zeiss MMS/MCS/PGS/CGS Miniature Spectrometer modules covering 190-2200nm in combination; Custom designs of all products. New: Excimer to NIR grade CaF<sub>2</sub> + Scintillation crystals from purest raw materials. Contact: Evan Friedmann, Sales Director - Americas, evan.friedmann@hellma.com; Dan Fields, Vice President, dan.fields@hellma.com

## General Sponsor

## Heraeus Quartz America LLC

#431

**SPIE** Corporate Member

100 Heraeus Blvd, Optics, Buford, GA, 30518-3456 (USA)  
+1 678 714 4350; fax +1 678 714 4355  
sales.hqs.optics.us@heraeus.com; optics.heraeus-quarzglas.com

**Featured Product: High purity fused silica for deep UV to NIR applications and precision molded domes and mirrors.**

Heraeus is a leader in the manufacturing of high purity fused silica and fused quartz glass materials and components used in broad photonics applications. Contact: David Gritz, Director of Sales, david.gritz@heraeus.com; Robert Sawyer, Account Manager, robert.sawyer@heraeus.com

## Hinds Instruments, Inc.

#416

**SPIE** Corporate Member

7245 NW Evergreen Pkwy, Hillsboro, OR, 97124-5822 (USA)  
+1 503 690 2000; fax +1 503 690 3000  
sales@hindsinstruments.com; www.hindsinstruments.com

Hinds provides solutions for polarization measurements. Our product line includes high speed optical choppers (20-84 kHz), Stokes polarimeters (for fiber, free space, astronomical light sources), photoelastic modulators (for MOKE, ellipsometry, rheology, and other spectroscopy applications), and birefringence measurement and imaging instrumentation as well as a full line of accessories for our products. All Hinds products have standard configurations and can be customized as required. Contact: Connie Wimmer, Technical Sales, sales@hindsinstruments.com; Linda Hirschy, Applications Scientist, sales@hindsinstruments.com

## HIWIN Corp.

#812

1400 Madeline Ln, Elgin, IL, 60124 (USA)  
+1 847 827 2270; fax +1 847 827 2291  
tradeshows@hiwin.com; www.hiwin.com

Hiwin Corp. manufactures an extensive line of both linear motion components and complete solutions. With a goal of supplying superior quality at the most competitive prices, the company offers a variety of precision ground and rolled ballscrews, linear guideways, electric actuators, ballscrew-driven stages, and linear motors, with many fully integrated value-added features. Contact: Shawn Lawrence, Product Marketing Manager, tradeshows@hiwin.com

## Hofstadter Analytical Services, LLC

#225

**SPIE** Corporate Member

10 N Norton Ave Ste 120, Tucson, AZ, 85719 (USA)  
+1 520 747 3282; fax +1 520 622 1124  
www.hofstadteranalytical.com

## HOYA Corp. USA - Optics Division

#236

**SPIE** Corporate Member

680 N McCarthy Blvd Ste 120, Milpitas, CA, 95035 (USA)  
+1 408 654 2200; fax +1 408 654 2270  
opticsales.hoyausa@hoya.com; www.hoyaoptics.com

**Featured Product: W Series -Sharp Cut Filters, UV-VIS-NIR Color Glass Filters, Optical Glasses in various forms.**

HOYA CORP USA Optics Division is a leading supplier of filter, optical and specialty glasses in semi-finished and finished forms. We operate around a worldwide network of R&D, precision manufacturing and mass scale production facilities, enabling HOYA to offer End-to-End Solutions unmatched by our competitors. Large selection of standard stock and custom components. UV-VIS-NIR Color Filter, Optical & Specialty glasses in various forms: Lenses, blanks, strips & blocks. Contact: Sushama Apte, Sales Engineer, sushama.apte@hoya.com; Lynn Brown, Division Manager, lynn.brown@hoya.com

## IDEX Optics & Photonics

#135

**SPIE** Corporate Member

200 Dorado Pl SE, Albuquerque, NM, 87123-3605 (USA)  
+1 505 296 9541; fax +1 505 298 9908  
cvilaseroptics@idexcorp.com; www.marketplace.idexop.com

**Featured Product: Optical systems, lasers, shutters, filters and custom & semi-custom optics**

IDEX Optics & Photonics Marketplace provides an optimal way to specify and purchase a carefully selected range of industry-leading optical component brands with best-in-class performance, value and reliability. Our standard product offering is designed for rapid delivery. The semi-custom product offering adds additional size or format options while minimizing delivery. Our commitment is to provide you the products you need, the highest level of customer service & extensive technical expertise

## Imaging Solutions Group

#744

**SPIE** Corporate Member

1387 Fairport Rd Ste 890, Fairport, NY, 14450 (USA)  
+1 585 388 5220; fax +1 585 388 5223  
sales@isgchips.com; www.isgcameras.com

## Imperial College London

#713

South Kensington Campus, Physics Laboratory, London, SW7 2AZ  
United Kingdom  
+44 20 7589 5111  
info@imperial.ac.uk; www.imperial.ac.uk

### Featured Product: Chromatic aberration measurement of high NA microscope objectives with metallic nanoparticles.

The Blackett Laboratory is the physics research department within Imperial College London. In particular, within the Experimental Solid State Group, Rupert Oulton's research is to exploit developments in the field of metal optics for real world applications. Part of this research involves the use of metallic nano-particles to mediate interactions between a light beam and individual atoms. The current technology is born from this investigation. Contact: Sylvain Gennaro, Ph.D / Research Assistant, sylvain.gennaro10@imperial.ac.uk; Lamia Baker, Senior Executive Technology Transfer, lamia.baker@imperialinnovations.co.uk

## INO

#338

**SPIE** Corporate Member

2740 rue Einstein, Quebec Metro High Tech Park, Quebec City, QC, G1P 4S4 Canada

+1 418 657 7006; fax +1 418 657 7009

info@ino.ca; www.ino.ca

### Featured Product: INO's auto-centering technology makes lens alignment 60 times faster than regular methods.

INO is a world-class technology developer and provider, using its core expertise in optics and photonics to bring to the industry custom solutions that enable more competitive products and production processes. INO produces in-house prototypes and short run products tailored to the needs of partners & clients. Contact: Pierre Talbot, Business Development Manager, pierre.talbot@ino.ca

## Inrad Optics

#143

**SPIE** Corporate Member

181 Legrand Ave, Northvale, NJ, 07647 (USA)

+1 201 767 1910; fax +1 201 767 9644

sales@inradoptics.com; www.inradoptics.com

Inrad Optics manufactures optics for applications from sensing to imaging. Our turn key production facilities offer crystal growth for non-linear optics, precision polishing for X-Ray optics, diamond turning of aspheric mirrors, optical contacting for beamsplitters, and thin film coating for multi-spectral imaging. Stop by to learn more about our Scintillation crystals for neutron detection. Contact: Sales, sales@inradoptics.com

### Promotional Partner

## IOP Publishing

#539

Temple Way, Temple Circus, Bristol, BS1 6HG United Kingdom

+44 117 929 7481; fax +44 117 929 4318

custserv@iop.org; www.ioppublishing.org

IOP Publishing provides publications through which leading-edge scientific research is distributed worldwide. Beyond our traditional journals programme, we make high-value scientific information easily accessible through an ever-evolving portfolio of books, community websites, magazines, conference proceedings and a multitude of electronic services Contact: Fiona Walker, Global Conferences & Exhibitions Manager, fiona.walker@iop.org; Chris Thomas, Advertising Sales Manager, chris.thomas@iop.org

## Isuzu Glass, Inc.

#624

**SPIE** Corporate Member

23505 Crenshaw Blvd Ste 130, Torrance, CA, 90505-5225 (USA)

+1 310 517 1866

sales@isuzuglas.com; www.isuzuglass.com

### Featured Product: Heat Absorbing Color Filter Glass, Molded Optics

Isuzu Glass is manufacture of molded optics and color filter glass. Isuzu Glass has been around for 110 years and has been developing original techniques and know-how and supplying a variety of optronics products to customers using unique manufacturing methods. The products manufactured by our state-of-the-art technologies are used in various fields requiring high reliability, and our company supplies the products in a variety of markets such as projectors, lasers, medical devices, sensors, etc. Contact: Sean Wilson, Business Development, sean@isuzuglass.com

## J.A. Woollam Co.

#614

645 M St Ste 102, Lincoln, NE, 68508-2243 (USA)

+1 402 477 7501

sales@jawoollam.com; www.jawoollam.com

### Featured Product: Spectroscopic Ellipsometry

J.A. Woollam Company offers a wide range of spectroscopic ellipsometers for nondestructive materials characterization, including thin film thickness (single and multilayer), optical constants, composition, growth/etch rates, and more. Instruments available for research and manufacturing metrology covering spectral ranges from vacuum ultra-violet to far infrared. Offering table-top, in-line, and in-situ models.

## Jenoptik Optical Systems, LLC

#217

**SPIE** Corporate Member

16490 Innovation Dr, Jupiter, FL, 33478-6428 (USA)

+1 561 881 7400; fax +1 561 881 1947

sales@jenoptik-inc.com; www.jenoptik-inc.com

JENOPTIK Optical Systems delivers a unique range of custom optical solutions ranging from precision assemblies to waferscale microoptics and in materials ranging from glasses, to crystals and polymers. Competencies include optical test, optical polishing, diamond turning and lithographic etching of materials for applications covering DUV to LWIR. We combine design and engineering with high volume manufacture at US and Global manufacturing sites in Germany and Israel. Contact: Ray Malcom, VP Sales & Marketing, ray.malcom@jenoptik-inc.com; Beth McDonald, Inside Sales Coordinator- Defense, beth.mcdonald@jenoptik-inc.com

## JML Optical Industries, LLC

#427

820 Linden Ave, Rochester, NY, 14625-2710 (USA)

+1 585 248 8900; fax +1 585 248 8924

jml@jmloptical.com; www.jmloptical.com

We solve our customer's imaging challenges through the design and manufacture of custom optical assemblies, components and systems. Our solutions encompass manufacturing of prototype and production volumes as well as flexible design and delivery options. We have an experienced design and engineering staff, vertically-integrated domestic manufacturing facility and network of off-shore manufacturing affiliates. Founded in 1972, we serve all industries that use imaging optics.

# EXHIBITOR DIRECTORY

## Kaufman & Robinson

#232

1330 Blue Spruce Dr, Ft Collins, CO, 80524 (USA)  
+1 970 495 0187  
info@ionsources.com

## Labsphere, Inc.

#644

**SPIE** Corporate Member  
231 Shaker St, North Sutton, NH, 03260 (USA)  
+1 603 927 4266; fax +1 603 927 4694  
labsphere@labsphere.com; www.labsphere.com

## Lake Shore Cryotronics, Inc.

#215

575 McCorkle Blvd, Westerville, OH, 43082-8699 (USA)  
+1 614 891 2243  
info@lakeshore.com; www.lakeshore.com

### Featured Product: Cryogenic probe stations for measuring photonic/electro-optical materials as a function of temp.

Supporting advanced research since 1968, Lake Shore Cryotronics (www.lakeshore.com) offers measurement and control solutions for materials characterization under extreme temperature and magnetic field conditions. High-performance solutions include cryogenic probe stations for early-stage photonic or electro-optical device R&D, precision characterizations systems for next-generation material research, cryogenic temperature sensors and instrumentation, and magnetic test and measurement systems.

## Lambda Research Corporation

#230

**SPIE** Corporate Member  
25 Porter Rd, Littleton, MA, 01460-1434 (USA)  
+1 978 486 0766; fax +1 978 486 0755  
sales@lambdare.com; www.lambdare.com

## Laser Quantum Inc.

#330

**SPIE** Corporate Member  
2033 Gateway Pl Ste 500, San Jose, CA, 95110-3712 (USA)  
+1 408 467 3885; fax +1 408 467 3886  
sales@laserquantum.com; www.laserquantum.com

### Featured Product: Laser Quantum "venteon ultra" few cycle femtosecond laser with integrated pump source.

Laser Quantum is a world-class manufacturer of revolutionary solid-state and ultrafast lasers. Our products lead the industry in performance specifications, reliability, compactness and operational lifetime. You will find Laser Quantum lasers used in laboratories and integrated in systems and machines worldwide. Our lasers are helping scientists to break new ground in many applications ranging from attosecond physics to forensics and genomics. Visit www.laserquantum.com for more information. Contact: Barney Mitchell, Vice President of Sales and Marketing, bmitchell@laserquantum.com; Dan Jones, Sales and Service Engineer, djones@laserquantum.com

## LightTrans GmbH

#238

Kahlaische Str 4, Jena, 07745 Germany  
+49 36 41 5312950; fax +49 36 41 5312901  
sales@lighttrans.com; www.lighttrans.com

## Lincoln Laser Co.

#529

**SPIE** Corporate Member  
234 E Mohave, Phoenix, AZ, 85004 (USA)  
+1 602 257 0407; fax +1 602 257 9022  
info@lincolnlaser.com; www.lincolnlaser.com  
Contact: Bill Kuypers, Marketing/Sales Director

## Luxel Corp.

#625

**SPIE** Corporate Member  
60 Saltspring Dr, Friday Harbor, WA, 98250-1879 (USA)  
+1 360 378 4137; fax +1 360 378 4266  
luxel@luxel.com; www.luxel.com

Luxel is the world's leading producer of ultra-thin freestanding filters used for soft x-rays and extreme ultraviolet light. Luxel products, including space flight filters, pressure windows, and imaging sensor protectors, are assembled in Class 5 cleanrooms. Filters are fabricated from over 70 different materials, as thin as 8nm up to 20µm. We offer extensive technical support including: thin film modeling, characterization and CAD design. Lead times can be as short as 1 week. www.luxel.com Contact: Travis Ayers, President, travis.ayers@luxel.com; Bruce Lairson, Chief Scientist, bruce.lairson@luxel.com

## Mad City Labs Inc.

#734

**SPIE** Corporate Member  
2524 Todd Dr, Madison, WI, 53713-2317 (USA)  
+1 608 298 0855; fax +1 608 298 9525  
sales@madcitylabs.com; www.madcitylabs.com

Mad City Labs designs and manufactures high precision, piezo nanopositioning systems and nanopositioning ready micropositioners for research and industry. Our products offer innovative flexure guided designs, piezomotors, proprietary low drift PicoQ® sensor technology and closed loop control. System attributes include picometer precision, high speeds, real time position sensing. Suitable for inspection, metrology, microscopy, imaging and beam steering applications. Custom/OEM specialists Contact: Shannon Ghorbani, USA Sales, shannon@madcitylabs.com; Ferdi Ciceri, European Sales, ferdi@madcitylabs.eu

## MaxEmil Photonics Corporation

#525

**SPIE** Corporate Member  
14125 Telephone Ave. STE. 7, Chino, CA, 91710 (USA)  
+1 909 565 1800; fax +1 909 465 1844  
sales@maxemil.com.tw; www.maxemil.com.tw

## Meadowlark Optics, Inc.

#245

**SPIE** Corporate Member  
5964 Iris Pkwy, Frederick, CO, 80530 (USA)  
+1 303 833 4333; fax +1 303 833 4335  
marketing@meadowlark.com; www.meadowlark.com

### Featured Product: Spatial Light Modulators, Optical Tweezing System, High-speed FLC Shutters, Hyperspectral Filters

Meadowlark Optics designs, develops, and manufactures an extensive range of high quality polarization systems and components including liquid crystal devices from the UV to MWIR. Standard products include Spatial Light Modulators (both transmissive and reflective), Waveplates, Shutters, Rotators, Tunable Optical Filters, Tri-Color Filters, Polarizers, Polarimeters, Pockels Cells and more. We also provide engineering services and custom solutions for application-specific requirements. Contact: Kelly Gregorak, VP-Sales and Marketing, kgregorak@meadowlark.com; Paul Searcy, VP-Technical Operations, psearcy@meadowlark.com

## Micro Laser Systems, Inc.

#417

**SPIE** Corporate Member

12841 Western Ave Ste H, Garden Grove, CA, 92841-4025 (USA)  
+1 714 898 6001  
sales@microlaser.com; www.microlaser.com

### Featured Product: Tiny & Large Fiber Collimators and Muon II small laser module

We are presenting new Small Fiber Collimators, Large Fiber Collimators (350 – 2000nm), Fiber Focusers and RGB Collimators. They complement our Fiber Coupled Lasers from 375nm to 1653nm for diffraction limited performance. Also new is our Muon II Series small free space laser module from 405 – 850nm. Put our expertise in optics, fiber optics and lasers to work for you in designing your next laser/optical system. We manufacture for aerospace, biomedical and industrial sectors. Contact: Norma Adachi, Marketing Director, norma@microlaser.com

## Midwest Optical Systems, Inc. (MidOpt) #819

322 N Woodwork Ln, Palatine, IL, 60067-4933 (USA)  
+1 847 359 3550; fax +1 847 359 3567  
info@midopt.com; www.midopt.com

MidOpt is the world's leading resource for optical filters used in CCD/CMOS camera imaging applications. Bandpass, dual bandpass, ND, UV, NIR, polarizing and other filters are available in a variety of standard thread and "slip" mounts for same day shipping, for any camera lens. Unmounted filters are also offered in custom configurations, and our filter test kits are essential lab testing tools to use in improving image quality. MidOpt is the exclusive U.S. distributor of Goyo Optical lenses. Contact: info@midopt.com

## Mindrum Precision, Inc.

#623

**SPIE** Corporate Member

10000 4th St, Rancho Cucamonga, CA, 91730-5723 (USA)  
+1 909 989 1728; fax +1 909 987 3709  
sales@mindrum.com

Custom machining, polishing of precision components and assemblies. Complex shaping, 5-axis CNC milling, CNC turning and CNC surface grinding. Plano, spherical and cylindrical polishing, on spindles, continuous and double-side lappers and polishers. High and low volumes. We work mainly with hard materials such as glass, quartz, sapphire and ceramics but also work with conventional materials such as aluminum, steel and titanium. Other capabilities include glassblowing, acid etching and soldering. Contact: Linda Kondris, Technical Sales, Linda@mindrum.com; Adam Pohl, VP Engineering, Adam@mindrum.com

## Minus K Technology Inc.

#735

**SPIE** Corporate Member

460 Hindry Ave Suite C, Inglewood, CA, 90301-2059 (USA)  
+1 310 348 9656; fax +1 310 348 9656  
sales@minusk.com; www.minusk.com

### Featured Product: New LC-4 isolator supports heavier payloads, requires no air or electricity and uses little room

Manufacturer of vibration isolation systems for AFMs, SPMs, SEMs, metrology, micro-hardness testers, lasers and optics. They are low-cost, passive, vacuum adaptable and require no air or electricity. Products: table-top platforms, workstations, floor platforms and custom systems. Guaranteed 1/2 Hz natural frequencies make them effective against low-frequency building vibrations. Isolation is typically 10 to 100 times better than air tables and even better than the higher-priced active systems. Contact: Erik Runge, Director of Engineering; Steve Varma, Operations Manager

## Molecular Vista, Inc.

#339

**SPIE** Corporate Member

6840 Via Del Oro Ste 110, San Jose, CA, 95119 (USA)  
+1 408 915 2595  
info@molecularvista.com; www.molecularvista.com

## MOXTEK, Inc.

#437

452 W 1260 N, Orem, UT, 84057-2941 (USA)  
+1 801 225 0930; fax +1 801 221 1121  
info@moxtek.com; www.moxtek.com

Moxtek is a leading supplier of advanced nano-optical and X-ray components for display electronics, imaging and analytical instrumentation.

## Naked Optics Corp.

#626

**SPIE** Corporate Member

1090 Delacroix Cir, Nokomis, FL, 34275-4563 (USA)  
+1 908 685 0352; fax +1 908 325 0250  
sales@nakedoptics.com; www.nakedoptics.com

## National Instrument Technology Research Center

#325

20 R&D Rd VI Hsinchu Science Park, Hsinchu City, 30076 Taiwan  
+886 3 577 9911; fax +886 3 578 9343  
service@itrc.narl.org.tw; www.itrc.narl.org.tw

## National Reconnaissance Office

#817

14675 Lee Rd, Chantilly, VA, 20151-1715 (USA)  
+1 703 808 2769; fax +1 703 808 2646  
dii@nro.mil; acq.westfields.net

## Natsume Optical Corporation

#629

**SPIE** Corporate Member

3461 Kamichaya Kanae, Iida-shi, Nagano, 395-0808 Japan  
+81 265 22 2434; fax +81 265 24 2467  
info@mflens.co.jp; www.mflens.com

### Featured Product: Aspherical, Cylindrical, Axicon, Spherical, Ultra Precision Optis, Freeform, Mirror

Natsume Optical Corporation, founded in 1947, is an optical device manufacturer specializing in various kinds and high precision optical products with more than 60 years' experience and developed technology.

# EXHIBITOR DIRECTORY

## Navitar

SPIE Corporate Member

200 Commerce Dr, Rochester, NY, 14623-3506 (USA)  
+1 585 359 4000; fax +1 585 359 4999  
info@navitar.com; www.navitar.com

### Featured Product: Navitar is featuring their MagniStar Bi-Telecentric Lenses and Custom Microscope Objectives.

Navitar designs, develops, manufactures and markets precision optical solutions for a wide variety of industries including Biomedical & Life Sciences, Defense & Security, Industrial Imaging and Projection spanning from standard video to 4K planetarium lenses. Applications for Navitar optics include machine vision, automation, assembly, imaging, testing, measuring, metrology, biometrics, telecommunications, photonics R&D, non-contact measurement, simulation, planetarium, amusement, and more. Contact: Craig Fitzgerald, VP Product and Business Development, craig.fitzgerald@navitar.com; Donald Ehinger, VP Sales, donald.ehinger@navitar.com

#635

## NKT Photonics Inc.

SPIE Corporate Member

1400 Campus Drive W, Morganville, NJ, 07751-1283 (USA)  
+1 732 395 1551; fax +1 732 414 4094  
laser\_sales@nktphotonics.com; www.nktphotonics.com

### Featured Product: SuperK Supercontinuum Sources, Koheras narrow linewidth fiber lasers, Crystal Fibre

NKT Photonics offers products from its SuperK supercontinuum systems series, Koheras ultra-precise fiber lasers and its range of microstructured fibers from its Crystal Fibre product line. Our products have many applications in material science such as Plasmonics, Metamaterials / Solar to bioimaging such as OCT fluorescence and spectroscopy. From photonic crystal fibers to the volume production of critical light engines, we are committed to serve our customers with superior fiber-based products Contact: Husain Imam, Sales Manager; Brad Sohnlein, Sales Engineer, brs@nktphotonics.com

#716

## Newport Corporation

SPIE Corporate Member

1791 Deere Ave, Irvine, CA, 92606-4814 (USA)  
+1 949 863 3144; fax +1 949 253 1680  
sales@newport.com; www.newport.com

### Featured Product: ONE-XY100- Integrated XY Linear Stage, 100 mm Travel, Linear Motor, ONE-XY Series

Newport, the world's largest photonics company provides innovative solutions and industry leading product brands to multiple markets. Our combined broad product portfolio which includes: Corion<sup>®</sup>, ILX Lightwave<sup>™</sup>, New Focus<sup>™</sup>, Ophir, Oriol<sup>®</sup> Instruments, Richardson Gratings<sup>™</sup>, and Spectra-Physics<sup>®</sup> Lasers enables us to better partner with our customers to provide complete photonic solutions to make, manage and measure light. Contact: Darron Young, Sr. Director, Sales North America, darron.young@newport.com

#412

## nPoint, Inc.

SPIE Corporate Member

3030 Laura Ln Ste 100, Middleton, WI, 53562-1872 (USA)  
+1 608 824 1770; fax +1 608 824 1774  
info@npoint.com; www.npoint.com

### Featured Product: NP Focus Series Objective Focusing Nanopositioning Piezo Stages

Designs & manufactures nanopositioning tools for OEM and research applications. Products include piezo actuated flexure stages and digital control electronics. Nanopositioning systems provide closed-loop translation in the X, XY, XYZ and tip/tilt. Enables high-speed, high-resolution, sub-nanometer precision for Optics, Semiconductor, Defense, Aerospace and Bio industries. Contact: Katerina Moloni, VP of Sales and Product Development, katerina.moloni@npoint.com; Justin Brink, Technical Sales, justin.brink@npoint.com

#331

## Newport Thin Film Lab., Inc.

SPIE Corporate Member

13824 Magnolia Ave, Chino, CA, 91710-7027 (USA)  
+1 909 591 0276; fax +1 909 902 1638  
sales@newportlab.com; www.newportlab.com

### Featured Product: UV/VIS/IR Coatings

Newport Thin Film Laboratory, Inc. manufactures optical thin films used in the ultraviolet, visible and infrared spectrum. NTFL can provide complete optics, or deposit high performance thin films on customer-supplied substrates. Our high volume capabilities result in competitive pricing. However, we also work closely with you to develop prototypes and coatings for custom applications. NTFL is a fully equipped ISO 6 (class 1000) clean room coating facility. Contact: Ever Mata, Sales Manager, emata@newportlab.com; P. Scott Powers, Engineering, sales@newportlab.com

#514

## Ocean Optics, Inc.

SPIE Corporate Member

830 Douglas Ave, Dunedin, FL, 34698-4942 (USA)  
+1 727 733 2447  
info@oceanoptics.com; www.oceanoptics.com

### Featured Product: Spark - Ultra-compact spectral sensor for a range of applications and integration options

Ocean Optics is the leader in spectroscopy applications knowledge. We provide modular optical sensing solutions for applications such as medical and biological research, environmental regulation, science education and process control. Our comprehensive range of complementary technologies includes light sources, chemical sensors, Raman instrumentation, optical fibers, probes, filters and other accessories. Our spectrometers and sensors are ideal for integration into OEM and custom instruments. Contact: Application Scientist, info@oceanoptics.com; OEM, oem@oceanoptisc.com

#413

## NiPro Optics, Inc

7 Marconi, Irvine, CA, 92618 (USA)  
+1 949 215 1151

sales@niprooptics.com; www.niprooptics.com

#538

# WHERE THE FUTURE OF PHOTONICS IS FOUND



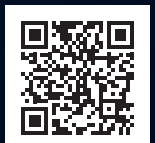
Photonics Online is the leading online community and industry resource for optics and photonics professionals.

- **Find Solutions** For Your Projects.
- Stay Current With **Industry Headlines**.
- **Engage** With Industry Thought Leaders.
- Register For Our **Free Newsletter**.

Visit us at [www.photonicsonline.com](http://www.photonicsonline.com).



**Photonics Online**



# EXHIBITOR DIRECTORY

## Ohara Corporation

#418

**SPIE** Corporate Member

23141 Arroyo Vista Ste 200, Rancho Santa Margarita, CA, 92688-2613 (USA)

+1 949 858 5700; fax +1 949 858 5455

sales@oharacorp.com; www.oharacorp.com

Manufacturer of precision optical glasses available as strip/slab, cut/molded blanks, high homogeneity blanks, fine gobs and polished ball lenses, near UV transmitting i-Line glasses, glass ceramic substrates, CaF<sub>2</sub>, UV & IR materials, Quartz, Fused Silica (standard and excimer grade). Ohara ClearCeram-Z ultralow expansion glass with excellent CTE uniformity. Supplier of double side polished substrates (excellent flatness/low surface roughness). Contact: Brion Hoffman, President, brionhoffman@oharacorp.com; Chris Ghio, Director of Sales, chrisghio@oharacorp.com

## Ontar Corporation

#741

**SPIE** Corporate Member

9 Village Way, North Andover, MA, 01845-2000 (USA)

+1 978 689 9622; fax +1 978 681 4585

sales@ontar.com; www.ontar.com

**Featured Product: PcModWin5, HITRAN PC, PcLnWin, PcNvMod, LIDAR PC, MODTRAN and ALTM**

Ontar Corporation est. 1981 is an R&D software company. We sell software for optical atmospheric remote sensing. Products calculate gas transmission and evaluate sensor performance. PcModWin5, HITRAN PC, PcLnWin, PcNvMod, LIDAR PC, MODTRAN and ALTM. Applications include; laser spectroscopy, atmospheric transmission, smart weapons for defense applications, EO sensors development/evaluations, ground and satellite image correction, hyper spectral imaging, laser comm. and LIDAR apps. Contact: Jason Hernandez, Software Manager, jhernandez@ontar.com; John Schroeder, Owner, jschroeder@ontar.com

## Optical Support, Inc.

#536

**SPIE** Corporate Member

1671 S Research Lp Ste 133, Tucson, AZ, 85710-3998 (USA)

+1 520 546 0642; fax +1 520 545 0376

www.opticalsupportinc.com

**Featured Product: Optical & Mechanical design, CNC machining, clean room assembly, alignment & test to customer needs.**

Optical Support, Inc. is an engineering services company specializing in design and manufacturing of precision optical instruments and equipment. OSI has the CNC machining, clean room assembly, alignment and test capabilities to provide both rapid prototyping and volume manufacturing to ensure faster time-to-market. OSI's experienced staff can solve complex design problems working with your engineering team through preliminary, conceptual, and detailed design reviews. Contact: Mark Bigelow, Vice President Business Development, mbigelow@opticalsupportinc.com; Michael Savard, President, msavard@opticalsupportinc.com

## Promotional Partner

### optics.org

#235

Ffordd Pengam, 2 Alexandra Gate, Cardiff, CF24 2SA United Kingdom

+44 29 2089 4751

sales@optics.org; www.optics.org

## OPTIDA

#227

**SPIE** Corporate Member

Savanoriu Str 231, Vilnius, Vilniaus, 02300 Lithuania

+370 5 2621508; fax +370 5 2621508

sales@optida.lt; www.optida.lt

**Featured Product: Low Tension Coatings, Ultra High LIDT Mirror, Low loss Optics, Complementary Chirped Mirror Pairs**

OPTIDA is the largest optical engineering company in the eastern and central region of the European Union, focused on the development and in-house production of optical coatings and components for laser systems, and optical devices for leading Original Equipment Manufacturers. Contact: Marius Šemeta, Chief Export Manager, marius@optida.lt; Donatas Sirgedas, Head of Sales and Business Development, donatas@optida.lt

## Optiforms Inc.

#213

**SPIE** Corporate Member

42310 Winchester Rd, Temecula, CA, 92590-4810 (USA)

+1 951 296 1300; fax +1 951 296 1178

sales@optiforms.com; www.optiforms.com

Optiforms is your optical solutions partner specializing in electroformed reflectors and thin film optical coatings. We offer a broad range of standard geometries for research and development purposes as well as the ability to produce unique shapes and custom designs in a quick and cost effective manner. We can also apply optical coatings to your supplied substrates to your specifications. Visit our website at www.optiforms.com for more information about our products and processes. Contact: sales@optiforms.com

## Optikos Corporation

#317

**SPIE** Corporate Member

107 Audubon Rd, Bldg 3, Wakefield, MA, 01880-1245 (USA)

+1 617 354 7557; fax +1 617 354 5946

sales@optikos.com; www.optikos.com

**Featured Product: Optical Metrology and Engineering Design**

Optikos provide paths and solutions to test and measure your optical and imaging performance. We offer standard and customized metrology products and services for most any imaginable measurement of lens, camera or ophthalmic system as well as production test stations; and provide engineering concept, design and production services, applying our expertise in optical engineering, electro-optics, infrared-optics and opto-mechanics to your vision. Contact: Jim Scott, Key Account Manager, jscott@optikos.com; Yvonne Chao, International Sales Manager, ychao@optikos.com

## Optimax

#534

**SPIE** Corporate Member

6367 Dean Pkwy, Ontario, NY, 14519-8939 (USA)

+1 585 265 1020

sales@optimaxsi.com; www.optimaxsi.com

**Featured Product: The Freedom of Freeforms - fewer elements, lighter weight and increased flexibility.**

Optimax is set-up to manufacture, test and deliver precision optics, including aspheres, cylinders, prisms, spheres, and now freeforms with the speed and quality your project demands. Our reliability has allowed us to become America's largest prototype optics manufacturer, while remaining committed to small volume, high quality and quick delivery of your prototype optic needs. Contact: Joseph Spilman, Sales Manager, sales@optimaxsi.com; Joe Pinto, Sales Engineer, sales@optimaxsi.com



## OptiPro Systems

#115

**SPIE** Corporate Member

6368 Dean Pkwy, Ontario, NY, 14519-8970 (USA)  
+1 585 265 0160; fax +1 585 265 9416  
sales@optipro.com; www.optipro.com

OptiPro Systems, located in Rochester, NY, has more than 30 years experience designing and manufacturing precision optical fabrication machines and metrology systems. A leader in the implementation of optical fabrication and metrology equipment, OptiPro develops cutting edge machines for complex optics with challenging surface and production requirements. Our team of engineers, technicians and scientists can turn your concepts into optimized production solutions. Contact: Mike Bechtold, President, mike@optipro.com; Ron Colavecchia, Director of Optics Technology, rcolavecchia@optipro.com

## OptoSigma Corporation

#619

**SPIE** Corporate Member

3210 S Croddy Way, Santa Ana, CA, 92704 (USA)  
+1 949 851 5881; fax +1 949 851 5058  
sales@optosigma.com; www.optosigma.com

### Featured Product: Optics, Optical Coatings, Opto-Mechanics, Manual & Motorized Translation Stages & Assemblies.

Global Manufacturer of Optics, Opto-Mechanics and application systems for Medical, Semiconductor, telecommunications, security/Defense, Research, R&D. Standard products available through our new global catalog, (Featuring >14,000 Products), and company website for fast delivery. Custom/OEM manufacturing for low or high volume, build to print, JIT, Kanban. Manufacturing facilities located in Japan, China and the USA. All factories company owned and operated.

## Osela Inc.

#327

**SPIE** Corporate Member

1860 32nd Ave, Lachine, QC, H8T 3J7 Canada  
+1 514 631 2227  
info@oselainc.com; www.oselainc.com

### Conference Bag Insert, Floor Graphics

## OZ Optics Ltd.

#315

**SPIE** Corporate Member

219 Westbrook Rd, Ottawa, ON, K0A 1L0 Canada  
+1 613 831 0981; fax +1 613 836 5089  
sales@zoptics.com; www.zoptics.com

### Featured Product: Online Catalog

30 years of excellence in providing World's Largest Online Components and Test Equipment Catalog, High power Components/Isolators/Polarization/Combiners/Patchcords/CO<sub>2</sub> Cleaner, Mode Field Adaptor, Fiber Pigtailed Lasers/Laser Diodes, Directional Taps, Power Monitors, Collimators/Focusers, PM/SM/MM Fused Fiber and PLCS Couplers, PM Patchcords/ Connectors/Splitters/Polarized Sources, Polarization Rotators/Controllers/Analyzers, Polarizers, PDL Emulators, Extinction Ratio meters, Power meters. Contact: Chris Song, Marketing Manager, csong@zoptics.com

## Pennwell/Laser Focus World

#816

**SPIE** Corporate Member

98 Spit Brook Rd, PennWell Technology Div, Nashua, NH, 03062-5737 (USA)  
+1 603 891 0123; fax +1 603 891 0574  
info@laserfocus.com; www.laserfocusworld.com

## PerkinElmer

#634

940 Winter St, Waltham, MA, 02451 (USA)  
+1 800 762 4000; fax +1 203 944 4904  
customercareUS@perkinelmer.com; www.perkinelmer.com

## PHASICS Corp.

#711

**SPIE** Corporate Member

169 11th St, San Francisco, CA, 94103 (USA)  
+1 415 610 9741  
contact@phasics.com; www.phasicscorp.com

### Featured Product: Wavefront sensors (193nm-14µm) for laser beam testing & correction, plasma control and lens testing

Phasics wavefront sensors offer high resolution (up to 400x300 phase pixels) and large dynamics from 193nm to 14µm. They are versatile tools for laser facility: a single sensor covers beam testing and correction (with a deformable mirror) as well as plasma density measurement. For lens and objective quality control up to far IR, they provide aberrations and MTF in a single shot. They also enable quantitative phase imaging. Their patented technology ensures accurate measurement and ease of use. Contact: Yoann Priol, US sales manager, priol@phasics.fr

## Photon Design

#337

**SPIE** Corporate Member

34 Leopold St, Oxford, OX4 1TW United Kingdom  
+44 1865 324990; fax +44 1865 324991  
pdadmin@photond.com; www.photond.com

### Featured Product: OmniSim/FETD: innovative new Maxwell simulator: faster than FDTD for tough problems like plasmonics

Photon Design was started in 1992 and now provides a wide range of innovative photonics CAD tools to 35 countries around the world, supplying most of the World's leading photonics companies, universities and government research labs. CAD products include tools for both passive and active (semiconductor) component and optical circuit modelling. The company has a team of the brightest people in photonics modelling, developing innovative solutions for tomorrow's photonics design projects. Contact: Dominic Gallagher, CEO, pdadmin@photond.com; Vincent Brulis, Technical Support, pdadmin@photond.com

### Meter Board

## Photon Engineering LLC

#313

**SPIE** Corporate Member

310 S Williams Blvd Ste 222, Tucson, AZ, 85711 (USA)  
+1 520 733 9557; fax +1 520 733 9609  
info@photonengr.com; www.photonengr.com

### Featured Product: FRED Optical Engineering software

Photon Engineering, LLC is a consulting and software development firm based in Tucson, Arizona. Photon Engineering develops and markets FRED, the premier proven software to solve today's challenging optical engineering problems. Users working within FRED's 3D virtual prototyping CAD environment can model and analyze virtually any optomechanical system containing arbitrary coherent, incoherent, and partially coherent sources. Engineering consulting and short courses are offered worldwide. Contact: Donata Pfisterer, Sales

# EXHIBITOR DIRECTORY

## Photonic Cleaning Technologies

#718

**SPIE** Corporate Member

1895 Short Ln, Bldg 1, Platteville, WI, 53818-8977 (USA)

+1 608 467 5396; fax +1 608 467 5397

sales@photoniccleaning.com; www.photoniccleaning.com

**Featured Product: First Contact Polymers™. Only no-residue strip coat available to clean & protect sensitive surfaces**

Manufacturer of First Contact Polymers™. THE Cleaning and Protection System. Apply liquid polymer and peel the dried film leaving the surface nearly atomically clean. Independent XPS/ESCA and Laser Damage Threshold testing shows no residue to the molecular level! Safe with high power laser optics. Remove Dust & Fingerprints. Reduce waste: non-toxic inert polymers. Clean Nanostructures, Gratings & Phase Masks! Protect and clean microscope objectives & CCD Sensors. Safe. Low Adhesion. No residue. Contact: David Giesen, Technical Sales and Manufacturing Manager, davidg@photoniccleaning.com; James Hamilton, CTO, hamiltonj@photoniccleaning.com

**Promotional Partner**

## Photonics Online

#223

2009 Mackenzie Way, Suite 280, Cranberry Township, PA, 16066 (USA)

+1 724 940 7555; fax +1 724 940 7707

info@photoniconline.com; www.photoniconline.com

**Promotional Partner**

## Photonics Spectra, a Photonics Media Publication

#127

**SPIE** Corporate Member

100 W St, 2nd Fl, Pittsfield, MA, 01202-4949 (USA)

+1 413 499 0514; fax +1 413 443 0472

info@photonics.com; www.photonics.com

Photonics Media -- the Pulse of the Industry -- Explore the world of light-based technology at www.Photonics.com, in print, or on our free mobile apps. As the publisher of Photonics Spectra, Industrial Photonics, BioPhotonics, and EuroPhotonics magazines, we bring you the latest news, research, and applications articles you need to succeed. Subscribe now for free within our publications or on www.Photonics.com. Contact: Karen Newman, Group Publisher, editorial@photonics.com; Ryan Laurin, Vice President, advertising@photonics.com

**Exhibitor Lounge, Promotional Partner**

## Physics Today

#333

One Physics Ellipse, College Park, MD, 20740-3843 (USA)

+1 301 209 3040; fax +1 301 209 0842

ptpub@aip.org; www.physicstoday.org

**Featured Product: Physics Today magazine subscription for just \$25/year**

With the credibility of a journal, Physics Today magazine offers its readership of 120,000 scientists and engineers access to the breakthroughs and insights achieved by their peers. The magazine cross-pollinates ideas from all fields across the physical sciences and strives to inspire researchers to think differently, overcome barriers and produce novel results. Join the Physics Today community at a special SPIE discount of just \$25/year at www.physicstoday.org/conf15 Contact: Christina Unger, Marketing Manager, cunger@aip.org

## PI

#519

**SPIE** Corporate Member

16 Albert St, Auburn, MA, 01501-1304 (USA)

+1 508 832 3456; fax +1 508 832 0506

info@pi-usa.us; www.pi-usa.us

## Piezosystem Jena

#424

**SPIE** Corporate Member

2B Rosenfeld Dr, Hopedale, MA, 01747 (USA)

+1 508 634 6688; fax +1 508 634 6868

usa@piezोजना.com; www.piezosystem.com

Piezosystem jena for 20+ years has provided high precision nano-positioning solutions in up to 5 axis of travel. X, XY, XYZ, tip/tilt positioning with sub-nm resolution can be achieved, with high resonant frequencies which allow for fast scanning. Using a closed loop feedback we can eliminate any hysteresis and drift. Complete digital systems are also readily available with micro manager and labview drivers. A leader for Research & OEM solutions. Contact: Peter Viglas, Sales Manager, pviglas@piezोजना.com

## PLX Inc.

#617

40 W Jefryn Blvd, Deer Park, NY, 11729-5761 (USA)

+1 631 586 4190; fax +1 631 586 4196

info@plxinc.com; www.plxinc.com

**Featured Product: The new PLX ACT-25 Electronic Autocollimator and Alignment Telescope.**

PLX provides unique optical instruments, technologies and solutions to problems of achieving and maintaining state-of-the-art optical accuracy and stability under severe environmental conditions. Our M.O.S.T.™ technology integrates complex optical elements into compact monolithic structures to achieve these objectives. You'll find PLX instruments and products in Military, Space / Aerospace, and Commercial / Industrial as well as laboratory applications around the world. Contact: Itai Vishnia, Director of Operations, iv@plxinc.com; Michael Rosen, Director of Marketing Services, mike@tackleboxmarketing.com

## Precision Asphere, Inc.

#631

**SPIE** Corporate Member

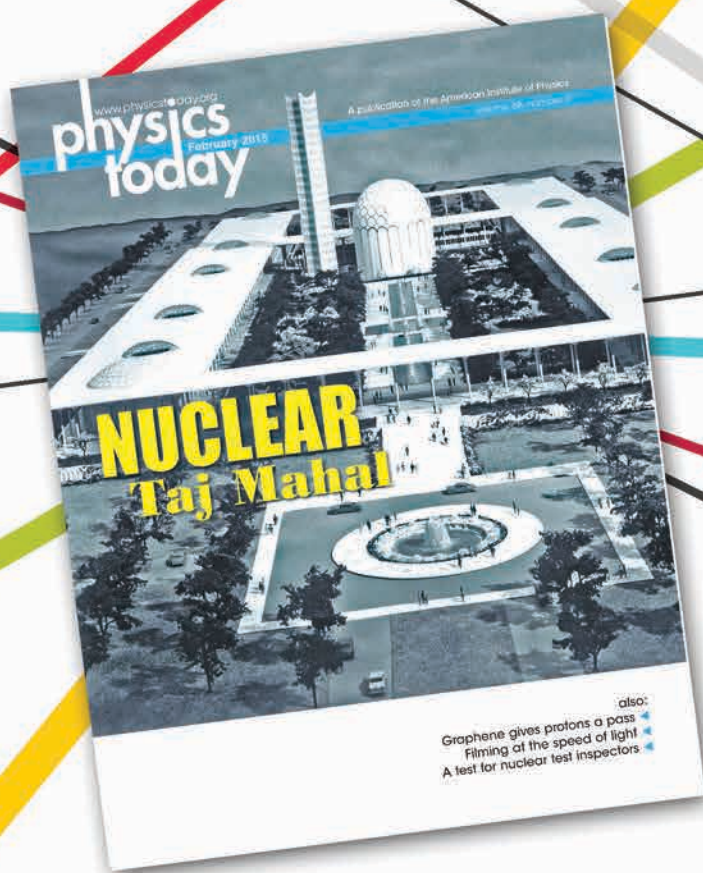
48860 Milmont Dr Unit 105-C, Fremont, CA, 94538 (USA)

+1 510 668 1508; fax +1 510 668 1595

sales@precisionasphere.com; www.precisionasphere.com

**Featured Product: Standalone OAP, Off-Axis Hyperbola, General OAP Aspheres, Freeform optics, made of Glass, Si, SiC**

PRECISION ASPHERE, Inc is a proud US company specialized in the manufacturing of high precision custom aspheres. Working with glasses, silicon, and silicon carbide, we can fabricate aspheric optical surfaces to less than 1/50 waves PV @633nm surface figure, with slope error < 1μRad, roughness < 2Å. Possessing the unique CAST technology and over 20 years' experience of aspheres manufacturing, PRECISION ASPHERE offers you the highest PERFORMANCE-to-COST ratio in the industry. Contact: John Kong, President, sales@precisionasphere.com



# Connecting fields across the physical sciences since 1948.

**Sign up for free email alerts  
and get connected!**

<http://aip.org/pt/alerts.html>



# EXHIBITOR DIRECTORY

## Precision Glass & Optics

#818

**SPIE** Corporate Member

3600 W Moore Ave, Santa Ana, CA, 92704 (USA)  
+1 714 540 0126; fax +1 714 540 1482  
info@pgo.com; www.pgo.com

### Featured Product: 30 Years of Providing Precision Optics, Thin Film Coatings, Glass Substrates/Fabrication Services

PG&O has delivered high quality, precision glass, optics, and optical coatings for a variety of applications for 30 years. The company has an extremely large inventory of glass products, a full optical fabrication shop, three large coating chambers, and an expert, in-house engineering staff to provide advanced, precision optical coatings and manufacturing of large mirror blanks. Other services include CNC machining, polishing, slicing, sawing, scribing, grinding, edging, assembly, and more. Contact: Dan Bukaty, Jr., President, danjr@pgo.com

## Precision Optical

#113

**SPIE** Corporate Member

320 Kalmus Dr, Costa Mesa, CA, 92626-6045 (USA)  
+1 949 631 6800; fax +1 949 642 7501  
sales@precisionoptical.com; www.precisionoptical.com

### Featured Product: Alignment cubes, Prisms, Corner Cubes, Prismatic Optical Components, Coatings and assemblies.

Manufacturer of Laser-Quality precision optical assemblies and components (VUV to IR). Including prisms, mirrors, windows, retro-reflectors, optical flats, filters, plate-type beam-splitters, alignment cubes, transmission flats, polarizing and non-polarizing cube beam-splitters, and coatings. We provide assembly and sub-assembly services. Glass to glass actively aligned assemblies. Glass to metal bonding, precision alignment and lapping services. Offering solutions for complex prism geometries. Contact: JEREMY GORDON, V.P. SALES & MARKETING, jgordon@precisionoptical.com; James McClure, SALES MANAGER, jmclure@precisionoptical.com

## Precision Optics Gera Corp.

#626

1090 Delacroix Cir, Nokomis, FL, 34275-4563 (USA)  
+1 941 803 4927  
info@pog.eu; www.pog.eu

POG designs, develops and processes custom optical and EO-mechanical systems and components from the UV through IR for machine vision, semiconductor industry, aerospace and defense. POG is a leading manufacturer of custom and standard microstructures on glass and ceramics – reticles, scales, calibration targets and test patterns. In-house photolithographic processes result in the highest possible quality for serial production and small batch quantities. Contact: Buzz Nesti, buzz.nesti@pog.eu; Andre Miessler, andre.miessler@pog.eu

## Princeton Instruments

#712

**SPIE** Corporate Member

3660 Quakerbridge Rd, Trenton, NJ, 08619-1208 (USA)  
+1 609 587 9797; fax +1 609 587 1970  
info@princetoninstruments.com; www.princetoninstruments.com

### Featured Product: IsoPlane 160 Compact Imaging Spectrograph Outperforms All Others in its Class

Princeton Instruments designs and manufactures high-performance CCD, ICCD, EMCCD, emiCCD, and InGaAs cameras; spectrographs; and optics-based solutions for the scientific research, industrial imaging, and OEM communities. We take pride in partnering with our customers to solve their most challenging problems in unique, innovative ways. Princeton Instruments is a registered ISO 9001:2008 company. For more information on Princeton Instruments products, please visit www.princetoninstruments.com. Contact: Matt Lyons, Sales Manager - Americas, mlyons@princetoninstruments.com

## Pure Photonics

#234

3851 Perie Ln, San Jose, CA, 95132 United States  
+1 510 566 3553  
info@pure-photonics.com; www.pure-photonics.com

## SPIE COURSES

### CONTINUING EDUCATION. RELEVANT TRAINING. PROVEN INSTRUCTORS.

Bring top instructors to your desktop or facility for convenient, consistent, and measurable learning—tailored to fit your schedule and meet your needs

[www.spie.org/education](http://www.spie.org/education)

**SPIE.**

## 2 WAYS TO TRAIN



### ONLINE COURSES

- Ensure training consistency across multiple locations
- Managers can track student progress and completion
- Content is modular - students can train as time allows
- Course remains active for a full year to allow review

### IN-COMPANY

- Catalog of 1100+ courses to choose from
- Customizable content
- Instructor teaches at your facility
- Ideal for training large groups at one time



## Quantum Design

#438

6325 Lusk Blvd, San Diego, CA, 92121-3733 (USA)  
+1 858 481 4400  
info@qdusa.com; www.qdusa.com

## Quartus Engineering Inc.

#336

10251 Vista Sorrento Pkwy Ste 250, San Diego, CA, 92121-3776 (USA)  
+1 858 875 6000; fax +1 858 875 6001  
www.quartus.com

## Qubitekk, Inc.

#639

1216 Liberty Way, Vista, CA, 92081 (USA)  
+1 661 829 6709; fax +1 661 829 6918  
www.qubitekk.com

## Rayleigh Optical Corp.

#521

3730 Commerce Dr Ste 1217, Baltimore, MD, 21227-1638 (USA)  
+1 410 881 7589  
info@rayleighoptical.com; www.rayleighoptical.com

### Featured Product: Large aspherical optics up to 2-m

Established in 1987, ROC manufactures large custom optics from a variety of materials, up to 2m. ROC specializes in the fabrication of large aspherical mirrors and lenses. Our capabilities include a 1.5 m CNC generator, large vertical test towers, computer-controlled polishing, CGH test methods, phase-measuring interferometry, and swing-arm profilometry. Our main focus is the production of high quality reflective and refractive imaging optics for the astronomical and research communities. Contact: Vilma Anderson, President and Co-founder, info@rayleighoptical.com; David S. Anderson, Director of Large Optics, info@rayleighoptical.com

## Raytheon ELCAN Optical Technologies

#737

**SPIE** Corporate Member  
450 Leitz Rd, Midland, ON, L4R 5B8 Canada  
+1 705 526 5401; fax +1 705 526 5831  
info@elcan.com; www.elcan.com

### Onsite Directory

## Rochester Precision Optics

#724

**SPIE** Corporate Member  
850 John St, West Henrietta, NY, 14586-9748 (USA)  
+1 585 292 5450; fax +1 585 292 5459  
sales@rpoptics.com; www.rpoptics.com

### Featured Product: Proven Technology. Trusted Experience.

Rochester Precision Optics has a long-standing history of excellence within the optics industry. RPO offers complete design services from our staff of mechanical engineers, optical engineers, and lens designers. RPO offers a full spectrum of Precision Optical Manufacturing including: Design and Engineering Services; Systems Integration; Lens Assembly; Visible and Infrared Components; Glass and Plastic Molded Aspheres; Thin Film Coating. Contact: Matthew Pembroke, Director of Sales, mpembroke@rpoptics.com; Ed Patton, Director of Business Development, epatton@rpoptics.com

## RPMC Lasers, Inc.

#516

**SPIE** Corporate Member  
203 Joseph St, O'Fallon, MO, 63366-2614 (USA)  
+1 636 272 7227  
info@rpmclasers.com; www.rpmclasers.com

RPMC offers high quality laser diode products from technology leading manufacturers in wavelengths from 375nm – 2.3um. We have a full range of products from single emitters to high power fiber coupled packages. We also offer laser diode accessories including diode drivers, TEC controllers and heatsinks. Lamp, DPSS & fiber lasers from nJ to 300J & CW, nanosecond, picosecond, or femtosecond outputs. Custom DPSS lasers also. For applications in Industrial, military, scientific, and medical app Contact: Chuck Ratermann, President, chuck@rpmclasers.com; Dean Micke, Vice President, dean@rpmclasers.com

## Ruda-Cardinal, Inc.

#740

**SPIE** Corporate Member  
1101 N Wilmot Ste 211, Tucson, AZ, 85712-4410 (USA)  
+1 520 546 1495; fax +1 520 546 1481  
accounting@ruda.com; ruda-cardinal.com

## SCHOTT North America, Inc.

#524

**SPIE** Corporate Member  
400 York Ave, Duryea, PA, 18642-2036 (USA)  
+1 570 457 7485; fax +1 570 457 7330  
info.optics@us.schott.com; www.us.schott.com

### Featured Product: Astro Filter - Specification of narrow steep bandpass filters with broad blocking for astronomy

SCHOTT Advanced Optics, with its deep technological expertise, is a valuable partner for its customers in developing products and customized solutions for applications in optics, lithography, astronomy, opto-electronics, architecture, life sciences, and research. With a product portfolio of more than 120 optical glasses, special materials and components, we master the value chain: from customized glass development to high-precision optical product finishing and metrology. Contact: David Schimmel, Marketing Manager, david.schimmel@us.schott.com

## Schrodinger

#334

5820 Oberlin Drive Suite 203, San Diego, CA, 92121 (USA)  
info@schrodinger.com; www.schrodinger.com

### Featured Product: Materials Science Suite

Founded in 1990, Schrödinger is widely recognized as a scientific and technological leader in developing state-of-the-art chemical simulation software. Schrödinger makes significant investments in R&D, which has led to major advances in the field of computational chemistry. The company is actively developing state-of-the-art simulation tools for materials research as well as enterprise software that can be deployed throughout an entire research organization. Contact: Tim Keefe, Director, Materials Science Sales, tim.keefe@schrodinger.com; Mathew D. Halls, Executive Director, Materials Science, mat.halls@schrodinger.com

# EXHIBITOR DIRECTORY

## Sierra Precision Optics

#312

**SPIE** Corporate Member

12830 Earhart Ave, Auburn, CA, 95602-9027 (USA)  
+1 530 885 6979; fax +1 530 885 1037  
sales@sierraoptics.com; www.sierraoptics.com

### Featured Product: Spherical & Cylindrical Lenses, Laser pump cavity flow tubes

Plano optics, Filters, Panels, Windows, Mirrors, Beam Splitters, Wedges & Prisms, Spherical & Cylindrical Lenses, Specialties: Cylindrical optics, Excimer laser Optics, UV/VIS/NIR Resonator optics, Flow Tubes & Custom shaped optics, 1/20th wave metal polishing of Invar & stainless steel. Materials, optical glasses UV, Visible, Near IR such as Fused Silica, Optical Glass BK7, Pyrex, SF grade, Filter Glass, Samarium, Quartz, CaF<sub>2</sub>, MgF<sub>2</sub>, Zerodur, Yag, Silicon, ZnSe, ZnS, & Ge. Contact: Russ Lowe, Sales & Marketing Manager, rlowe@sierraoptics.com; Stephen Bennion, Engineering Manager, sbennion@sierraoptics.com

## Siskiyou Corporation

#328

**SPIE** Corporate Member

110 SW Booth St, Grants Pass, OR, 97526-2410 (USA)  
+1 541 479 8697; fax +1 541 479 3314  
sales@siskiyou.com; www.siskiyou.com

Siskiyou Corporation manufactures motion control devices with manual and computer interfaced controllers, translation stages, mirror mounts, lens positioners, adjustment screws, construction hardware, fiber grippers, and other opto-mechanical components for use in research and manufacturing. Siskiyou Corporation will also custom tailor devices to fit your needs. Contact: Marion Murphy, Receptionist, reception@siskiyou.com; Mark Mittelstaedt, Western Regional Sales Manager, markm@siskiyou.com

### Promotional Partner

## Society of Vacuum Coaters

#745

71 Pinon Hill Place NE, Albuquerque, NM, 87122 (USA)  
+1 505 856 6924; fax +1 505 856 6716  
svcinfo@svc.org; www.svc.org

### Featured Product: 2016 Annual Technical Conference, Education Program and Exhibit. Indianapolis, IN | May 9-13, 2016

SVC is a non-profit organization promoting technical excellence by providing a global forum to inform, educate, and engage the members, the technical community, and the public on all aspects of vacuum coating, surface engineering and related technologies. SVC provides year-round offerings of On-Location Tutorial Courses, instructional webinars, printed and digital publications, and on-line resources for those involved in vacuum coating and related technologies. Contact: Vivienne Mattox, Executive Director, viviennemattox@svc.org; Beth Strong, Executive Manager, bethstrong@svc.org

## SODERN

#736

20 ave Descartes, Limeil Bevannes Cedex, 94451 France  
+33 1 45 95 7086  
com@sodern.fr; www.sodern.fr/

### Featured Product: Space optics: lens assemblies, filters, scrambling windows, UV lenses, detection modules

Sodern proposes world class integrated solutions for opto-mechanical space systems. Sodern's expertise spans over the whole project life cycle from R&D to equipment's qualification & associated mission support. Sodern can design space equipments combining some or all of following technologies: optics; detection (CCD, CMOS-APS, IR, gamma, neutrons); stabilised lasers; electronic, FPGA; real-time software; very high stability opto-mechanical assemblies; mechanisms; ultra-high vacuum. Contact: Arnaud Colmon, business development manager, arnaud.colmon@sodern.fr

## Special Optics, A Navitar Company

#635

**SPIE** Corporate Member

315 Richard Mine Rd, Wharton, NJ, 07885-1659 (USA)  
+1 973 366 7289; fax +1 973 366 7407  
sales@specialoptics.com; www.specialoptics.com

## Spectral Instruments

#344

**SPIE** Corporate Member

420 N Bonita Ave, Tucson, AZ, 85745-2747 (USA)  
+1 520 884 8821; fax +1 520 884 8803  
info@specinst.com; www.specinst.com

Spectral Instruments specializes in the development and manufacture of cooled CCD cameras for demanding low-light applications. We provide the finest low noise <3e-, high sensitivity, -110C cooling, 16-bit CCD cameras that current technology can offer. Optical inputs can include windows with custom coatings through fiber optic tapers or faceplates. Readout options are designed to be flexible and customized to the application. Custom CCD designs and OEM camera production are available. Contact: Kevin Toerne, Systems Specialist, ktoerne@specinst.com

## Spectrogon US, Inc.

#318

**SPIE** Corporate Member

115 Route 46 W Ste A2, Mountain Lakes, NJ, 07046 (USA)  
+1 973 331 1191; fax +1 973 331 1373  
sales.us@spectrogon.com; www.spectrogon.com

### Featured Product: Optical Filters, Holographic Diffraction Gratings, Thin film optical components

Spectrogon specializes in the design & manufacturing of optical filters, thin film coatings and components for analytical, medical, and scientific applications. Spectrogon is the world leader in the design and manufacture of Holographic Diffraction Gratings for laser compression/stretcher applications, tuning, and spectroscopic instruments. Spectrogon offers a huge inventory of stock filters (www.spectrogon.com) that can ship within 2 weeks. Contact: Steve Finn, Sales Manager, sales.us@spectrogon.com; Kelly Neeb, Sales Adm., sales.us@spectrogon.com

## SPIE Career Center

#235

1000 20th Street, Bellingham, WA, 98225-6705 (USA)  
+1 360 685 5551; fax +1 360 647 1445  
sales@spiecareercenter.org; www.spiecareercenter.org

### Featured Product: Online Job Board; Recruitment Advertising; Job Fairs

The SPIE Career Center is the leading recruitment resource for companies and professionals in the optics and photonics community. Whether you're looking for a new job or searching for top candidates, our resources will help you find the perfect match for your needs. Job seekers can post their resumes, search our online job board and access additional resources for career advancement. Employers can advertise jobs online, access the SPIE searchable resume database and exhibit in SPIE Job Fairs. Contact: Lacey Barnett, Career Center Sales Coordinator, LaceyB@spie.org

## SPIE Digital Library

#241

PO Box 10, Bellingham, WA, 98227-0010 (USA)  
+1 360 676 3290; fax +1 360 647 1445  
spiedlhelp@spie.org; www.spiedigitallibrary.org

### Featured Product: The World's largest collection of optics and photonics applied research

The SPIE Digital Library contains more than 425,000 articles from SPIE journals and proceedings, as well as more than 210 eBooks. Abstracts are freely searchable, and an increasing number of full articles in the society's 10 peer-reviewed journals are published with open access. Approximately 18,000 new research papers, eBooks, and other publications are added each year. Contact: William Goodman, SPIE Digital Library Sales, willg@spie.org

## StellarNet, Inc.

#422

**SPIE** Corporate Member

14390 Carlson Cir, Tampa, FL, 33626-3003 (USA)  
+1 813 855 8687; fax +1 813 855 0394  
contactus@stellarnet.us; www.stellarNet.us

### Featured Product: Complete Raman Spectroscopy Systems. Low cost lasers, spectrometers and accessories available.

Since 1993, StellarNet, Inc. has been a global provider of low cost miniature spectrometers and spectroscopy software for product analysis, research, education, and OEM. StellarNet instrumentation is rugged for any environment- lab, process, or field. We offer complete systems and accessories including integrating spheres, light sources, optical fibers, and probes. Applications include LED/Laser characterization, solar spectral analysis, thin-film metrology, colorimetry, chemistry, and LIBS. Contact: Jason Pierce, Business Director, Contactus@stellarnet.us

## Surface Optics Corporation

#638

11555 Rancho Bernardo Rd, San Diego, CA, 92127-1441 (USA)  
+1 858 675 7404; fax +1 858 675 2028  
contact@surfaceoptics.com; www.surfaceoptics.com

### Featured Product: SOC710-VP Hyperspectral Imaging System

Surface Optics Corporation (SOC) offers a single engineering and manufacturing source for the characterization, control, and exploitation of the optical properties of surfaces. For over 35 years, Surface Optics has provided hemispherical and bidirectional reflectance measurement services, custom instrument engineering services, analytical software, reflectometers, hyperspectral and multispectral imagers, and surface coating products for a broad range of industry applications. Contact: Wes Autran, Sales, wautran@surfaceoptics.com

### Featured Exhibitor

## Sutter Instrument Corp.

#528

**SPIE** Corporate Member

One Digital Dr, Novato, CA, 94949-5703 (USA)  
+1 415 883 0128; fax +1 415 883 0572  
info@sutter.com; www.sutter.com

### Featured Product: Lambda HPX-L5 High powered liquid cooled LED light source and TLED+ high-output LED light source

Manufacturer of precision electromechanical devices for scientific research and industrial OEM for 41 years. Imaging products include the Lambda HPX-L5 and TLED+ high-output LED light sources and the SOM simple microscope as well as optical filterwheels, tunable filter changers; xenon and plasma light sources with integrated wavelength selection capabilities, and our stepper-motor controlled SmartShutter. The P-2000 CO<sub>2</sub> laser-based micropipette puller remains the premier NSOM fiber tip puller. Contact: Jack Belgum, SR, VP, R&D, jack@sutter.com; Aleandra Cooper, Dir. Sales & Marketing, alex@sutter.com

## Sydor Optics, Inc.

#216

**SPIE** Corporate Member

31 Jetview Drive, Rochester, NY, 14624 (USA)  
+1 585 271 7300; fax +1 585 271 7309  
sales@sydor.com; www.sydor.com

### Featured Product: Custom Glass Wafers: Diameters from 10mm - 450mm, Thickness down to 0.1mm (size dependent)

Sydor Optics is a custom manufacturer of precision flat-surfaced, parallel and wedged glass optical components specializing in double-sided and single-sided grinding & polishing, CNC machining and laser machining. Custom optical components manufactured with a variety of optical glass substrates include wafers, windows, filters, beamsplitters, wedges, lightpipes, mirrors, optical flats and witness samples. ITAR Registered, ISO 9001:2008 Certified. Contact: Michael Naselaris, General Manager, sales@sydor.com

## Synopsys, Inc.

#117

690 E. Middlefield Road, Mountain View, CA, 94043 (USA)  
+1 626 795 9101; fax +1 626 795 9102  
optics@synopsys.com; optics.synopsys.com

### Featured Product: LightTools 8.3 enables modeling and design of freeform optics for a wide range of applications

Synopsys' Optical Solutions Group is a leading developer of optical design and analysis tools, with CODE V® imaging design software, LightTools® illumination design software, LucidShape® products for automotive lighting, and RSoft™ products for photonic component and optical systems design. The group is also an independent supplier of optical engineering services. Contact: Stuart David, Senior Manager, Worldwide Sales, optics@synopsys.com

## Syntec Optics

#226

**SPIE** Corporate Member

7100 Junction Rd, Pavilion, NY, 14525-9749 (USA)  
+1 585 768 2513; fax +1 585 768 0699  
info@syntecoptics.com; www.syntecoptics.com

### Featured Product: High Precision Polymer Optical Components and Optical Sub-Systems

For over 30 years, Syntec Optics has built a solid foundation in new processes for producing various geometries and shapes of optical elements for both visible and IR light. Syntec focuses on custom polymer optics for the Medical, Defense/Security, and the Consumer/Industrial sectors. Syntec Optics has been spurring innovation in single point diamond turning for over a decade, and has been reinventing polymer optic applications and tolerances. Contact: Shauna Smith, Sales & Marketing, Sales@syntecoptics.com

## TDK-Lambda Americas-High Power Div. #324

405 Essex Rd, Neptune, NJ, 07753 (USA)  
+1 732 922 9300; fax +1 732 922 1441  
sales@us.tdk-lambda.com; www.us.tdk-lambda.com/hp

# EXHIBITOR DIRECTORY

## Tec 5 USA

**SPIE** Corporate Member

80 Skyline Dr, Plainview, NY, 11803-2518 (USA)  
+1 516 635 2000; fax +1 516 939 0555  
info@tec5usa.com; www.tec5usa.com

### Featured Product: Multi-Channel Spectrometer System

tec5USA offers high quality products for optical spectroscopy from complete systems to the individual components. All products are designed for reproducibility, low maintenance, and fast acquisition. Fiber-optic accessories include light guides and probes for a multitude of measurements. Software support ranges from programming tools to applications (incl. chemometrics). Customizations possible. Contact: Gert Noll, General Manager, info@tec5usa.com; Stacey Carrier, Product Manager, stacey@tec5usa.com

#530

## Thorlabs

**SPIE** Corporate Member

56 Sparta Ave, Newton, NJ, 07860-2402 (USA)  
+1 973 300 3000; fax +1 973 300 3600  
sales@thorlabs.com; www.thorlabs.com

### Featured Product: Thorlabs' Kurios™ Liquid Crystal (LC) Tunable Bandpass Filter

Thorlabs designs, develops, and manufactures building blocks for the Photonics industry, including optomechanics, motion control electronics, nanopositioning stages, fiber and optical components, laser diodes, tunable lasers, and vibration isolation systems. Headquartered in Newton, NJ, our portfolio includes system-level solutions, including complete OCT, multiphoton, confocal, and adaptive optics systems.

#428

## Tecnisco Ltd.

#815

2-2-15 Minami Shinagawa, Shinagawa-ku, Tokyo, 140-0004 Japan  
+81 3 3458 4561; fax +81 3 3458 2780  
o-sales@tecnisco.co.jp; www.tecnisco.co.jp/en  
Contact: Haruka Aizawa, Marketing

## Teledyne Judson Technologies

#445

**SPIE** Corporate Member

221 Commerce Dr, Montgomeryville, PA, 18936-9641 (USA)  
+1 215 368 6900; fax +1 215 362 6107  
information@teledynejudson.com; www.teledynejudson.com

Teledyne Judson Technologies is the recognized leader of infrared photodetectors and accessories for spectroscopy, instrumentation, medical and space applications. Specializing in Ge, InGaAs, X-InGaAs, InAs, PbS, PbSe, InSb, and HgCdTe (PC and PV), our products encompass single and multi-element designs with integrated detector/dewar/cooler (IDCA) assemblies. TJT also provides InGaAs, InSb, and MCT two-dimensional focal plane arrays integrated to dewars and coolers. Contact: Mark Sediva, Sales Engineer, mark.sediva@teledyne.com; Joseph Kimchi, VP, Business Development, joe.kimchi@teledyne.com

## Thermo Scientific - CIDTEC

#131

**SPIE** Corporate Member

101 Commerce Blvd, Thermo Fisher Scientific, Liverpool, NY, 13088-4507 (USA)  
+1 315 451 9410; fax +1 315 451 9421  
sales.cidtec@thermo.com; www.thermoscientific.com/cidtec

### Featured Product: 2K x 2K Random access camera with eXtreme Dynamic Range (XDR). Radiation hard digital color cameras.

Thermo Scientific - CIDTEC manufactures high performance UV-NIR sensitive cameras for demanding scientific imaging applications, radiation environments, and unique machine vision inspection applications. Cameras include eXtremely wide Dynamic Range (XDR) for the SpectraCAM line of scientific cameras with unparalleled linear dynamic range, as well as KiloRAD PTZ, MegaRAD and ColorRAD cameras for operation in radiation environments. Deep UV and X-Ray coating deposition services are also available. Contact: Tony Chapman, Director of Sales and Marketing, tony.chapman@thermofisher.com; Suraj Bhaskaran, Engineering Director, suraj.bhaskaran@thermofisher.com

## Lanyards

## TRIOPTICS GmbH

#628

**SPIE** Corporate Member

Hafenstr 35-39, Wedel, 22880 Germany  
+49 4103 18006 0; fax +49 4103 18006 20  
sales@trioptics.com; www.trioptics.com

We have the largest spectrum of optical measurement technology and supply test systems for R&D and production for every manufacturing step in optics: From a system for refractive index measurement, via various lens test systems, up to MTF test systems and camera module testers, we can supply the appropriate optical measurement system for every process step. Our field of activity comprises the development and production of optical and precision instruments. Contact: Tom McDaniel, t.mcdaniel@trioptics-usa.com; Harvey Miller, harvey.miller@trioptics-usa.com

## United Lens Company, Inc.

#726

**SPIE** Corporate Member

259 Worcester St, Southbridge, MA, 01550-1376 (USA)  
+1 508 765 5421; fax +1 508 765 0500  
www.unitedlens.com

### Featured Product: High Power Laser Mirrors: Pulsed: 40J/cm<sup>2</sup>, 20 nsec 20 Hz @1064nm

ULC is ITAR registered & ISO 9001:2008 certified, Optical component manufacturer in USA serving the Defense/Aerospace & Commercial Photonics Industry since 1916. Providing complete fabrication of precision Flats & Curved substrates, various shapes & sizes from 4mm to 600 mm range. In house Thin film coatings for challenging spectral performance in UV- Mid IR, High-power Laser Mirrors & Windows, Debris Shields, Filters, Beam Splitters, Lenses. Contact: Tara King, Sales Manager, tking@unitedlens.com; William Hill, Sales Representative, bhill@unitedlens.com



## University of Arizona College of Optical Sciences #728

SPIE Corporate Member

1630 E University Blvd, Tucson, AZ, 85721-0095 (USA)  
+1 520 621 6997  
info@optics.arizona.edu; www.optics.arizona.edu

### Featured Product: Educational and research institution

The University of Arizona, College of Optical Sciences educates students in all aspects of the study and application of light, performing internationally recognized research in optical engineering, quantum optics, applied optics and photonics, and image science. The College of Optical Sciences is the world's premier optical institute, with award-winning faculty members, a diverse student body, challenging courses, pioneering research programs and close relationships with the optics industry. Contact: R. John Koschel, Associate Dean for Academic Programs, jkoschel@optics.arizona.edu; Kaye Rowan, Senior Director of Development, rowan@optics.arizona.edu

## University of California, Irvine Extension #335

110 Theory Ste 250, Irvine, CA, 92617-3202 (USA)  
+1 949 824 5414  
unex-services@uci.edu; www.extension.uci.edu

### Featured Product: Online Optical Engineering and Optical Instrument Design Certificate Programs

UC Irvine Extension is the continuing education unit of the University of California, Irvine. We offer certificate programs in over 60 areas including Optics. We currently have two online optics programs: Optical Engineering and Optical Instrument Design. Both programs address the growing demand for skilled professionals who can conceptualize, design, and manufacture optical components and systems. Contact: Jennifer Spitzer, Program Manager, jspitzer@uci.edu

## University of Southern California Viterbi School of Engineering #636

3650 McClintock Ave, OHE 106, Los Angeles, CA, 90089 (USA)  
+1 213 740 4488; fax +1 213 821 0851  
DEN@viterbi.usc.edu; viterbi.usc.edu/gapp

**PRISM20  
AWARDS16**

PrismAwards.org

# Call for Entries

## The most prestigious award for new optics and photonics products.



Apply online by 9 October 2015: PrismAwards.org

PRESENTED BY SPIE & PHOTONICS MEDIA

# EXHIBITOR DIRECTORY

## UTC Aerospace Systems - Sensors Unlimited Products

#618

SPIE Corporate  
Member

330 Carter Rd Ste 100, Princeton, NJ, 08540-7419 (USA)

+1 609 333 8200

sui\_info@utas.utc.com; www.sensorsinc.com

**Featured Product: Sensors Unlimited 320CSX MicroSWIR Camera - Affordable, non-ITAR, small SWaP for industrial markets.**

Sensors Unlimited, Inc., a UTC Aerospace Systems company, develops innovative shortwave infrared (SWIR) sensing/imaging solutions based on indium gallium arsenide imaging technology. Products include InGaAs-SWIR cameras & systems, 1- and 2-D focal plane arrays & extended wavelength response InGaAs image sensors. Imaging applications include near-infrared spectroscopy, security/surveillance, line-scan inspection, process control, laser beam profiling, microscopy, OCT, art inspection & astronomy. Contact: Shannon Larbig, Sales Manager, sui\_info@utas.utc.com

## Vincent Associates

#229

803 Linden Ave, Rochester, NY, 14625-2709 (USA)

+1 585 385 5930; fax +1 585 385 6004

vincentassociates@uniblitz.com; www.uniblitz.com

**Featured Product: DSS35B Series, a 35mm bi-stable shutter and the VED24 drive controller.**

Vincent Associates, manufacturer of UNIBLITZ electronically programmed shutters and shutter drive systems. They produce standard devices (LS, VS & CS series for high reliability), XRS (x-ray use), NS series (bi-stable and uni-stable configurable), the DSS (Design Scalable Shutters), TS series (flag alternative) and the new RS20, square aperture shutter design. Standard aperture sizes range from 2-90mm with many types of mounting systems offered. Ask us about our custom capability designs too. Contact: Dominick Polizzi, Sales Manager, dpolizzi@uniblitz.com; Adam Lamb, CTO, alamb@uniblitz.com

**SPIE provided over \$4 million in support of education and outreach programs in 2014.**

### GIVING.

SPIE supports tomorrow's leaders through a wide array of scholarships, grants, educational materials, and networking opportunities.



SPIE Scholarships

Education Outreach Grants

Student Chapters

Student Activities

Best Student Paper Prizes

Free Posters

Free Educational DVDs and Videos

Women in Optics

Education and Training in Optics and Photonics Conference (ETOP)

Hands on Optics (HOO): K-12 outreach

Science Fairs

Optics Education Directory

Free SPIE Journal Access in developing nations

Active Learning in Optics and Photonics (ALOP): Teacher Training

International Centre for Theoretical Physics (ICTP) Winter College

Visiting Lecturer Program

SPIE is the international society for optics & photonics.

[www.spie.org/giving](http://www.spie.org/giving) **SPIE.**

## Vital Materials Co., Limited

#627

**SPIE** Corporate Member

No 268 DongFengZhong Rd, Unit 2901-2904 Exchange Sq,  
Guangzhou, 510030 China  
+86 20 83511906; fax +86 20 83511907  
sales@vitalchem.com; www.vitalchem.com

### Featured Product: Germanium related products, ZnSe, high purity products

Vital is a global rare metals based materials technology group. As the market leader in the global rare metals industry, Vital is the largest producer of selenium and tellurium materials, as well as the key producer of gallium, indium, germanium, bismuth, and cadmium products. Our subsidiary Phoenix Infrared Corporation is a US based company that produces and sells a variety of Infrared Materials, Optics and Laser Replacement Parts. Contact: Frank Boghe, Business Manager, frank.boghe@vitalchem.com; Dustin Docter, Sales Manager, dustin.docter@vitalchem.com

## Xenics

#518

**SPIE** Corporate Member

Ambachtenlaan 44, Leuven, 3001 Belgium  
+32 16 38 99 00; fax +32 16 38 99 01  
sales@xenics.com; www.xenics.com

### Featured Product: Xenics Xeva-2.35-320, versatile SWIR T2SL camera up to 2.35 μm

Xenics is a pioneer of path-breaking infrared technology with a proven track record of more than ten years. Xenics designs and markets infrared imagers, cores and cameras of best-in-class image quality to support innovative R&D, industrial automation, machine vision, process control and high-end security applications. The company offers a complete portfolio of line-scan and 2-D area-scan products for the VisNIR, SWIR, MWIR and LWIR ranges. Contact: Hervé Copin, CEO Xenics USA, Inc., herve.copin@xenics.com

## Z & Z Optoelectronics Tech. Co., Ltd.

#316

**SPIE** Corporate Member

No 3 Keyuan South Rd, High Tech Zone, Chengdu, Sichuan, 610041 China  
+86 28 8513 9768; fax +86 28 8525 5889  
sales@zsoptic.com; www.zsoptic.com

### Featured Product: Super Polishing, IR Optics, Laser Optics, UV Optics, Spherical lens, Plano optics, mirror, window

Z&Z is the first brand of Super Polishing from China. As a professional manufacturer of high precision IR and laser optics, Z&Z supports many reputed US and EU customers over the past 15 years. Our super polishing optics meet roughness of 0.1um and S/D 10-5. Custom optics with IR and UV materials are available (Ge, Si, fused silica, BK7, ZnSe, ZnS, Sapphire, CaF<sub>2</sub>, MgF<sub>2</sub>, GaAs, BaF<sub>2</sub>, etc). S/D is up to 5-1 and flatness up to 1/20λ. Products include mirrors, substrates, wedge and spherical lens. Contact: Cynthia Qi, SUPERVISOR, sales@zsoptic.com

## Zemax, LLC

#423

**SPIE** Corporate Member

22908 NE Alder Crest Dr Ste 100, Redmond, WA, 98053 (USA)  
+1 425 844 0152; fax +1 425 844 0153  
info@zemax.com; www.zemax.com

### Featured Product: Zemax OpticStudio™ software design platform that incorporates both optical and illumination design.

Zemax LLC - Optical & Illumination Design Software: Since 1991 Zemax has delivered design software, training, and support that set the standards for the optical and illumination design industry. Today Zemax is the preferred design platform for researchers, engineers, designers and students around the world. Zemax has the largest user base in the industry and works with industry leaders to understand today's design challenges and shape the next generation of design software. <http://www.zemax.com>  
Contact: Jessica Bjazevich, Marketing Coordinator, Jessica.Bjazevich@zemax.com; Rick Elento, Director of Sales & Marketing, rick.elento@zemax.com

## Zurich Instruments AG

#535

**SPIE** Corporate Member

Technoparkstrasse 1, Zurich, 8005 Switzerland  
+41 44 515 0410; fax +41 44 515 0419  
info@zhinst.com; www.zhinst.com

Contact: Andrew Turner, Technical Sales Manager, andrew.turner@zhinst.com; Dr. Paolo Navaretti, Application Scientist, paolo.navaretti@zhinst.com

## Zygo Corporation

#522

**SPIE** Corporate Member

Laurel Brook Rd, Middlefield, CT, 06455-1291 (USA)  
+1 860 347 8506  
inquire@zygo.com; www.zygo.com

For more than 40 years, Zygo Corporation has provided high precision noncontact measurement instruments, precision optical components, assemblies, and electro-optical design to the aerospace, defense, semiconductor, automotive, and optical industries. ZYGO's proprietary optical manufacturing and assembly technologies along with ITAR and FDA compliant facilities reduce time to market and costs while enabling superior quality and performance. Contact: David Melton, Director Sales & Support, dmelton@zygo.com; Marc Tricard, Director Optical Sales, mtricard@zygo.com

## Advertisers Index

AT-Fachverlag GmbH, inside front cover

Europa Science, p. 36

IOP Publishing Ltd., p. 5

Pennwell/Laser Focus World, p. 3

optics.org, p. 48

Phononics Media, p. 11

Photonics Online, p. 21

Physics Today, p. 25

Sutter Instrument Corp., back cover

# STUDENT CHAPTERS

---

Visit the student section of the exhibition and see what our Student Chapters have accomplished in research and outreach. Meet some of the best and brightest students from across the globe.

---

## Australian National University

Nonlinear Physics Centre Research School of Physics & Engineering, 59 Mills Road, Acton ACT 2601, Australia, katie.chong@anu.edu.au

## Bauman Moscow State Technical University

Moscow, 2nd Baumanskaya str. 5, Russia, yakov.egor@gmail.com

## Beijing Institute of Technology

5 South Zhongguancun St, Haidian District, School of Optoelectronics, 6014 Lab, Beijing, China, 815424379@qq.com

## Beijing University of Posts and Telecommunications

No.10 Xitucheng Road, Haidian Distric, Beijing, China., China, ningjieyu@bupt.edu.cn

## Capital Normal University

Capital Normal Univ, Rm 414 Dept of Physics, No 105 Xisanhuan-Bei Rd Haidian District, 100048 Beijing, China, China, minjieyuan@126.com

## Capítulo Estudiantil Univ. de Antioquia

Calle 70 #52-21, Instituto de Física, Medellín, Colombia, Colombia, fgomez79@gmail.com

## Changchun Inst Optics, Mech & Physics

Dong\_Nanhu Road 3888, Changchun, Jilin, 130033, PR China, China, yuanjz0826@163.com

## Charles Univ. in Prague

Institute of Physics, Ke Karlovu 5, Prague 2, Czech Republic 121 16, Czech Republic, nadvl@fzu.cz

## Chernivtsi National University

Kotsyubynskiy St 2, Chernivtsi, Ukraine, 58012, Ukraine, igaroshapanko@gmail.com

## CIOp-UNLP

Camino Centenario and 506, Gonnet, La Plata, Argentina, davidm@ciop.unlp.edu.ar

## CITEDI-IPN

Ave del Parque No 1310 Mesa de Otay, Tijuana, BC, Mexico, 22510, México, enrique.hdez@gmail.com

## Cochin University of Science and Technology

SPIE Cusat Student Chapter, Department of Physics, Cochin University of Science and Technology, Cochin-682022, Kerala, India, India, titu.thomas@ymail.com

## Ctr. de Investigaciones en Optica

Loma del Bosque 115, Colonia Lomas del Campestre León, Guanajuato, Mexico, essym@cio.mx

## Delhi Technological University

Delhi Technological University, Shahbad Daultapur, Main Bawana Road, Delhi-110042., INDIA, nishant.shankhwar@gmail.com

## Ecole Polytechnique-Paris Tech

LPICM Bat 406 rte de Saclay, Palaiseau, Cedex, France, 91128, thi-huong, dang@polytechnique.edu

## EPFL

Clément Javerzac-Galy, EPFL SB ICMP LPQM1, PH D3 345, Station 3, CH-1015 Lausanne, Switzerland, gregoire.smolik@epfl.ch

## FEMTO-ST

Dépt MN2S/FEMTO-ST/UFR Sciences, 16 rue de Gray, Besancon CEDEX, France 25030, France, tnkovalevich@gmail.com

## Gdansk Univ. of Technology

G. Narutowicza 11/12, Gdansk 80-233, Poland, Faculty of Electronics, Telecommunications and Informatics, Gdańsk Univ. of Tech. room 349 EA., Poland, michal@trojanowski.info

## Huazhong University of Science and Technology

1037 Luoyu Road, Wuhan, Hubei, China, linzk@hust.edu.cn

## Imperial College London

Secretary, UK, e.simpson12@imperial.ac.uk

## Indian Institute of Science

Indian Institute of Science Chapter, ECE Dept, Bangalore, India, 560 012, Phone: 91 80 22932832, INDIA, rakesh9920@gmail.com

## Indian Institute of Technology Madras

Indian Institute of Technology Madras Chapter, Applied Optics Lab/Dept of Physics, Chennai Tamil Nadu, India, 600036, India, manjumanoj1@yahoo.com

## Institute for Atomic Physics

Atomistilor Street, No. 409, Margurele, Ilfov, 077125, Romania, agota.simon@inflpr.ro

## Institute of Engineering and Management

Salt Lake Electronics Complex Sector-V, Kolkata, West Bengal, India, 700091, INDIA, subha.dchowdhury@gmail.com

## Institute of Radiophysics and Electronics

12 Akademika Proskura St, Kharkov, Ukraine, 61085, Phone: 380 57 7203463, Web: <http://ire-osaspie.at.ua/>, Ukraine, georgiivdo@gmail.com

## Instituto Nacional de Astrofísica, Óptica y Electrónica

Luis Enrique Erro # 1, México, ralphcerezo@gmail.com

## ITM University

ITM University, Sector 23A, Gurgaon, Haryana-122017, India, INDIA, manica.kathuria@yahoo.com

## ITMO University

Photonics & Optical Information Technologies Dept, 3b Kadetskaya liniya, St Petersburg, Russian Federation, 199034, Phone: 7 812 323 64 37, Web: <http://osc.ifmo.ru>, Russia, semenandronaki@gmail.com

## Karlsruhe Institute of Technology

c/o ASTA, Adenauerring 7, 76131 Karlsruhe, Germany, orlando.trsp@gmail.com

## Lomonosov Moscow State University

Physics Dept/International Laser Center, Moscow State University, Lenin Hills 1-62, Moscow, 119991, Russian Federation, schipilo.daniil@physics.msu.ru

## National Central University

No. 300, Jhongda Rd., Jhongli District, Taoyuan City 32001, Taiwan (R.O.C.), Taiwan, w\_4240@hotmail.com

## National Chiao Tung University

Dept of Photonics, 1001 University Road, Hsinchu, Taiwan 300, ROC, Taiwan, spp02042003@gmail.com

## National Institute of Technology Tiruchirappalli

National Institute of Technology Tiruchirappalli Chapter, Department of Physics, National Institute of Technology (NIT), Tanjore Road, Tiruchirappalli -620015, Tamil Nadu, India., Cell: +91-9786724469, India, amirphy9@yahoo.com

## National Taipei University of Technology

1, Sec. 3, Zhongxiao E. Rd., Taipei 10608, Taiwan, R.O.C., joun80217@hotmail.com

## National Taiwan University

National Taiwan University B113 Dept of physics No.1, Sec. 4, Roosevelt Rd., Taiwan, cmksmart@gmail.com

## National Technical University of Ukraine

National Technical University of Ukraine 2014 - 2015 report about organisation of student conferences, projects, exhibits & scientific works., Ukraine, alexevgood@gmail.com

## Northwestern University

Northwestern University, 633 Clark Street, Evanston, IL 60208-0001, United States, lingxuanpeng2016@u.northwestern.edu

## Peking University

Physics Dept North Room 243, No 5 Yiheyuan Rd Haidian, Beijing 100871, China, China, wangplzu@163.com

## Pennsylvania State University

121 Electrical Engineering East, United States, cxz167@psu.edu

## Purdue University

1205 W State St, West Lafayette, IN 47907-2057, United States, shalaginov@purdue.edu

## Rochester Institute of Technology

54 Lomb Memorial Drive, Rochester, NY 14623, United States, jxc4005@rit.edu

## Saint-Petersburg State Univ. of Aerospace Instrumentation

190000, 67 Bolshaya Morskaya, St Petersburg, Russia, zlakovoe@gmail.com

## Samara

Karl Marks Str 20-30, Samara 443096, Russian Federation, myakole@gmail.com

## Shenzhen University

Inst. of Optoelectronics, Shenzhen University, Nanhai Ave 3688, Shenzhen, Guangdong, P.R.China, 518060, China, ludajiang@outlook.com

## Sichuan University

No.24 South Section 1 Yihuan Road, Chengdu, Sichuan, China, zchen1226@126.com

## Silesian University of Technology

Faculty of Elec Engg/Dept of Optoelectronics, Akademicka Str 2A, Gliwice, Poland 44-100, Phone: 048 32 237 2902, Poland, pdmk.mail@gmail.com

# STUDENT CHAPTERS

## Stellenbosch University

Merensky Building, Merriman Avenue, Stellenbosch, South Africa, iminda@sun.ac.za

## Techno India Chapter

EM-4/1, Sector-V, Salt Lake, Kolkata, West Bengal 700091., India, aishik.cricphy@gmail.com

## Tunisia

Engineering School of Communication of Tunis, Ghazala Technopark, Ariana, Tunisia 2083, Tunisia, trichili.abderrahmen@gmail.com

## Univ. de Guadalajara

Dept of Electronics, Av Revolucion, Col Olympica, Modulo O, Puerto Sur, Guadalajara, JAL, Mexico, C.P. 44430, Phone: 13785900, Mexico, sergio.carranza.93@gmail.com

## Univ. Laval

Pavillon d'Optique Photonique, 2375 de la Terrasse, bureau 2177, Québec, QC, Canada, G1V 0A7, Canada, alex.cote.gt2@gmail.com

## Univ. Nacional Autónoma de México

Centro de Ciencias Aplicadas y Desarrollo Tecnológico, Ciudad Universitaria, Coyoacán, México D.F., Apdo. Postal 70-186, C.P. 04510, México, gabrielcsan@gmail.com

## Univ. of Arkansas

Rm 226 Dept of Physics, 825 W Dickson St, Fayetteville, AR, United States 72701, United States, grabraha@uark.edu

## Univ. of California, Davis

1 Shields Avenue, Davis, CA 95616, United States, ekleung@ucdavis.edu

## Univ. of Guanajuato

Carretera Salamanca - Valle de Santiago KM.3.5+1.8 Comunidad de Palo Blanco, Salamanca, Gto., Mexico, albet\_6@hotmail.com

## Univ. Politécnica de Tulancingo

Calle Ingenierias No 100 Col. Huapalcalco, Tulancingo, HI, México 43629, Mexico, roman.diaz@upt.edu.mx

# Subscribe for free\*



**Electro Optics**, with more than 40 years of history, is the magazine, website, and e-newsletter (EONewsliner) for the photonics market, covering technology, business and applications. It is Europe's leading publication for all those involved in the supply, integration or use of photonics components.

[www.electrooptics.com/subscribe](http://www.electrooptics.com/subscribe)



**Imaging and Machine Vision Europe** is the leading magazine, website, and e-newsletter (IMVENewsliner) for those involved in the integration and use of vision technologies across a wide range of disciplines, including manufacturing, traffic, security, military and medicine.

[www.imveurope.com/subscribe](http://www.imveurope.com/subscribe)



**Laser Systems Europe** is the magazine for integrators and users of laser systems, with a focus on applications, alongside up-to-date information on suitable products and technologies. The publication is supported by the LIA (Laser Institute of America).

[www.lasersystemseurope.com/subscribe](http://www.lasersystemseurope.com/subscribe)

\*Subscription is free for qualifying individuals

## Register online now

All titles are published by Europa Science Ltd, 9 Clifton Court, Cambridge, CB1 7BN, UK. Tel: +44 (0)1223 211170. [www.europascience.com](http://www.europascience.com)

## Univ. Veracruzana

Privada Primavera #19, Col Tatahuicapan, Xalapa, Veracruz, Mexico, Mexico, hannahjenn@hotmail.com

## Universidad Nacional de Colombia Medellín

Universidad Nacional de Colombia, CII 59A # 63-20 AA 3840, 050034, Núcleo El Volador, Escuela de Física, Medellín- Antioquia, Colombia, Colombia, eorregor@unal.edu.co

## Universitat Jaume I, GOC

Escuela Superior de Tecnología y Ciencias Experimentales, Dept de Física (Área de Óptica), Av Vicent Sos Baynat s/n, Universidad Jaume I, Castelló de la Plana, Spain, 12071, Spain, irlles@uji.es

## University of Arizona

1630 E University Blvd, Tucson, AZ 85719, United States, cbradley@optics.arizona.edu

## University Of Calcutta

Department of Applied Optics and Photonics, JD-2, Sector-III, Salt Lake City, Kolkata-700098, West Bengal. India, India, anusmita89@gmail.com

## University of Connecticut

Dept of Electrical & Computer Engineering, 371 Fairfield Rd, Storrs Mansfield, CT, 06269, United States, mohsen.erfanzadeh@uconn.edu

## University of Dayton

Electro-Optics Program, Fitz Hall 572, 300 College Park, Dayton, OH, United States, 45469-2951, Phone: 937 229 3611, Web: <http://campus.udayton.edu/~spie/>, United States, zhous4@udayton.edu

## University of Delhi at Acharya Narendra Dev College

Acharya Narendra Dev College, Govind Puri, Giri Nagar, Kalkaji, New Delhi, Delhi 110019, INDIA, KEVIVIDEVIRT@GMAIL.COM

## University of Exeter

Physics Building, Stocker Road, University of Exeter, Exeter, EX4 4QL, UK, m.j.gentile@exeter.ac.uk

## University of Latvia

Skunu Street 4, Riga, LV-1586, Latvia, elza.linina@gmail.com

## University of North Carolina, Charlotte

Grigg Hall Room 235, 9201 University City Blvd, Charlotte, NC, 28223, rbikmeto@unc.edu

## University of Otago

Physics Department, 730 Cumberland Street, Dunedin 9016, New Zealand, bianca.j.sawyer@postgrad.otago.ac.nz

## University of Oulu

Optoelectronics and Measurement Techniques Lab, P.O. Box 4500, Oulu, Finland 90014, Finland, olyabibikova@gmail.com

## University of South Florida

4202 E. Fowler Ave. Enb 118, Tampa, FL, United States, 33620-0001, wanhg@mail.usf.edu

## University of St Andrews

University of St Andrews, School of Physics and Astronomy, North Haugh, St Andrews KY16 9SS, United Kingdom, mj35@st-andrews.ac.uk

## University of Toronto

35 St. George Street, Toronto, ON, Canada, M5S 1A4., Canada, Ahmed. Dorrah@mail.utoronto.ca

## University of Warsaw

Faculty of Physics, ul. Pasteura 5, Warsaw, Poland 02-093, Poland, justyna.piwowar@gmail.com

## Utsunomiya University

Center for Optical Research and Education, 1-2 07 Chome, Yoto Utsunomiya-Shi Tochigi, Japan 321-8585, Phone: 81 28 689 7136, Japan, parra\_g@opt.utsunomiya-u.ac.jp

## Vilnius University

VU Laser Research Ctr, Sauletekio Ave 10 - 1st floor, Vilnius, Lithuania, 10223, Phone: 370 5 2366001, Lithuania, deividassab@gmail.com

## Vinnitsa National Technical University

Vinnytsia city, Kviateka str., 13/128, Ukraine, olya128@mail.ru

## Vrije Univ. Brussel

Pleinlaan 2, VUB, B-PHOT (Building F, 9th floor), 1050 Brussels, Belgium, jensdp1990@gmail.com

## Washington State University

Washington State Univ. Chapter, Dept of Physics & Astronomy, Webster 746, PO Box 642814, Pullman, WA, United States, 99164, Phone: 509 335 4672, United States, thomas.bersano@wsu.edu

## Washington Univ. in St. Louis

East Bldg CB 8225, 4525 Scott Ave, Saint Louis, MO, United States, 63110, United States, mreisman@wustl.edu

## Wroclaw Univ. of Technology

Wybrzeze Wyspianskiego 27, 50-370 Wroclaw, Poland, marika.zelazo@gmail.com

## Yerevan State University

Department of Physics, 21 Shopron Str, Yerevan, Armenia, 375090, Armenia, hakob.fizika@gmail.com

SPIE.

 stay connected  
optics.org



daily coverage of the optics and photonics  
industry and the markets that it serves

the business of photonics  
 **optics.org**



# PRODUCT CATEGORIES

## ASTRONOMY

4D Technology  
Applied Surface Technologies  
CoorsTek Engineered Ceramics  
GPD Optoelectronics Corp.  
Luxel Corp.  
Mad City Labs Inc.  
Optical Support, Inc.  
Photon Engineering LLC  
Precision Asphere, Inc.  
Precision Optical  
Rayleigh Optical Corp.  
SODERN  
Sutter Instrument Corp.  
Teledyne Judson Technologies  
Thermo Scientific - CIDTEC  
Xenics

## BASIC RESEARCH, SCIENCE

AdlOptica Optical Systems GmbH  
Applied Surface Technologies  
asphericon Inc.  
attocube systems Inc.  
B&W Tek, Inc.  
Chroma Technology  
FJW Optical Systems, Inc.  
Hinds Instruments, Inc.  
Laser Quantum Inc.  
Luxel Corp.  
Mad City Labs Inc.  
Micro Laser Systems, Inc.  
Minus K Technology Inc.  
Navitar  
Ocean Optics, Inc.  
Peter Kaszian Unternehmensberatung  
PHASICS Corp.  
Photon Design  
Photon Engineering LLC  
PLX Inc.  
Precision Glass & Optics  
Rayleigh Optical Corp.  
Schrodinger  
Surface Optics Corporation  
Sydor Optics, Inc.  
Thermo Scientific - CIDTEC  
University of Arizona College of Optical Sciences

## BIOMEDICAL, MEDICAL IMAGING, HEALTH CARE

Accumold  
Applied Surface Technologies  
asphericon Inc.  
attocube systems Inc.  
B&W Tek, Inc.  
Chroma Technology  
Elite Engineering  
FISBA AG  
Hinds Instruments, Inc.  
HOYA Corp. USA - Optics Division  
IDEX Optics & Photonics  
Laser Quantum Inc.  
Mad City Labs Inc.  
Micro Laser Systems, Inc.  
Midwest Optical Systems, Inc. (MidOpt)  
Minus K Technology Inc.

Navitar  
Ocean Optics, Inc.  
Optical Support, Inc.  
OptoSigma Corporation  
PHASICS Corp.  
Photon Engineering LLC  
Sutter Instrument Corp.  
Sydor Optics, Inc.  
Syntec Optics  
Thermo Scientific - CIDTEC  
UTC Aerospace Systems - Sensors  
Unlimited Products  
Xenics

## CAMERAS AND IMAGING SYSTEMS

4D Technology  
CoorsTek Engineered Ceramics  
Elite Engineering  
FJW Optical Systems, Inc.  
Isuzu Glass, Inc.  
Minus K Technology Inc.  
Navitar  
Optical Support, Inc.  
Precision Optics Gera Corp.  
Princeton Instruments  
SODERN  
Spectral Instruments  
Surface Optics Corporation  
Syntec Optics  
Thermo Scientific - CIDTEC  
UTC Aerospace Systems - Sensors  
Unlimited Products  
Xenics

## CHEMICAL AND BIOLOGICAL ANALYSIS

B&W Tek, Inc.  
Elite Engineering  
GPD Optoelectronics Corp.  
Hellma USA  
Hinds Instruments, Inc.  
Inrad Optics  
Isuzu Glass, Inc.  
Laser Quantum Inc.  
Micro Laser Systems, Inc.  
Ocean Optics, Inc.  
Peter Kaszian Unternehmensberatung  
Sutter Instrument Corp.  
Sydor Optics, Inc.  
Teledyne Judson Technologies  
Thermo Scientific - CIDTEC

## COMMUNICATIONS & NETWORKING

Accumold  
Ontar Corporation  
UTC Aerospace Systems - Sensors  
Unlimited Products

## COMPUTING SYSTEMS, DATA PROCESSING

attocube systems Inc.  
Elite Engineering  
Photon Design

## COMPUTING, DATA PROCESSING HARDWARE

Elite Engineering  
Isuzu Glass, Inc.

## CONSULTING SERVICES

AdlOptica Optical Systems GmbH  
asphericon Inc.  
Elite Engineering  
G-S Plastic Optics  
Navitar  
Optical Support, Inc.  
Optikos Corporation  
Photon Engineering LLC  
Precision Optics Gera Corp.  
Rayleigh Optical Corp.  
Rochester Precision Optics  
Schrodinger  
Synopsys, Inc.

## CONSUMER ELECTRONICS

Accumold  
HOYA Corp. USA - Optics Division

## DEFENSE, SECURITY, LAW ENFORCEMENT

asphericon Inc.  
CoorsTek Engineered Ceramics  
FISBA AG  
FJW Optical Systems, Inc.  
IDEX Optics & Photonics  
Inrad Optics  
Laser Quantum Inc.  
Midwest Optical Systems, Inc. (MidOpt)  
nPoint, Inc.  
Optikos Corporation  
PLX Inc.  
Precision Asphere, Inc.  
Precision Glass & Optics  
Precision Optics Gera Corp.  
Rochester Precision Optics  
Sierra Precision Optics  
Surface Optics Corporation  
Sydor Optics, Inc.  
Syntec Optics  
UTC Aerospace Systems - Sensors  
Unlimited Products  
Vital Materials Co., Limited  
Xenics

## DETECTORS, SENSORS

ADIT Electron Tubes  
CoorsTek Engineered Ceramics  
Elite Engineering  
Energetiq Technology, Inc.  
GPD Optoelectronics Corp.  
Hellma USA  
Hinds Instruments, Inc.  
HOYA Corp. USA - Optics Division  
Inrad Optics  
nPoint, Inc.  
Ontar Corporation  
Rochester Precision Optics  
SODERN  
Surface Optics Corporation

Tec 5 USA  
Teledyne Judson Technologies  
Thermo Scientific - CIDTEC  
UTC Aerospace Systems - Sensors  
Unlimited Products  
Vital Materials Co., Limited  
Xenics

## DISPLAYS

Isuzu Glass, Inc.  
UTC Aerospace Systems - Sensors  
Unlimited Products

## DISPLAYS: CONSUMER, INFORMATION, ENTERTAINMENT

Isuzu Glass, Inc.  
Schrodinger

## DISTRIBUTOR, RESELLER, INTEGRATOR

Ontar Corporation

## EARTH SCIENCES, ENVIRONMENTAL MONITORING, CLIMATE

ADIT Electron Tubes  
GPD Optoelectronics Corp.  
Harris  
Ocean Optics, Inc.  
SODERN  
Spectrogon US, Inc.  
Surface Optics Corporation  
Tec 5 USA  
Xenics

## EDUCATION AND TRAINING

PLX Inc.  
Society of Vacuum Coaters  
University of Arizona College of Optical Sciences

## ELECTRICAL/SIGNAL ANALYSIS EQUIPMENT

Tec 5 USA  
Zurich Instruments AG

## ELECTRONIC COMPONENTS

ADIT Electron Tubes  
Hinds Instruments, Inc.  
Siskiyou Corporation

## ELECTRONIC, DIGITAL IMAGING

Elite Engineering  
Isuzu Glass, Inc.  
Luxel Corp.  
Minus K Technology Inc.  
Navitar  
Ontar Corporation  
Siskiyou Corporation

# PRODUCT CATEGORIES

## EMERGING PHOTONICS TECHNOLOGIES

Photon Design  
Sydor Optics, Inc.

## FIBER OPTICS AND ACCESSORIES

AdlOptica Optical Systems GmbH  
Aerotech, Inc.  
Applied Surface Technologies  
Energetiq Technology, Inc.  
FISBA AG  
FJW Optical Systems, Inc.  
Hellma USA  
Micro Laser Systems, Inc.  
Ocean Optics, Inc.  
RPMC Lasers, Inc.  
Tec 5 USA

## INDUSTRIAL SENSING AND MEASUREMENT

4D Technology  
ADIT Electron Tubes  
attocube systems Inc.  
B&W Tek, Inc.  
Elite Engineering  
FISBA AG  
FJW Optical Systems, Inc.  
GPD Optoelectronics Corp.  
Hellma USA  
HOYA Corp. USA - Optics Division  
Navitar  
nPoint, Inc.  
Ocean Optics, Inc.  
PHASICS Corp.  
PLX Inc.  
Spectrogon US, Inc.  
Syntec Optics  
Tec 5 USA  
UTC Aerospace Systems - Sensors  
Unlimited Products  
Zygo Corporation

## LASER COMPONENTS AND ACCESSORIES

Chroma Technology  
CryLight Photonics, Inc.  
FISBA AG  
FJW Optical Systems, Inc.  
Hinds Instruments, Inc.  
IDEX Optics & Photonics  
Inrad Optics  
Laser Quantum Inc.  
Mad City Labs Inc.  
nPoint, Inc.  
OptoSigma Corporation  
PHASICS Corp.  
PLX Inc.  
Sydor Optics, Inc.

## LASER INDUSTRY

Aerotech, Inc.  
asphericon Inc.  
B&W Tek, Inc.  
CoorsTek Engineered Ceramics  
FISBA AG  
FJW Optical Systems, Inc.  
Hellma USA

Inrad Optics  
Laser Quantum Inc.  
Micro Laser Systems, Inc.  
OPTIDA  
OptoSigma Corporation  
Photon Design  
Photon Engineering LLC  
Precision Asphere, Inc.  
RPMC Lasers, Inc.  
Vital Materials Co., Limited

## LASERS AND SYSTEMS

AdlOptica Optical Systems GmbH  
B&W Tek, Inc.  
Energetiq Technology, Inc.  
IDEX Optics & Photonics  
Laser Quantum Inc.  
Micro Laser Systems, Inc.  
Ontar Corporation  
RPMC Lasers, Inc.

## LED, OLED, NON-LASER LIGHT SOURCES

B&W Tek, Inc.  
Chroma Technology  
Energetiq Technology, Inc.  
Hellma USA  
Laser Quantum Inc.  
Midwest Optical Systems, Inc. (MidOpt)  
Ocean Optics, Inc.  
Precision Optics Gera Corp.  
Sutter Instrument Corp.  
Synopsys, Inc.  
UTC Aerospace Systems - Sensors  
Unlimited Products

## LIGHTING AND ILLUMINATION

HOYA Corp. USA - Optics Division  
Isuzu Glass, Inc.  
Optical Support, Inc.  
Synopsys, Inc.

## LITHOGRAPHIC EQUIPMENT

CoorsTek Engineered Ceramics  
Synopsys, Inc.

## MACHINE VISION, FACTORY AUTOMATION

4D Technology  
Aerotech, Inc.  
Chroma Technology  
Elite Engineering  
FJW Optical Systems, Inc.  
Hellma USA  
Isuzu Glass, Inc.  
Mad City Labs Inc.  
Midwest Optical Systems, Inc. (MidOpt)  
Minus K Technology Inc.  
OPTIDA  
Precision Asphere, Inc.  
Precision Optics Gera Corp.  
Thermo Scientific - CIDTEC  
UTC Aerospace Systems - Sensors  
Unlimited Products

## MATERIALS PROCESSING, LASERS IN MANUFACTURING

AdlOptica Optical Systems GmbH  
Aerotech, Inc.  
attocube systems Inc.  
FISBA AG  
Harris  
Isuzu Glass, Inc.  
Precision Asphere, Inc.

## MATERIALS, ABRASIVES, CHEMICALS

Harris  
HOYA Corp. USA - Optics Division  
Inrad Optics  
Isuzu Glass, Inc.  
Ohara Corporation  
Precision Glass & Optics  
Sydor Optics, Inc.

## MICROSCOPES

AdlOptica Optical Systems GmbH  
Applied Surface Technologies  
attocube systems Inc.  
Chroma Technology  
Hinds Instruments, Inc.  
Mad City Labs Inc.  
Minus K Technology Inc.  
Navitar  
nPoint, Inc.  
Peter Kaszian Unternehmensberatung  
PHASICS Corp.  
Sutter Instrument Corp.  
Zygo Corporation

## MICROTECHNOLOGY

AdlOptica Optical Systems GmbH  
FISBA AG

## MISC CONSUMABLES AND EQUIPMENT

Aerotech, Inc.  
Applied Surface Technologies

## MOUNTS, TABLES, VIBRATION ISOLATION

Aerotech, Inc.  
CoorsTek Engineered Ceramics  
Minus K Technology Inc.  
Optical Support, Inc.  
OptoSigma Corporation

## NANOTECHNOLOGY PRODUCTS

Luxel Corp.

## OPTICAL COATINGS, THIN FILMS

AccuCoat Inc.  
Andover Corporation  
asphericon Inc.  
Chroma Technology  
CryLight Photonics, Inc.  
Diverse Optics Inc.  
G-S Plastic Optics  
IDEX Optics & Photonics

Inrad Optics  
Luxel Corp.  
Midwest Optical Systems, Inc. (MidOpt)  
Newport Thin Film Lab., Inc.  
OPTIDA  
OptoSigma Corporation  
Precision Glass & Optics  
Princeton Instruments  
Rochester Precision Optics  
Society of Vacuum Coaters  
SODERN  
Spectrogon US, Inc.  
Surface Optics Corporation  
Sydor Optics, Inc.  
Z & Z Optoelectronics Tech. Co., Ltd.  
Zygo Corporation

## OPTICAL COMMUNICATION, NETWORKING DEVICES

Photon Design  
Siskiyou Corporation  
Synopsys, Inc.

## OPTICAL COMPONENTS - FILTERS, MIRRORS, OTHER

AccuCoat Inc.  
Andover Corporation  
asphericon Inc.  
Chroma Technology  
CoorsTek Engineered Ceramics  
CryLight Photonics, Inc.  
G-S Plastic Optics  
Harris  
Heraeus Quartz America LLC  
HOYA Corp. USA - Optics Division  
IDEX Optics & Photonics  
Inrad Optics  
Laser Quantum Inc.  
Midwest Optical Systems, Inc. (MidOpt)  
Minus K Technology Inc.  
MOXTEK, Inc.  
Newport Thin Film Lab., Inc.  
Ocean Optics, Inc.  
Ohara Corporation  
OPTIDA  
OptoSigma Corporation  
PLX Inc.  
Precision Asphere, Inc.  
Precision Glass & Optics  
Precision Optical  
Princeton Instruments  
Rayleigh Optical Corp.  
Rochester Precision Optics  
Sierra Precision Optics  
SODERN  
Spectrogon US, Inc.  
Sutter Instrument Corp.  
Sydor Optics, Inc.  
Syntec Optics  
Z & Z Optoelectronics Tech. Co., Ltd.

# PRODUCT CATEGORIES

## OPTICAL COMPONENTS - LENSES

Accumold  
Andover Corporation  
asphericon Inc.  
CryLight Photonics, Inc.  
Diverse Optics Inc.  
FISBA AG  
G-S Plastic Optics  
Harris  
Hellma USA  
Heraeus Quartz America LLC  
HOYA Corp. USA - Optics Division  
IDEX Optics & Photonics  
Midwest Optical Systems, Inc. (MidOpt)  
Natsume Optical Corporation  
Navitar  
Ohara Corporation  
OptoSigma Corporation  
Precision Asphere, Inc.  
Precision Glass & Optics  
Precision Optics Gera Corp.  
Rayleigh Optical Corp.  
Rochester Precision Optics  
Sierra Precision Optics  
SODERN  
Syntec Optics  
Z & Z Optoelectronics Tech. Co., Ltd.  
Zygo Corporation

## OPTICAL DATA STORAGE

AdlOptica Optical Systems GmbH

## OPTICAL DESIGN AND ENGINEERING

AdlOptica Optical Systems GmbH  
Andover Corporation  
Chroma Technology  
G-S Plastic Optics  
Harris  
IDEX Optics & Photonics  
Navitar  
Optical Support, Inc.  
OPTIDA  
Optikos Corporation  
Peter Kaszian Unternehmensberatung  
PHASICS Corp.  
Photon Design  
Photon Engineering LLC  
Precision Glass & Optics  
Precision Optics Gera Corp.  
Rochester Precision Optics  
SODERN  
Synopsys, Inc.  
Syntec Optics  
Zygo Corporation

## OPTICAL FABRICATION EQUIPMENT

Accumold  
Applied Surface Technologies  
Harris  
OptiPro Systems  
Rayleigh Optical Corp.

## OPTICS MANUFACTURING

AccuCoat Inc.  
Accumold  
Aerotech, Inc.  
Andover Corporation  
Applied Surface Technologies  
asphericon Inc.  
Chroma Technology  
CoorsTek Engineered Ceramics  
CryLight Photonics, Inc.  
Energetiq Technology, Inc.  
G-S Plastic Optics  
Harris  
Hellma USA  
Heraeus Quartz America LLC  
HOYA Corp. USA - Optics Division  
IDEX Optics & Photonics  
Inrad Optics  
Luxel Corp.  
Midwest Optical Systems, Inc. (MidOpt)  
Natsume Optical Corporation  
Navitar  
OPTIDA  
Optikos Corporation  
OptiPro Systems  
OptoSigma Corporation  
PHASICS Corp.  
Precision Glass & Optics  
Precision Optical  
Precision Optics Gera Corp.  
Rayleigh Optical Corp.  
Rochester Precision Optics  
Sierra Precision Optics  
Sydor Optics, Inc.  
Syntec Optics  
Tec 5 USA  
Zygo Corporation

## OPTOMECHANICAL COMPONENTS, DEVICES

Aerotech, Inc.  
FISBA AG  
Optical Support, Inc.  
Sierra Precision Optics  
Syntec Optics

## POSITIONING EQUIPMENT, MOTION CONTROL AND ACCESSORIES

Aerotech, Inc.  
attocube systems Inc.  
HIWIN Corp.  
Mad City Labs Inc.  
nPoint, Inc.  
Siskiyou Corporation  
Sutter Instrument Corp.

## PUBLISHERS, ASSOCIATIONS, CLUSTERS, SOCIETIES

CRC Press/Taylor & Francis Group  
IOP Publishing  
Society of Vacuum Coaters

## SEMICONDUCTOR-MANUFACTURING

Aerotech, Inc.  
Applied Surface Technologies  
CoorsTek Engineered Ceramics  
Inrad Optics  
Optical Support, Inc.  
Photon Design  
Schrodinger  
Synopsys, Inc.

## SOFTWARE

4D Technology  
B&W Tek, Inc.  
Ontar Corporation  
Photon Design  
Photon Engineering LLC  
Schrodinger  
Synopsys, Inc.

## SOLAR & ALTERNATIVE ENERGY

Abet Technologies, Inc.  
AdlOptica Optical Systems GmbH  
Hinds Instruments, Inc.  
Luxel Corp.  
Precision Glass & Optics  
Schrodinger  
Surface Optics Corporation  
Tec 5 USA

## SOLAR AND ALTERNATIVE ENERGY TECHNOLOGY

Abet Technologies, Inc.  
Luxel Corp.  
Syntec Optics

## SPECTROSCOPY DEVICES AND EQUIPMENT

B&W Tek, Inc.  
Hellma USA  
Laser Quantum Inc.  
MOXTEK, Inc.  
Ocean Optics, Inc.  
PLX Inc.  
Princeton Instruments  
Tec 5 USA  
Zurich Instruments AG

## TEST AND MEASUREMENT, METROLOGY

4D Technology  
ADIT Electron Tubes  
Applied Surface Technologies  
Apre Instruments, LLC  
attocube systems Inc.  
B&W Tek, Inc.  
FJW Optical Systems, Inc.  
G-S Plastic Optics  
Harris

Mad City Labs Inc.  
Ohara Corporation  
Optical Support, Inc.  
Optikos Corporation  
OptiPro Systems  
PHASICS Corp.  
PLX Inc.  
Precision Optics Gera Corp.  
Princeton Instruments  
Tec 5 USA  
Zurich Instruments AG  
Zygo Corporation

## VACUUM, COOLING, GAS HANDLING EQUIPMENT

attocube systems Inc.  
Luxel Corp.  
Mad City Labs Inc.  
Micro Laser Systems, Inc.  
nPoint, Inc.  
Society of Vacuum Coaters



# 38

## SPIE COURSES & WORKSHOPS

SPIE STUDENT MEMBERS  
GET 50% OFF COURSES

### You can't afford to stop learning. Register for Courses and Workshops at SPIE Optics + Photonics.

Get focused, efficient training that you can apply directly to your daily work. Learn from some of the most experienced and accomplished minds in industry and research. Take advantage of the unique opportunity to interact with experts and peers who share similar challenges.

#### COURSE TRACKS

- Optical Design and Systems Engineering
- Optomechanics and Optical Manufacturing
- Detectors and Imaging
- Remote Sensing
- Astronomical Optics and Instrumentation
- Nanoscience
- Optics and Photonics for Sustainable Energy
- Illumination Engineering
- Metrology
- Nanoengineering
- Signal, Image, and Data Processing
- Atmospheric and Space Optical Systems
- Professional Development
- Workshops for Optics Educators

#### NEW AND FEATURED COURSES

- Probability for Systems Engineers
- Physical Optics Designs (with Examples)
- Gradient Index (GRIN) Optical Design
- Specifying and Mitigating Laser Damage
- Wavefront Data Analysis
- Introduction to Optical Alignment Techniques
- Finite Element Analysis of Optics
- MTF in Optical and Electro-Optical Systems

[www.spie.org/education](http://www.spie.org/education)

#### MONEY-BACK GUARANTEE

We are confident that once you experience an SPIE course for yourself you will look to us for your future education needs. However, if for any reason you are dissatisfied, we will gladly refund your money. We just ask that you tell us what you did not like; suggestions for improvement are always welcome.

#### CONTINUING EDUCATION UNITS



SPIE has been approved as an authorized provider of CEUs by IACET, The International Association for Continuing Education and Training (Provider #1002091). In obtaining this approval, SPIE has demonstrated that it complies with the ANSI/IACET Standards which are widely recognized as standards of good practice. SPIE reserves the right to cancel a course due to insufficient advance registration.

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY
<b>Optical Design and Systems Engineering</b>				
SC690 <b>Optical System Design: Layout Principles and Practice</b> ( <i>Greivenkamp</i> ) 8:30 am to 5:30 pm, \$635 / \$745	SC835 <b>Infrared Systems - Technology &amp; Design</b> ( <i>Daniels</i> ) 8:30 am to 5:30 pm, \$1230 / \$1485		SC1086 <b>Optical Materials, Fabrication and Testing for the Optical Engineer</b> ( <i>DeGroot Nelson</i> ) 8:30 am to 12:30 pm, \$375 / \$430	
SC1164 <b>Wavefront Data Analysis</b> ( <i>Mahajan</i> ) 1:30 pm to 5:30 pm, \$450 / \$505 <b>NEW</b>	SC003 <b>Practical Optical System Design</b> ( <i>Youngworth</i> ) 8:30 am to 5:30 pm, \$690 / \$800	SC017 <b>Principles of Fourier Optics and Diffraction</b> ( <i>Gaskill</i> ) 8:30 am to 5:30 pm, \$735 / \$845	SC1166 <b>Physical Optics Design (with Examples)</b> ( <i>Soskind</i> ) 8:30 am to 12:30 pm, \$375 / \$430 <b>NEW</b>	
	SC1112 <b>Introduction to Electro-Optical Systems Design</b> ( <i>Stotts</i> ) 8:30 am to 5:30 pm, \$665 / \$775	SC454 <b>Fabrication Technologies for Micro- and Nano-Optics</b> ( <i>Suleski</i> ) 8:30 am to 12:30 pm, \$375 / \$430	SC1165 <b>Probability for Systems Engineers</b> ( <i>Arenberg</i> ) 8:30 am to 12:30 pm, \$375 / \$430 <b>NEW</b>	
	SC1003 <b>Optical Scatter Metrology for Industry</b> ( <i>Stover</i> ) 8:30 am to 12:30 pm, \$445 / \$500	SC912 <b>Intermediate Lens Design</b> ( <i>Bentley</i> ) 8:30 am to 5:30 pm, \$635 / \$745	SC1167 <b>Gradient Index (GRIN) Optical Design</b> ( <i>Moore</i> ) 8:30 am to 12:30 pm, \$375 / \$430 <b>NEW</b>	
	SC915 <b>Radiometry Revealed</b> ( <i>Shaw</i> ) 8:30 am to 12:30 pm, \$375 / \$430			
	SC567 <b>Introduction to Optical Remote Sensing Systems</b> ( <i>Shaw</i> ) 1:30 pm to 5:30 pm, \$375 / \$430			
	SC492 <b>Predicting, Modeling, and Interpreting Light Scattered by Surfaces</b> ( <i>Germer</i> ) 1:30 pm to 5:30 pm, \$375 / \$430			
	SC1114 <b>The Proper Care of Optics: Cleaning, Handling, Storage and Shipping</b> ( <i>Schalck</i> ) 1:30 pm to 5:30 pm, \$420 / \$475			

# COURSES

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY
<b>Optomechanics and Optical Manufacturing</b>				
SC014 <b>Introduction to Optomechanical Design</b> ( <i>Vukobratovich</i> ) 8:30 am to 5:30 pm, \$1075 / \$1330		SC454 <b>Fabrication Technologies for Micro- and Nano-Optics</b> ( <i>Suleski</i> ) 8:30 am to 12:30 pm, \$375 / \$430	SC1086 <b>Optical Materials, Fabrication and Testing for the Optical Engineer</b> ( <i>DeGroot Nelson</i> ) 8:30 am to 12:30 pm, \$375 / \$430	SC1120 <b>Finite Element Analysis of Optics</b> ( <i>Doyle, Genberg</i> ) 8:30 am to 5:30 pm, \$670 / \$780
SC1164 <b>Wavefront Data Analysis</b> ( <i>Mahajan</i> ) 1:30 pm to 5:30 pm, \$450 / \$505 <span style="color: red; font-weight: bold;">NEW</span>	SC015 <b>Structural Adhesives for Optical Bonding</b> ( <i>Daly</i> ) 8:30 am to 12:30 pm, \$375 / \$430	SC010 <b>Introduction to Optical Alignment Techniques</b> ( <i>Castle</i> ) 8:30 am to 5:30 pm, \$600 / \$710	SC1166 <b>Physical Optics Design (with Examples)</b> ( <i>Soskind</i> ) 8:30 am to 12:30 pm, \$375 / \$430 <span style="color: red; font-weight: bold;">NEW</span>	SC1085 <b>Optomechanical Systems Engineering</b> ( <i>Kasunic</i> ) 8:30 am to 5:30 pm, \$670 / \$780
	SC492 <b>Predicting, Modeling, and Interpreting Light Scattered by Surfaces</b> ( <i>Germer</i> ) 1:30 pm to 5:30 pm, \$375 / \$430	SC1019 <b>Mounting of Optical Components</b> ( <i>Kasunic</i> ) 8:30 am to 5:30 pm, \$680 / \$790	SC796 <b>Strength Properties of Glass and Ceramics</b> ( <i>Pepi</i> ) 8:30 am to 12:30 pm, \$415 / \$470	
	SC1114 <b>The Proper Care of Optics: Cleaning, Handling, Storage and Shipping</b> ( <i>Schalck</i> ) 1:30 pm to 5:30 pm, \$420 / \$475	SC1168 <b>Specifying And Mitigating Laser Damage</b> ( <i>McGuire</i> ) 1:30 pm to 5:30 pm, \$375 / \$430 <span style="color: red; font-weight: bold;">NEW</span>	SC011 <b>Design of Efficient Illumination Systems</b> ( <i>Cassarly</i> ) 1:30 pm to 5:30 pm, \$375 / \$430	
			SC1167 <b>Gradient Index (GRIN) Optical Design</b> ( <i>Moore</i> ) 8:30 am to 12:30 pm, \$375 / \$430 <span style="color: red; font-weight: bold;">NEW</span>	
			SC213 <b>Introduction to Interferometric Optical Testing</b> ( <i>Wyant</i> ) 8:30 am to 12:30 pm, \$410 / \$465	
<b>Detectors and Imaging</b>				
SC157 <b>MTF in Optical and Electro-Optical Systems</b> ( <i>Boreman</i> ) 8:30 am to 5:30 pm, \$640 / \$750	SC504 <b>Introduction to CCD and CMOS Imaging Sensors and Applications</b> ( <i>Janesick</i> ) 8:30 am to 5:30 pm, \$740 / \$850	SC916 <b>Digital Camera and Sensor Evaluation Using Photon Transfer</b> ( <i>Janesick</i> ) 8:30 am to 5:30 pm, \$655 / \$765	SC1167 <b>Gradient Index (GRIN) Optical Design</b> ( <i>Moore</i> ) 8:30 am to 12:30 pm, \$375 / \$430 <span style="color: red; font-weight: bold;">NEW</span>	
	SC915 <b>Radiometry Revealed</b> ( <i>Shaw</i> ) 8:30 am to 12:30 pm, \$375 / \$430		SC194 <b>Multispectral and Hyperspectral Image Sensors</b> ( <i>Lornheim</i> ) 1:30 pm to 5:30 pm, \$455 / \$510	
	SC567 <b>Introduction to Optical Remote Sensing Systems</b> ( <i>Shaw</i> ) 1:30 pm to 5:30 pm, \$375 / \$430			

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY
<b>Remote Sensing</b>				
	SC835 <b>Infrared Systems - Technology &amp; Design</b> ( <i>Daniels</i> ) 8:30 am to 5:30 pm, \$1230 / \$1485		SC1165 <b>Probability for Systems Engineers</b> ( <i>Arenberg</i> ) 8:30 am to 12:30 pm, \$375 / \$430 <b>NEW</b>	
SC157 <b>MTF in Optical and Electro-Optical Systems</b> ( <i>Boreman</i> ) 8:30 am to 5:30 pm, \$640 / \$750	SC504 <b>Introduction to CCD and CMOS Imaging Sensors and Applications</b> ( <i>Janesick</i> ) 8:30 am to 5:30 pm, \$740 / \$850	SC916 <b>Digital Camera and Sensor Evaluation Using Photon Transfer</b> ( <i>Janesick</i> ) 8:30 am to 5:30 pm, \$655 / \$765	SC194 <b>Multispectral and Hyperspectral Image Sensors</b> ( <i>Lomheim</i> ) 1:30 pm to 5:30 pm, \$455 / \$510	
	SC1112 <b>Introduction to Electro-Optical Systems Design</b> ( <i>Stotts</i> ) 8:30 am to 5:30 pm, \$665 / \$775			
	SC915 <b>Radiometry Revealed</b> ( <i>Shaw</i> ) 8:30 am to 12:30 pm, \$375 / \$430			
	SC567 <b>Introduction to Optical Remote Sensing Systems</b> ( <i>Shaw</i> ) 1:30 pm to 5:30 pm, \$375 / \$430			
<b>Astronomical Optics and Instrumentation</b>				
	SC835 <b>Infrared Systems - Technology &amp; Design</b> ( <i>Daniels</i> ) 8:30 am to 5:30 pm, \$1230 / \$1485		SC1086 <b>Optical Materials, Fabrication and Testing for the Optical Engineer</b> ( <i>DeGroot Nelson</i> ) 8:30 am to 12:30 pm, \$375 / \$430	SC1120 <b>Finite Element Analysis of Optics</b> ( <i>Doyle, Genberg</i> ) 8:30 am to 5:30 pm, \$670 / \$780
	SC1112 <b>Introduction to Electro-Optical Systems Design</b> ( <i>Stotts</i> ) 8:30 am to 5:30 pm, \$665 / \$775	SC010 <b>Introduction to Optical Alignment Techniques</b> ( <i>Castle</i> ) 8:30 am to 5:30 pm, \$600 / \$710		
	SC1003 <b>Optical Scatter Metrology for Industry</b> ( <i>Stover</i> ) 8:30 am to 12:30 pm, \$445 / \$500	SC1019 <b>Mounting of Optical Components</b> ( <i>Kasunic</i> ) 8:30 am to 5:30 pm, \$680 / \$790	SC1165 <b>Probability for Systems Engineers</b> ( <i>Arenberg</i> ) 8:30 am to 12:30 pm, \$375 / \$430 <b>NEW</b>	SC1085 <b>Optomechanical Systems Engineering</b> ( <i>Kasunic</i> ) 8:30 am to 5:30 pm, \$670 / \$780
SC014 <b>Introduction to Optomechanical Design</b> ( <i>Vukobratovich</i> ) 8:30 am to 5:30 pm, \$1075 / \$1330			SC796 <b>Strength Properties of Glass and Ceramics</b> ( <i>Pepi</i> ) 8:30 am to 12:30 pm, \$415 / \$470	
SC157 <b>MTF in Optical and Electro-Optical Systems</b> ( <i>Boreman</i> ) 8:30 am to 5:30 pm, \$640 / \$750	SC915 <b>Radiometry Revealed</b> ( <i>Shaw</i> ) 8:30 am to 12:30 pm, \$375 / \$430		SC213 <b>Introduction to Interferometric Optical Testing</b> ( <i>Wyant</i> ) 8:30 am to 12:30 pm, \$410 / \$465	
SC1164 <b>Wavefront Data Analysis</b> ( <i>Mahajan</i> ) 1:30 pm to 5:30 pm, \$450 / \$505 <b>NEW</b>	SC015 <b>Structural Adhesives for Optical Bonding</b> ( <i>Daly</i> ) 8:30 am to 12:30 pm, \$375 / \$430			
	SC567 <b>Introduction to Optical Remote Sensing Systems</b> ( <i>Shaw</i> ) 1:30 pm to 5:30 pm, \$375 / \$430			
	SC492 <b>Predicting, Modeling, and Interpreting Light Scattered by Surfaces</b> ( <i>Germer</i> ) 1:30 pm to 5:30 pm, \$375 / \$430			
	SC1114 <b>The Proper Care of Optics: Cleaning, Handling, Storage and Shipping</b> ( <i>Schalck</i> ) 1:30 pm to 5:30 pm, \$420 / \$475			

# COURSES

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY
<b>Nanoscience</b>				
		SC454 <b>Fabrication Technologies for Micro- and Nano-Optics</b> ( <i>Suleski</i> ) 8:30 am to 12:30 pm, \$375 / \$430 SC1082 <b>Nanophotonics and Metaphotonics</b> ( <i>Prasad, Baev</i> ) 8:30 am to 12:30 pm, \$375 / \$430		
<b>Optics + Photonics for Sustainable Energy</b>				
	SC1003 <b>Optical Scatter Metrology for Industry</b> ( <i>Stover</i> ) 8:30 am to 12:30 pm, \$445 / \$500 SC915 <b>Radiometry Revealed</b> ( <i>Shaw</i> ) 8:30 am to 12:30 pm, \$375 / \$430 SC492 <b>Predicting, Modeling, and Interpreting Light Scattered by Surfaces</b> ( <i>Germer</i> ) 1:30 pm to 5:30 pm, \$375 / \$430			
<b>Illumination Engineering</b>				
SC157 <b>MTF in Optical and Electro-Optical Systems</b> ( <i>Boreman</i> ) 8:30 am to 5:30 pm, \$640 / \$750	SC915 <b>Radiometry Revealed</b> ( <i>Shaw</i> ) 8:30 am to 12:30 pm, \$375 / \$430		SC011 <b>Design of Efficient Illumination Systems</b> ( <i>Cassarly</i> ) 1:30 pm to 5:30 pm, \$375 / \$430	
<b>Metrology</b>				
SC1164 <b>Wavefront Data Analysis</b> ( <i>Mahajan</i> ) 1:30 pm to 5:30 pm, \$450 / \$505 <span style="color: red; font-weight: bold;">NEW</span>	SC1003 <b>Optical Scatter Metrology for Industry</b> ( <i>Stover</i> ) 8:30 am to 12:30 pm, \$445 / \$500	SC017 <b>Principles of Fourier Optics and Diffraction</b> ( <i>Gaskill</i> ) 8:30 am to 5:30 pm, \$735 / \$845	SC213 <b>Introduction to Interferometric Optical Testing</b> ( <i>Wyant</i> ) 8:30 am to 12:30 pm, \$410 / \$465	
	SC492 <b>Predicting, Modeling, and Interpreting Light Scattered by Surfaces</b> ( <i>Germer</i> ) 1:30 pm to 5:30 pm, \$375 / \$430			
<b>Nanoengineering</b>				
	SC1003 <b>Optical Scatter Metrology for Industry</b> ( <i>Stover</i> ) 8:30 am to 12:30 pm, \$445 / \$500	SC454 <b>Fabrication Technologies for Micro- and Nano-Optics</b> ( <i>Suleski</i> ) 8:30 am to 12:30 pm, \$375 / \$430 SC1082 <b>Nanophotonics and Metaphotonics</b> ( <i>Prasad, Baev</i> ) 8:30 am to 12:30 pm, \$375 / \$430		



SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY
<b>Signal, Image, and Data Processing</b>				
SC157 <b>MTF in Optical and Electro-Optical Systems</b> ( <i>Boreman</i> ) 8:30 am to 5:30 pm, \$640 / \$750	SC1112 <b>Introduction to Electro-Optical Systems Design</b> ( <i>Stotts</i> ) 8:30 am to 5:30 pm, \$665 / \$775	SC916 <b>Digital Camera and Sensor Evaluation Using Photon Transfer</b> ( <i>Janesick</i> ) 8:30 am to 5:30 pm, \$655 / \$765		
		SC017 <b>Principles of Fourier Optics and Diffraction</b> ( <i>Gaskill</i> ) 8:30 am to 5:30 pm, \$735 / \$845		
<b>Atmospheric and Space Optical Systems</b>				
SC157 <b>MTF in Optical and Electro-Optical Systems</b> ( <i>Boreman</i> ) 8:30 am to 5:30 pm, \$640 / \$750	SC1112 <b>Introduction to Electro-Optical Systems Design</b> ( <i>Stotts</i> ) 8:30 am to 5:30 pm, \$665 / \$775	SC916 <b>Digital Camera and Sensor Evaluation Using Photon Transfer</b> ( <i>Janesick</i> ) 8:30 am to 5:30 pm, \$655 / \$765	SC1165 <b>Probability for Systems Engineers</b> ( <i>Arenberg</i> ) 8:30 am to 12:30 pm, \$375 / \$430 <span style="color: red; font-weight: bold; border: 1px solid red; border-radius: 50%; padding: 2px;">NEW</span>	
	SC915 <b>Radiometry Revealed</b> ( <i>Shaw</i> ) 8:30 am to 12:30 pm, \$375 / \$430			
	SC567 <b>Introduction to Optical Remote Sensing Systems</b> ( <i>Shaw</i> ) 1:30 pm to 5:30 pm, \$375 / \$430			
	SC1114 <b>The Proper Care of Optics: Cleaning, Handling, Storage and Shipping</b> ( <i>Schalck</i> ) 1:30 pm to 5:30 pm, \$420 / \$475			
<b>Professional Development</b>				
	WS897 <b>Effective Technical Presentations</b> ( <i>Doumont</i> ) 8:30 am to 12:30 pm, \$150 / \$200		WS1058 <b>Critical Skills for Compelling Research Proposals</b> ( <i>Diehl</i> ) 8:30 am to 12:30 pm, \$125 / \$175	
	WS908 <b>Effective Scientific Papers</b> ( <i>Doumont</i> ) 1:30 pm to 5:30 pm, \$150 / \$200		WS1059 <b>Resumes to Interviews: Strategies for a Successful Job Search</b> ( <i>Lawson, Krinsky</i> ) 1:30 pm to 5:30 pm, \$125 / \$175	
<b>Workshops for Optics Educators</b>				
		WS1142 <b>It's Elementary -- Light and Optics for Kids</b> ( <i>DeHarpporte</i> ) 8:30 am to 10:30 am, \$25 / \$50		
		WS1156 <b>Dumpster Optics: Real optical science with free stuff</b> ( <i>Donnelly, Magnani</i> ) 10:30 am to 12:30 pm, \$10 / \$15 <span style="color: red; font-weight: bold; border: 1px solid red; border-radius: 50%; padding: 2px;">NEW</span>		

# INDUSTRY EVENTS

Information, insight, and connections to help you succeed.

## Getting Hired Panel

Tuesday 11 August 2015 · 2:00 PM - 3:30 PM

Location: Exhibit Floor, Presentation Area

Join us for a panel discussion on careers in optics and photonics outside the academic world. Learn about the process of getting hired at tech-based companies and non-academic jobs directly from professionals in the optics and photonics sector.

## Funding Your Photonics Venture

Tuesday 11 August 2015 · 3:30 PM - 5:00 PM

Location: Exhibit Floor, Presentation Area



*Speakers:*

**Michael Larson, PhD,**  
Founder & President,  
Tissue Fusion LLC



**Mark Wippich,**  
Market Tech, Inc.



**Allen Oppenheimer,**  
A. M. Oppenheimer, Inc.

Money—it is often what separates a good business idea from a good business implementation. Now, the landscape for funding new ventures is changing - corporate investment programs, crowd-funding, non-traditional VCs, and more are providing new options for funding. Learn about these from a series of experts involved in new technology ventures.

Networking to follow with beer and pretzels. Meet the panelists, photonics entrepreneurs from around the world, and members of the San Diego technology community.

## Women in the Optics and Photonics Workplace

Wednesday 12 August 2015 · 10:30 AM - 12:00 PM

Location: Exhibit Floor, Presentation Area

What are the keys to personal and professional growth for women in optics and photonics? Are the challenges faced by women in the field different from men? What role do networking, mentoring, and community building play in the lives of women scientists and engineers?

Women leaders will share their perspectives on these and other questions in a lively round table discussion. Provocative data from the SPIE Global Salary Survey Report will inform the conversation.

Coffee, mimosas, and snacks served at 10:30 am. Program begins 10:45 am. Free and open to all registered attendees. Sponsored by the SPIE Career Center



*Moderator:*

**Adam Resnick,**  
Marketing  
Analyst, SPIE



*Panelist:*

**Rosalie Clemens,**  
Director of  
Business  
Development, ASE  
Optics



*Panelist:*

**Sophia Hayes,**  
Assistant  
Professor,  
Department  
of Chemistry,  
University of  
Cyprus



*Panelist:*

**Katerina Moloni,**  
Director of Sales,  
nPoint, Inc.

## Patent Filing Considerations and Portfolio Evaluation for Photonic Engineers and Managers

Wednesday 12 August 2015 · 1:30 PM - 3:00 PM

Location: Exhibit Floor, Presentation Area



*Speakers:*

**Babak Tehrani,**  
Perkins Coie



**Bing Ai,**  
Perkins Coie

This optics-flavored workshop begins with an introduction to U.S. patents and global patent protection, including legal and business impacts of the first-inventor-to-file regime under the America Invents Act (AIA). The workshop also covers patent valuation and intellectual property due diligence considerations for small and large companies that may be the target of acquisition, may be looking to secure financing or purchase/license another company's IP assets. Time permitting, the workshop will also venture into additional issues faced by IP managers such as pros and cons of patent filings versus trade secrets.

## ITAR and Other International Trade Regulations: Strategies for Navigating U.S. Export Controls and International Trade Issues for the Optics and Photonics Industry

Wednesday 12 August 2015 · 3:00 PM - 5:00 PM

Location: Exhibit Floor, Presentation Area



*Speaker:* **Kerry Scarlott,** Goulston & Storrs

If your company's sales activities, products or services come into contact with foreign jurisdictions, this is a must-attend program. The stakes have never been higher. Anyone who wants to answer questions such as, "How do U.S. export controls apply to me?" or "What are the legal pitfalls of doing business internationally?" or "What

are best practices for engaging in global trade?" will benefit from attending this workshop.

**INTENDED AUDIENCE:** Owners, executives, product managers who wish to learn how to grow business while effectively and efficiently navigating U.S. international trade laws and regulations.

## Market Profile Update

Thursday 13 August 2015 · 9:15 AM - 9:45 AM

Location: Exhibit Floor, Presentation Area



*Keynote Speaker:* **Stephen G. Anderson,**  
Industry and Market Strategist, SPIE

Measuring the size of an industry is difficult for many reasons. What categories and suppliers are included? What data are available? How can they be compared? Stephen G. Anderson, Industry and Market Strategist at SPIE, will provide a 2012 vs 2014 analysis and provide a broader look into the

profile of the global optics and photonics industry. Don't miss this valuable presentation in the Sails Pavilion Presentation Area. Free and open to all attendees.



© Eric Lafforgue

**Light-based technologies respond to the needs of humankind**

## **Join us in celebrating the International Year of Light on the exhibition floor**

The International Year of Light is a global initiative highlighting to the citizens of the world the importance of light and light-based technologies in their lives, for their futures, and for the development of society.

We hope that the International Year of Light will increase global awareness of the central role of light in human activities and that the brightest young minds continue to be attracted to careers in this field.

For more information on how you and your organization can participate, visit:

[www.spie.org/IYL](http://www.spie.org/IYL)



**INTERNATIONAL  
YEAR OF LIGHT  
2015**



**SPIE.**

## REGISTRATION

---

### EXHIBITION HOURS

Tuesday 11 August · 10:00 am to 5:00 pm

Wednesday 12 August · 10:00 am to 5:00 pm

Thursday 13 August · 10:00 am to 2:00 pm

### ONSITE REGISTRATION AND BADGE PICK-UP HOURS

Convention Center, Sails Pavilion (Upper Level)

Sunday 9 August · 7:00 am to 5:00 pm

Monday 10 August · 7:15 am to 5:00 pm

Tuesday 11 August · 7:30 am to 5:00 pm

Wednesday 12 August · 7:30 am to 5:00 pm

Thursday 13 August · 7:45 am to 4:00 pm

## SPIE Press Room

Convention Center, Sails Pavilion (Upper Level)

Open during Registration hours

For Registered Press only. The Press Room provides meeting space, refreshments, access to exhibitor press releases, and Internet connections. Press are urged to register before the meeting by emailing name, contact information, and name of publication to [media@spie.org](mailto:media@spie.org). Preregistration closes approximately 10 days before the start of the event.

## FOOD AND BEVERAGE SERVICES

---

### Coffee Breaks

Sunday and Monday

Upper Level Lobby

Tuesday and Wednesday

Exhibition Hall, Sails Pavilion (Upper Level)

Thursday · 10:00 to 11:00 am

Exhibition Hall, Sails Pavilion (Upper Level)

Thursday · 3:00 to 4:00 pm

Upper Level Lobby

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

### Food and Refreshments for Purchase

Upper Level Lobby Service Carts

Sunday through Thursday · 9:00 am to 3:00 pm

Food Outlet – Exhibition Hall, Sails Pavilion (Upper Level)

Tuesday through Thursday · 11:00 am to 2:00 pm

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

## ONSITE SERVICES

---

### Internet Access

#### WIRED INTERNET ACCESS

Convention Center, Ballroom 6 Lobby (Upper Level)

Complimentary wired Internet access is available; attendees can hook up their laptops or use provided workstations.

#### WIFI

Upper Level Lobbies

Complimentary wireless access is also available; instructions will be posted onsite.

#### SPIE CONFERENCE AND EXHIBITION APP

On your Smart Phone (iPhone, Android)

Search and browse the program, special events, participants, exhibitors, courses, and more.

### SPIE Bookstore

Convention Center, Sails Pavilion (Upper Level)

The SPIE Bookstore is your source for the latest SPIE Press Books, Proceedings, and Education and Professional Development materials. Become an SPIE member, explore the Digital Library, take home a free SPIE poster, or buy a souvenir (tie, t-shirt, educational toys, and more).

### SPIE Luggage and Coat Check

Convention Center, Hall A Lobby (Ground Level)

Sunday and Monday · 7:15 am to 6:00 pm

Tuesday and Wednesday · 7:30 am to 6:00 pm

Thursday · 7:45 am to 6:00 pm

Complimentary luggage, package, and coat storage are available. Please note hours; no late pickup available.

### Business Center

Monday through Thursday · Convention Center, Hall D Lobby (Ground Level)

FedEx, Kinko. Services include photocopying, faxing, printing services, and shipping. Office supplies are also available. Phone 619-525-5450.

### Restaurant and City Information

Convention Center, Hall B2 (Ground Level)

10:00 am to 6:00 pm

Services include sightseeing, shopping, and restaurant information.

### Lost and Found

Cashier, Convention Center, Sails Pavilion (Upper Level)

Open during Registration Hours

Found items will be kept at Cashier for the duration of the meeting. At the end of the meeting, all found items will be turned over to the San Diego Convention Center Security, lost and found hotline: 619-525-5407.

# SPIE EVENT POLICIES

## Acceptance of Policies and Registration Conditions

The following Policies and Conditions apply to all SPIE Events. As a condition of registration, you will be required to acknowledge and accept the SPIE Registration Policies and Conditions contained herein.

---

### Granting Attendee Registration and Admission

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 or remove any individual whether registered or not, be they attendees, exhibitors, representatives, or vendors, who in their sole opinion are not, or 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 any attendee, exhibitor, representative, or vendor 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.

### Misconduct Policy

SPIE is a professional, not-for-profit society committed to providing valuable conference and exhibition experiences. SPIE is dedicated to equal opportunity and treatment for all its members and meeting attendees. Attendees are expected to be respectful to other attendees, SPIE staff, and contractors. Harassment and other misconduct will not be tolerated; violators will be asked to leave the event.

### Identification

To verify registered participants and provide a measure of security, SPIE will ask attendees to present a government-issued Photo ID at registration to collect registration materials.

Individuals are not allowed to pick up badges for attendees other than themselves. 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.

### Capture and Use of a Person's Image

By registering for an SPIE event, I grant full permission to SPIE to capture, store, use, and/or reproduce my image or likeness by any audio and/or visual recording technique (including electronic/digital photographs or videos), and create derivative works of these images and recordings in any SPIE media now known or later developed, for any legitimate SPIE marketing or promotional purpose.

By registering for an SPIE event, I waive any right to inspect or approve the use of the images or recordings or of any written copy. I also waive any right to royalties or other compensation arising from or related to the use of the images, recordings, or materials. By registering, I 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.

### Payment Method

Registrants for paid elements of the event, who do not provide a method of payment, will not be able to complete their registration. Individuals with incomplete registrations will not be able to attend the conference until payment has been made. SPIE accepts VISA, MasterCard, American Express, Discover, Diner's Club, checks and wire transfers. Onsite registrations can also pay with Cash.

### Authors/Coauthors

By submitting an abstract, you agree to the following conditions:

- An author or coauthor (including keynote, invited, and solicited speakers) will register at the author registration rate, attend the meeting, and make the presentation as scheduled.
- A full-length manuscript (minimum 6 pages) for any accepted oral or poster presentation will be submitted for publication in the SPIE Digital Library, printed conference Proceedings, and CD. (Some SPIE events have other requirements that the author is made aware of at the time of submission.)
- Only papers presented at the conference and received according to publication guidelines and timelines will be published in the conference Proceedings and SPIE Digital Library (or via the requirements of that event).

### Audio, Video, Digital 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 the materials presented in any meeting/course room or in course notes on display without written permission. Consent forms are available at Speaker Check-In. Individuals not complying with this policy will be asked to leave a given session and/or asked to surrender their recording media.

**EXHIBITION HALL:** For security and courtesy reasons, recordings of any kind are prohibited unless one has 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.

Your registration signifies your agreement to be photographed or videotaped by SPIE in the course of normal business. Such photos and video may be used in SPIE marketing materials or other SPIE promotional items.

## Laser Pointer Safety Information/Policy

SPIE supplies tested and safety-approved laser pointers for all conference meeting rooms. For safety reasons, SPIE requests that presenters use provided laser pointers.

Use of a personal laser pointer represents user's acceptance of liability for use of a non-SPIE-supplied laser pointer. If you choose to use your own laser pointer, it must be tested to ensure <5 mW power output. Laser pointers in Class II and IIIa (<5mW) are eye safe if power output is correct, but output must be verified because manufacturer labeling may not match actual output. Come to Speaker Check-In and test your laser pointer on our power meter. You are required to sign a waiver releasing SPIE of any liability for use of potentially non-safe, personal laser pointers. Misuse of any laser pointer can lead to eye damage.

## Access to Technical and Networking Events

Persons under the age of 18 including babies, carried or in strollers, and toddlers are not allowed in technical or networking events. Anyone 18 or older must register as an attendee. All technical and networking events require a valid conference badge for admission.

## Underage Persons on Exhibition Floor Policy

For safety and insurance reasons:

- No persons under the age of 18 will be allowed in the exhibition area during move-in and move-out.
- Children 14 and older, accompanied by an adult, will be allowed in the exhibition area during open exhibition hours only.
- All children younger than 14, including babies in strollers and toddlers, are not allowed in the exhibition area at any time.

## Unauthorized Solicitation Policy

Unauthorized solicitation in the Exhibition Hall is prohibited. Any non-exhibiting manufacturer or supplier 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 Policy

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 Policy

At SPIE events where wireless is included with your registration, SPIE provides wireless access for attendees during the conference and exhibition but cannot guarantee full coverage in all locations, all of the time. Please be respectful of your time and usage so that all attendees are able to access the internet.

Excessive usage (e.g., streaming video, gaming, multiple devices) reduces bandwidth and increases cost for all attendees. No routers may be attached to the network. Properly secure your computer before accessing the public wireless network. Failure to do so may allow unauthorized access to your laptop as well as potentially introduce viruses to your computer and/or presentation. SPIE is not responsible for computer viruses or other computer damage.

## Mobile Phones and Related Devices Policy

Mobile phones, tablets, laptops, pagers, and any similar electronic devices should be silenced during conference sessions. Please exit the conference room before answering or beginning a phone conversation.

## Smoking

For the health and consideration of all attendees, smoking, including e-cigarettes, is not permitted at any event elements, such as but not limited to: plenaries, conferences, workshops, courses, poster sessions, hosted meal functions, receptions, and in the exhibit hall. Most facilities also prohibit smoking and e-cigarettes in all or specific areas. Attendees should obey any signs preventing or authorizing smoking in specified locations.

## Hold Harmless

Attendee agrees to release and hold harmless SPIE from any and all claims, demands, and causes of action arising out of or relating to your participation in the event you are registering to participate in and use of any associated facilities or hotels.

## Event Cancellation

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

## Confidential Reporting of Unethical or Inappropriate Behavior

SPIE is an organization with strong values of responsibility and integrity. Our Ethics Statement and Code of Professional Conduct contain general guidelines for conducting business with the highest standards of ethics. SPIE has established a confidential reporting system for staff & other stakeholders to raise concerns about possible unethical or inappropriate behavior within our community. Complaints may be filed by phone or through the website, and, if preferred, may be made anonymously. The web address is [www.SPIE.ethicspoint.com](http://www.SPIE.ethicspoint.com) and the toll free hotline number is 1-888-818-6898.

---

## SPIE INTERNATIONAL HEADQUARTERS

PO Box 10  
Bellingham, WA 98227-0010 USA  
Tel: +1 360 676 3290  
Fax: +1 360 647 1445  
[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  
Fax: +44 29 2089 4750  
[info@spieeurope.org](mailto:info@spieeurope.org) • [www.SPIE.org](http://www.SPIE.org)

Through collaboration, companies large and small, steer the latest innovations toward practical relevance in the global marketplace.

SPIE Corporate Membership increases your visibility, adds individual benefits, and provides significant discounts on:

SPIE exhibitions\* | SPIE Digital Library subscriptions  
Advertising rates | Mailing lists | Recruitment services

\*Corporate Members receive a 15% discount on exhibit space at SPIE Exhibitions.

SPIE Corporate Members as of 7-7-2015

3SAE Technologies, Inc.  
4D Technology Corp.  
A\*STAR National Metrology Ctr.  
ABB Analytical Measurement  
Abet Technologies, Inc.  
Abrisa Technologies  
ABTech, Inc.  
Access Laser Co.  
Access Optics LLC  
Acktar Ltd.  
Adimec Electronic Imaging, Inc.  
AdlOptica Optical Systems GmbH  
Admesy B.V.  
Adsys Controls, Inc.  
AdTech Ceramics  
AdTech Optics, Inc.  
AdValue Photonics, Inc.  
Advance Reproductions Corp.  
Advanced Abrasives Corp.  
Advanced Cooling Technologies, Inc.  
Advanced Fiber Resources (Zhuhai) Ltd.  
Advanced Microoptic Systems GmbH  
Advanced Optowave Corp.  
Advanced Research Corp.  
Advantest America, Inc.  
AdvR, Inc.  
Aerotech, Inc.  
AFL  
Agilent Technologies, Inc.  
AKELA Laser Corp.  
Alazar Technologies Inc.  
ALIO Industries  
Allied Vision Technologies Inc.  
AllMotion, Inc.  
Alluxa

Alnair Labs Corp.  
ALPAO S.A.S.  
Alpine Research Optics, LLC  
Alson E. Hatheway Inc.  
Altos Photonics, Inc.  
American Beryllia Inc.  
American GMG Inc.  
AMETEK HCC Industries, Inc.  
AMETEK Precitech, Inc.  
AMETEK Taylor Hobson Inc.  
AMETEK Vision Research®, Inc.  
AMETEK, Inc.  
Ampex Data Systems Corp.  
Amplitude Laser  
Andor Technology Ltd.  
Andover Corp.  
Aperture Optical Sciences Inc.  
Applied Image, Inc.  
Applied Optics Ctr., a Div. of Optex Systems, Inc.  
Applied Optics, Inc.  
Applied Photonics Inc.  
Applied Physics & Electronics, Inc.  
Applied Surface Technologies  
Applied Technology Associates  
Äpre Instruments, LLC  
April Electro-Optics Co., Ltd.  
Archer OpTx, Inc.  
Arden Photonics Ltd.  
Arroyo Instruments, LLC  
ASA Astroysteme GmbH  
Asahi Spectra USA Inc.  
Ascentta, Inc.  
ASE Optics  
ASML  
ASML Brion  
ASML US, Inc.  
asphericon, Inc.  
ASTRODESIGN, Inc.  
attocube systems Inc.  
Avantes, Inc.

Avo Photonics, Inc.  
Ayase America Inc.  
B&W Tek, Inc.  
BaySpec, Inc.  
Beamtech Optronics Co., Ltd.  
Beijing Scitlion Technology Co., Ltd.  
Berliner Glas KGaA Herbert Kubatz GmbH & Co.  
BigC Dino-Lite Digital Microscope  
Biophotonic Solutions, Inc.  
Block Engineering, LLC  
Blue Ridge Optics, LLC  
Boston Applied Technologies, Inc.  
Boston Electronics Corp.  
Boston Micromachines Corp.  
Boulder Nonlinear Systems  
BoXin Photoelectric Co., Ltd.  
Brandywine Photonics, LLC  
Breault Research Organization, Inc.  
Brewer Science, Inc.  
Brimrose Technology Corp.  
Bristol Instruments, Inc.  
Brolis Semiconductors UAB  
BWT Beijing Ltd.  
Calmar Laser  
Cambridge Technology, Inc.  
Canon Nanotechnologies, Inc.  
Canon U.S.A., Inc.  
Carl Zeiss, Inc.  
Cascade Laser Corp.  
Cascade Optical Corp.  
CeramOptec SIA/US Fiberoptec Technology, Inc.  
Changchun Hengrun Optoelectronics Tech. Co., Ltd.  
Changchun New Industries Optoelectronics Technology Co., Ltd.  
Chroma Technology Corp.  
CI Systems, Inc.

Clear Align  
CMOSIS International  
Coastal Connections  
Coherent, Inc.  
Continuum  
Contour Metrological & Manufacturing, Inc.  
CorActive High-Tech Inc.  
Coresix Precision Glass, Inc.  
CPG Optics, Inc.  
CREOL, The College of Optics and Photonics, Univ. of Central Florida  
Cristal Laser S.A.  
CryLight Photonics, Inc.  
Cryslaser Inc.  
Crystal IS, Inc.  
Cybel LLC  
Daheng New Epoch Technology, Inc.  
Dalian Actech, Inc.  
DataRay Inc.  
Daylight Solutions Inc.  
Deltronic Crystal Industries, Inc.  
Deposition Sciences, Inc.  
Diamond USA Inc.  
DIAS Infrared Corp.  
DiCon Fiberoptics, Inc.  
DILAS Diode Laser, Inc.  
DILAS Diodenlaser GmbH  
Directed Light, Inc.  
Diverse Optics Inc.  
Docter Optics, Inc.  
DRS Technologies  
DST CONTROL AB  
Dunhua Zhengxing Abrasive Co., Ltd.  
Dynamic Structures Ltd.  
E.R. Precision Optical Corp.  
e2v Aerospace and Defense, Inc.  
e2v technologies plc  
Edmund Optics GmbH  
Edmund Optics Inc.  
Electro Optical Components, Inc.

Electro Optical Industries, Inc.  
Electro-Optical Imaging, Inc.  
Electro-Optics Technology, Inc.  
Elite Engineering Corp.  
Elite Optoelectronics Co., Ltd.  
Elliot Scientific Ltd.  
EMD Millipore Corp  
EMF Corp.  
Eminess Technologies, Inc.  
Empire Precision Plastics  
Empire West, Inc.  
Energetiq Technology, Inc.  
EPIR Technologies, Inc.  
EPIX, Inc.  
Epner Technology Inc.  
Esterline CMC Electronics, Inc.  
Evaporated Coatings, Inc.  
EVERIX, Inc.  
Exalos AG  
Excelitas Technologies Corp.  
Excell Technology  
Exciton, Inc.  
Feinwerkoptik Zünd AG  
Femtochrome Research, Inc.  
FEMTOLASERS, Inc.  
Fianium Inc.  
Fiber Optic Valley AB  
FiberCryst S.A.S.  
Fiberguide Industries, Inc.  
Fibertech Optica Inc.  
ficonTEC Corp.  
ficonTEC Service GmbH  
First Light Imaging S.A.S.  
First Sensor, Inc.  
FISBA AG  
FiveFocal LLC  
FJW Optical Systems, Inc.  
FLIR Systems, Inc.  
FluxData, Inc.  
FOCtek Photonics, Inc.  
Foreal Spectrum, Inc.



# SPIE CORPORATE MEMBERS

Fotofab, LLC  
Frankfurt Laser Co.  
Fraunhofer UK Research Ltd.  
Fraunhofer-Institut für Photonische Mikrosysteme  
Fresnel Technologies Inc.  
Fuzhou Alpha Optics Co., Ltd.  
GAMDAN Optics  
General Dynamics-Global Imaging Technologies  
General Ruby & Sapphire Co.  
Gentec Electro-Optics Inc.  
Georgia Tech Research Institute  
GL Optic Lichtmesstechnik GmbH  
Glass Fab, Inc.  
Gooch & Housego plc  
GPD Optoelectronics Corp.  
Greenlight Optics, LLC  
greenTEG AG  
Grintech GmbH  
G-S Plastic Optics  
GTI Technologies, Inc.  
Guernsey Coating Labs., Inc.  
Gulf Photonics, Inc.  
Haas Laser Technologies, Inc.  
Halocarbon Products  
Hamamatsu Corp.  
Haphit Ltd.  
Hardin Optical Co.  
HC Photonics Corp.  
Headwall Photonics Inc.  
Heidelberg Instruments Inc.  
Hellma USA, Inc.  
heracle GmbH  
Heraeus Quartz America LLC  
HibriLaser, Inc.  
Hinds Instruments, Inc.  
Hofstadter Analytical Services, LLC  
HOLO/OR Ltd.  
HOLOEYE Photonics AG  
Holographix LLC  
HORIBA Instruments Inc.  
HOYA Corp. USA  
HTA Photomask  
Huanic Corp.  
Ibsen Photonics A/S  
ibss Group, Inc.  
Ideal Aerosmith, Inc.  
IDEX Optics & Photonics  
II-VI Optical Systems  
Imaging Solutions Group  
IMEC  
IMPERX Inc.  
IMRA America, Inc.  
Incom Inc.  
Indian Hills Community College  
Infrared Systems Development Corp.  
Infratec Infrared LLC  
INGENERIC GmbH  
Innolume GmbH  
Innovations in Optics, Inc.  
Innovative Photonic Solutions  
Innovative Photonics Technologies, LLC  
INO  
InPhenix, Inc.  
Inrad Optics  
Insight Photonic Solutions, Inc.  
Inspectrology LLC  
Intlvac  
IntraAction Corp.  
IO Industries, Inc.  
IPG Photonics Corp.  
Iradion Laser, Inc.  
IRCAM GmbH  
IRCameras, LLC  
IRD Glass  
IRflex Corporation  
Iris AO, Inc.  
IRnova AB  
IRTronix, Inc.  
Isomet Corp.  
ISP Optics Corp.  
Isuzu Glass, Inc.  
ITF Technologies Inc.  
ITW Opto Diode Corp.  
JAYCO Cleaning Technologies  
JDSU  
JENOPTIK Optical Systems GmbH  
JENOPTIK Optical Systems, LLC  
JEOL USA Inc.  
Jinan Jingzheng Electronics Co., Ltd.  
JSR Micro, Inc.  
Kapteyn-Murnane Labs., Inc.  
Kentek Corp.  
Keopsys Inc.  
Kigre, Inc.  
KiloLambda Technologies, Ltd.  
Kinetic Systems, Inc.  
Kiyohara Optics USA  
Kopp Glass, Inc.  
KrellTech  
Kugler of America Ltd.  
L-3 Communications  
L-3 Communications Cincinnati Electronics  
Labsphere, Inc.  
LaCroix Optical Co.  
Lambda Research Corp.  
Lambda Research Optics, Inc.  
Lanmark Controls Inc.  
Laser Components GmbH  
Laser Components USA, Inc.  
Laser Focus World  
Laser Institute of America  
Laser Operations LLC / QPC Lasers  
Laser Quantum USA  
Laser-Compact Co. Ltd.  
Laserline Inc.  
Lasernet, Inc.  
Lasertel, Inc.  
Laservision USA  
LASORB  
LASOS Lasertechnik GmbH  
Lattice Electro Optics, Inc.  
LEONI Fiber Optics, Inc.  
Leybold Optics USA, Inc.  
Light Tec  
LightComm Technology Co., Ltd.  
LightMachinery Inc.  
LightPath Technologies, Inc.  
Lincoln Laser Co.  
Litron Lasers Ltd.  
Lockheed Martin Aculight  
LT Ultra Precision Optics, LLC  
Lumencor, Inc.  
Luna Innovations Inc.  
Luvantix SSCP  
Luxel Corp.  
M Squared Lasers  
M3 Measurement Solutions  
Mad City Labs., Inc.  
Mahr-ESDI  
Market Tech, Inc.  
Marktech Optoelectronics  
Marubeni America Corp.  
Materion Barr Precision Optics & Thin Film Coatings  
Max Levy Autograph, Inc.  
MaxEmil Photonics Corp.  
Meadowlark Optics, Inc.  
MegaWatt Lasers, Inc.  
Mentor Graphics Corp.  
Mesa Photonics, LLC  
Mettrue, Inc.  
Micro Laser Systems, Inc.  
MicroCircuit Labs., LLC  
MICRONIX USA, LLC  
Micronor Inc.  
Microtech Instruments, Inc.  
Mightex Systems  
Mikro-Tasarim San. ve Tic. Ltd. Sti.  
Mildex, Inc.  
Mindrum Precision, Inc.  
Minus K Technology Inc.  
Mirrorcle Technologies, Inc.  
ML Optic Corp.  
MLD Technologies, LLC  
Molecular Vista, Inc.  
Montana Economic Development  
Montana Photonics Industry Alliance  
MONTFORT Laser GmbH  
MPA Crystal Corp.  
MPB Communications Inc.  
Multi IR Optoelectronics Co., Ltd.  
Multisorb Technologies  
MWTechnologies, Lda  
Naked Optics Corp.  
NAMICS Technologies, Inc.  
NANEO Precision IBS Coatings GmbH  
Nanophase Technologies Corp.  
nanoplus GmbH  
nanosystec GmbH  
Nanotronics Imaging  
National Aperture, Inc.  
National Defense Industrial Association  
National Institute of Standards and Technology  
Natsume Optical Corp.  
Navitar Inc.  
New England Optical Systems  
New England Photoconductor Corp.  
New Scale Technologies, Inc.  
New Source Technology, LLC  
Newport Corp.  
Newport Thin Film Lab., Inc.  
NiCoForm, Inc.  
NKT Photonics A/S  
NKT Photonics France  
NKT Photonics GmbH  
NKT Photonics Inc.  
nLIGHT Corp.  
Norland Products Inc.  
Norlase ApS  
NorPix Inc.  
Northrop Grumman Cutting Edge Optronics  
NP Photonics, Inc.  
nPoint, Inc.  
Nufern  
Nutfield Technology  
Ocean Optics, Inc.  
OEWaves, Inc.  
OFS  
Ohara Corp.  
Ondax, Inc.  
Onefive GmbH  
Ontar Corporation  
OPCO Laboratory, Inc.  
Open Photonics, Inc.  
Optec S.p.A.  
Opti Temp, Inc.  
Optical Engines, Inc.  
Optical Filter Source, LLC  
Optical Support, Inc.  
OPTICS 1, Inc.  
Optics Balzers  
Optics Technology, Inc.  
Optida Co., Ltd.  
Optiforms  
OptiGrate Corp.  
Optikos Corp.  
Optilab LLC  
Optimax Systems, Inc.  
OptiPro Systems  
OptiSource, LLC  
Optiwave Systems Inc.  
OptiWorks, Inc.  
Opto-Alignment Technology, Inc.  
Optofluidics  
Opto-Knowledge Systems, Inc.  
Optonetic LLC  
OptoSigma Corp.  
Optotune Switzerland AG  
Optowide Technologies Co., Ltd  
optX imaging system  
OSELA Inc.  
Oxxius SA  
OZ Optics Ltd.  
Pacific Laser Equipment  
PANalytical  
Pangolin Laser Systems, Inc.  
Pavilion Integration Corp.  
PCO-TECH Inc.  
PD-LD, Inc.  
Perkins Precision Developments, LLC  
PFG Precision Optics, Inc.  
PHASICS Corp.  
Photon Design  
Photon Engineering LLC  
Photon etc. Inc.  
Photonic Cleaning Technologies  
Photonics Industries International, Inc.  
Photonics Media/Laurin Publishing  
PHOTONIS USA, Inc.  
Photop Technologies, Inc.  
PI (Physik Instrumente) L.P.  
PI miCos GmbH  
PicoQuant Photonics North America, Inc.  
piezosystem jena, Inc.  
Pixelteq, Inc.  
Plasma-Therm LLC  
Plasmonics, Inc.  
Polaris Motion  
PolarOnyx Laser Inc.  
Povolzhskiy State Univ. of Telecommunications and Informatics  
Precision Asphere, Inc.  
Precision Glass & Optics  
Precision Optical  
Princeton Instruments  
Princeton Lightwave, Inc.

# SPIE CORPORATE MEMBERS

Prizmatix Ltd.  
PROMET Optics  
Proto Labs, Inc.  
PVP Advanced EO Systems, Inc.  
QD Laser, Inc.  
QED Technologies, Inc.  
Qioptiq Ltd.  
Quantel USA  
Quantum Composers, Inc.  
Radiantis  
Raicol Crystals Ltd.  
Rainbow Research Optics, Inc.  
Raptor Photonics Ltd.  
Raytheon ELCAN Optical Technologies  
Redondo Optics, Inc.  
Research Electro-Optics, Inc.  
Reynard Corp.  
RGB Lasersysteme GmbH  
Richardson Gratings™, a Newport Corp. Brand  
RICOR USA, Inc.  
RMT Ltd.  
Rochester Precision Optics, LLC  
Rocky Mountain Instrument Co.  
Ross Optical Industries  
RPC Photonics, Inc.  
RPMC Lasers, Inc.  
RSP Technology  
Rubicon Technology Inc.  
Ruda-Cardinal, Inc.  
S.I. Howard Glass Co., Inc.  
Sacher Lasertechnik GmbH  
Sage Design Automation, Inc.  
Salem Distributing Co., Inc.  
Santa Barbara Infrared, Inc.  
Satisloh North America Inc.  
Savvy Optics Corp.  
SCANLAB America, Inc.  
ScannerMAX  
SCD Semiconductor Devices  
SCD.USA, LLC  
Schäfter + Kirchhoff GmbH  
Schneider Optical Machines Inc.  
Schneider Optics, Inc.  
SCHOTT AG  
SCHOTT DiamondView Armor Products, LLC  
SCHOTT North America, Inc.

Scientific Materials Corp.  
Seattle Photonics Associates LLC  
Seemorgh System ICT Group  
Seiler Instrument & Manufacturing Co., Inc.  
Seiwa Optical America Inc.  
SemiNex Corp.  
SensL  
Sensofar-Tech, S.L.  
Shanghai Jiaguang Optics Group  
Shanghai Optics Inc.  
Shasta Crystals  
Sheaumann Laser, Inc.  
Sierra Precision Optics  
Sierra-Olympic Technologies, Inc.  
Sigmadyne, Inc.  
Sill Optics GmbH & Co. KG  
Simera Technology Group Pty Ltd.  
Siskiyou Corporation  
SlicingTech  
SmarAct GmbH  
Space Optics Research Labs., LLC (SORL)  
Special Optics, Inc.  
Specim Spectral Imaging Ltd.  
Spectral Instruments, Inc.  
Spectrogon AB  
Spectrogon UK Ltd.  
Spectrogon US, Inc.  
Spectrum Scientific, Inc.  
Spectrum Thin Films Corp.  
Spica Technologies, Inc.  
SRI International Sarnoff  
SRICO Inc.  
Stanford Computer Optics, Inc.  
StellarNet, Inc.  
Stemmerich, Inc.  
Sunny Opotech North America, Inc.  
Sunny Technology  
Sutter Instrument Corp.  
Swamp Optics, LLC  
SwissLitho AG  
Sydor Optics, Inc.  
Synopsys, Inc.  
Syntec Optics  
TAG Optics, Inc.

tec5USA, Inc.  
Techmetals, Inc.  
Technical Manufacturing Corp.  
TecOptics, Inc.  
Tecport Optics, Inc.  
Teledyne Judson Technologies  
Telic Co.  
Telops  
Tempo Plastic Co.  
Tempotec Optics Co., Ltd.  
TeraDiode, Inc.  
Texas Instruments Inc.  
TFO, LLC  
The Hong Kong Polytechnic Univ.  
The Univ. of Arizona  
The Univ. of New Mexico  
Thermo Fisher Scientific Inc.  
Thorlabs GmbH  
Thorlabs Inc.  
TJS, Inc.  
TLC International World Headquarters  
Tokyo Ohka Kogyo America, Inc.  
TOPTICA Photonics Inc.  
Tornado Spectral Systems  
Tower Optical Corp.  
TRIOPTICS GmbH  
TRUMPF Inc.  
Twinleaf LLC  
Tydex  
UAB Altechna  
Umicore Optical Materials USA, Inc.  
United Lens Co., Inc.  
Universal Photonics Inc.  
UpTek Solutions Corp.  
UTC Aerospace Systems  
Valtech Corp.  
Varioptic-A BU of Parrot SA  
Vermont Photonics Technologies Corp.  
VisiMax Technologies, Inc.  
Vision Components GmbH  
Vista Optronics Inc.  
Vital Materials Co., Ltd.

Vixar Inc.  
VORTRAN Laser Technology, Inc.  
Wacom Corp.  
Wasatch Photonics, Inc.  
Wavelength Electronics, Inc.  
Wavelength Opto-Electronic (S) Pte. Ltd.  
World Star Tech  
Wuhan Yangtze Soton Laser Co., Ltd.  
WZW-Optic AG  
XEI Scientific, Inc.  
Xenics NV  
XIMEA Corp.  
XYALIS  
Yenista Optics Inc.  
Z & Z Optoelectronics Tech. Co., Ltd.  
ZC Optoelectronic Technologies Ltd.  
Zemax Europe Ltd.  
Zemax, LLC  
Zeta Instruments  
Z-LASER Optoelektronik GmbH  
Z-LASER-America Inc.  
Zomega Terahertz Corp.  
Zurich Instruments AG  
Zygo Corporation

**SPIE.** OPTICS+  
PHOTONICS

CONNECTING MINDS.  
ADVANCING LIGHT.

20**16**

# OPTICS + PHOTONICS.

The latest research in optical engineering and applications,  
nanotechnology, sustainable energy, and organic photonics

MARK YOUR CALENDAR

[WWW.SPIE.ORG/OP2016](http://WWW.SPIE.ORG/OP2016)

San Diego Convention Center  
San Diego, California, USA

Conferences & Courses  
28 August-1 September 2016

Exhibition  
30 August-1 September 2016

# Precision Instrumentation for Science and Industry

Visit us at Booth #528

## OPTICAL PRODUCTS

Our latest products include the **Lambda HPX-L5**, a new high-powered white light LED and the versatile **SOM** simple moving microscope optimized to allow *in vivo* and *in vitro* experimentation in one set-up. As with our two-photon **MOM** microscope, the **SOM** can robotically position the objective over the sample and focus, opening up experimental possibilities.



## MICROMANIPULATION

World-class micromanipulators, rock-solid mounting platforms, and precision X-Y translation is now offered in economically priced system bundles. Each system comes with 2 manipulators (**MPC-385-2** or **MPC-325-2**) and either the classic moving scope design with translator, or large moving platform stage. The powerful Multi-Link Position Control™ software allows you to link and coordinate movement of multiple devices that can be connected to our **MPC-200** controller.



## DESIGN AND MANUFACTURING

We've combined extensive years of motor control experience and in-house precision CNC machined parts to create a line of versatile optical products to serve the tremendous growth in photonics, optical research, and imaging techniques. Our extensive engineering expertise and 50,000 square foot state-of-the-art manufacturing facility, allow us to rapidly fabricate custom imaging solutions at economical prices, making us a preferred OEM vendor for the life sciences and industry.



## MICROPIPETTE FABRICATION

Sutter Instrument, the recognized leader in micropipette fabrication technology, offers leading edge technology in the **P-2000** micropipette puller, which allows for fast and repeatable nanospray tip production with complete control of tip morphology. The **P-2000** can be pre-programmed to produce tips to your specifications at no extra charge.

