



Optics +
Photonics

2019

EXHIBITION GUIDE

Exhibition
13-15 August 2019

Conferences and Courses
11-15 August 2019

San Diego Convention Center
San Diego, California, USA

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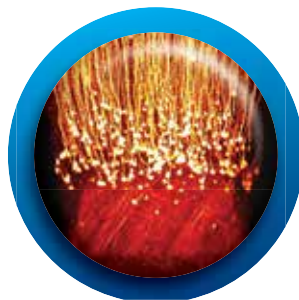
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Exhibition: 13-15 August 2019
 Conferences and Courses: 11-15 August 2019
 San Diego Convention Center, San Diego, California, USA

EXHIBITION GUIDE

Tuesday 13 August · 10:00 am to 5:00 pm
 Wednesday 14 August · 10:00 am to 5:00 pm
 Thursday 15 August · 10:00 am to 2:00 pm

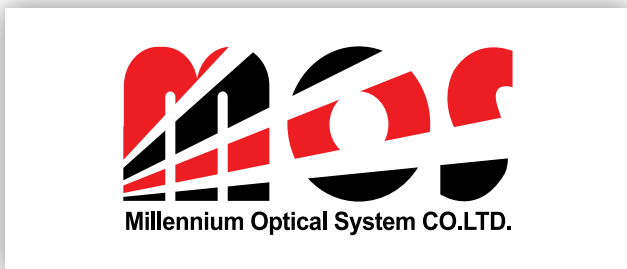
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SPIE is the international society for optics and photonics, a not-for-profit organization founded in 1955 to advanced light-based technologies. The Society serves nearly 264,000 constituents from approximately 166 countries, offering conferences, continuing 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 2018.

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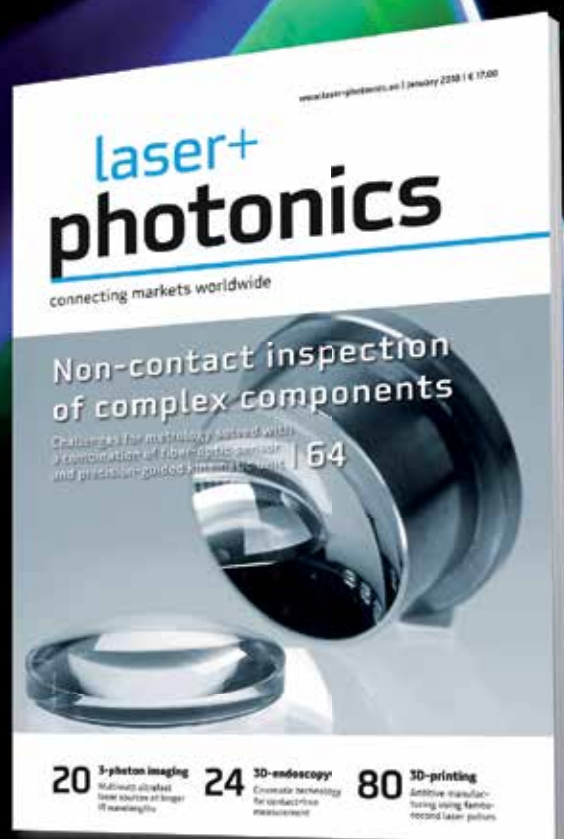
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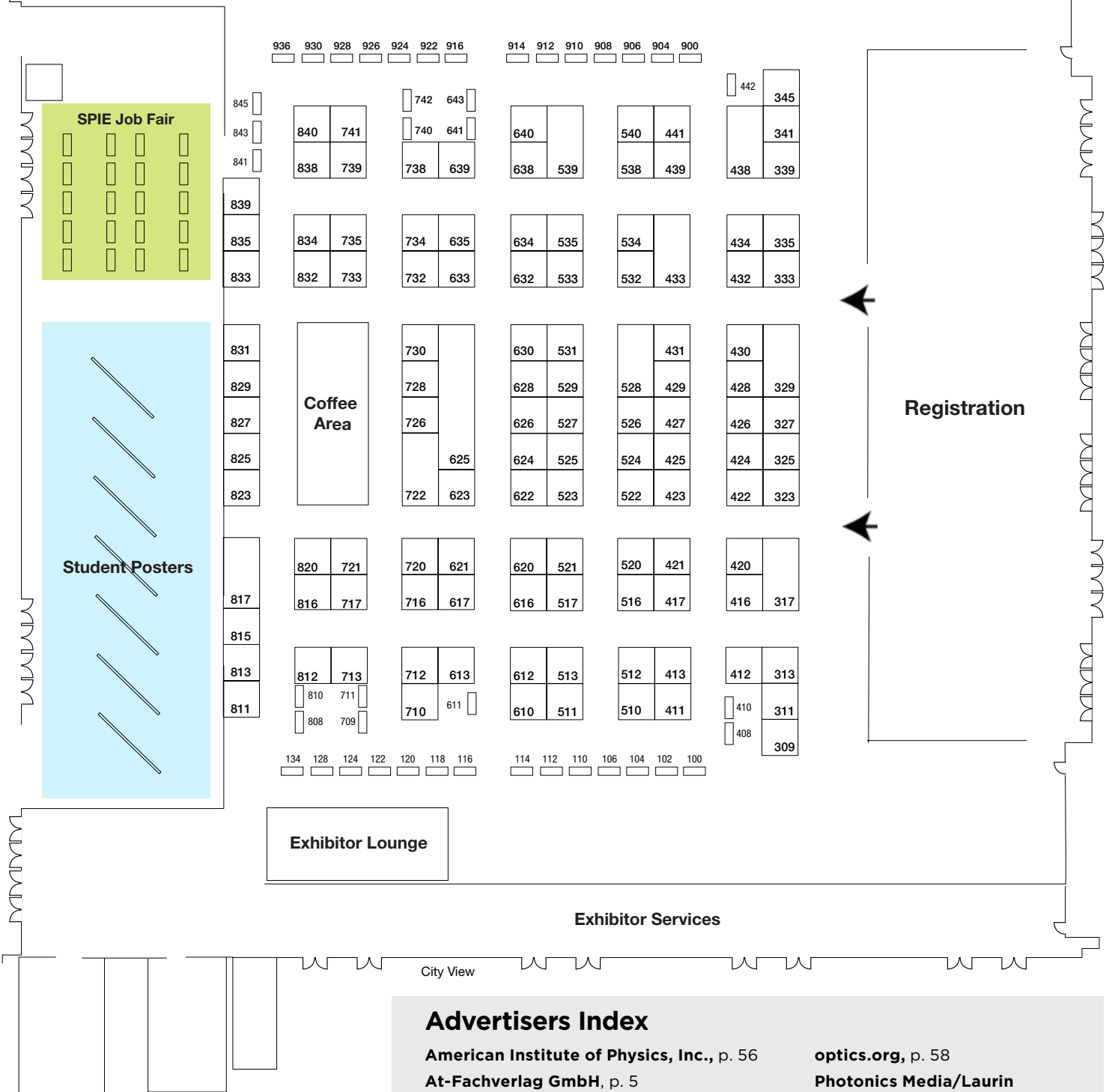
Exhibition Ice Cream Social
 Thursday · 12:30 to 1:30 PM
 Exhibition Hall

Join representatives of companies in the exhibition and celebrate the end of the show with ice cream.

EXHIBITION FLOORPLAN

Water View

CONVENTION CENTER — UPPER LEVEL — SAILS PAVILION



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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 44–47, 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

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 San Diego, California, USA

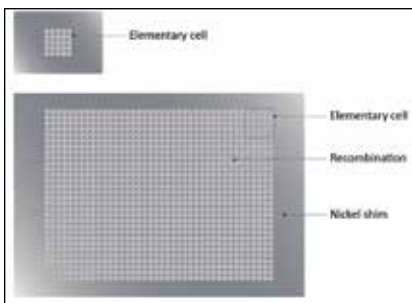
3D AG

Laettichstrasse 4a, Baar, 6340 Switzerland
 +41 41 768 25 25
 sales@3dag.ch; www.3dag.ch

Featured Product: Manufacturing nickel shims up to 1300 x 1700 mm² for replication of micro and nanostructures

We are an independent business based in Switzerland with 30 years of experience in micro- and nanotechnology. 3D AG explored and acquired a wide knowledge in the processing structures for various functionalities surfaces. We manufacture durable tools by electroforming processes.

Additionally, if you hold a small sample, we have developed high precision UV step and repeat recombination machine enabling us to upscale your structure up to 1000 x 1200 mm² thus creating a large micro structured tool.
 Contact: Martina Mueller, CEO, m.mueller@3dag.ch; Marek Krehel, Optical Engineer, m.krehel@3dag.ch



Production and upscaling of tools for micro and nanotechnology for mass replication.

#527

4D Technology Corp.

SPIE Corporate Member

A Nanometrics Business, 3280 E Hemisphere Loop Ste 146, Tucson, AZ, 85706-5039 (USA)

+1 520 294 5600; fax +1 520 294 5601

4Dinfo@nanometrics.com; www.4dtechnology.com

Featured Product: On-Axis Dynamic AccuFiz Fizeau Interferometer. On-axis for precision, dynamic for fast measurements

Designs and manufactures dynamic laser interferometers and optical profilers, micropolarizer cameras and surface defect gauges. With vibration-insensitive dynamic measurements, customers gain size & weight-reduced portability, easy integration into robotics, and measurements in difficult/turbulent environments. Serving: precision machined surfaces, optics, astronomy, aerospace, space-based telescopes, flexible electronics, automotive, and in-line production measurements. A Nanometrics business. Contact: Steve Martinek, VP of Sales and Marketing, smartinek@nanometrics.com; Edgar Schrock, Marketing Manager, eschrock@nanometrics.com

#523

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AccuCoat Inc.

SPIE Corporate Member

111 Humboldt St Ste 8, Rochester, NY, 14609 (USA)
+1 585 288 2330; fax +1 585 288 2331

coatings@accucoatinc.com; www.accucoatinc.com

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#831

Accumold

1711 SE Oralabor Rd, Ankeny, IA, 50021 (USA)
+1 515 964 5741; fax +1 515 964 5742

micromolding@accumold.com; www.accu-mold.com

Featured Product: Micro injection molding, polymer optics & more

Accumold® is a high-tech manufacturer of precision micro molded plastic components with part geometries from 5cm to less than 1mm in size. Processes include: insert molding, clean room molding and 2-shot molding. Materials include: peek, Ultem, LCP, and most engineered



thermoplastics. Markets include: micro electronics, medical, micro optics, sensors and other emerging technologies. Contact: Aaron Johnson, VP Marketing, ajohnson@accu-mold.com; Rick Brown, Sales / Optics, rbrown@accu-mold.com

Micro injection molding including polymer optics.

#728

ADIT Electron Tubes

300 Crane St, Sweetwater, TX, 79556-0870 (USA)
+1 325 235 1418; fax +1 325 235 2872

sales@electrontubes.com; www.et-enterprises.com

Featured Product: Photodetector modules for photon counting & analog detection will be on display

ADIT Electron Tubes designs and manufactures photomultiplier tubes, housings, voltage dividers, signal processing modules and photodetector modules. Photomultipliers are available in diameters from 1/2" to 11", some with our new high QE photocathodes. Tubes are available for use at cryogenic temperatures, high temperatures, with low background glass and qualified for space flight. Two manufacturing facilities, in West Texas and West London, help to ensure fast delivery and competitive pricing. Contact: Paul Davison, Sales Manager, paul@electrontubes.com



We offer photodetector modules for analog detection and photon counting units with USB connection.

#900

Agilent Technologies, Inc.

2850 Centerville Rd, Wilmington, DE, 19808-1610 (USA)
+1 302 636 2000; fax +1 302 633 8916
cag_sales-na@agilent.com; www.agilent.com

Featured Product: Cary 7000 Universal Measurement Spectrophotometer

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the most stringent laboratory practices, from sample preparation to final report. Learn more www.agilent.com. Contact: Jason Cherney, Marcom Specialist, jason_cherney@agilent.com

The Cary 7000 UMS delivers solutions for R&D and QA/QC in optics, coatings, & other applications.

#323

ALIO Industries Corp.

SPIE Corporate Member

5335 Xenon St, Arvada, CO, 80002-1348 (USA)
+1 303 339 7500; fax +1 303 339 7501

sales@alioindustries.com; www.alioindustries.com

Featured Product: ALIO's Patented Hybrid Hexapod®: Game changing performance in 6 degree of freedom positioning

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our customers enabling solutions for state of the applications. Contact: Walter Silvesky, VP Sales, walter.silvesky@alioindustries.com

Dual hybrid hexapod flexible alignment platform for nano precision silicon photonics applications

#434

All Flex Flexible Circuits and Heaters #517

1705 Cannon Ln, Northfield, MN, 55057-3605 (USA)
+1 507 663 7162; fax + 1 844 274 3970
marketing@allflexinc.com; www.allflexinc.com

All Flex is an industry leading flexible circuit and heater manufacturer providing prototype in high volumes with component assembly. Flex circuits include single-sided, double-sided, multilayer, and long Maxi-Flex with fine line capability. Quick turn custom and stock polyimide and silicone rubber heaters. All Flex has provided flexible solutions to the medical, aerospace, military, and industrial markets for over 25 years. AS9100, ISO9001, ITAR, MIL-PRF-31032/3 & MIL-PRF-31032/4 Certified. Contact: Kelsey Smith, Marketing, ksmith@allflexinc.com

ALPAO S.A.S. #910

727 rue Aristide Bergès, Montbonnot St Martin, 38330 France
+33 476 890 965; fax +33 476 514 532
contact@alpao.fr; www.alpao.com

With more than 10 years of experience in adaptive optics, ALPAO designs and manufactures a complete range of adaptive optics products for use in research and industry from 2008. ALPAO provides deformable mirrors, wavefront sensors and softwares. ALPAO's products are tailor-made for various applications such as astronomy, ophthalmology, microscopy, wireless optical communications and laser applications. Contact: Abdesselem El Hassouni, Sales Engineer, abdesselem.elhassouni@alpao.fr

Amsterdam Scientific Instruments B.V. #114

Science Park 105, Amsterdam, 1098 XG Netherlands
+31 613 349900
hans.radhoe@amscins.com; www.amscins.com

Featured Product: Timepix3Cam, Ultrafast nanosecond optical camera for Ion/Electron/Neutron 3D imaging

Amsterdam Scientific Instruments is a fast growing high-tech company based at the Science Park in Amsterdam. We develop imaging detectors for X-rays, electron microscopy and mass spectrometry. Our hybrid pixel detectors are based on Cern's Timepix/Medipix technology and have been implemented by many leading research institutes worldwide. It is



our absolute goal to deliver and continue developing high performance, high quality detection and imaging products and technology to accelerate research. Contact: Hans Radhoe, Sales Director, hans.radhoe@amscins.com

Timepix3Cam, Ultrafast nanosecond optical camera for single photon counting to image Ions/Electrons.

Andor Technology Ltd. #120

SPiE Corporate Member
300 Baker Ave Ste 150, Concord, MA, 01742-2124 (USA)
+1 860 290 9211; fax +1 860 290 9566
s.cummings@andor.com; www.andor.com

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Andover Corporation #531

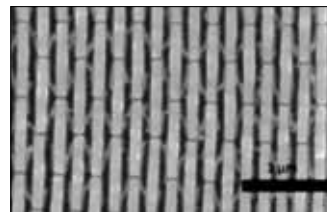
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4 Commercial Dr, Salem, NH, 03079-2800 (USA)
+1 603 893 6888; fax +1 603 893 6508
info@andcorp.com; www.andcorp.com

Featured Product: IR Coating & Dicing Services

Andover Corporation was established in 1976 with the purpose of designing and manufacturing high-quality optical filters and coatings. Over the years as the company has grown, the focus has remained on quality. Our current facility spans 44,000 square feet on 17 acres of land in Salem, NH. We manufacture filters and coatings for a wide variety of applications. Our facility is custom-designed and state-of-the-art, and includes automated coating, glass polishing, and fabrication equipment. Contact: Michael Tiner, Chief Operating Officer, mtiner@andovercorp.com; Mark Kfoury, Director of Technical Sales, mark.kfoury@andovercorp.com

Applied NanoTools Inc. #134

NINT Bldg, 11421 Saskatchewan Dr NW, Edmonton, AB, T6G 2M9 Canada
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sales@appliednt.com; www.appliednt.com



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Applied Surface Technologies #106

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+1 908 464 6675; fax +1 908 464 7475
co2clean@co2clean.com; www.co2clean.com

Featured Product: CO2 Snow Jet

We demonstrate precision cleaning using a CO2 Snow Jet, a quick and safe process capable of removing particles of all sizes, (visible to below 5 nanometers), organic residues, solvent stains, and water spots. CO2 Snow cleans all types of substrates, optics, diamond turned optics, fiber-optics, wafers, mirrors, large telescopes mirrors, analytical samples (AFM & XPS), and many other items. We demonstrate manual, portable, and semi-automated units for R&D or manufacturing. Bring samples. Contact: Robert Sherman, roberts@co2clean.com

Äpre Instruments, Inc. #410

SPIE Corporate Member

2440 Ruthrauff Rd Ste 100-120, Tucson, AZ, 85705 (USA)
+1 520 639 8195
sales@apre-inst.com; www.apre-inst.com

Featured Product: S50|HR Fizeau Interferometer - 50mm Aperture

Need an Interferometer? ÄPRE gives you more! More performance in higher image resolution, greater slope acceptance and lower retrace errors. More source options: stabilized HeNe, SLM laser diodes, patented SCI technology and wavelength modulated options. More native apertures with 6mm, 50mm, 100mm, 150mm, 300mm, plus custom and beam expanded options. More product life with upgrades and restorations of most common interferometers; plus the option to add SCI technology to your upgrade. Contact: Donald (Don) Pearson II, Vice President Sales, dpearson@apre-inst.com; Robert Smythe, President, rsmythe@apre-inst.com

Arete Associates #428

Sensors Sources and Systems Div, 2500 Trade Ctr Ave Ste A, Longmont, CO, 80503 (USA)
+1 303 651 6756
info@arete.com; www.arete.com

Areté works across the electromagnetic spectrum developing sensors and the associated signal processing algorithms necessary for the extraction and interpretation of data for systems operating under water, in the atmosphere, and in space. In addition, with an emphasis on enhanced signal processing and real-time executable software, Areté is able to improve the performance of existing sensor systems at fractions of the cost and time to operations of replacement systems. Contact: James Murray, EO Director, jmurray@arete.com; Andrew Paul, Senior Principal Scientist, apaul@arete.com

asphericon GmbH #420

SPIE Corporate Member

Stockholmer Str 9, Jena, 07747 Germany
+49 3641 3100500; fax +49 3641 3100501
sales@asphericon.com; www.asphericon.com

Featured Product: Fast lane prototyping reduced lead time of up to 3 weeks for optical elements including coating

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AT-Fachverlag GmbH #408

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

Photonik is a German-language trade journal published 6 times a year, covering the high-tech areas of optical technologies (opto-electronics, laser technology, image processing, optical communication, optical metrology etc.). In this area, Photonik provides the highest circulation in the German speaking marketplace. Photonik publishes technical articles, reports on new products and business news. The magazine is targeted at development engineers and industrial users of such products.

attocube systems Inc. #838

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+1 510 649 9245
info@attocube.com; www.attocube.com

attocube is the technology leader for ultra precise motion and sensing solutions compatible with extreme environmental conditions such as UHV, magnetic field, radiation exposure, as well as cryogenic to elevated operating temperatures. The portfolio also includes integrated measurement systems, such as the attoDRY800 cryo-optical table and a Photonic Probe Station, an ultra-stable, extremely compact and easy to use table top setup for nanophotonic device characterization.

Avantes, Inc. #820

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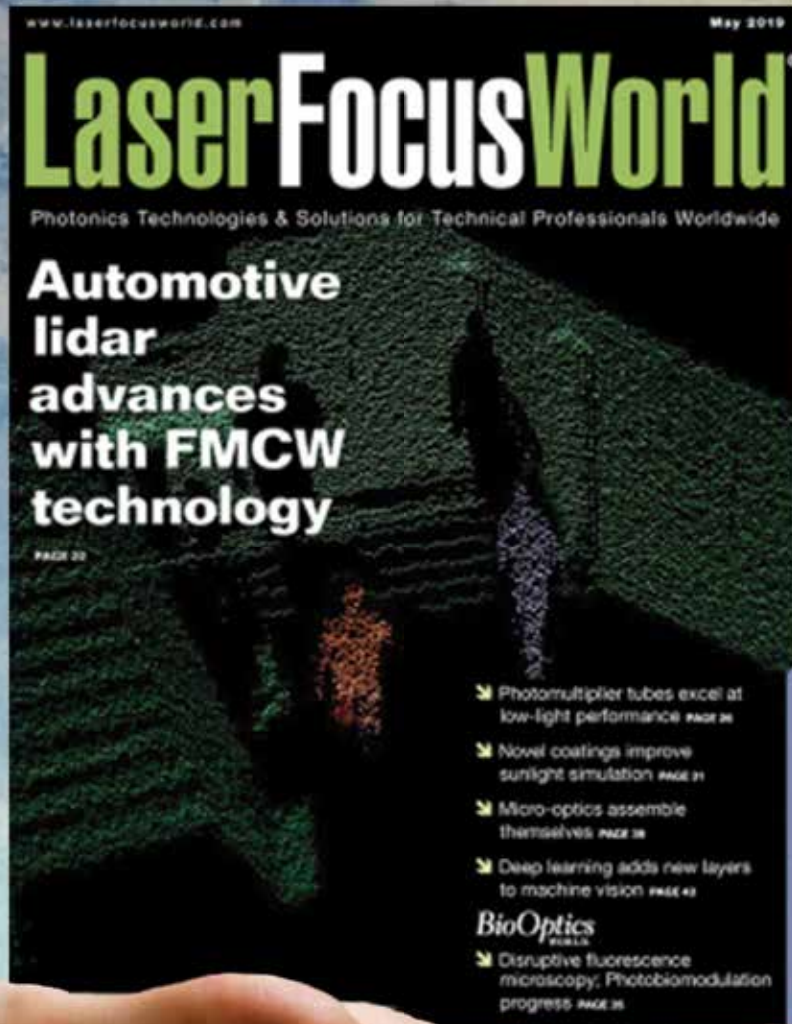
500 S Arthur Ave Ste 500, Louisville, CO, 80027-3038 (USA)
+1 303 410 8668; fax +1 303 410 8669
infousa@avantes.com; www.avantes.com

Avantes, a leader in fiber optic spectroscopy, offers a range of spectrometers, light sources, & fiber optics for measurements in the range 190-2500 nm. Avantes is excited to debut the first ever 4096 pixel compact CMOS spectrometer, built with an automated manufacturing system providing unbeatable unit-to-unit repeatability and thermal stability. Avantes also features the high-resolution AvaSpec-NIR512-1.7-HSC-EVO as the newest in our NIRLine of Spectrometers for measurements to 1700nm. Contact: Damon Lenski, General Manager, infousa@avantes.com



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Gigabit Ethernet thermo-electric cooled
high-sensitivity spectrometer.**

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Bruker Nano, Inc. #535

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+1 520 741 1044; fax +1 520 294 1799
productinfo@bruker.com; www.bruker.com

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Campbell Engineering Inc. #533

20412 Barents Sea Cir, Lake Forest, CA, 92630 (USA)
+1 949 859 3306
sales@campbellcnc.com; www.campbellcnc.com

Featured Product: Manufacturer of precision machined components specific to medical, photonics, and aerospace

Campbell Engineering strives to partner with customers to meet their customized needs. A complete ISO-9001 machine shop that includes 3, 4 & 5 axis CNC Mills (horizontal & vertical with on machine probing), Lathes, Wire EDM, CMM and Optical / Vision inspection systems. Your one-stop machine shop. Prototypes / High Speed Production / Assemblies / Kitting. CEI takes pride in precision and quality to surpass customer demands. "Today's quality is tomorrow's reputation". Contact: James Campbell, President/CEO, sales@campbellcnc.com; Pam Nola, CFO, pam@campbellcnc.com

Chroma Technology Corp. #734

SPIE Corporate Member

10 Imtec Ln, Bellows Falls, VT, 05101-3119 (USA)
+1 802 428 2500; fax +1 802 428 2525
sales@chroma.com; www.chroma.com

Featured Product: optical filters, illumination, contract engineering

Chroma is an employee-owned company that designs and manufactures precision optical filters and coatings from 220-2600nm for myriad applications. We provide application engineering support and short cycle times and are as comfortable designing and manufacturing custom filters as we are our catalog items; regularly offering custom filters at catalog prices. Contact: Kelly Stockwell, OEM Engineering, kstockwell@chroma.com; Christopher Conca, OEM Sales, cconca@chroma.com

CMM Optic #835

SPIE Corporate Member

488 Oliver Dr, Troy, MI, 48084-5426 (USA)
+1 248 273 1111; fax +1 248 362 2152
info@cmmoptic.com; www.cmmoptic.com

CMM Optic offers 30 years experience in the fabrication of precision diamond-turned optical components, opto-mechanical assemblies and integrated solutions, from prototype to high-volume production. CMM Optic is a global leading manufacturer in the optics industry for American-made precision products. Our state of the art facility and tenure in the optics industry allow us to excel in manufacturing and inspection of the most challenging optical components and assembled solutions. Contact: Tom Goundry, VP, Business Development, tgoundry@cmmoptic.com; Kevin McMahon, President, kmcmahon@cmmoptic.com

Collins Aerospace - Sensors Unlimited Products #512

SPIE Corporate Member

330 Carter Rd Ste 100, Princeton, NJ, 08540-7438 (USA)
+1 609 333 8200; fax +1 609 333 8103
sui_info@collins.com; www.sensorsinc.com

Sensors Unlimited, Inc., a Collins Aerospace 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 security/surveillance, near-infrared spectroscopy, line-scan inspection, process control, laser beam profiling, microscopy, OCT & art inspection. Contact: Paul Messina, Business Development Manager, paul.messina@collins.com; Scott Cogan, Business Development Manager, scott.cogan@collins.com

Coursen Coating Labs, Inc. #924

SPIE Corporate Member

2925 College Ave #A1, Costa mesa, CA, 92626 (USA)
+1 714 585 4172
dan@coursencoatinglabs.com; www.coursencoating.com

Featured Product: Proprietary Solderable Coating for Optics

Coursen Coating Labs specializes in developing innovative custom solutions to meet the changing needs of our customers who are facing a world of increasing competition and decreasing product life cycles. Let Coursen Coating Labs develop an innovative and cost effective solution to your problem that pushes the envelope in terms of performance while, at the same time, meeting your price requirements. Contact: Dan Coursen, President / CEO, dan@coursencoatinglabs.com

DataRay Inc. #102

SPIE Corporate Member

1675 Market St, Redding, CA, 96001-1022 (USA)
+1 530 395 2500; fax +1 530 395 2500
sales@dataray.com; www.dataray.com

Featured Product: The new TaperCamD-LCM has an active area of up to 25 x 25 mm with 12.5 µm pixels and a 2500:1 SNR

DataRay Inc. was founded in 1988 to bring affordable, high-performance beam profiling to the photonics community. DataRay manufactures precision, UV to 16 µm beam profiling instruments for laser,



assembly and fiber optic telecom beam profiling and imaging to ISO 11146 standards. DataRay Inc. is an ISO 9001 certified company. Contact: Nea Hamilton, Sales Engineer, nhamilton@dataray.com; sales@dataray.com

The new TaperCamD-LCM is a large area CMOS beam profiler with 25 x 25 mm active area and 2500:1 SNR.

DCM Tech, Corp.

SPIE Corporate Member

4455 Theurer Blvd, Winona, MN, 55987-1593 (USA)
+1 507 452 4043; fax +1 507 452 7970
interest@dcm-tech.com; www.dcm-tech.com

DCM Tech designs and builds a line of precision rotary surface grinders. We have provided quality machine tool equipment and customer satisfaction since 1974. Our response to customer needs over the

years has allowed us to provide long lasting, application specific, solutions to customers worldwide. Use of DCM Tech rotary surface grinders has consistently brought dollars to our customers' bottom line via process improvement. Contact: Brian Ebbinger, Technical Specialist, brianebbinger@dcm-tech.com



DCM IG280SD / IG380SD / IG480SD high precision rotary surface grinders. Built with pride in the USA!

#624

Electro Optics Magazine

#740

4 Signet Ct, Cambridge, CB5 8LA United Kingdom
+44 1223 221030
sales@europascience.com; www.electrooptics.com

Featured Product: Electro Optics Magazine

Electro Optics is the premier European Optics and Photonics magazine. Published by Europa Science, we offer up to date and in-depth news, features and information about the European photonics industry. Contact: Jon Hunt, Head of Business Development, jon.hunt@europascience.com; Charlie Mitchell, Partnership and Events Executive, Charlie.mitchell@Europascience.com

Energetiq Technology, Inc.

#739

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 (LDLS™)

Energetiq, a wholly-owned subsidiary of Hamamatsu, develops and manufactures ultra-bright Laser-Driven Light Sources (LDLS™) that offer an unmatched combination of radiance, stability, longevity and broad

wavelength range. Energetiq's most recent innovation is advanced Laser-Driven Tunable Light Sources (LDTLS™) that allow for precise wavelength selection. Energetiq also manufactures an EUV (Extreme Ultraviolet) source platform uniquely suited for 13.5nm semiconductor inspection applications. Contact: Mae Steinberg, Marketing Communications, info@energetiq.com



The TLS-EQ-9 Laser-Driven Tunable Light Source for precise wavelength tuning.

Diverse Optics Inc.

#630

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

We know that your optics are as unique as you are. You can reduce cost, trim weight, simplify design, and improve the performance of your optics using polymers. For 30 years, we've manufactured the most challenging polymer optic components and assemblies for leading defense, medical, and commercial applications with advanced technology and an experienced team of professionals. With our knowledge of injection molding and diamond turning, we'll show you how polymer optics are perfected. Contact: Letty Trevino, Sales Engineer, Letty.Trevino@Diverseoptics.com

Dover Motion

#411

159 Swanson Rd, Boxborough, MA, 01719 (USA)
+1 508 475 3400; fax +1 508 836 3223
sales@dovermotion.com; www.dovermotion.com

Edmund Optics Inc.

#333

SPIE Corporate Member

101 E Gloucester Pike, Barrington, NJ, 08007-1380 (USA)
+1 856 547 3488; fax +1 856 573 6295
sales@edmundoptics.com; www.edmundoptics.com

Edmund Optics is a leading global supplier of optics and optical components, designing and manufacturing a wide array of multi-element optical lenses, coatings, imaging systems, and optomechanical equipment. Led by skilled optical engineers and scientists, EO is application focused and pursues new ways to implement optical technology, enabling advancements in industrial metrology, semiconductor manufacturing, life sciences, and more. Contact: Customer Service, sales@edmundoptics.com

Enli Technology Co., Ltd.

#712

1F., No.96, Luke 5th Rd., Luzhu Dist, Kaohsiung City, 821 Taiwan
+886 7 6955669; fax +886 7 6955785
qeservice@enli.com.tw; www.enlitechnology.com

Featured Product: Solar Simulator, Quantum Efficiency Measurement System, LED Photoluminescence Yield Measurement

Enli Technology- Solar Simulator Expert. Solar simulators, quantum efficiency measurement system, LED photoluminescence quantum yield measurement and optical metrological instruments. We're dedicated to designing and manufacturing high-end measurement system which can be used in the fields of new materials science, perovskite, solar cell/module testing and analysis. Enli Tech believes that our configurable and customized solutions can assist users in achieving their research goals. Contact: Kate Liu, Marketing Specialist, kate_liu@enli.com.tw; Joyce Wang, Assistant Manager, joyce_wang@enli.com.tw

Epner Technology Inc.

#427

SPIE Corporate Member

279 Frost St, Brooklyn, NY, 11222-5601 (USA)
+1 718 782 5948; fax +1 718 963 2930
info@epner.com; www.epner.com

EXHIBITOR DIRECTORY

Evaporated Coatings, Inc.

#639

SPIE Corporate Member

2365 Maryland Rd, Willow Grove, PA, 19090-1708 (USA)
+1 215 659 3080; fax +1 215 659 1275

sales@evapcoat.com; www.evaporatedcoatings.com

ECl deposits optical coatings including IBS LWP/SWP, Tri-band & bandpass filters, anti-reflection & attenuation coatings, low-pol. beamsplitters, transparent conductive, enhanced metal & dielectric mirrors. ECl expertly coats glass, Ultem, Zeonex, molded optics, semiconductors, crystals, ultra thin wafers, laser bars, prisms, fiber-ends & ball lenses. Wide experience coating high stain glasses, metals, micro optics, and crystals. Full aperture, IBS, APS & IAD deposition technologies. Contact: Joe Brychell, VP- Sales & Marketing, sales@evapcoat.com; Amanda Burke, Sales Engineer, aburke@evapcoat.com

Filmetrics, Inc.

#438

10655 Roselle St, San Diego, CA, 92121-1506 (USA)

+1 858 573 9300; fax +1 858 573 9400

info@filmetrics.com; www.filmetrics.com

Fresnel Technologies Inc.

#309

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

Featured Product: Our 250 μ m diameter molded PMMA aspheric lens will excel in endoscopes and other micro applications

Fresnel Technologies has the largest off-the-shelf polymer optics catalog in the US. We design and manufacture orders large and small, from millions of parts to a single prototype. Our diamond turning machines allow micro- and nano-machining of metal and polymer optics. We produce silicone lenses, microlens arrays, and AR/VR lenses. From conventional plastic lenses to freeform optics, from Fresnel lenses for the visible spectrum to passive IR optics for the Internet of Things, we make it all. Contact: Linda Claytor, Vice president, lclaytor@fresneltech.com; Nelson Claytor, President, nclaytor@fresneltech.com

GPD Optoelectronics Corp.

#100

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

GPD Optoelectronics Corp., is a global supplier of Ge & InGaAs photodetectors operating in the 0.8 to 2.6 micron short wave infrared (SWIR) spectrum. The Ge photodiodes, InGaAs photodiodes and InGaAs APDs are available in die on carrier, TO package, TEC module, single/multi-mode fiber (with high reliability packaging), SMA/FC/SC/ST active mount, & custom designs. GPD has Si over Ge, Si over InGaAs, InGaAs over InGaAs "two-color sandwich" sensors for ratio pyrometry & InGaAs quadrant sensors. Contact: George Gasparian, Sales/Application Engineer, ggasparian@gpd-ir.com; Rufus Ward, President, rward@gpd-ir.com

GS Plastic Optics

#621

SPIE Corporate Member

408 St. Paul Street, Rochester, NY, 14605-1788 (USA)

+1 585 295 0200; fax +1 585 232 2314

gspartners@gsoptics.com; www.gsoptics.com

Featured Product: Precision Polymer Optics

GS Plastic Optics works with executives and program managers to solve complex optical challenges. We manufacture high-performance injection molded polymer optics specifically designed to help customers improve their competitiveness and market share. Our in-house team consists of experts in diamond turning, thin film coating, mold fabrication, and opto-

mechanical assembly. We have all of the advanced metrology equipment needed to control performance and quality. Contact: Bob Podlena, Director of Sales and Marketing, rpodlena@gsoptics.com; Steve Orth, Sales Executive, sorth@gsoptics.com



Injection molded optics. Engineered for your success.

Hamamatsu Corp.

#735

SPIE Corporate Member

360 Foothill Rd, Bridgewater, NJ, 08807-2932 (USA)

+1 908 231 0960; fax +1 908 231 1539

cwall@hamamatsu.com; www.hamamatsu.com

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, UV light and x-rays. These devices include silicon photomultipliers, photodiodes, photomultiplier tubes, image sensors, cameras, and light sources. Hamamatsu Photonics also offers specialized systems for select applications.

Hardin Optical Co.

#520

SPIE Corporate Member

PO Box 219, 87679 Kehl Ln, Bandon, OR, 97411-0219 (USA)

+1 541 347 9467; fax +1 541 347 8176

optics@hardinoptical.com; www.hardinoptical.com

Featured Product: Custom Optical Components

Hardin Optical manufactures precision optical components for commercial and defense applications. We fabricate custom optical elements used in UV, Visible, and IR applications. Our manufacturing facility includes CNC grinding and polishing, conventional grinding and polishing, diamond turning, and thin film coating capabilities. We take pride in our record of on-time delivery of quality products. Hardin Optical Company was founded in 1976. www.hardinoptical.com

Heidelberg Instruments Inc. #526

SPIE Corporate Member

2539 W 237th St Ste A, Torrance, CA, 90505 (USA)
+1 310 212 5071; fax +1 310 212 5254
info@himt.us; www.himt.us

Heidelberg Instruments is a world leader in the production of high precision photolithography systems and maskless aligners. Heidelberg Instruments has an installation base of over 850 systems in more than 50 countries. Our systems are installed in academic and industrial sites and are used in research, development and production. Applications include MEMS, microfluidics, micro optics, MOEMS, CMOS, semiconductor packaging, display technology and many more. Contact: Niels Wijnaendts van Resandt, Director of Sales North & South America, sales@himt.de

HEIDENHAIN Corp. #311

SPIE Corporate Member

333 State Pkwy, Schaumburg, IL, 60173-5337 (USA)
+1 847 490 1191; fax +1 847 490 3931
marketing01@heidenhain.com; www.heidenhain.com

ETEL, founded in 1974 and based in Switzerland, is a supplier 100% dedicated to direct drive technology. Their range of linear and torque motors, position and motion controllers and high-end motion system products provides a large selection to meet nearly all customers' needs and the process improvement they've been looking for. The synergies with companies belonging to the HEIDENHAIN Group have allowed ETEL to merge its respective knowledge and expertise, and proved to be a winning combination. Contact: Daniel Wiseman, Motion Systems Sales Engineer, dwiseman@heidenhain.com; Peter Suliga, Regional Sales Mgr, Motion Systems, psuliga@heidenhain.com

HILLTOP Technology Laboratory, Inc. #511

51 Parker, Irvine, CA, 92618 (USA)
+1 949 680 2525; fax +1 949 289 9940
sales@hilltop21.com; www.hilltop21.com

HILLTOP Technology Laboratory, Inc. specializes in prototypes, custom CNC machining, short-run productions, and quick-turnaround products. Rapid prototyping of precision machining is its specialty. Contact: Yumi Ryan, Purchaser / Administrative Assistant, sales@hilltop21.com

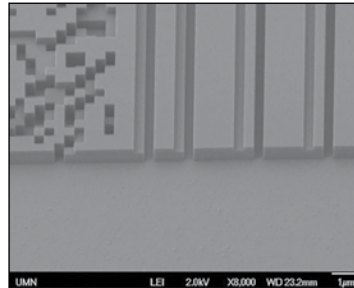
Himax IGI Precision #928

SPIE Corporate Member

4611 E Lake St, Minneapolis, MN, 55406-2305 (USA)
+1 612 721 6283; fax +1 612 721 3802
sales@himaxigi.com; www.himaxigi.com

Featured Product: Micro Optic Arrays, Diffractive Optics, Nano Structures for prototype & high volume optics, DOE, MLA

Himax IGI designs & manufactures innovative micro & nano patterns for displays, optics, telecommunications, biomedical, & other applications. NanoSculpt technologies are used to make photoresist masters, nickel shims, & soft molds with diverse pattern characteristics that create the desired surface or optical properties. Products made by Himax IGI are used in Nano-imprint lithography, injection molding, roll-to-roll, embossing, stamping, & other prototype and high volume manufacturing processes. Contact: Kendra Stritch, Sales Engineer, kendra_stritch@himaxigi.com; Rob Larsen, VP, rob_larsen@himaxigi.com



4 layer Diffractive Optical Elements (DOEs) and Phase Plates.

Hinds Instruments, Inc. #327

SPIE Corporate Member

7245 NW Evergreen Pkwy Ste 150, Hillsboro, OR, 97124 (USA)
+1 503 690 2000; fax +1 503 690 3000
sales@hindsinstruments.com; www.hindsinstruments.com

Featured Product: POLSnap an Affordable Stokes Polarimeter with a Data Rate of 4 Stokes Vectors per Second

Hinds Instruments - a global leader in polarization measurement and analysis - innovates, develops, manufactures and distributes polarization measurement instrumentation for research and industry. Our standard and custom products, both integrated systems and stand-alone components, are designed for our markets: FPD, LCD, pharmaceutical development, materials research, solar and fusion energy research, thin films and more. Please visit us at www.hindsinstruments.com for more information. Contact: Connie Wimmer, Sales Engineer, sales@hindsinstruments.com; Andrew Werst, Sales Engineer, sales@hindsinstruments.com

HIWIN Corp. #539

12455 Jim Dhamer Dr, Huntley, IL, 60142-8065 (USA)
+1 847 827 2270; fax +1 847 827 2291
info@hiwin.com; www.hiwin.com

Hofstadter Analytical Services, LLC #711

SPIE Corporate Member

10 N Norton Ave Ste 120, Tucson, AZ, 85719-6038 (USA)
+1 520 747 3282; fax +1 520 747 3282
dan@hofstadteranalytical.com; www.hofstadteranalytical.com

EXHIBITOR DIRECTORY

HOYA Corp. USA

#116

SPIE Corporate Member

Optics Div, 680 N McCarthy Blvd Ste 120, Milpitas, CA, 95035-5120 (USA)

+1 408 654 2200; fax +1 408 654 2270

opticsales.hoyausa@hoya.com; www.hoyaoptics.com

Featured Product: W Series - Sharp Cut Filters & ND Filters, UV-VIS-NIR Color Filters, Specialty and Optical Glasses

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 ND Color Filters, Optical & Specialty glasses in various forms: Lenses, blanks, strips & blocks. Contact: Brett Martin, General Manager, brett.martin@hoya.com; Naoko Sato-Tazuma, Account Manager of Sales, naoko.sato@hoya.com

II-VI Optical Systems

#632

SPIE Corporate Member

36570 Briggs Rd, Murrieta, CA, 92563-2347 (USA)

+1 951 926 2994; fax +1 951 926 9026

opticalsystems.info@ii-vi.com; www.opticalsystems.com

II-VI Optical Systems' expanding and extensive capabilities cover a wide range of products and applications, including high precision optical assemblies, high energy lasers, hypersonic applications, infrared optics, thin film coatings and optical materials. As a vertically integrated provider, II-VI Optical Systems is uniquely positioned to meet the critical and complex design, engineering, and production requirements of customers in the defense, aerospace and commercial industries. Contact: Janice Roewer, Inside Sales Manager, janice.roewer@ii-vi.com

Infinite Optics Inc.

#841

SPIE Corporate Member

1712 Newport Cir Ste F, Santa Ana, CA, 92705-5118 (USA)

+1 714 557 2299; fax +1 714 557 2170

info@infiniteoptics.com; www.infiniteoptics.com

Featured Product: High Efficiency AR Coatings from .9-14nm on various Chalcogenide glass

Infinite Optics specializes in optical thin-film coatings ranging from 193nm's to 20 microns. We support astronomical, industrial, medical and military markets by fabricating and coating optics required for telescopes, lasers and optoelectronic devices. Our services include special applications, development, production runs and quality control. We are DDTC registered and ITAR compliant. Contact: Stan King, Sales Manager, stan@infiniteoptics.com; Geza Keller, Sales, geza@infiniteoptics.com

INO

#726

SPIE Corporate Member

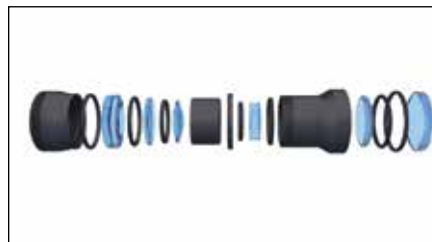
2740 Einstein St, Quebec, QC, G1P 4S4 Canada

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

info@ino.ca; www.ino.ca

Featured Product: INO's QuickCTR passive lens auto-centering offers fast and precise alignment. License available

INO provides innovation in the field of optics/photonics. The solutions provided to our customers are ranging from product development to industrialization and technology transfer/licensing. Specialties: passive lens auto-centering technology, optical and optomechanical design, MEMS foundry and packaging, THz, IR, multispectral and hyperspectral



imaging, fibers and fiber lasers, lidars, 3D sensors. Contact: Eric Pineau, Sales Director, eric.pineau@ino.ca

INO's QuickCTR passive lens auto-centering offers fast and precise alignment. License available.

Inrad Optics

#816

SPIE Corporate Member

181 Legrand Ave, Northvale, NJ, 07647-2498 (USA)

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

sales@inradoptics.com; www.inradoptics.com

Inrad Optics manufactures optical components and assemblies for applications from sensing to imaging. We grow non-linear crystals, scintillation crystals, and x-ray diffraction crystals. Products include toroids and bent crystal x-ray analyzers, fast neutron detectors, transmission window assemblies, Pockels cells, aspheric reflective mirrors, beamsplitters, lenses, and waveplates. Contact: Sales Team, sales@inradoptics.com

IOP Publishing Ltd.

#908

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

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

custserv@iop.org; www.ioppublishing.org

Featured Product: JPhys Photonics is a new open access journal highlighting the most significant optics research

IOP Publishing's portfolio includes journals, books, conference proceedings and science news resources. Our titles Journal of Optics, JPhys: Photonics, Laser Physics and Laser Physics Letters serve the whole of the optics community. Contact: Ben Sheard, Publisher, ben.sheard@ioppublishing.org

IRD Glass

#843

SPIE Corporate Member

810 E St Paul St, Litchfield, MN, 55355 (USA)
+1 320 693 7217; fax +1 320 693 7216
ird@irdglass.com; www.irdglass.com

Featured Product: Precision custom Fused Silica light pipes and homogenizers

IRD Glass-A first aid station for your frustrations for over 36 years! IRD does things with glass that no one else in the world does! IRD Glass provides a full spectrum of custom manufacturing capabilities: Sapphire windows, laser reflectors, HLDT mirrors, filters, precision tubes, cylinder & rod lenses, prisms, wedges, light pipes, assemblies, thin-film coatings and the metrology to measure & verify our processes. IRD will always be here when you need us most! Contact: Michelle deCastro, National Sales Manager, michelle.decastro@irdglass.com

Isuzu Glass, Inc.

#341

SPIE Corporate Member

23505 Crenshaw Blvd Ste 130, Torrance, CA, 90505-5225 (USA)
+1 310 517 1866; fax +1 310 517 1869
sales@isuzuglass.com; www.isuzuglass.com

Featured Product: Optical colored glass, produced by Isuzu's unique composition process, Glass molded lens

For around 110 years, Isuzu Glass has been developing original techniques and know-how and supplying a variety of optical lens to customers using unique manufacturing methods. Our mold division, melting division, polishing division, coating division and r&d division, all 5 division will make it possible to offer the largest line-up of functional glass products used in the wavelength range of invisible ultraviolet and far-infrared rays. Contact: Hiro Yokoi, President, sales@isuzuglass.com; Naoko Kaga, Advanced Engineer, nkaga@isuzuglass.com

J.A. Woollam

#722

SPIE Corporate Member

645 M St Ste 102, Lincoln, NE, 68508-2243 (USA)
+1 402 477 7501; fax +1 402 477 8214
sales@jawoollam.com; www.jawoollam.com

Featured Product: New Theta-SE for fast mapping of film properties. New iSE for real-time growth and etch rates

The J.A. Woollam Company offers a wide range of spectroscopic ellipsometers for non-destructive materials characterization, including thin film thickness (single and multilayer films), refractive index, optical constants n&k, alloy composition, in-situ growth/etch rates, and more. Woollam company offers ellipsometer instruments for research and manufacturing metrology. Woollam offers table-top, in-line, and in-situ models covering spectral ranges from the vacuum ultra-violet to far infrared. Contact: Ron Synowicki, Engineer, sales@jawoollam.com; Andrew Martin, Engineer, sales@jawoollam.com

James C. Wyant College of Optical Sciences

#626

SPIE Corporate Member

94 Meinel Bldg, 1630 E University Blvd, Tucson, AZ, 85721-0095 (USA)

+1 520 621 6997; fax +1 520 626 1480

info@optics.arizona.edu; www.optics.arizona.edu

Featured Product: Education & Research

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 Koshel, Associate Dean of Academics, rkoshel@optics.arizona.edu; Kaye Rowan, Development Director, rowan@optics.arizona.edu

Kaufman & Robinson, Inc.

#516

SPIE Corporate Member

1330 Blue Spruce Dr, Fort Collins, CO, 80524-2030 (USA)
+1 970 495 0187; fax +1 970 484 9350

krisales@ionsources.com; www.ionsources.com

Featured Product: We have a variety of sources for optics and photonics applications, including ion assist

Our products are vacuum-based process tools which interact with materials at the atomic level. Typical material processes include the precision deposition of thin films, remote plasma etching of patterned wafers, and nanometer-scale modification of surfaces. We are respected across the globe for innovative designs, product quality and technical expertise. Our products incorporate technical features such as gridded

or gridless sources, DC or RF discharges and automated power supply controllers. Contact: Chris Griffith, Director of Sales, griffith@ionsources.com; Carrie Stadtmueller, Marketing, stadtmueller@ionsources.com

We have a variety of sources for many optics and photonics applications, including ion-assist.



EXHIBITOR DIRECTORY

KOHZU Precision & LAB Motion Systems c/o Daniel F Crews, LLC #118

c/o Daniel F Crews, LLC, PO Box 2804, Evergreen, CO, 80437-2804 (USA)

+1 303 944 1082

dan@dfcrews.com; dfcrews.com

Featured Product: KOHZU offers multiple motorized 6-axis motion systems ideal for optical applications in ATMO and VAC

KOHZU Precision (est. 1945), manufactures reliable, high precision, production quality, linear stages (X & XY), rotary axes (R), vertical lift stages (zed axis, Z), Tip/Tilt stages for atmo or vac environments. Manual or motorized. KOHZU also manufactures 6-axis alignment stations, metrology & synchrotron equipment. Perfect for LABS, EDU and Industrial Equipment. DFCrews also represents LAB Motion Systems,



a manufacturer of precision and ultra-precision rotary air bearings and multi-axis system. Contact: Dan Crews, President, dan@dfcrews.com

Daniel F Crews, LLC is also Sales Rep for LAB Motion Systems! The markets' most precise rotaries!

Labsphere, Inc. #412

SPiE Corporate Member

PO Box 70, North Sutton, NH, 03260-0070 (USA)

+1 603 927 4266; fax +1 603 927 4694

labsphere@labsphere.com; www.labsphere.com

LaCroix Precision Optics #613

SPiE Corporate Member

PO Box 2556, Batesville, AR, 72503 (USA)

+1 870 698 1881; fax +1 870 698 1880

info@lacroixoptics.com; lacroixoptics.com

Featured Product: Short lead time precision aspheres

Since 1947, LaCroix Precision Optics has positioned itself as a premier domestic volume and prototype manufacturer of custom precision optics. Capabilities include spherical, aspherical, plano, and custom coated optics. At our facility in Batesville, Arkansas, we use both traditional methods and advanced CNC processing to achieve the highest level of precision and quality demanded by our customers. ISO 9001:2015, ITAR certified and compliant.

Lake Shore Cryotronics, Inc. #623

575 McCorkle Blvd, Westerville, OH, 43082-8699 (USA)

+1 614 891 2244; fax +1 614 818 1600

info@lakeshore.com; www.lakeshore.com

SPONSOR

Lambda Research Corp. #423

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

Featured Product: TracePro software for design of optics and illumination systems

Lambda Research Corporation sets itself apart as a cost-effective, single-source solution for optics and illumination design. Lambda sells TracePro® opto-mechanical software known for its ease of use, CAD interface and accuracy in illumination design, OSLO® optical design software renowned for its power and flexibility in lens design, and RayViz™, a ray-tracing add-in for SOLIDWORKS. Lambda also distributes the ScatterMaster ScatterScope4™ scatterometer. Contact: Kathy Johnson, Sales Manager, sales@lambdare.com

Laser Components USA, Inc. #425

SPiE Corporate Member

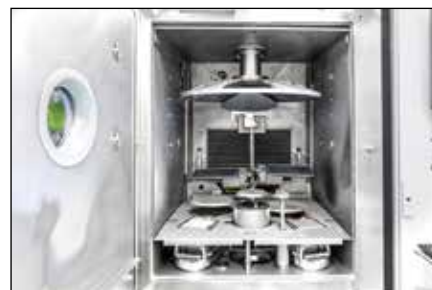
116 S River Rd Unit C, Bedford, NH, 03110-6734 (USA)

+1 603 821 7040; fax +1 603 821 7041

info@laser-components.com; www.laser-components.com

Featured Product: Standard or custom coated wafers up to 12" with AR coatings or mirrors

One of our strengths is the in-house production of coatings for laser optics. Our manufacturing capabilities include E-Beam coating, Ion-Assisted Deposition (IAD) coating and Ion Beam Sputtering (IBS) coating. We provide a number of standard coatings as well as coating solutions, designed specifically for your application requirement.



Contact: Matt Robinson, Sales Director, sales@laser-components.com; Huyen Vu, Sales Director, sales@laser-components.com

Standard or custom coated wafers up to 12" with AR coatings or mirrors.

Laser Focus World #721

SPiE Corporate Member

PennWell Technology Div, 61 Spit Brook Rd Ste 501, Nashua, NH, 03062 (USA)

+1 603 891 0123; fax +1 603 891 0574

info@laserfocus.com; www.laserfocusworld.com

Published since 1965, Laser Focus World - a monthly magazine for engineers, researchers, scientists, and technical professionals - provides comprehensive global coverage of optoelectronic technologies, applications, and markets. Nearly 80,000 qualified optoelectronics professionals from around the world currently subscribe. Contact: Jeff Nichols, National Sales Manager, jeffn@pennwell.com; Anne Marie St. John-Brooks, Regional Sales Manager, annemarie@pennwell.com

Laser Quantum Inc.

#429

SPIE Corporate Member

47673 Lakeview Blvd, Fremont, CA, 94538-6544 (USA)
+1 510 210 0157; fax +1 408 352 6192

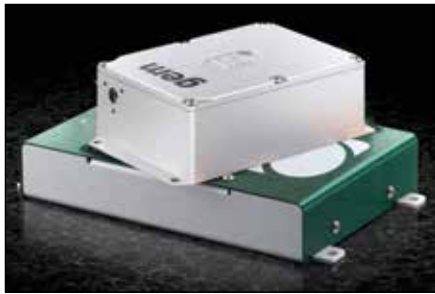
lqinc.admin@laserquantum.com; www.laserquantum.com

Featured Product: Gem 640nm DPSS laser at 50-500mW MTTF >400,000 hours Low noise & high stability for high throughput

Laser Quantum is a world-class manufacturer of revolutionary continuous wave and ultrafast laser sources. Our products lead the industry in their performance specifications, reliability, compactness and operational lifetimes. Our lasers are helping scientists to break new ground in applications ranging from attosecond physics to forensics and genomics. Laser Quantum is now part of Novanta, a trusted technology partner to OEMs in the medical and advanced industrial technology markets.

Contact: Ben Sedgley, Sales Engineer, ben.sedgley@laserquantum.com; Barney Mitchell, VP Sales and Marketing, barney.mitchell@laserquantum.com

Gem 640nm DPSS laser, 50-500mW MTTF >400,000 hours. Low noise & high stability for high throughput.



LightTrans International UG

#110

SPIE Corporate Member

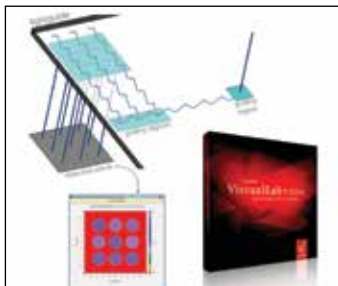
Kahlaische Str 4, Jena, 07745 Germany
+49 36 41 5312950; fax +49 36 41 5312901
info@lighttrans.com; www.lighttrans.com

Featured Product: VirtualLab Fusion – Fast Physical Optics modelling and design software

LightTrans group is based in Jena in the state of Thuringia, the historical and present center of optics in Germany. Our products and services shorten or even enable development cycles of optical components and systems. All our activities are based on the Fast Physical Optics

design software "VirtualLab Fusion", which provides ray tracing and physical optics field tracing methods. Our products include optical design software, optical engineering, training and consulting as well as prototyping.

"VirtualLab Fusion - enabling fast physical optics modeling and design for complex optical systems".



SPONSOR

Luminate

#716

SPIE Corporate Member

260 E Main St Ste 6000,
Rochester, NY, 14604 (USA)
+1 585 214 0589; fax +1 585 327 7931

info@nextcorps.org; www.luminate.org



Featured Product: Luminate Startup Accelerator Program

Luminate is the world's largest startup accelerator for Optics, Photonics, and Imaging enabled applications. The competitive program accepts 10 companies per year, and awards \$100,000 in funding to each, along with the chance to compete for up to \$2 million in follow-on funding. Mentoring, training, and connections to the global OPI ecosystem and investors is provided. Applications are accepted June 1 through September 30 at luminate.org/apply Contact: Sujatha Ramanujan, Managing Director, sujatha.ramanujan@nextcorps.org; Holly Barrett, Marketing Director, holly.barrett@nextcorps.org

Luxel Corp.

#834

SPIE Corporate Member

PO Box 1879, 60 Saltspring Dr, Friday Harbor, WA, 98250-9062 (USA)

+1 360 378 4137; fax +1 360 378 4266

luxel@luxel.com; www.luxel.com

Featured Product: Soft X-Ray Filters for Princeton Instruments' PI-MTE Camera

Luxel is the world's leading producer of ultra-thin freestanding filters for soft x-ray & EUV transmission. We offer more than 70 different materials, with thicknesses ranging from 8nm to 20µm, & custom 2D and 3D apertures. Luxel products, including spaceflight filters, pressure windows, & sensor protectors, are assembled in Class 5 cleanrooms. We offer extensive technical support with thin film modeling, characterization, & CAD capabilities. Lead times as short as 1 week. www.luxel.com Contact: Travis Ayers, President, Travis.Ayers@luxel.com; Ben Zeiger, Chief Scientist, Ben.Zeiger@luxel.com

Mad City Labs., Inc.

#534

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

Featured Product: The Mad360™ precision rotation stage. Bidirectional continuous motion: 1 mrad steps, 20 rotation/sec

Mad City Labs designs & manufactures a complete product line of high precision piezo nanopositioners, micropositioners, and microscopes suitable for inspection, metrology, microscopy, and astronomy applications. Our nanopositioners include PicoQ® sensors yielding picometer precision and low noise performance. Our micropositioners & microscope stages have excellent stability and control. Mad City Labs provides innovative solutions from the micro-to-pico scale with outstanding technical support. Contact:, Technical Sales, sales@madcitylabs.com,; European Sales, sales@madcitylabs.eu



The Mad360™ is a compact rotational stage with minimum steps of 1 milliradian and speeds up to 20Hz.

EXHIBITOR DIRECTORY

Masimo Semiconductor

#640

25 Sagamore Park Rd, Hudson, NH, 03051 (USA)
+1 603 595 8900; fax +1 603 595 0975
www.masimosemi.com

Meadowlark Optics, Inc.

#926

SPIE Corporate Member

5964 Iris Pkwy, Frederick, CO, 80504-6412 (USA)
+1 303 833 4333; fax +1 303 833 4335
sales@meadowlark.com; www.meadowlark.com

Featured Product: High Speed Liquid Crystal Variable Retarders and Spatial Light Modulators

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 shutters, rotators, waveplates/retarders, spatial light modulators, tunable optical filters, tri-color filters, polarizers, polarimeters and more. We also provide custom solutions and a complete line of fabrication services. Contact: Kelly Gregorak, kelly@meadowlark.com; Ron Stepanek, Sales, rstepanek@meadowlark.com

Micro Laser Systems, Inc.

#325

SPIE Corporate Member

12841 Western Ave Ste H, Garden Grove, CA, 92841-4025 (USA)
+1 714 898 6001; fax +1 714 897 0979
sales@microlaser.com; www.microlaser.com

Featured Product: FC3 & FC7 Fiber Collimators and Pigtailed Laser Modules

We are a manufacturer of diffraction limited fiber coupled laser systems, optical systems and fiber optic systems from 240nm to 6000nm. Unique products include various sizes of fiber collimators, splitters, combiners, fibers and receivers. They are used in quantum optics, scanning, lidar, free space comm, optical tweezers, metrology, etc. Our expertise in



combining lasers, optics and fiber optics ensures the systems work in your application. We design and build all products in California. Contact: Norma Adachi, Marketing Director, norma@microlaser.com

New FC3 and FC7 fiber collimators with 1mm and 3mm beams

SPONSOR

Millennium Optical System Co., Ltd.

#738

29 Dunbangi-gil, Beobwon-eup (332-8 Sambang-ri, Paju-si, Kyonggi, 10829 Korea, Republic of
+82 31 946 7041; fax +82 31 946 7043
sales@mosoptics.com; www.mosoptics.com

Featured Product: Optical lens, window, prism, filter, beamsplitter, mirror, Assemblies, IR, ITO, Coating

MOS is a professional manufacturer of optical components, producing prism, lens, filter and so on used in many industries such as electricity, telecommunication, electronics, optical research institutes, and making precision optical components related to major industries such as space equipment, core parts for defense, advanced medical equipment, laser equipment, core parts for precision instruments, semiconductor equipment, core parts, etc. Contact: Youngsu Kim, USA Branch manager, youngsu.kim@mosoptics.com; Amy Kang, Assistant manger, sales@mosoptics.com



Special prisms with the tightest angular and surface tolerances.

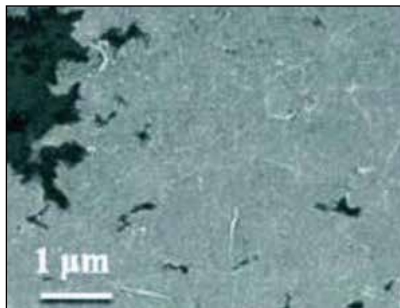
MilliporeSigma

#922

6000 N Teutonia Ave, Milwaukee, WI, 53209 (USA)
+1 800 558 9160; fax +1 800 962 9591
aldrich@sial.com; www.sigmaaldrich.com

Featured Product: Nanomaterials; Quantum Dots; Organic Electronic and Solar Cell Materials

Sigma-Aldrich Materials Science is a strategic technology initiative of MilliporeSigma, a business of Merck KGaA, Darmstadt, Germany. The leading provider of materials for use in energy, biomedical, and electronics research. Our inorganic and organic chemicals, polymers, nanomaterials, and materials for electronics and alternative energy are used worldwide. We support innovation through development and distribution of state-of-the-art materials, scientific collaboration and manufacturing. Contact:



Taryn Fuhrman-Hall, Product Marketing, taryn.fuhrman@milliporesigma.com; Richard Sullivan, Product Manager, richard.sullivan@milliporesigma.com

1 mg/mL (electrochem. exfoliated graphene) / 0.2 mg/mL (PEDOT:PSS) hybriide ink dispersion in DMF.

Mindrum Precision, Inc.

#313

SPIE Corporate Member

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

Custom machining and polishing of ultra-precision components and assemblies. Complex shaping ability with 5-axis CNC milling, CNC turning and CNC surface grinding. Plano, spherical and cylindrical polishing using spindle, continuous and double-sided equipment. We work with hard materials i.e. glass, quartz, sapphire and ceramics, etc. Also work with conventional materials i.e. aluminum, steel and titanium, etc. Other capabilities include glassblowing, acid etching, soldering, wire EDM and dicing. Contact: Linda Kondris, Technical Sales, linda@mindrum.com; Dave Hamilton, Vice President, dave@mindrum.com

SPONSOR

MKS Instruments, Inc.

#317

SPIE Corporate Member

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

Spectra-Physics, Ophir and Newport are brands within the MKS Instruments Light & Motion division. We provide a full range of solutions including lasers, beam measurement and profiling, motion control, vibration isolation systems, photonics instruments, opto-mechanical components and optical elements. Contact: Bill Casey, bill_casey@mksinst.com

Moulded Optics GmbH

#833

Steinstrasse 13-15, Schöffengrund, 35641 Germany
+49 6445 6000 0; fax +49 6445 6000 40
info@mouldedoptics.com; www.mouldedoptics.com

Featured Product: Molded glass and plastic optical components

Moulded Optics GmbH, an ISO 9001:2015 certified supplier, will be displaying many types of molded glass and plastic optical components including standard aspheric lenses from 4mm to 80mm diameter sizes, half-ball (Hemispheres) lenses in 3mm, 4mm, 5mm and 6mm diameter sizes, and custom molded glass and plastic optical components from approximately 2mm to 100mm sizes, including lenses, hybrid optics, micro Lens, arrays, mirrors, prisms and special shapes for illumination applications. Contact: Martin Pfeil, Managing Director, martin.pfeil@mouldedoptics.com; Astrid Lehr, Sales Manager, sales@mouldedoptics.com

MOXTEK Inc.

#439

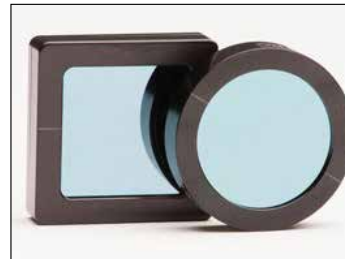
SPIE Corporate Member

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

Featured Product: Inorganic wire-grid polarizers & polarizing beam splitters

MOXTEK® manufactures high performance components for analytical x-ray instrumentation and optical systems. Our inorganic Nanowire® optical polarizers & polarizing beam splitters are ideal for applications that require broadband wavelengths, heat tolerance, and large angles of incidence. Our UV-VIS-IR polarizers are used for a variety of application including: 2D & 3D projection display, machine vision, HMD,

HUD, polarimetry, medical/dental imaging, interferometry, spectroscopy, and many others. Contact: Taylor Taniuchi, Sales Engineer, ttaniuchi@moxtek.com; Jenifer Powell, Key Account Specialist, jpowell@moxtek.com



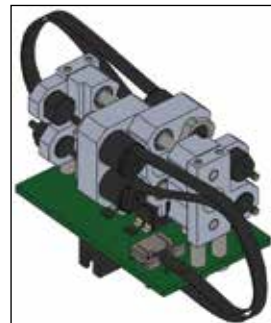
Moxtek's new double sided absorptive polarizers absorb s-polarized light from both directions.

MPS Micro Precision Systems AG #635

Chemin du Long-Champ 95, Biel/Bienne, 2504 Switzerland
+41 32 344 43 00; fax +41 32 344 43 01
info@mpsag.com; www.mpsmicrosystems.com

MPS develops and manufactures electro-mechanical microsystems used in different fields of applications such as Medical, Automation,

Optics, Aerospace and Science. MPS microsystems are characterized by their miniaturization, their very accurate and smooth movement (even over long distances), their extremely low friction and their extreme stiffness. More specifically MPS technology suits very well the requirements for high performance active optics. Contact: Grégoire Bagnoud, Director Business Development, gregoire.bagnoud@mpsag.com; Peter Brombach, Sales Manager, peter.brombach@mpsag.com



Zoom Mechanism.

neaspec GmbH

#840

Eglfingler Weg 2, Haar, Bavaria, 85540 Germany
+49 89 420 797 20-300; fax +49 89 420 797 20-399
sales@neaspec.com; www.neaspec.com

Featured Product: neaSNOM/nano-FTIR near-field optical microscope

See the nanoworld: neaspec GmbH is the world-leading manufacturer of ultra-stable & easy-to-use near-field and advanced optical imaging and spectroscopy tools that can be used for microscopy and spectroscopy at the 10-nanometer scale. The company was founded in 2007 by the pioneers of nanoscale infrared microscopy to revolutionize nanoscale analytics, with the ultimate goal to enable technological & scientific progress in every lab around the world. Contact: Tobias Gokus, Application Engineer, tobias.gokus@neaspec.com

EXHIBITOR DIRECTORY

Newport Corporation

#317

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

Newport is a brand within the MKS Instruments Light & Motion division. The Newport product portfolio consists of a full range of solutions including motion control, optical tables and vibration isolation systems, photonics instruments, optics and opto-mechanical components. For more information, visit www.newport.com. Contact: Roberto Iniguez, roberto.iniguez@newport.com

NKT Photonics Inc.

#532

SPIE Corporate Member

3514 N Vancouver Ave Ste 310, Portland, OR, 97227-2026 (USA)
+1 503 444 8404; fax +1 503 914 1664
sales-us@nktphotonics.com; www.nktphotonics.com

Featured Product: KOHERAS HARMONIK single-frequency ultra-narrow linewidth 780nm fiber laser <7W, robust & reliable

NKT Photonics is the leading supplier of high-performance fiber lasers, fiber optic sensing systems, and photonic crystal fibers. Our main markets are within imaging, sensing and material processing. Our products include ultrafast lasers, supercontinuum white light lasers, low noise fiber lasers, distributed temperature sensing systems and a wide range of specialty fibers. NKT Photonics has its headquarters in Denmark with sales and service worldwide. NKT Photonics is wholly owned by NKT A/S. Contact: Dave Stockwell, Sales Manager, Dave.Stockwell@nktphotonics.com; Min Chen, Senior Sales Manger, min.chen@nktphotonics.com

NM Laser Products, Inc.

#839

337 Piercy Rd, San Jose, CA, 95138-1403 (USA)
+1 408 227 8299; fax +1 408 227 8265
sales@nmlaser.com; www.nmlaser.com

Featured Product: Hi-LIDT, Next generation LASER SHUTTER Technology, w/patented broadband absorbing diamond Technology

Laser shutter development, manufacture and sales. OEM Specialist; 30 years + refining technical solutions for high irradiance lasers. Safety interlocks, processing shutters and pulse gating models. For average powers to hundreds of watts and fluence levels to 10 J/cm². Highly integrated and compact solutions achieving laser industry requirements such as damage threshold, thermal gradients/flow, particle generation, out-gassing, photo-chemical material changes, and fail-safe closure. Contact: David Woodruff, Sales Engr., sales@nmlaser.com; Nilam Patel, Sales Associate, nilam@nmlaser.com

Novus Light Technologies Today

#914

PO Box 272574, Ft. Collins, CO, 80527-2574 (USA)
+1 970 672 1109
info@novustoday.com; www.novuslight.com

Novus Light Technologies Today is an online publication that offers expert commentary, industry perspective and vital on-line discussions on a comprehensive list of photonics subjects: optics, automation, electronics, lasers, MEMs/Nanotech, LEDs, imaging and machine vision, photovoltaics, displays and cameras. Contact: Ron Sherwood, Senior Account Manager, ron.sherwood@novustoday.com

nPoint, Inc.

#620

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: RXY20-476 tip/tilt stage provides 20mrad of fast, precise, and frictionless motion

nPoint, Inc. designs and manufactures nano-positioning tools for OEM applications. Products include piezo-actuated flexure stages and digital control electronics. Nano-positioning 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 Product Development, katerina.moloni@npoint.com

NTFL

#422

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 Custom Coatings - Plasma Enhanced Magnetron Sputtering & Ion Assisted E-Beam

Newport Thin Film Laboratory, Inc. (NTFL) is a leading manufacturer of superior optical thin film coatings. For more than four decades, custom thin film coatings produced by NTFL have contributed to engineering progress worldwide. NTFL is a fully equipped cleanroom coating facility specializing in the design and manufacture of vacuum deposited optical thin films used in the ultraviolet, visible and infrared spectrum. We can accommodate optics up to 1370mm Dia. ISO 9001:2015 & ITAR Registered. Contact: Ever Mata, Director of Sales & Marketing, emata@newportlab.com; P.Scott Powers, Director of Engineering, pspowers@newportlab.com

Ohara Corp.

#521

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: strip/slab, cut/molded blanks, high homogeneity blanks, fine gobs, polished ball lenses, near uv transmitting i-Line glass, glass ceramic substrates, CaF₂, UV & IR materials, quartz, fused silica (standard and excimer grade). Ohara ClearCeram-Z ultralow expansion glass (excellent CTE uniformity; large sizes). Nanoceram. 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

Ophir

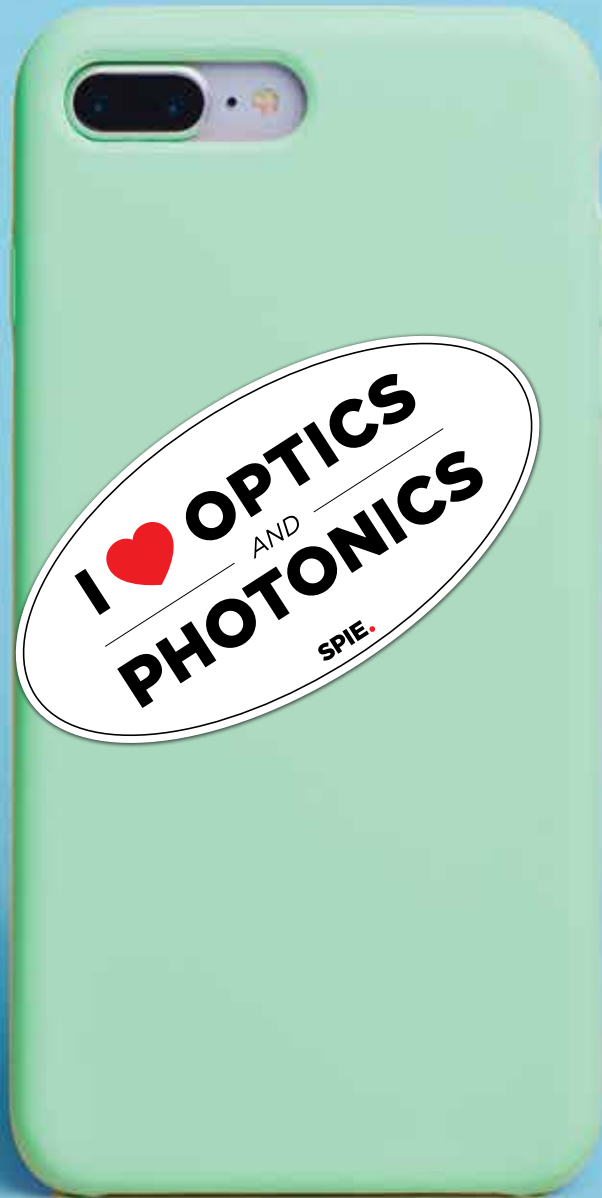
#317

3050 N 300 W, North Logan, UT, 84341 (USA)
+1 949 863 3144
sales@us.ophir-opt.com; www.ophiropt.com/laser-measurement

Ophir is a brand within the MKS Instruments Light & Motion division. The Ophir product portfolio consists of laser and LED measurement products including laser power and energy meters, beam profilers, high-performance IR thermal imaging lenses and optics for CO₂ and high-power fiber laser applications. For more information, visit www.ophiropt.com. Contact: Derrick Peterman, Derrick.Peterman@us.ophiropt.com

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PHOTONICS

EXHIBITOR DIRECTORY

Optical Perspectives Group, LLC #124

7011 E Calle Tolosa, Tucson, AZ, 85750-2532 (USA)
+1 520 529 2950
reparks@optiper.com; www.optiper.com

Featured Product: Center precision optics without a rotary table using the Axicon Centering Station

Optical Perspectives Group is an opto-mechanical engineering consulting company with expertise in the practical, hardware side of optics. OPG can help with issues such as test and inspection of components as well as alignment and assembly of optical systems. In addition, OPG sells the Point Source Microscope (PSM), an autostigmatic microscope that aids in optical system alignment and the Axicon Centering Station for centering precision optics without the need of a precision rotary table. Contact: Robert Parks, President, reparks@optiper.com

Optical Systems Design, LLC #122

8987 E Tanque Verde Rd Ste 309-1014, Tucson, AZ, 85749-9399 (USA)
+1 520 288 8816
info@osdoptics.com; www.osdoptics.com



SYNOPSIS™, versatile and fast.
Searches design space and reaches optimized systems in a breeze.

optics.org

#625

Ffordd Pengam, 2 Alexandra Gate,
Cardiff, CF24 2SA United Kingdom
+44 29 2089 4747; fax +44 29 2089 4750
sales@optics.org; www.optics.org



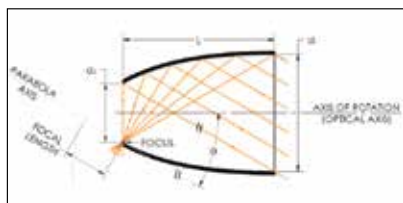
optics.org is the leading online resource for professionals working and using photonics based technologies. Targeted towards OEM markets optics.org delivers the latest photonics business news, market trends and product applications. You can also find the latest photonics jobs, events and a comprehensive buyers guide. With thousands of users visiting the site every month it is an effective place to find news and get your products to market. Contact: Robert Fisher, Head of Sales & Marketing, optics.org, rob.fisher@optics.org

Optiforms, Inc.

#633

SPIE Corporate Member

42310 Winchester Rd, Temecula, CA, 92590-4810 (USA)
+1 951 296 1300; fax +1 951 296 1178



marketing@optiforms.com; www.optiforms.com

Compound Parabolic Concentrators efficiently collect and concentrate light from a distant source.

Optik +

#610

Leiferder Weg 44a, Braunschweig Niedersachsen, 38122 Germany
+49 531 2379497; fax +49 531 2379601
info@optik-plus.de; www.optik-plus.de

Featured Product: Spherical lenses, aspherical lenses and cylindrical lenses, optical prisms, windows, mirrors

OPTIK + is a family-owned company based in Braunschweig/Germany, which specializes in manufacturing in a wide range of high-precision optical components as well as spherical, aspherical and cylindrical lenses from 5-120mm diameter. Also we manufacture laser optics, optical prisms, windows and mirrors. Nearly all glass types of the companies SCHOTT, OHARA and CDGM as well as quartz glass, CaF2 and germanium are processed. All optical components can be coated according to customer requirements. Contact: Michael Sandelmann, Owner, info@optik-plus.de; Yannik Sandelmann, y.sandelmann@optik-plus.de

Optikos Corp.

#528

SPIE Corporate Member

Bldg 3, 107 Audubon Rd, Wakefield, MA, 01880-1245 (USA)
+1 617 354 7557; fax +1 617 354 5946
sales@optikos.com; www.optikos.com

Featured Product: LensCheck™ System

The Optical Engineering Experts®--Optikos develops and manufactures standard and custom metrology products for measuring lenses, camera systems and ophthalmic components; and offers in-house IQ Lab™ testing and qualification services. Our engineering teams provide expert design and manufacturing for optically-based product development in any industry or application, including medical devices and diagnostics, aerospace and defense, automotive and consumer electronics. Contact: George Meyer, Key Account Manager, gmeyer@optikos.com; Byron Seabolt, Key Account Manager, bseabolt@optikos.com

SPONSOR

Optimax Systems, Inc.

#638

SPIE Corporate Member

6367 Dean Pkwy,
Ontario, NY, 14519-8939 (USA)
+1 585 265 1020; fax +1 585 265 1033
sales@optimaxsi.com; www.optimaxsi.com



Featured Product: Optics for High Power: precision optics for Directed Energy, DUV systems and HEL

Optimax is America's largest optics manufacturer. On the cutting edge of future applications, Optimax implements an engineered solutions approach to help our customers achieve breakthroughs in the aerospace, defense, semiconductor, research, and medical industries. Optimax has a wide range of capabilities to support your programs, including aspheres, cylinders, freeforms, prisms, spheres, and advanced e-beam, APS, IAD, and IBS coatings. Contact: Joe Spilman, Director of Sales & Marketing, sales@optimaxsi.com

OptiPro Systems

#829

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 over 35 years of experience designing and manufacturing precision optical fabrication machines and metrology systems. OptiPro develops cutting edge machines for a variety of precision optics, including spheres, aspheres, freeforms, aspheric cylinders, torics, and more. These solutions are designed to yield prototype to high volume production of parts manufactured from a range of materials including optical glasses, ceramics, crystals, and alloys. Contact: Ron Colavecchia, Director of Optics Technology, rcolavecchia@optipro.com; Mike Bechtold, President, mike@optipro.com

Opto-Alignment Technology, Inc. #612

SPIE Corporate Member

1034-A Van Buren Ave, Indian Trail, NC, 28079-5541 (USA)
+1 704 893 0339; fax +1 704 893 0403
sales@optoalignment.com; www.optoalignment.com

Featured Product: Lens Alignment System (LAS) demo with DMI for valued in-process metrology and post-assembly QA tool

Opto Alignment is a leading manufacturer of ultra-precision alignment, assembly and inspection optical systems. Our flagship product, the Laser Alignment & Assembly Station (LAS), employs latest generation illumination and vision technologies, along with computer automation, to achieve sub-micron centering precision. 2019 brings the introduction of our most advanced product offering, 3D Profiling tools developed with a high performance-to-price ratio for a wide range of applications. Contact: Ron Garden, Chief Technology Officer, ron.garden@optoalignment.com; Mark Green, Optical Engineer, mark.green@optoalignment.com



Bench Top LAS with non-contact option to measure tilt of aspheric lenses for precision alignment.

OptoSigma Corp.

#433

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, opto-mechanics, laser safety, fiber optics, vibration isolation

OptoSigma has been a leader in thin film coatings, opto-mechanics, manual and motorized positioning components and optical components for more than 20 years. We're committed to providing unrivaled service and engineering insight for our customers on every product we offer. Our global manufacturing prowess enables us to offer the best selection from stock while handling custom orders of all types and quantities.

Discover why thousands of customers worldwide rely on OptoSigma. Contact: Dan Denison, Sales Manager, sales@optosigma.com

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OptoTech Optical Machinery Inc. #112

PO Box 7, Palm, PA, 18070 (USA)
+1 215 679 2091; fax +1 215 679 2013
info@optotech.us; www.optotech.us

OptoTech is a German based company of the Schunk Group, offering the most comprehensive product range in the field of optics manufacturing equipment. We supply optics processing centers for grinding, polishing and centering/edging, correction polishing machines, measuring technology, as well as alignment and joining technologies. Whether round optics, plano optics, aspherics, cylinders or freeform surfaces from Ø 1 mm to 2000mm. OptoTech offers cutting edge technology, tooling and service. Contact: John Meyer, Sales Manager Precision Optics North America, j.meyer@optotech.us; Matthias Pfaff, Division Manager Precision Optics, m.pfaff@optotech.de

OSELA Inc.

#628

SPIE Corporate Member

1869 32nd Ave, Lachine, QC, H8T 3J1 Canada
+1 514 631 2227; fax +1 514 631 2462
info@osela.com; www.osela.com

Oselo is a specialized manufacturer of laser illumination systems and structured lighting for industrial applications in machine vision, life sciences and research. With an experienced and skilled staff knowledgeable in the area of beam shaping optics and lasers allows us to continually innovate our product portfolio offering to our customers. Based on our standard platform and our expertise, we offer very competitive customized solution specific to the needs of our customers.



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PerkinElmer, Inc.

#812

940 Winter St, Waltham, MA, 02451 (USA)

+1 203 925 4602; fax +1 203 944 4904

info@perkinelmer.com; www.perkinelmer.com

PerkinElmer, Inc. is a global leader focused on improving the health and safety of people and their environment. With our analytical instrumentation, and leading laboratory services, we focus on improving the integrity and safety of the world we live in.

PHASICS Corp.

#912

SPIE Corporate Member

11th Fl, 600 California St, San Francisco, CA, 94108 (USA)

+1 415 610 9741

contact@phasics.com; www.phasicscorp.com

Featured Product: Kaleo MultiWave - TWE and RWE of coated optics at their design wavelength

Phasics offers high resolution wavefront sensors (up to 120 000 phase pixels) from deep UV to far-IR. Its patented technology ensures both accurate measurements and ease of use. In laser facilities, a single instrument covers beam test, adaptive optics with any deformable mirror and plasma diagnosis. For lens metrology, it provides on- and off-axis MTF and aberrations at several wavelengths on a same easy-

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Kaleo MultiWave: TWE and RWE of coated optics at their design wavelength over large diameters.

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Photon Engineering LLC

#417

SPIE Corporate Member

310 S Williams Blvd No 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 manager, donatap@photonengr.com; Patrick McNenny, VP of Engineering Services, patrickm@photonengr.com

Photonic Cleaning Technologies

#832

SPIE Corporate Member

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

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

sales@photoniccleaning.com; www.photoniccleaning.com

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#823

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Photonics Online

#611

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Physics Today

#442

One Physics Ellipse, College Park, MD, 20740-3843 (USA)
+1 301 209 3000
physicstoday.org

Featured Product: Physics Today Magazine

Physics Today is the most influential and closely followed physics magazine in the world. Join the community of more than 115,000 scientists and engineers engaging with the content every month. A subscription is just \$25/year at www.physicstoday.org/subscribe. Contact: Christina Unger Ramos, Marketing & Sales Manager, cunger@aip.org

PI (Physik Instrumente) L.P.

#421

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

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Motors, Piezo Drivers & Digital Motion Controllers; Voice Coil Actuators, MicroMot Contact: Sales Dept, info@pi-usa.us

Mini L-505 stage + P-616 XYZ piezo scanner for photonics alignment with 1" travel, sub-nm resolution.

piezosystem jena, Inc.

#430

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Precision Glass & Optics

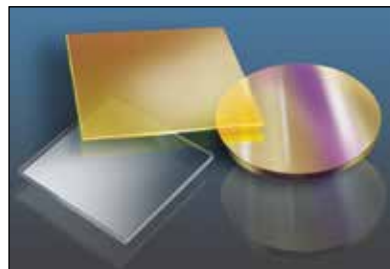
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info@pgo.com; www.pgo.com

Featured Product: NEW! PG&O fabricates finished optics out of infrared (IR) materials that operate from 0.75µm - 1µm

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& silicon. The IR materials available operate from 0.75µm to 15µm. Contact: Dan Bukaty, Jr., President, danjr@pgo.com

NEW! PG&O fabricates finished optics out of infrared (IR) materials that operate from 0.75µm - 15µm.

EXHIBITOR DIRECTORY

Precision Optical

#720

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: Custom Prisms, Large Optical Window/Mirrors, Corner Cube Retroreflector, Porro Prism, Alignment Cube

Precision Optical offers a diverse portfolio of capabilities for production of precision optical components. With reliable, efficient strategies for manufacturing many different prism shapes, sizes, materials, thin film coatings and assemblies, prototype to production. The company's success has been our commitment to expanding capabilities in all areas of optical component fabrication, giving Precision Optical unsurpassed process control and flexibility in responding to our customer requirements.

Contact: Jeremy Gordon, Vice President of Sales & Marketing, jgordon@precisionoptical.com; James McClure, Sales Manager, jmclure@precisionoptical.com

Qual Diamond Hi-Tech

#441

SPIE Corporate Member

1 2707 High Bluff Dr Ste 200, San Diego, CA, 92130-2037 (USA)
+1 858 350 4253

info@qualdiamond.com; www.qualdiamond.com

Quantum Design

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sales@quartus.com; www.quartus.com

Quartus Engineering is a solutions provider with competencies in finite element analysis, opto-mechanical design, system development, and prototype/low quantity builds, with experience with laser communication, LIDAR, camera calibration, factory automation and beyond. Quartus provides complete systems, component design/analysis, or integrate with an existing team to supplement expertise. Quartus has capabilities in STOP analysis and simulation-driven design of complex optical systems. Contact: Alex Halterman, Engineering Manager, alex.halterman@quartus.com

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lyoung@rsfibers.com; www.rsfibers.com

Rainbow Research Optics, Inc. #538

SPIE Corporate Member

6830 S Dawson Cir, Centennial, CO, 80112-4208 (USA)
+1 303 371 3000; fax +1 303 371 1333
sales@rr-optics.com; www.rr-optics.com

Featured Product: Custom Optics and Coatings

Rainbow Research Optics is a custom optics manufacturer in Denver, Colorado. We manufacture optics and coating from customer supplied designs and drawings. Please contact us for a quote on your desired optics. We are ITAR registered and ISO 9001:2015 Certified. We will quote quantities from 1 through 20,000. Our 30,000 sq. ft. facility and 65 employees are standing by to assist you with every aspect of your optical component and assembly needs. Contact: Eli Bruner, Director of Sales and Marketing, e.bruner@rr-optics.com; Mark Chan, Senior Sales Engineer, m.chan@rr-optics.com

Rigaku Innovative Technologies, Inc. #827

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1900 Taylor Rd, Auburn Hills, MI, 48326-1740 (USA)
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Riverhawk Co. #634

215 Clinton Rd, New Hartford, NY, 13413 (USA)
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info@riverhawk.com; www.riverhawk.com

Rochester Precision Optics, LLC #416

SPIE Corporate Member

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

Featured Product: Design & engineering, high volume manufacturing, precision molding, glass & plastic, visible & IR

Rochester Precision Optics (RPO) specializes in high volume production of precision glass molded lenses & aspheres, advanced polymer lens molding, IR optics and the design & engineering of precision optical, optomechanical and electro-optical assemblies and sub-systems. Formerly known as Kodak Optical Imaging Systems, Rochester Precision Optics serves defense, consumer electronics, industrial, medical & life sciences markets with complete optical design and manufacturing services. Contact: Joseph D'Ambrosia, Senior Director, Business

Development & Marketing, jdambrosia@rpoptics.com; Elizabeth Bubacz, Marketing Coordinator, ebubacz@rpoptics.com



RPO designs & manufactures high-performance SWIR, MWIR and LWIR infrared chalcogenide glass lenses.

Ruda Cardinal, Inc. #513

SPIE Corporate Member

3280 E Hemisphere Loop Ste 180, Tucson, AZ, 85706 (USA)
+1 520 546 1495; fax +1 520 546 1481
info@ruda.com; www.ruda.com

Featured Product: Optical System: Vis, Vis-NIR, SWIR, Reflective, Catadioptrics, Aspherics

Ruda-Cardinal, Inc. is a leader in the field of Optical Engineering. Specializing in rapid prototyping and creative solutions to unique and complicated optical challenges. From conceptualization to production, RCI offers innovative solutions to any optical design or manufacturing challenge. Using state-of-the-art opto-mechanical design software and testing equipment, RCI ensures the highest degree of quality through all stages of development. Contact: Stuart Singer, Senior Technical Director, ssinger@ruda.com; Kate Medicus, Ph.D., Exe. Vice President, kmedicus@ruda.com

Santec USA Corp. #930

SPIE Corporate Member

433 Hackensack Ave, Hackensack, NJ, 07601 (USA)
+1 201 488 5505; fax +1 201 488 7702
info@santec.com; www.santec.com

Featured Product: Tunable Lasers & Spatial Light Modulators

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EXHIBITOR DIRECTORY

Schrödinger, LLC

#525

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+1 212 295 5800; fax +1 212 295 5801
info@schrodinger.com

Schrödinger is a leading provider of advanced molecular simulations and enterprise software solutions and services for its clients, which include all major pharmaceutical and biotechnology companies worldwide, as well as leading materials science researchers. Founded in 1990, Schrödinger has nearly 300 employees and operations in the United States, Europe, Japan, and India, as well as business partners in China and Korea.

SCI Engineered Materials

#524

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+1 614 486 0261; fax +1 614 486 0912
sales@targetmaterials.com; www.sci-engineered-materials.com

Featured Product: We will displaying some of our materials including MgF2, ZnS, as well as other ceramics and metals

SCI Engineered Materials is a global supplier and manufacturer of advanced materials for PVD thin film applications. Through partnerships with end users and OEM's, SCI develops innovative and customized solutions enabling commercial success. We serve the optic, photonic, solar, media storage, photovoltaic, display application, and semiconductor industries. Contact: Eric Massey, Sales Rep., emassej@sciengineeredmaterials.com



Magnesium Fluoride (MgF2) forms:-sputtering targets- evaporation pieces.

scia Systems GmbH

#641

SPIE Corporate Member

Annaberger Str 240, Chemnitz, Saxony, 09125 Germany
+49 371 5347 780; fax +49 371 5347 781
info@scia-systems.com; www.scia-systems.com

Featured Product: scia Finish 1500 - Final surface form error correction on large area optics with Angstrom precision

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Sia Armadillo

#424

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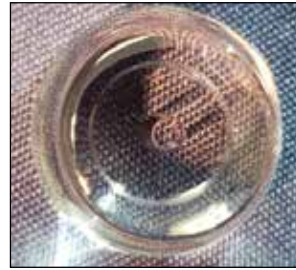
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+1 408 834 7410

info@armadillosia.com; www.armadillosia.com

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Sierra Precision Optics

#810

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Flatwork-Plano Optics (Filters, Panels, Windows, Mirrors, Beam Splitters, Wedges and Prisms) Spherical Lens and Cylindrical Lens. Our specialties include Cylindrical Optics UV, VIS, IR. IR Laser Components, Laser Flow Tubes and Custom Shaped Optics. Contact: Russ Lowe, Sales & Marketing Manager, rlowe@sierraoptics.com

Siskiyou Corporation

#730

SPIE Corporate Member

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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: Theeya Howell, Tradeshow Event Coordinator, reception@siskiyou.com

SmarAct Inc.

#617

2140 Shattuck Ave Ste 1103, Berkeley, CA, 94704 (USA)
+1 415 766 9006
info-us@smaract.com; www.smaract.com

Featured Product: SmarPod: a compact and high-precision 6DoF platform with parallel kinematics for optical alignment

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SmarPod, a compact 6DoF parallel-kinematic system for manipulating objects with nanometer resolution.

Spectral Instruments. Inc.

#815

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

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Spectrogon US, Inc.

#916

SPIE Corporate Member

115 Route 46 W Ste A2, Mountain Lakes, NJ, 07046 (USA)
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sales.us@spectrogon.com; www.spectrogon.com

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Spectroscopy

#104

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spectroscopyedit@ubm.com; www.spectroscopyonline.com

Featured Product: Spectroscopy

Spectroscopy's mission is to enhance productivity, efficiency, and the overall value of spectroscopic instruments and methods as a practical analytical technology across a variety of fields. Scientists, technicians, and laboratory managers gain proficiency and competitive advantage for the real-world issues they face through unbiased, peer-reviewed technical articles, trusted troubleshooting advice, and best-practice application solutions. Contact: Melissa Devlin, Marketing Manager, melissa.devlin@ubm.com; Stephanie Shaffer, Publisher, stephanie.shaffer@ubm.com

StellarNet, Inc.

#732

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: SMART-Control device offers an integrated CPU and options for different communication protocols

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SPIE Career Center

#625

1000 20th St, Bellingham, WA, 98225-6705 (USA)

+1 360 685 5551; fax +1 360 647 1445

sales@spiecareercenter.org; www.

spiecareercenter.org

SPIE CAREER CENTER

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 Manager, lacey.barnett@spie.org; Robert Dentel, Sales, robertd@spie.org

Synopsys, Inc.

#329

SPIE Corporate Member

690 E Middlefield Rd, Mountain View, CA, 94043-4010 (USA)

+1 650 584 5000; fax +1 650 584 4102

info@synopsys.com; www.synopsys.com

Featured Product: CODE V®, LightTools®, LucidShape®, RSoft™, PIC Design Suite

Synopsys' Optical Solutions Group provides optical design tools that help you produce superior designs and attain cost-to-manufacture savings. Our tools include CODE V® imaging design software, LightTools® illumination design software, LucidShape® products for automotive lighting, the RSoft™ products for photonic device and optical communications design, and the PIC Design Suite for photonic integrated circuit design. Learn more at <https://www.synopsys.com/optical-solutions.html>.

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Syntec Optics

#540

SPIE Corporate Member

515 Lee Rd, Rochester, NY, 14606-4236 (USA)

+1 585 768 2513; fax +1 585 768 0699

sales@syntecoptics.com; www.syntecoptics.com

Featured Product: Electro-optical, opto-mechanical & photonic assembly

Syntec Optics is North America's largest private manufacturer of custom plastic optics serving the medical, defense and biometric industries by producing "precision plastic optics for tomorrow's technologies" from our location in Rochester, NY. We specialize in design for manufacturability, precision plastic optics, diamond turning, coating, electro-optical assembly, opto-mechanical assembly, photonic assembly and metrology. Contact: Sara Burke, Sales Manager, sburke@syntecoptics.com; Robert Parada, President & GM, rparada@syntecoptics.com

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FIBER OPTICS AND ACCESSORIES

Accumold
ALIO Industries Corp.
Applied Surface Technologies
Energetiq Technology, Inc.
GPD Optoelectronics Corp.
Himax IGI Precision
Isuzu Glass, Inc.
Micro Laser Systems, Inc.
Navitar Inc.
OZ Optics Ltd.
piezosystem jena, Inc.
Sia Armadillo
SmarAct Inc.
StellarNet, Inc.

INDUSTRIAL SENSING AND MEASUREMENT

All Flex Flexible Circuits and Heaters
Åpre Instruments, Inc.
attocube systems Inc.
Chroma Technology Corp.
Hamamatsu Corp.
HEIDENHAIN Corp.
J.A. Woollam
Laser Components USA, Inc.
Micro Laser Systems, Inc.
NM Laser Products, Inc.
Optical Perspectives Group, LLC
Opto-Alignment Technology, Inc.
PHASICS Corp.
piezosystem jena, Inc.
Sia Armadillo
SmarAct Inc.
StellarNet, Inc.
Syntec Optics
VIAVI Solutions Inc.
Vision Engineering Inc. (incl. Vision Optics division)
Wordingham Technologies
Zygo Corporation

LASER COMPONENTS AND ACCESSORIES

Arete Associates
Chroma Technology Corp.
Infinite Optics Inc.
Inrad Optics
IRD Glass
Isuzu Glass, Inc.
LaCroix Precision Optics
Laser Quantum Inc.
Luxel Corp.
Meadowlark Optics, Inc.
Millennium Optical System Co., Ltd.
MPS Micro Precision Systems AG
NM Laser Products, Inc.
OZ Optics Ltd.
PHASICS Corp.
Photonic Cleaning Technologies
piezosystem jena, Inc.
Riverhawk Co.
Sia Armadillo
Vincent Associates

LASER INDUSTRY

ALIO Industries Corp.
Arete Associates
Diverse Optics Inc.
Inrad Optics
Laser Quantum Inc.
LightTrans International UG
Millennium Optical System Co., Ltd.
MPS Micro Precision Systems AG
NM Laser Products, Inc.
OptoSigma Corp.
Photonic Cleaning Technologies
Photonics Media
Rainbow Research Optics, Inc.
SmarAct Inc.
Zaber Technologies Inc.

LASERS AND SYSTEMS

ALIO Industries Corp.
Arete Associates
Hamamatsu Corp.
INO
Laser Components USA, Inc.
Laser Quantum Inc.
Micro Laser Systems, Inc.
OZ Optics Ltd.
YSL Photonics

LED, OLED, NON-LASER LIGHT SOURCES

Chroma Technology Corp.
Energetiq Technology, Inc.
GS Plastic Optics
Hamamatsu Corp.
Laser Quantum Inc.
OZ Optics Ltd.

LIGHTING AND ILLUMINATION

Energetiq Technology, Inc.
Enli Technology Co., Ltd.
Himax IGI Precision
Infinite Optics Inc.
Isuzu Glass, Inc.
Lambda Research Corp.
LightTrans International UG
Moulded Optics GmbH
Sia Armadillo
StellarNet, Inc.
Synopsys, Inc.

LITHOGRAPHIC EQUIPMENT

Heidelberg Instruments Inc.
Laser Quantum Inc.
Mad City Labs., Inc.
NM Laser Products, Inc.
Ruda Cardinal, Inc.

MACHINE VISION, FACTORY AUTOMATION

4D Technology Corp.
ADIT Electron Tubes
ALIO Industries Corp.
Åpre Instruments, Inc.
Chroma Technology Corp.
DCM Tech, Corp.
Diverse Optics Inc.
HEIDENHAIN Corp.
KOHZU Precision & LAB Motion Systems c/o Daniel F Crews, LLC
Mad City Labs., Inc.
Meadowlark Optics, Inc.
Navitar Inc.
Opto-Alignment Technology, Inc.
Ruda Cardinal, Inc.
Vincent Associates
Vision Engineering Inc. (incl. Vision Optics division)
Wordingham Technologies
Zaber Technologies Inc.

MATERIALS PROCESSING, LASERS IN MANUFACTURING

attocube systems Inc.
Inrad Optics
IRD Glass
Laser Components USA, Inc.
OZ Optics Ltd.
Photonic Cleaning Technologies
Riverhawk Co.
Sia Armadillo
YSL Photonics

MATERIALS, ABRASIVES, CHEMICALS

DCM Tech, Corp.
Infinite Optics Inc.
Inrad Optics
MilliporeSigma
OptoTech Optical Machinery Inc.
Photonic Cleaning Technologies
Universal Photonics Inc.

MICROSCOPES

ALPAO S.A.S.
Andor Technology Ltd.
attocube systems Inc.
Bruker Nano, Inc.
Mad City Labs., Inc.
Millennium Optical System Co., Ltd.
Navitar Inc.
neaspec GmbH
Optical Perspectives Group, LLC
piezosystem jena, Inc.
Riverhawk Co.
Ruda Cardinal, Inc.
Sia Armadillo
Vincent Associates
Vision Engineering Inc. (incl. Vision Optics division)
Zygo Corporation

MICROTECHNOLOGY

3D AG
Accumold
Heidelberg Instruments Inc.
INO
Meadowlark Optics, Inc.
MPS Micro Precision Systems AG
SmarAct Inc.

MISC CONSUMABLES AND EQUIPMENT

Applied Surface Technologies
Photonic Cleaning Technologies
SPIE Career Center

MOUNTS, TABLES, VIBRATION ISOLATION

Navitar Inc.
OptoSigma Corp.
Zaber Technologies Inc.

NANOTECHNOLOGY PRODUCTS

3D AG
Himax IGI Precision
Luxel Corp.
MilliporeSigma
neaspec GmbH

PRODUCT CATEGORIES

OPTICAL COATINGS, THIN FILMS

AccuCoat Inc.
Andover Corporation
Chroma Technology Corp.
Coursen Coating Labs, Inc.
GS Plastic Optics
Hardin Optical Co.
Infinite Optics Inc.
Inrad Optics
IRD Glass
Isuzu Glass, Inc.
J.A. Woollam
LaCroix Precision Optics
Laser Components USA, Inc.
Luxel Corp.
Millennium Optical System Co., Ltd.
MilliporeSigma
Moulded Optics GmbH
NTFL
Optimax Systems, Inc.
OptoTech Optical Machinery Inc.
Precision Glass & Optics
Rainbow Research Optics, Inc.
scia Systems GmbH
VIAVI Solutions Inc.
Vision Engineering Inc. (incl. Vision Optics division)

OPTICAL COMMUNICATION, NETWORKING DEVICES

ADIT Electron Tubes
Siskiyou Corporation

OPTICAL COMPONENTS - FILTERS, MIRRORS, OTHER

AccuCoat Inc.
Andover Corporation
Chroma Technology Corp.
CMM Optic
Coursen Coating Labs, Inc.
Diverse Optics Inc.
GS Plastic Optics
Hardin Optical Co.
Himax IGI Precision
Infinite Optics Inc.
Inrad Optics
IRD Glass
LaCroix Precision Optics
Laser Components USA, Inc.
LightTrans International UG
Luxel Corp.
Meadowlark Optics, Inc.
Millennium Optical System Co., Ltd.
Mindrum Precision, Inc.
Moulded Optics GmbH
Optik +
Optimax Systems, Inc.
OptoSigma Corp.
Precision Glass & Optics
Rainbow Research Optics, Inc.
Riverhawk Co.
Ruda Cardinal, Inc.
Syntec Optics
Taiyo Optics (Dong Guan) Corp.
Vision Engineering Inc. (incl. Vision Optics division)
Zygo Corporation

OPTICAL COMPONENTS - LENSES

3D AG
Accumold
Coursen Coating Labs, Inc.
Diverse Optics Inc.
GS Plastic Optics
Hardin Optical Co.
Himax IGI Precision
Infinite Optics Inc.
IRD Glass
LaCroix Precision Optics
LightTrans International UG
Micro Laser Systems, Inc.
Millennium Optical System Co., Ltd.
Moulded Optics GmbH
Navitar Inc.
Optik +
Optimax Systems, Inc.
OptoSigma Corp.
Precision Glass & Optics
Rainbow Research Optics, Inc.
Ruda Cardinal, Inc.
Syntec Optics
Taiyo Optics (Dong Guan) Corp.
Vision Engineering Inc. (incl. Vision Optics division)
Zygo Corporation

OPTICAL DESIGN AND ENGINEERING

Andover Corporation
Areté Associates
Chroma Technology Corp.
Coursen Coating Labs, Inc.
Diverse Optics Inc.
Enli Technology Co., Ltd.
GS Plastic Optics
Himax IGI Precision
INO
Lambda Research Corp.
LightTrans International UG
MPS Micro Precision Systems AG
Navitar Inc.
Optical Perspectives Group, LLC
Optikos Corp.
Opto-Alignment Technology, Inc.
Photon Engineering LLC
Photonics Media
Precision Glass & Optics
Ruda Cardinal, Inc.
SmarAct Inc.
Synopsis, Inc.
Syntec Optics
Vincent Associates
Zygo Corporation

OPTICAL FABRICATION EQUIPMENT

3D AG
Accumold
Andover Corporation
Applied Surface Technologies
DCM Tech, Corp.
Diverse Optics Inc.
Enli Technology Co., Ltd.
J.A. Woollam
OptiPro Systems
Opto-Alignment Technology, Inc.
OptoTech Optical Machinery Inc.
scia Systems GmbH
Universal Photonics Inc.

OPTICS MANUFACTURING

Accumold
ALPAO S.A.S.
Andover Corporation
Âpre Instruments, Inc.
CMM Optic
DCM Tech, Corp.
Diverse Optics Inc.
Energetiq Technology, Inc.
GS Plastic Optics
Hardin Optical Co.
Himax IGI Precision
Infinite Optics Inc.
Inrad Optics
IRD Glass
J.A. Woollam
KOHZU Precision & LAB Motion Systems c/o Daniel F Crews, LLC
LaCroix Precision Optics
Luxel Corp.
Meadowlark Optics, Inc.
Micro Laser Systems, Inc.
Millennium Optical System Co., Ltd.
Moulded Optics GmbH
MPS Micro Precision Systems AG
Navitar Inc.
NTFL
Optical Perspectives Group, LLC
Optikos Corp.
Optimax Systems, Inc.
OptiPro Systems
Opto-Alignment Technology, Inc.
OptoSigma Corp.
Photonic Cleaning Technologies
Precision Glass & Optics
Rainbow Research Optics, Inc.
Riverhawk Co.
Ruda Cardinal, Inc.
scia Systems GmbH
Taiyo Optics (Dong Guan) Corp.
Zygo Corporation

OPTOMECHANICAL COMPONENTS, DEVICES

ALIO Industries Corp.
Âpre Instruments, Inc.
CMM Optic
INO
MPS Micro Precision Systems AG
Opto-Alignment Technology, Inc.
OptoSigma Corp.
Rainbow Research Optics, Inc.
Vincent Associates
Wordingham Technologies

PHOTONIC INTEGRATION

Micro Laser Systems, Inc.

POSITIONING EQUIPMENT, MOTION CONTROL AND ACCESSORIES

ALIO Industries Corp.
attocube systems Inc.
HEIDENHAIN Corp.
KOHZU Precision & LAB Motion Systems c/o Daniel F Crews, LLC
Mad City Labs., Inc.
MPS Micro Precision Systems AG
NM Laser Products, Inc.
OptoSigma Corp.
PI (Physik Instrumente) L.P.
piezosystem jena, Inc.
Riverhawk Co.
Siskiyou Corporation
SmarAct Inc.
Zaber Technologies Inc.

PUBLISHERS, ASSOCIATIONS, CLUSTERS, SOCIETIES

IOP Publishing Ltd.
Novus Light Technologies Today
Photonics Media

SEMICONDUCTOR DEFENSE SECURITY

Optimax Systems, Inc.

SEMICONDUCTOR MANUFACTURING

ALIO Industries Corp.
Energetiq Technology, Inc.
Enli Technology Co., Ltd.
Heidelberg Instruments Inc.
J.A. Woollam
Laser Quantum Inc.
NM Laser Products, Inc.
Optimax Systems, Inc.
Rainbow Research Optics, Inc.
Schrödinger, LLC
scia Systems GmbH
SmarAct Inc.
Zaber Technologies Inc.

SOFTWARE

4D Technology Corp.
ALPAO S.A.S.
Äpre Instruments, Inc.
Arete Associates
Lambda Research Corp.
LightTrans International UG
Photon Engineering LLC
Schrödinger, LLC
SPIE Career Center
Synopsis, Inc.

SOLAR & ALTERNATIVE ENERGY

Enli Technology Co., Ltd.
Hinds Instruments, Inc.
J.A. Woollam
Lambda Research Corp.
Luxel Corp.
MilliporeSigma
Moulded Optics GmbH
Opto-Alignment Technology, Inc.
Schrödinger, LLC

SOLAR AND ALTERNATIVE ENERGY TECHNOLOGY

Andor Technology Ltd.
Enli Technology Co., Ltd.
MilliporeSigma
Sia Armadillo
Syntec Optics

SPECTROSCOPY DEVICES AND EQUIPMENT

Andor Technology Ltd.
Bruker Nano, Inc.
Hamamatsu Corp.
Hinds Instruments, Inc.
J.A. Woollam
Lambda Research Corp.
Laser Quantum Inc.
neaspec GmbH
Sia Armadillo
StellarNet, Inc.
Vincent Associates

STRUCTURAL AND INFRASTRUCTURE SENSING

OZ Optics Ltd.

TEST AND MEASUREMENT, METROLOGY

4D Technology Corp.
Applied Surface Technologies
Äpre Instruments, Inc.
attocube systems Inc.
Bruker Nano, Inc.
Diverse Optics Inc.
Enli Technology Co., Ltd.
HEIDENHAIN Corp.
Hinds Instruments, Inc.
Inrad Optics
J.A. Woollam
Lambda Research Corp.
Mad City Labs., Inc.
Meadowlark Optics, Inc.
Optical Perspectives Group, LLC
Optikos Corp.
OptiPro Systems
Opto-Alignment Technology, Inc.
OptoTech Optical Machinery Inc.
PHASICS Corp.
SmarAct Inc.
StellarNet, Inc.
Vision Engineering Inc. (incl. Vision Optics division)
Wordingham Technologies
Zygo Corporation

VACUUM, COOLING, GAS HANDLING EQUIPMENT

Applied Surface Technologies
attocube systems Inc.
HEIDENHAIN Corp.
J.A. Woollam
Mad City Labs., Inc.
Micro Laser Systems, Inc.
scia Systems GmbH
Zaber Technologies Inc.

VEHICLE SENSING AND CONTROL

Accumold
Laser Components USA, Inc.
Moulded Optics GmbH
Optikos Corp.
Riverhawk Co.
Synopsis, Inc.
VIAVI Solutions Inc.



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- Advanced metrology
- Detectors and imaging
- Deep learning
- LiDAR
- Remote sensing
- Nanoscience
- Optics educators

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Information for Course attendees:
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New NEW AND FEATURED COURSES

- **Introduction to Fundamental Performance Limits of CCD and CMOS Imagers** (*James Janesick*)
- **Optical Measurement of Surface Topography** (*Peter de Groot*)
- **Photodetectors – A Practical Selection Guide** (*Slawomir Piatek*)
- **Mirror System Design with Freeform Surfaces** (*José Sasián*)
- **Introduction to Magnetic Random Access Memory (MRAM): Fundamentals, Current Status, and Emerging Device Concepts** (*Pedram Khalili*)

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COURSE INDEX

ADVANCED METROLOGY

- Sun SC213 **Introduction to Interferometric Optical Testing** (*Wyant*)
8:30 am to 12:30 pm, \$440 / \$500 / \$275
- Sun SC1271 **Optical Measurement of Surface Topography** (*de Groot*)
8:30 am to 12:30 pm, \$405 / \$465 / \$261
- Sun SC1164 **Wavefront Data Analysis** (*Mahajan*) 1:30 pm to 5:30 pm,
\$480 / \$540 / \$291

DETECTORS AND IMAGING

- Sun SC1222 **Deep Learning and Its Applications in Image Processing**
(*Nasrabadji*) 8:30 am to 5:30 pm, \$655 / \$770 / \$383
- Mon SC1274 **Introduction to Fundamental Performance Limits of CCD
and CMOS Imagers** (*Janesick*) 1:30 pm to 5:30 pm,
\$545 / \$605 / \$317

INDUSTRY AND EXHIBITORS

- Mon SC1170 **The Very Least You Need To Know About Optics** (*Diehl*)
1:30 pm to 3:30 pm, \$125 / \$150 / \$60

NANOSCIENCE

- Sun SC1043 **Shaping Light, with Applications in Advanced
Microscopy and Optical Trapping** (*Dholakia, Spalding*)
1:30 pm to 5:30 pm, \$405 / \$465 / \$261
- Mon SC1273 **Introduction to Magnetic Random Access Memory
(MRAM): Fundamentals, Current Status, and Emerging
Device concepts** (*Khalili*) 8:30 am to 12:30 pm, \$405 / \$465 /
\$261

OPTICAL DESIGN AND SYSTEMS ENGINEERING

- Sun SC1271 **Optical Measurement of Surface Topography** (*de Groot*)
8:30 am to 12:30 pm, \$405 / \$465 / \$261
- Sun SC690 **Optical System Design: Layout Principles and Practice**
(*Greivenkamp*) 8:30 am to 5:30 pm, \$690 / \$805 / \$397
- Sun SC1277 **Photodetectors – A Practical Selection Guide** (*Piatek*) 8:30
am to 12:30 pm, \$405 / \$465 / \$261
- Sun SC1121 **Recent Developments in Laser Beam Engineering**
(*Soskind*) 8:30 am to 12:30 pm, \$440 / \$500 / \$275
- Sun SC1272 **Mirror System Design with Freeform Surfaces** (*Sasián*)
1:30 pm to 5:30 pm, \$405 / \$465 / \$261
- Mon SC254 **Integrated Opto-Mechanical Analysis** (*Genberg, Doyle*)
8:30 am to 5:30 pm, \$725 / \$840 / \$411
- Mon SC912 **Intermediate Lens Design** (*Bentley*) 8:30 am to 5:30 pm,
\$690 / \$805 / \$397
- Mon SC915 **Radiometry Revealed** (*Shaw*) 8:30 am to 12:30 pm,
\$405 / \$465 / \$261
- Mon SC700 **Understanding Scratch and Dig Specifications** (*Aikens*)
8:30 am to 12:30 pm, \$405 / \$465 / \$261
- Mon SC1017 **Optics Surface Inspection Workshop** (*Aikens*) 1:30 pm to
5:30 pm, \$505 / \$565 / \$301
- Tue SC1247 **Polarized Light and Optical Design** (*Chipman, Young*)
8:30 am to 5:30 pm, \$655 / \$770 / \$383
- Tue SC003 **Practical Optical System Design** (*Youngworth, Olson*)
8:30 am to 5:30 pm, \$655 / \$770 / \$383
- Tue SC1199 **Stray Light Analysis and Control** (*Fest*) 8:30 am to
5:30 pm, \$700 / \$815 / \$401
- Wed SC1165 **Introduction to Applied Probability for Systems
Engineers** (*Arenberg*) 8:30 am to 12:30 pm, \$405 / \$465 /
\$261
- Wed SC863 **Introduction to Modern Optical Drawings – the ISO 10110
Standard** (*Aikens*) 1:30 pm to 5:30 pm, \$405 / \$465 / \$261

OPTICAL SYSTEMS AND LENS DESIGN

- Mon SC912 **Intermediate Lens Design** (*Bentley*) 8:30 am to 5:30 pm,
\$690 / \$805 / \$397
- Wed SC1086 **Optical Materials, Fabrication and Testing for the Optical
Engineer** (*DeGroot Nelson*) 8:30 am to 12:30 pm,
\$405 / \$465 / \$261

OPTICS + PHOTONICS FOR SUSTAINABLE ENERGY

- Mon SC915 **Radiometry Revealed** (*Shaw*) 8:30 am to 12:30 pm,
\$405 / \$465 / \$261

OPTOMECHANICS AND OPTICAL MANUFACTURING

- Sun SC213 **Introduction to Interferometric Optical Testing** (*Wyant*)
8:30 am to 12:30 pm, \$440 / \$500 / \$275
- Sun-Mon SC014 **Introduction to Optomechanical Design**
(*Vukobratovich*) 8:30 am to 5:30 pm, \$1,180 / \$1,445 / \$653
- Mon SC1169 **Optical Manufacturing Fundamentals** (*Williamson*) 8:30 am
to 5:30 pm, \$685 / \$800 / \$395
- Tue SC015 **Fastening Optical Elements with Adhesives** (*Daly*) 8:30 am
to 12:30 pm, \$405 / \$465 / \$261
- Tue SC010 **Introduction to Optical Alignment Techniques** (*Castle*) 8:30
am to 5:30 pm, \$655 / \$770 / \$383
- Tue SC1019 **Mounting of Optical Components** (*Kasunic*) 8:30 am to 5:30
pm, \$735 / \$850 / \$415
- Wed SC1086 **Optical Materials, Fabrication and Testing for the Optical
Engineer** (*DeGroot Nelson*) 8:30 am to 12:30 pm,
\$405 / \$465 / \$261
- Thu SC1085 **Optomechanical Systems Engineering** (*Kasunic*) 8:30 am
to 5:30 pm, \$655 / \$770 / \$383

PROFESSIONAL DEVELOPMENT

- Sat WS1249 **Student Chapter Leadership Workshop** (*Doumont*) 8:00 am
to 5:00 pm, \$50 / \$50 / \$50

REMOTE SENSING

- Sun SC1220 **Imaging Spectrometry** (*Hagen*) 1:30 pm to 5:30 pm,
\$405 / \$465 / \$261
- Mon SC915 **Radiometry Revealed** (*Shaw*) 8:30 am to 12:30 pm,
\$405 / \$465 / \$261
- Mon SC567 **Introduction to Optical Remote Sensing Systems** (*Shaw*)
1:30 pm to 5:30 pm, \$405 / \$465 / \$261
- Tue SC1232 **Introduction to LIDAR for Autonomous Vehicles** (*Shaw*)
1:30 pm to 5:30 pm, \$405 / \$465 / \$261

SIGNAL, IMAGE, AND DATA PROCESSING

- Sun SC157 **MTF in Optical and Electro-Optical Systems** (*Boreman*)
8:30 am to 5:30 pm, \$700 / \$815 / \$401

X-RAY, GAMMA-RAY, AND PARTICLE TECHNOLOGIES

- Sun SC1277 **Photodetectors – A Practical Selection Guide** (*Piatek*) 8:30
am to 12:30 pm, \$405 / \$465 / \$261

WORKSHOPS FOR OPTICS EDUCATORS

- Tue WS1141 **Problem-Based Learning: Engaging Students in STEM**
(*Donnelly*) 10:00 am to 12:00 pm, \$15 / \$20 / \$15
- Tue WS1156 **Dumpster Optics: Teaching Optics with Junk** (*Magnani,
Viera-González*) 1:30 pm to 3:30 pm, \$15 / \$20 / \$15
- Wed WS1248 **Training the Trainer in OPTIKS: Outreach for
Professionals Who Teach in Informal Environments and
K-12 Schools** (*McKee, Magnani, Posner*) 8:30 am to 12:30
pm, \$15 / \$20 / \$15
- Wed WS1201 **I SEE THE LIGHT! Demonstrations and Activities for
Outreach Events** (*McKee*) 3:30 pm to 5:30 pm, \$15 / \$20 /
\$15

PRICE KEY: SPIE Member / Non-Member / Student Member

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY
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Advanced Metrology

<p>SC213 Introduction to Interferometric Optical Testing (<i>Wyant</i>) 8:30 am to 12:30 pm, \$440 / \$500 / \$275</p>				
<p>New SC1271 Optical Measurement of Surface Topography (<i>de Groot</i>) 8:30 am to 12:30 pm, \$405 / \$465 / \$261</p>				
<p>SC1164 Wavefront Data Analysis (<i>Mahajan</i>) 1:30 pm to 5:30 pm, \$480 / \$540 / \$291</p>				

Detectors and Imaging

<p>SC1222 Deep Learning and Its Applications in Image Processing (<i>Nasrabad</i>) 8:30 am to 5:30 pm, \$655 / \$770 / \$383</p>	<p>New SC1274 Introduction to Fundamental Performance Limits of CCD and CMOS Imagers (<i>Janesick</i>) 1:30 pm to 5:30 pm, \$545 / \$605 / \$317</p>			
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Industry and Exhibitors

	<p>SC1170 The Very Least You Need To Know About Optics (<i>Diehl</i>) 1:30 pm to 3:30 pm, \$125 / \$150 / \$60</p>			
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Nanoscience



<p>SC1043 Shaping Light, with Applications in Advanced Microscopy and Optical Trapping (<i>Dholakia, Spalding</i>) 1:30 pm to 5:30 pm, \$405 / \$465 / \$261</p>	<p>New SC1273 Introduction to Magnetic Random Access Memory (MRAM): Fundamentals, Current Status, and Emerging Device Concepts (<i>Khalili</i>) 8:30 am to 12:30 pm, \$405 / \$465 / \$261</p>			
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See course descriptions online or onsite.
Register at the SPIE Cashier.

COURSE SCHEDULE

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY
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Optical Design and Systems Engineering

SC1271 Optical Measurement of Surface Topography (<i>de Groot</i>) 8:30 am to 12:30 pm, \$405 / \$465 / \$261	SC254 Integrated Opto-Mechanical Analysis (<i>Genberg, Doyle</i>) 8:30 am to 5:30 pm, \$725 / \$840 / \$411	SC1247 Polarized Light and Optical Design (<i>Chipman, Young</i>) 8:30 am to 5:30 pm, \$655 / \$770 / \$383	SC1165 Introduction to Applied Probability for Systems Engineers (<i>Arenberg</i>) 8:30 am to 12:30 pm, \$405 / \$465 / \$261	
SC690 Optical System Design: Layout Principles and Practice (<i>Greivenkamp</i>) 8:30 am to 5:30 pm, \$690 / \$805 / \$397	SC912 Intermediate Lens Design (<i>Bentley</i>) 8:30 am to 5:30 pm, \$690 / \$805 / \$397	SC003 Practical Optical System Design (<i>Youngworth, Olson</i>) 8:30 am to 5:30 pm, \$655 / \$770 / \$383	SC863 Introduction to Modern Optical Drawings – the ISO 10110 Standard (<i>Aikens</i>) 1:30 pm to 5:30 pm, \$405 / \$465 / \$261	
 SC1277 Photodetectors – A Practical Selection Guide (<i>Piatek</i>) 8:30 am to 12:30 pm, \$405 / \$465 / \$261	SC915 Radiometry Revealed (<i>Shaw</i>) 8:30 am to 12:30 pm, \$405 / \$465 / \$261	SC1199 Stray Light Analysis and Control (<i>Fest</i>) 8:30 am to 5:30 pm, \$700 / \$815 / \$401		
SC1121 Recent Developments in Laser Beam Engineering (<i>Soskind</i>) 8:30 am to 12:30 pm, \$440 / \$500 / \$275	SC700 Understanding Scratch and Dig Specifications (<i>Aikens</i>) 8:30 am to 12:30 pm, \$405 / \$465 / \$261			
 SC1272 Mirror System Design with Freeform Surfaces (<i>Sasián</i>) 1:30 pm to 5:30 pm, \$405 / \$465 / \$261	SC1017 Optics Surface Inspection Workshop (<i>Aikens</i>) 1:30 pm to 5:30 pm, \$505 / \$565 / \$301			

Optical Systems and Lens Design

SC912 Intermediate Lens Design (<i>Bentley</i>) 8:30 am to 5:30 pm, \$690 / \$805 / \$397	SC1086 Optical Materials, Fabrication and Testing for the Optical Engineer (<i>DeGroote Nelson</i>) 8:30 am to 12:30 pm, \$405 / \$465 / \$261
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Optics and Photonics for Sustainable Energy

SC915 Radiometry Revealed (<i>Shaw</i>) 8:30 am to 12:30 pm, \$405 / \$465 / \$261

See course descriptions online or onsite.
Register at the SPIE Cashier.

COURSE SCHEDULE

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY
Optomechanics and Optical Manufacturing				
SC213 Introduction to Interferometric Optical Testing (<i>Wyant</i>) 8:30 am to 12:30 pm, \$440 / \$500 / \$275	SC1169 Optical Manufacturing Fundamentals (<i>Williamson</i>) 8:30 am to 5:30 pm, \$685 / \$800 / \$395	SC015 Fastening Optical Elements with Adhesives (<i>Daly</i>) 8:30 am to 12:30 pm, 8:30 am to 5:30 pm, \$405 / \$465 / \$261	SC1086 Optical Materials, Fabrication and Testing for the Optical Engineer (<i>DeGroot Nelson</i>) 8:30 am to 12:30 pm, \$405 / \$465 / \$261	SC1085 Optomechanical Systems Engineering (<i>Kasunic</i>) 8:30 am to 5:30 pm, \$655 / \$770 / \$383
SC014 Introduction to Optomechanical Design (<i>Vukobratovich</i>) 8:30 am to 5:30 pm, \$1,180 / \$1,445 / \$653		SC010 Introduction to Optical Alignment Techniques (<i>Castle</i>) 8:30 am to 5:30 pm, \$655 / \$770 / \$383		
		SC1019 Mounting of Optical Components (<i>Kasunic</i>) 8:30 am to 5:30 pm, \$735 / \$850 / \$415		
Remote Sensing				
SC1220 Imaging Spectrometry (<i>Hagen</i>) 1:30 pm to 5:30 pm, \$405 / \$465 / \$261	SC915 Radiometry Revealed (<i>Shaw</i>) 8:30 am to 12:30 pm, \$405 / \$465 / \$261	SC1232 Introduction to LIDAR for Autonomous Vehicles (<i>Shaw</i>) 1:30 pm to 5:30 pm, \$405 / \$465 / \$261		
	SC567 Introduction to Optical Remote Sensing Systems (<i>Shaw</i>) 1:30 pm to 5:30 pm, \$405 / \$465 / \$261			
Signal, Image, and Data Processing				
SC157 MTF in Optical and Electro-Optical Systems (<i>Boreman</i>) 8:30 am to 5:30 pm, \$700 / \$815 / \$401				
X-Ray, Gamma-Ray, and Particle Technologies				
SC1277 Photodetectors – A Practical Selection Guide (<i>Platek</i>) 8:30 am to 12:30 pm, \$405 / \$465 / \$261				
Workshops for Optics Educators				
		WS1141 Problem-Based Learning: Engaging Students in STEM (<i>Donnelly</i>) 10:00 am to 12:00 pm, \$15 / \$20 / \$15	WS1248 Training the Trainer in OPTIKS: Outreach for Professionals Who Teach in Informal Environments and K-12 Schools (<i>McKee, Magnani, Posner</i>) 8:30 am to 12:30 pm, \$15 / \$20 / \$15	
		WS1156 Dumpster Optics: Teaching Optics with Junk (<i>Magnani, Viera-González</i>) 1:30 pm to 3:30 pm, \$15 / \$20 / \$15	WS1201 I SEE THE LIGHT! Demonstrations and Activities for Outreach Events (<i>McKee</i>) 3:30 pm to 5:30 pm, \$15 / \$20 / \$15	
<p align="center">- SATURDAY -</p> <p align="center">Professional Development</p>				
WS1249 Student Chapter Leadership Workshop (<i>Doumont</i>) 8:00 am to 5:00 pm, \$50 / \$50 / \$50				



Photo credit: Kallol Mukherjee



International Day of Light

16 May

The International Day 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.

SPIE supports the International Day of Light and its annual celebration on 16 May.



SPIE IDL GRANTS

SPIE provides seed funding up to US\$3,000 to organizations creating Day of Light activities.



IDL RESOURCES

SPIE encourages communities to plan their own annual celebration on 16 May and provides various resources to help create an event.



SPIE PHOTO CONTEST

Amateur and professional photographers alike should submit photos demonstrating the vital role that light plays in our lives for a chance to win US\$2,500.



SPIE.

Learn more: spie.org/idl

RELATED EVENTS



Student Chapter Poster Exhibit

Tuesday 13 August 2019 · 10:00 AM - 5:00 PM

Location: Conv. Ctr. Sails Pavilion, Exhibition Hall

Discover how SPIE Student Chapters have helped increase optics awareness and literacy in their regions.

Student Chapter Exhibit Mixer

Tuesday 13 August 2019 · 3:30 PM - 5:00 PM

Location: Conv. Ctr. Sails Pavilion, Exhibition Hall

Join us for refreshments and a late-afternoon mixer in the Student Chapter section of the Exhibition Hall. Meet our amazing students and learn about the innovative activities of some of the best and brightest Student Chapters across the globe!

SPIE Career Lab Meetup

Tuesday 13 August 2019 · 4:30 PM - 5:30 PM

Location: Conv. Ctr. Sails Pavilion, Exhibition Hall

Join members of the SPIE Career Lab Editorial Board for a networking event focused on brainstorming and developing ideas for discussion topics and interaction on the SPIE Career Lab Facebook group.

Friends of Bill W.

Tuesday 13 August 2019 · 5:00 PM - 6:00 PM

Location: Marriott Marquis, Laguna

Join others for a self-organized Friends of Bill W. meeting at Optics + Photonics. Start off the week in a safe and supportive environment.

Annual General Meeting of the SPIE Corporation

Tuesday 13 August 2019 · 6:00 PM - 7:00 PM

Location: Marriott Marquis, Marina Ballroom E

Agenda:

- Report on the "State of the Society"
- Treasurer's Report
- 2019 Election Results
- Q&A with SPIE Officers

This is the general business meeting of the Society. All SPIE Members are welcome and encouraged to attend. This is your forum for expressing your ideas about the Society. Results of the 2019 election will be announced, and there will be a report on the "State of the Society." Questions are encouraged. This meeting will be followed by the Members Reception. Both events are open to Members only.

Exhibition Ice Cream Social

Thursday · 12:30 to 1:30 PM

Exhibition Hall

Join representatives of companies in the exhibition and celebrate the end of the show with ice cream.



Job Fair

Tuesday-Wednesday 13-14 August 2019 · 10:00 AM - 5:00 PM

Location: Conv. Ctr. Sails Pavilion, Exhibition Hall

Top employers are coming together to interview and hire candidates. This is your chance to connect with the best, and meet recruiters on the exhibition floor.

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Registration

Onsite Registration and Badge Pick-up Hours

CONFERENCE REGISTRATION

Marriott Marquis, Marina Foyer (Level 3)

Saturday, 10 August · 10:00 AM - 5:00 PM

CONFERENCE + EXHIBITION REGISTRATION

San Diego Convention Center, Sails Pavilion (Upper Level)

Sunday, 11 August · 7:15 AM - 5:00 PM

Monday, 12 August · 7:30 AM - 5:00 PM

Tuesday, 13 August · 7:30 AM - 5:00 PM

Wednesday, 14 August · 7:30 AM - 5:00 PM

Thursday, 15 August · 7:45 AM - 4:00 PM

CONFERENCE REGISTRATION INCLUDES:

- Admission to all conference sessions, plenaries, panels, and poster sessions
- Admission to the Exhibition
- All-Conference Welcome Reception
- Coffee breaks
- A choice of online proceedings via the SPIE Digital Library

COURSE AND WORKSHOP REGISTRATION

- Courses and workshops are priced separately.
- Course-only registration includes your selected course(s), course notes, coffee breaks, and admittance to the exhibition.
- Course prices include applicable taxes.
- Onsite, please go to Course Materials Pickup after you pick up your badge at main registration.
- Multiple facilities may be used for courses; allow yourself enough time to register, pick up your materials, and possibly walk to a nearby facility before your course begins.

EXHIBITION REGISTRATION

- Exhibition-Only visitor registration is complimentary.
- The Exhibition is open Tuesday, Wednesday, and Thursday

PRESS REGISTRATION

- For credentialed press and media representatives only.
- See our press registration page for SPIE policy.
- Please email contact information, title and organization to media@spie.org

Onsite Services

Internet Access

Lobbies and Meeting Rooms

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

SPIE Conference and Exhibition App

Search and browse the program, special events, participants, exhibitors, courses, and more. Free Conference App available for iPhone and Android phones.



SPIE Bookstore

Conv. Ctr. Sail Pavilion (Upper Level)

Stop by the SPIE Bookstore to browse the latest SPIE Press Books, proceedings, and educational materials. While there, get a t-shirt or educational toy to bring home to the family.

SPIE Education Services

Conv. Ctr. Sail Pavilion (Upper Level)

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

SPIE Luggage and Coat Check

Convention Center, Hall A Lobby (Ground Level)

Sunday through Wednesday · 7:30 AM - 6:00 PM

Thursday · 8:00 AM - 6:00 PM

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

Business Center

FedEx Kinko, Convention Center, Hall D Lobby (Ground Level)

Monday through Thursday · 8:00 AM - 6:00 PM

Services include photocopying, faxing, printing services, and shipping. Office supplies are also available. Phone +1 619 525 5450

Restaurant and City Information

Conv. Ctr. Hall B Lobby (Ground Level)

Sunday through Thursday · 9:00 AM - 6:00 PM

Services include sightseeing, shopping, and restaurant information

Child Care Services

Marion's Childcare, Inc.

Email: amy@hotelchildcare.com

Office: +1 619 303 4379 or text +1 619 663 4379

Note: SPIE does not imply an endorsement nor recommendation of these services. They are provided on an "information only" basis for your further analysis and decision. Other services may be available.

Lobby Services and Amenities

ATMs

Convention Center, Hall B Lobby & Hall E Lobby (Ground Level)

Courtesy Phones

Convention Center Lobbies

Free local calls.

Nursing Mother's Lounge

Convention Center, Hall A Lobby & Hall E Lobby (Ground Level)

The lounges are located inside the women's restroom. Each lounge is equipped with comfortable furniture and a separate private area for nursing mothers. Power outlets are available. There is no storage or refrigeration available in the Nursing Mother's Lounge.

Gender Inclusive Restroom

Convention Center, Hall A Lobby (Ground Level)



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optics.org/newsletter

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Quiet Room

Conv. Ctr., Sails Pavilion (Upper Level) Registration Area. Open during registration hours

The Quiet Room is intended for silent meditation, reflection or prayer. No mobile device or computer use, and no food or beverages allowed.

Urgent Message Line

An urgent message line is available during registration hours, 619-525-6200.

Lost and Found

Cashier, Conv. Ctr. Sail Pavilion (Upper Level)
Open during registration Hours

Found items will be kept at Cashier 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: +1 619 525 5407

Food and Beverage Services

Complimentary Coffee

Sunday · 7:30 AM - 4:00 PM
Room 6A Lobby, Conv. Ctr. (Upper Level)

Monday · 7:30 AM - 4:00 PM
Room 6A Lobby, Conv. Ctr. (Upper Level)

Tuesday
7:30 AM - 9:30 AM
Room 6A Lobby, Conv. Ctr. (Upper Level)
10:00 AM - 4:00 PM
Exhibition Hall, Conv. Ctr. Sail Pavilion (Upper Level)

Wednesday
7:30 AM - 9:30 AM
Room 6A Lobby, Conv. Ctr. (Upper Level)
10:00 AM - 4:00 PM
Exhibition Hall, Conv. Ctr. Sail Pavilion (Upper Level)

Thursday
7:30 AM - 9:30 AM
Room 6A Lobby, Conv. Ctr. (Upper Level)
10:00 AM - 2:00 PM
Exhibition Hall, Conv. Ctr. Sail Pavilion (Upper Level)
2:00 PM - 4:00 PM
Room 6A Lobby, Conv. Ctr. (Upper Level)

Food and Refreshments for Purchase

STARBUCKS
Conv. Ctr. Lobby B (Ground Level)
Sunday and Monday · 7:00 AM - 3:00 PM
Tuesday and Wednesday · 7:00 AM - 4:00 PM
Thursday · 7:00 AM - 2:00 PM

MRS. FIELDS COOKIES / AUNTIE ANNE'S PRETZELS
Conv. Ctr. Upper Lobby 6A (Upper Level)
Sunday through Thursday · 7:30 AM - 4:00 PM

Travel

Welcome to San Diego

With 70 miles of beautiful beaches, near-perfect weather year-round, and a variety of magnificent settings countywide, San Diego offers a fun and inexpensive getaway, for kids and adults, any time of year. No stay in San Diego is complete without a trip to the waterfront. San Diego Bay is bustling with activity, as it serves as the homeport for Navy ships, a large sport fishing fleet, thousands of pleasure craft, and the USS Midway Museum is a retired aircraft carrier that now serves as a fascinating interactive floating museum. The largest urban cultural park in the United States, Balboa Park is often referred to as the "Smithsonian of the West." Its 1,200 lush acres are home to 85 cultural attractions, including 15 museums, eight gardens and the San Diego Zoo.

Airport Information

San Diego International Airport (SAN) is conveniently located three miles northwest of downtown San Diego.

Transportation from the Airport

Taxi service from the San Diego Airport to the downtown hotels is approximately US \$15-25 depending on traffic.

Uber or Lyft from the San Diego Airport to the downtown hotels is approximately US \$6-8 (shared ride) or US \$12-17.

SHUTTLES AND PUBLIC TRANSPORTATION

Bayfront Shuttle

US \$3 to ride all day - hop on the Big Bay Shuttle to visit the numerous hotels, attractions, shops and restaurants along the scenic San Diego bay. Shuttle route includes Hilton Bayfront, Marriott Marquis & Marina, Seaport Village, Broadway/Navy Pier, Maritime Museum, Sheraton Hotel & Marina.

San Diego Trolley - Metropolitan Transit System

Trolley cars are red and travel above ground on light rail lines every 15 minutes. If guests purchase Day Tripper Passes from the Transit e-store (on-line), before their arrival date, they can then use Bus 992 from the airport to the America Plaza Trolley Station to your hotel and to and from the convention center for unlimited rides at that one flat rate. Or you can purchase a day pass for \$5 (subject to change) when you board the 992 bus at the airport from any Terminal. Get off at Broadway and Kettner Blvd. and walk to the America Plaza Trolley Station. From there, take the Orange Line with signage 'Downtown/Convention Center' to your hotel or to the convention center.

Driving Directions and Parking

Find links to the PDFs of **Driving Directions** to the San Diego Convention Center and Hotels, the **San Diego Convention Center Parking**, and rates, and for **Parking in the vicinity** of the San Diego Convention Center online, on the SPIE Optics + Photonics travel information page.

Use **Parking Panda** to reserve parking at the lots and garages surrounding the San Diego Convention Center.

Car Rental

Hertz Car Rental is the selected as the official car rental agency for this Event. To reserve a car, identify yourself as an Optics + Photonics conference attendee using the Hertz Meeting Code CV# 029B0024. Discount rates apply for rentals up to one week prior through one week after the conference dates. Note: When booking from International Hertz locations, the CV # must be quoted with the letters CV before the number, i.e. CV029B0024. Click here to book online Book Hertz Online. Be sure to enter the code to receive the meeting discount rate.

- In the United States call +1 800 654 2240.
- In Canada call 1-800-263-0600, or +1 416 620 9620 in Toronto.
- In Europe and Asia call the nearest Hertz Reservation Center or travel agent.
- Outside of these areas call +1 405 749 4434.

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.

Attendee Registration and Admission Policy

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 to remove any individual whether registered or not, be they attendees, exhibitors, representatives, or vendors, whose conduct is not in keeping with the character and purpose of the event. Without limiting the foregoing, SPIE and event management reserve the right to remove or refuse entry to anyone who has registered or gained access under false pretenses, provided false information, or for any other reason whatsoever that they deem is cause under the circumstances.

Payment Policy

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

SPIE Safe Meeting Policy | Code of Conduct

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

SPIE does not tolerate harassment of event participants, attendees, exhibitors, speakers, volunteers, contractors, service providers, venue staff, or SPIE staff. This Code of Conduct applies to all SPIE meeting-related events, including those sponsored by other organizations but held in conjunction with SPIE events, in public or private facilities.

The SPIE Anti-Harassment Policy may be found at spie.org/policy (PDF)

The SPIE Code of Conduct may be found at spie.org/conduct (PDF)

In addition, SPIE Members and authors of SPIE publications must adhere to the SPIE Code of Ethics, found at spie.org/ethics (PDF)

Reporting of Unethical or Inappropriate Behavior

Onsite at an SPIE meeting, contact any SPIE Staff with concerns or questions for thorough follow-up. If you feel in immediate danger, please dial the local emergency number for police intervention.

SPIE has established a confidential reporting system for staff and all meetings participants to raise concerns about possible unethical or inappropriate behavior within our community. Complaints may be filed by phoning toll-free to +1-888-818-6898 from within the United States and Canada, or online at www.SPIE.ethicspoint.com and may be made anonymously.

Identification Requirement Policy

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

Individuals are not allowed to pick up badges for other attendees. Further, attendees may not have some other person participate in their place at any conference-related activity. Such other individuals will be required to register on their own behalf to participate.

Access to Conference Events / Access for Children Younger than 18

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

Exhibition Hall Access / Access for Children Younger than 18

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

Unauthorized Solicitation Policy

Unauthorized solicitation in the Exhibition Hall is prohibited. Any nonexhibiting 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.

Recording Policy

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

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

Capture and Use of a Person's Image

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

By registering for an SPIE event, you waive any right to inspect or approve the use of the images or recordings or of any written copy. You also waive any right to royalties or other compensation arising from or related to the use of the images, recordings, or materials. By registering, you release, defend, indemnify and hold harmless SPIE from and against any claims, damages or liability arising from or related to the use of the images, recordings or materials, including but not limited to claims of defamation, invasion of privacy, or rights of publicity or copyright infringement, or any misuse, distortion, blurring, alteration, optical illusion or use in composite form that may occur or be produced in taking, processing, reduction or production of the finished product, its publication or distribution.

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 the 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 (<5 mW) are eye safe if power output is correct, but output must be verified because manufacturer labeling may not match actual output. You are required to sign a waiver releasing SPIE of any liability for use of potentially non-safe, personal laser pointers. Waivers are available at Speaker Check-In.

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

No-Smoking Policy

Smoking, including e-cigarettes, is not permitted at any SPIE event.

Agreement to 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 Policy

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

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SPIE CORPORATE MEMBERSHIP

SPIE Corporate Membership gives companies the best visibility in the industry, access to important information (the latest R&D updates, educational opportunities, and industry intelligence) and top talent.

SPIE, with more Corporate Members than any society or association in our field, is the definitive global business resource for the photonics industry and its members.

That's why SPIE is recognized as "best for industry"—and why joining is good for business.

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	asphericon GmbH	Ceres Holographics Ltd.	Deltronic Crystal Industries, Inc.	Fiberguide Industries, Inc.
	A-Star Photonics, Inc.	Chiral Photonics, Inc.	Diamond USA Inc.	Fibertech Optica Inc.
	ASTRODESIGN, Inc.		DIAS Infrared Corp.	
			Diffraction Limited	

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Ltd.	IDEX Health & Science,	Applied Physics Lab.,	Luxel Corp.	Inc.
Fuzhou Intpho	LLC	LLC	LUXMUX Technology	Natsume Optical Corp.
Technology Co., Ltd.	IDEX Optical	JSR Micro, Inc.	Corp.	Navitar Inc.
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GenISys Inc	Imagine Optic SA	KrellTech	Mahr	Photoconductor Corp.
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Inc.	IMRA America, Inc.	L-1 Standards and	Market Tech, Inc.	Inc.
Gigajot Technology Inc.	Incom, Inc.	Technology, Inc.	Marktech Optoelectronics	New Source Technology,
Glass Fab, Inc.	Indian Hills Community	L3 Kigre, Inc.	Marubeni America Corp.	LLC
GM Cruise LLC	College	L3 Space & Sensors	Materion Precision Optics	NextCorps
Gooch & Housego PLC	Infinite Optics Inc.	Imaging & Detection	MB Cognitio	NKT Photonics A/S
GPD Optoelectronics	Infrared Materials, Inc.	Sensors	Meadowlark Optics, Inc.	nLIGHT, Inc.
Corp.	Infrared Systems	Labsphere, Inc.	Mega-9	Norland Products Inc.
Gpixel Inc.	Development Corp.	LaCroix Precision Optics	MegaWatt Lasers, Inc.	NorPix, Inc.
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GS Plastic Optics	Innolume GmbH	Inc.	MicroCircuit Laboratories,	Labs.
Guernsey Coating Labs.,	Innovations in Optics, Inc.	LambdaMetrics LLC	LLC	Northrop Grumman
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Inc.	InPhenix, Inc.	Laser Focus World	Mightex Systems	NP Photonics, Inc.
Hamamatsu Corp.	Inrad Optics	Laser Institute of America	Mikro-Tasarim Elektronik	nPoint, Inc.
Hangzhou Multi IR	Insight Photonic	Laser-Femto	San. ve Tic. A.S.	NTFL
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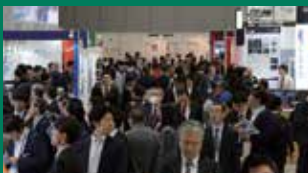
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