Exhibition Guide
Moving Technology to Market™

Exhibition
14–16 August 2012

Conferences and Courses
12–16 August 2012

Location
San Diego Convention Center
San Diego, California, USA
OptiCentric® 3D

Measuring lens centering, air spacing, and center thickness inside of assembled optical systems with ONE instrument

- Combining the known centering measurement technology integrated in OptiCentric® with the OptiSurf® low coherence interferometer for measuring the air gaps between lens elements and the center thickness of lenses within the optical system
- The cross-interaction allows fast alignment of the lens system, and provides a significant increase of the overall measurement accuracy and detailed manufacturing quality information for comprehensive compliance testing of assembled optics
- Measurement accuracy of
  - centering errors: 0.1 μm
  - air spacing and center thickness: 1 μm

TriAngle® 3D

First electronic autocollimator measuring angles in all three dimensions simultaneously: PITCH, YAW AND ROLL

The TriAngle® electronic autocollimators represent high-precision angle measurement systems for high demands on angle resolution and measuring accuracy. The new TriAngle® 3D series combines a proprietary reticle and reflector design with a sophisticated software and enables not only the measurement of the two classical tilt angles square to the beam of light (pitch and yaw) but of the roll angle around the beam as well.
2012 Optics+ Photonics
Optical components, devices, and materials.

Exhibition Guide

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Exhibition Hours
San Diego Convention Center, Exhibition Hall A, B1
Tuesday 14 August · 10:00 am to 5:00 pm
Wednesday 15 August · 10:00 am to 5:00 pm
Thursday 16 August · 10:00 am to 2:00 pm
SPIE thanks our sponsors for their generous support of Optics + Photonics 2012

Coffee/Dessert Breaks

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Sensors Unlimited - Goodrich ISR Systems, has been the leading innovator of InGaAs technology for shortwave infrared imaging since 1991. Our cutting-edge SWIR products are available in high-volume quantities for a wide variety of applications, including laser detection, surveillance, spectroscopy, process control, penetration of fog, haze, and smoke, biomedical imaging, and more.

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Meet. Discuss. Impress.

Talk with representatives from companies currently looking to hire.

See us in the Exhibition Hall
San Diego Convention Center, San Diego, California, USA
Tuesday 14 August, 10:00 am to 5:00 pm
Wednesday 15 August, 10:00 am to 5:00 pm

spie.org/opjobfair

Game Challenge

hosted by

Visit the SPIE Career Center, Booth 1045, Wednesday, 15 August, to participate in the Optikos Game Challenge.

By participating in the game challenge, your name will be entered into a drawing to win an Amazon Kindle! Make sure to stop by and talk with representatives about job opportunities and hiring resources.
Electro Optics, with more than 40 years of history, is the magazine, website, and e-newsletter (EONewsline) for the photonics market, covering technology, business and applications. It is Europe’s leading publication for all those involved in the supply, integration or use of photonics components. www.electrooptics.com/subscribe

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

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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 42-44, 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 map on pages 6-7. The address of each exhibitor is also listed, making this Exhibition Guide an excellent reference tool.

Exhibition Hours
Tuesday 14 August, 10:00 am to 5:00 pm
Wednesday 15 August, 10:00 am to 5:00 pm
Thursday 16 August, 10:00 am to 2:00 pm

More than 230 companies
AccuCoat Inc. #1120
111 Humboldt St Ste 8, Rochester, NY, 14609 United States
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office@accucoatincl.com; http://www.accucoatincl.com/
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Accumold #636
1711 SE Oralabor Rd, Ankeny, IA, 50021 United States
+1 515 964 5741
micromolding@accu-mold.com; http://www.accu-mold.com/
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Accumold® is a high-tech manufacturer of precision micro, small and lead frame injection molded plastic components. Utilizing processes developed from Accumold’s Micro-Mold® technology, the company designs, builds and produces unique molds and parts efficiently for markets that include Micro Electronics, Medical, Micro Optics, Automotive, and Military Applications. Molded parts range in size from 7 cm to parts the size of a grain of sand with tolerances often in microns. Contact: Rick Brown, Optics Application Sales Engineer, rbrown@accu-mold.com; Aaron Johnson, Sales, ajohnson@accu-mold.com

ADIT Electron Tubes #719
300 Crane St, Sweetwater, TX, 79556-0870 United States
+1 800 399 4557; fax +1 325 235 2872
sales@electrontubes.com; http://www.electrontubes.com
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AdiOptica GmbH #1139
SPIE Corporate Member
Rudower Chaussee 29, Berlin, 12489 Germany
+49 30 5659 0888 0; fax +49 30 5659 0888 1
info@adioptica.com; www.adioptica.com
Featured Product: F-piShaper NA0.1_50_80_1064 for high power fiber lasers to provide flattop profile of focused beams.
AdiOptica GmbH works in field of refractive Laser Beam Shaping Optics transforming Gaussian to flattop intensity profiles and finding applications in numerous industrial and scientific techniques. Result of multi year developments is family of piShaper systems, today >40 models: almost 100% efficiency, spectrum from UV to IR, power from mW to kW, CW and pulse lasers, achromatic design, wide range of flattop spot sizes, low sensitivity to misalignment. AdiOptica is locating in Adlershof, Berlin. Contact: Alexander Laskin, Project Manager, alex@adioptica.com; Vadim Laskin, General Manager, info@adioptica.com
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Aerotech, Inc.  #628
101 Zeta Drive, Pittsburgh, PA, 15238-2811 United States
+1 412 963 7470; fax +1 412 963 7459
sales@aerotech.com; http://www.aerotech.com
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Agilent Technologies, Inc.  #635
2850 Centerville Rd, Wilmington, DE, 19808-1610 United States
+1 302 636 2000; fax +1 302 633 8916
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11919 I-70 Frontage Rd N, #119, Wheat Ridge, CO, 80033 United States
+1 303 339 7500; fax +1 303 339 7501
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126 Baywood Avenue, Longwood, FL, 32750 United States
+1 407 339 4355; fax +1 407 334 3806
amri@analogmodules.com; www.analogmodules.com
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sales@aseoptics.com; www.aseoptics.com

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77 Danbury Rd, Wilton, CT, 06897-4407 United States
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Avantes, Inc.  #817
9769 W 119th Dr Ste 4, Broomfield, CO, 80021 United States
+1 303 410 8668; fax +1 303 410 8669
infousa@avantes.com; http://www.avantes.com
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sales@bwtek.com; http://www.bwtek.com
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+1 303 444 3602
info@bachresearch.com; www.bachresearch.com

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info@bnlinear.com; http://www.bnlinear.com

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CVI Melles Griot \#837
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200 Dorado Pl SE, Albuquerque, NM, 87123-3605 United States
+1 505 296 9541; fax +1 505 298 9908
orders@cvimellesgriot.com; http://www.cvimellesgriot.com

Featured Product: APEX and ASAP 2012 - Unmatched accuracy, capability, flexibility, and speed in optical software. APEX is a complete suite of optical design software that evolves with your business needs. PRO/D, an Optical Systems feature, enables optimal alignment in seconds. ASAP is a powerful, easy-to-use commercial software tool for the design of optical systems. ASAP 2012 is the latest version to include APEX. Contact: Ashley Gasque, Acquisitions Editor, Optical Sciences, ashley.gasque@taylorandfrancis.com; John Navas, Senior Acquisitions Editor, Physics, john.navas@informa.com

CVI Melles Griot – Optical Systems provides the complete solution from prototype to production, or any stage in between, delivering precision lens systems to its customers giving them the competitive advantage required to deliver the best product to market. Working seamlessly with the customer from start to finish ensures the perfect balance of performance, lifetime, and manufacturability. Contact: Tom Goundry, Product Manager, tgoundry@idexcorp.com

Featured Product: Optical Systems.

DURABLE, PRECISE OPTICAL FILTERS AND COATINGS FROM UV TO NEAR-IR

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College of Optical Sciences, The Univ. of Arizona \#1019
SPIE Corporate Member
1630 E University Blvd, Tucson, AZ, 85721-0095 United States
+1 520 621 4112; fax +1 520 626 1480
mail@optics1.com; http://www.optics.arizona.edu

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Featured Product: Optical Systems.

CIVI Melles Griot – Optical Systems provides the complete solution from prototype to production, or any stage in between, delivering precision lens systems to its customers giving them the competitive advantage required to deliver the best product to market. Working seamlessly with the customer from start to finish ensures the perfect balance of performance, lifetime, and manufacturability. Contact: Tom Goundry, Product Manager, tgoundry@idexcorp.com

Featured Product: Optical Systems.
Exhibition Guide

Diverse Optics Inc. #835
10310 Regis Ct., Rancho Cucamonga, CA, 91730 United States
+1 909 593 9330; fax +1 909 596 1452
info@diverseoptics.com; www.diverseoptics.com

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

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3901 Burton Dr, Santa Clara, CA, 95054 United States
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Electro Optics is Europe’s leading title for the photonics industry, covering business, applications and technology. Its feature-led content gives photonics entrepreneurs the information they need to stay at the cutting edge of the industry, enabling them to monitor trends, make the best of the latest technology, and learn where to invest next. Supported by a website and two email newsletters, Electro Optics is available free to qualifying individuals at www.electrooptics.com/subscribe. Contact: Warren Clark, Publishing Director, warren.clark@europascience.com; Jon Hunt, Advertising Sales Manager, jon.hunt@europascience.com

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+1 408 986 2410; fax +1 408 327 1300
ustechnologies@e6.com; www.e6.com

Featured Product: Polished CVD (chemical vapour deposited) Diamond products.

E6 fabricates and sells precision industrial diamond products. Products are made from engineered synthetic poly- and monocrystal diamond and diamond composites. Technologies using diamond include high power laser optics: laser exit windows, output couplers, beam splitters and novel YAG cooling. Other areas are: IR spectroscopy, thermal management, high energy particle detectors and scientific applications. Standard and custom engineered configurations are available to meet your requirements. Contact: Thomas Obeloer, Business Development Manager, thomas.obeloer@e6.com; Peter Santini, Business Development Manager, peter.santini@e6.com
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7 Constitution Way, Woburn, MA, 01801-1024 United States
+1 781 939 0763; fax +1 781 939 0769
info@energetiq.com; http://www.energetiq.com

Featured Product: Introduced a novel new technology for broadband DUV/VIS/NIR high brightness light source.
Energetiq Technology, Inc. is a developer and manufacturer of broadband light sources for use in analytical instrumentation. Energetiq has introduced a novel new technology for broadband DUV/VIS/NIR high brightness light source. The EQ-99 and EQ-1500 LDLS™ are Laser-Driven Light Sources that have a repeatable, long life with extremely stable output. Contact: Peter Dwyer, Global Sales Director, pdwyer@energetiq.com

Filmetrics, Inc.
3560 Dunhill St Ste 100, San Diego, CA, 92121 United States
+1 858 573 9300; fax +1 858 573 9400
mcdaniel@filmetrics.com; www.filmetrics.com

Featured Product: PARTS, Single-spot measurement system.
With PARTS we’ve added scatterometry and grazing-incidence reflectance to our already-powerful simultaneous reflectance-transmittance platform. The result is simple model-free measurement of thickness, n, and k of single-layer films! Full analysis of complex multilayer films is also possible with a single mouse click. Analysis of advanced thin-film applications, including Solar and OLEDs, benefit greatly from the combination of perpendicular (0°) and angled (70°) reflectance and transmittance. Contact: Midori McDaniel, International Marketing Associate, mcdaniel@filmetrics.com; Aaron Grabman, grabman@filmetrics.com

Flexible Optical BV (OKO Tech)
Polakweg 10-11, Rijswijk, 2288 GG Netherlands
+31 (0)70 262 9420; fax +31 (0)70 710 1400
oko@okotech.com; http://www.okotech.com

Featured Product: Technologies available from federal laboratories thru licensing; use of facilities; work for others.
The Federal Laboratory Consortium (FLC) is the nationwide network of federal laboratories providing the forum to develop strategies & opportunities for linking laboratory technologies & expertise with the marketplace. For the public & private sectors, the FLC brings all federal laboratories together with potential users of government-developed technologies. The Consortium creates an environment that adds value to & supports the technology transfer efforts of its members & potential partners. Contact: Thomas H. Brown, Program Manager, tbrown@utrs.com

Federal Laboratory Consortium for Technology Transfer
950 North Kings Hwy Suite 208, Cherry Hill, NJ, 08034 United States
+1 856 667 7727; fax +1 856 667 8009
info@federallabs.org; www.federallabs.org

Featured Product: Technologies available from federal laboratories thru licensing; use of facilities; work for others.
The Federal Laboratory Consortium (FLC) is the nationwide network of federal laboratories providing the forum to develop strategies & opportunities for linking laboratory technologies & expertise with the marketplace. For the public & private sectors, the FLC brings all federal laboratories together with potential users of government-developed technologies. The Consortium creates an environment that adds value to & supports the technology transfer efforts of its members & potential partners. Contact: Thomas H. Brown, Program Manager, tbrown@utrs.com

Filmetrics, Inc.
3560 Dunhill St Ste 100, San Diego, CA, 92121 United States
+1 858 573 9300; fax +1 858 573 9400
mcdaniel@filmetrics.com; www.filmetrics.com

Featured Product: PARTS, Single-spot measurement system.
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Flexible Optical BV (OKO Tech)
Polakweg 10-11, Rijswijk, 2288 GG Netherlands
+31 (0)70 262 9420; fax +31 (0)70 710 1400
oko@okotech.com; http://www.okotech.com

Featured Product: Technologies available from federal laboratories thru licensing; use of facilities; work for others.
The Federal Laboratory Consortium (FLC) is the nationwide network of federal laboratories providing the forum to develop strategies & opportunities for linking laboratory technologies & expertise with the marketplace. For the public & private sectors, the FLC brings all federal laboratories together with potential users of government-developed technologies. The Consortium creates an environment that adds value to & supports the technology transfer efforts of its members & potential partners. Contact: Thomas H. Brown, Program Manager, tbrown@utrs.com
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**Exhibition Guide**

**Fotofab**

3758 W Belmont Ave, Chicago, IL, 60618-5292 United States
+1 773 463 6211; fax +1 773 463 3387
sales@fotofab.com; http://www.fotofab.com

**Featured Product:** Fotofab produces precision thin metal parts in hours using photochemical etching.

Fotofab manufactures precision, thin metal parts to customer specifications using photochemical etching. Common applications include RF shields, step lids, screens, apertures, leadframes, enclosures, connector housings, and deposition masks. Using their unique process, Fotofab can achieve lower tooling costs and a quicker turnaround than traditional methods of manufacturing. Standard delivery is one week with same day delivery options available.

Contact: Dan Sima, Sales Manager, dsima@fotofab.com; James Tankersley, Sales Engineer, sales@fotofab.com

**Gentec Electro-Optics Inc.**

445 Saint-Jean-Baptiste Ste 160, Quebec, QC, G2R 5N7 Canada
+1 418 651 8003; fax +1 418 651 1107
info@gentec-eo.com; www.gentec-eo.com

**Georgia Tech Research Institute / SENSIC**

925 Dalney Street, Suite 102, Atlanta, GA, 30332-0870 United States
+1 404 407 7367; fax +1 404 407 9372
sensiac@gtri.gatech.edu; www.sensiac.org

**Featured Product:** Adv Materials, Sensor Technology, Prof Dev Courses, SENSIC Library, UAVs, IRCM, EW, Sensor Fusion.

GTRI is a highly-regarded applied research & development organization and an integral part of Georgia Tech, and as such, provides access to one of America’s leading research universities and the world’s leading problem solvers. SENSIC is a DoD Information Analysis Center at Georgia Tech whose objective is to facilitate the use of scientific/technical information related to military sensing technologies, i.e., EO/IR, LIDAR, Radar, Antennas, CBRNE, Syst Eng, MEMS, and Data Fusion, among others. Contact: John Devitt, SENSIC Director, john.devitt@gtri.gatech.edu; Ben Medlin, TAT Manager, ben.medlin@gtri.gatech.edu

**GPD Optoelectronics Corp**

7 Manor Parkway, Salem, NH, 03079 United States
+1 603 894 6865; fax +1 603 894 6866
sales@gpd-ir.com; www.gpd-ir.com

**G-S Plastic Optics**

408 St Paul St, Rochester, NY, 14605-1788 United States
+1 585 295 0200; fax +1 585 232 2314
info@gsoptics.com; http://www.gsoptics.com

**Featured Product:** Precision Polymer Optics.

G-S PLASTIC OPTICS manufactures precision polymer optics for imaging, scanning, detection, and illumination applications worldwide. In addition to an extensive catalog offering of precision polymer optics, the company has in-house capability to provide custom designed diamond turned and injection molded prototypes, production injection molding of optics, thin film and reflective coatings, and integrated optical solutions for a wide range of military, medical, commercial, and consumer markets.

Contact: Will Beich, Dir. New Business Development, wbeich@gsoptics.com

**Gulf Photonics, Inc.**

448 Commerce Blvd, Oldsmar, FL, 34677 United States
+1 813 855 6618; fax +1 813 855 6627
photonics@gulfphotonics.com; www.gulfphotonics.com/photonics

Gulf Photonics is a supplier of high quality, quick turn fiber optic assemblies for research and OEM use. We work with fused silica fiber and borosilicate fiber drawn in-house, offering a line of standard patch and bifurcated cables, reflection probes, and accessories, as well as a wide array of options for custom assemblies.

**Hamamatsu Corp.**

360 Foothill Rd, Bridgewater, NJ, 08807-2932 United States
+1 908 231 0960; fax +1 908 231 1539
usa@hamamatsu.com; http://www.sales.hamamatsu.com/

**Hardin Optical Co.**

87679 Kehl Rd, Bandon, OR, 97411 United States
+1 541 347 9467; fax +1 541 347 2611
optics@hardinoptical.com; http://www.hardinoptical.com

**Heidelberg Instruments Inc.**

2807 Oregon Ct Ste E2, Torrance, CA, 90503-2635 United States
+1 310 212 5071; fax +1 310 212 5254
sales@himt.de; http://www.himt.de

**Hellma USA, Inc.**

80 Skyline Dr, Plainview, NY, 11803-2518 United States
+1 516 939 0888; fax +1 516 939 0555
info@hellmausa.com; http://www.hellmausa.com

**Featured Product:** New Zeiss CGS Compact Spectrometer for industrial applications in the UV-NiR range.

Manufacturer of Hellma Optics, Photometer Cells, Fiber Optic Immersion Probes, Photometric Calibration Standards, Quartz Microplates, Calcium Fluoride and more. Optics include Cylindrical/Flat Optics, Beam Splitters and Mirrors for Laser and other applications. All types of standard and custom Spectroscopy Cells and accessories. CaF2 raw material for VUV/DUV/UV, Vis and IR applications. Supplier of Heraeus Light Sources and Zeiss MMS/MCS/PGS/CGS Spectrometers and OEM diaphragm gratings.

Contact: Evan Friedmann, Technical Sales, evan@hellmausa.com; Dan Fields, Sales Manager, dfields@hellmausa.com
Heraeus Quartz America LLC #1025
100 Heraeus Blvd, Buford, GA, 30518-3456 United States
+1 678 714 4350; fax +1 678 714 4355
sales.hqs.optics.us@heraeus.com; http://optics.heraeus-quarzglas.com

Featured Product: Spectrosil synthetic fused silica for deep UV applications and high power NIR lasers.

Heraeus is a leader in the manufacturing of high purity quartz materials and components, and produces various types of high purity fused silica for use in semiconductor manufacturing, telecommunications, optical, chemical, lamps and a variety of other advanced applications. Contact: David Gritz, Director of Sales, david.gritz@heraeus.com; Robert Sawyer, Account Manager, robert.sawyer@heraeus.com

Hinds Instruments, Inc. #618
7245 NW Evergreen Pkwy, Hillsboro, OR, 97124 United States
+1 503 690 2000; fax +1 503 690 3000
sales@hindsinstruments.com; http://www.hindsinstruments.com

Featured Product: New PEM-ATCTM -for long term stability and freedom from drift caused by ambient temperature changes.

Hinds Instruments is the polarization metrology specialist for applications including stress birefringence, MOKE, Stokes and Mueller Matrix polarimetry, fluorescence polarization, Faraday rotation, interferometry, and others. Hinds products include Exicor® birefringence measurement and hysteresis loop tracer systems, imaging systems, Mueller matrix polarimeters, and a complete line of polarization components including photoelastic modulators, optical choppers, detectors, and lock-in amplifiers. Contact: Connie Wimmer, Sales, cwimmer@hindsinstruments.com; Doug Mark, Sales, dmark@hindsinstruments.com

Hitachi High Technologies America, Inc. #531
5100 Franklin Dr, Pleasanton, CA, 94588-3355 United States
+1 800 548 9001; fax +1 925 218 2900
sales-LS@hitachi-hta.com; http://www.hitachi-hta.com

Featured Product: U-4100 UV-Visible-NIR Spectrophotometer

Hitachi High Technologies America, Inc., provides a wide array of advanced scientific instrumentation, including Variable Pressure/UHR Field Emission Scanning Electron Microscopes, Biological and Analytical Transmission Electron Microscopes, Focused Ion/Electron Beam Systems, Table Top Microscopes, Ion Milling sample preparation equipment, Data Storage Systems, HPLC, Preparative/Counter Current Chromatography systems, Amino Acid Analyzers, LC/MS and UV/FL Spectrophotometers. Contact: sales-ls@hitachi-hta.com; sales-ls@hitachi-hta.com

Infinite Optics, Inc. #622
1712-F Newport Cir, Santa Ana, CA, 92705-5118 United States
+1 714 557 2299; fax +1 714 557 2170
info@infiniteoptics.com; www.infiniteoptics.com

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: Geza Keller, Sales, geza@infiniteoptics.com; Stan King, Sales, stan@infiniteoptics.com

Inrad Optics, Inc. #935
181 Legrand Ave, Northvale, NJ, 07647 United States
+1 201 767 1910; fax +1 201 767 9644
sales@inradoptics.com; www.inradoptics.com

Inrad Optics manufactures exceptional crystalline materials, precision glass and metal optical components and photonic devices. Vertically integrated from growth through systems, products include BBO, KD*P, LiNbO3 Pockels Cells and Q-Switch elements, ZnGeP2 and UV crystal components, large precision transmission flats and mirrors, complex optical assemblies, X-ray monochromators, metal parabolas, and Be and AlBeMet mirrors. Contact: George Murray, West Coast Sales Manager, gmurray@inradoptics.com; Jeff Brunner, Sales Manager, Eastern US, jbrunner@inradoptics.com

Instrument Technology Research Ctr. #934
20 R&D Rd VI, Hsinchu Science Based Industrial Park, Hsinchu City, 300 Taiwan
+1 886 3 577 9911; fax +1 886 3 578 9343
emily@itrc.narl.org.tw; http://www.itrc.narl.org.tw/

Featured Product: Advanced optical, mechanical and electrical instruments.

National Instrument Technology Research Center (ITRC) is located in the worldwide renowned Hsinchu Science Park, Taiwan. The four main research fields ranged from electro-optics and remote sensing, nanotechnology and bio-medical, vacuum and thin-film technology, and instrumentation and auto-system engineering. The mission of ITRC is to establish and to innovate on cutting edge instruments and instrumentation technologies for the enhancement and promotion of national science competence. Contact: Chi-Hung Hwang, Deputy Director General, chhwang@itrc.narl.org.tw; Juowen Wang, Division Manager, juowen@itrc.narl.org.tw

IntraAction Corp. #426
3719 Warren Ave, Bellwood, IL, 60104-2055 United States
+1 708 547 6644; fax +1 708 547 0687
sales@intraaction.com; www.intraaction.com

IntraAction specializes in precision transmission flats and mirrors, complex optical assemblies, X-ray monochromators, metal parabolas, and Be and AlBeMet mirrors. Contact: John Spingler, Sales, johnspingler@intraaction.com; Emily Cragg, Marketing, emilycragg@intraaction.com; Stan King, Sales, stan@infiniteoptics.com
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IRCameras, LLC #437
30 S. Calle Cesar Chavez, Suite D, Santa Barbara, CA, 93103
+1 508 668 5650; fax +1 805 963 3858
sales@ircameras.com; www.ircameras.com
Featured Product: IRC900 & IRC800 MWIR nBn and InSb cameras for scientific, industrial and military applications.
IRCameras provides the most technologically advanced infrared imaging systems available for scientific, industrial and military applications. In addition to our extensive line-up of standard commercial cameras and IDCs, we offer custom design and build services to meet unique optical, packaging and space-constrained requirements. Contact: Eric Lovette, Marketing, eric.lovette@ircameras.com; Pattie Street, Manager, pattie@IRCameras.com

Iridian Spectral Technologies Ltd. #424
2700 Swansea Crescent, Ottawa, ON, K1G 6R8 Canada
+1 613 741 4513; fax +1 613 741 9986
inquiries@iridian.ca; www.iridian.ca
Iridian is a diversified optical filter manufacturer that is an international leader in filter design and manufacture, customized for application in the fields of fiber optic communications, optical spectroscopy, 3D entertainment, aerospace, among others. Iridian was recently ranked in the top 150 tech companies in Canada winning the 2010 Canada Export Achievement Award for the province of Ontario sponsored by Profit magazine together with Export Development Corporation (EDC). Contact: Catherine Aldous, Sales Engineer, catherine.aldous@iridian.ca

Isuzu Glass, Inc. #1018
23505 Crenshaw Blvd Ste 130, Torrance, CA, 90505-5225
United States
+1 310 517 1866; fax +1 310 517 1866
sales@isuzuglass.com; www.isuzuglass.com
Manufacturer of molded glass optical components, lenses, lens arrays, CPV secondary concentrators, CPC's, light pipes, fly eye lenses. Manufacturer and fabricator of optical filter glasses. Heat absorbing, laser safety,cuton/cut off, color compensation filter glasses. Customized filter glass capabilities. Moldable glasses for IR and UV transmission. Serving the Aerospace, Medical, Machine Vision, Military and Optical Instrumentation industries. Contact: Mike Preston, Sales Manager, mike@isuzuglass.com; Hiro Yokoi, Vice President, hiro@isuzuglass.com

ITT Exelis #624
400 Initiative Dr, Rochester, NY, 14606 United States
+1 585 269 5600; fax +1 585 269 5202
www.exelisinc.com
Featured Product: Precision optic component design and fabrication.
ITT Exelis Geospatial Systems is a global supplier of innovative night vision, remote sensing and navigation solutions that provide sight and situational awareness at the space, airborne, ground and soldier levels. Key applications include image intensification and thermal imaging; advanced power supplies; multi-spectral image systems; weather and climate monitoring; space science; C4ISR; GPS-based positioning, navigation and timing systems; and image exploitation software.

J.A. Woollam Co., Inc. #923
645 M Street, Ste 102, Lincoln, NE, 68508 United States
+1 402 477 7501
sales@jawoollam.com; www.jawoollam.com
Featured Product: Spectroscopic Ellipsometer.
The J.A. Woollam Company offers a wide range of spectroscopic ellipsometers for nondestructive materials characterization, including thin film thickness (single and multilayer), optical constants, composition, growth/etch rates, and more. Instruments available for research and manufacturing metrology covering spectral ranges from vacuum ultra-violet to far infrared. Offering table-top, in-line, and in-situ models.

JENOPTIK Optical Systems, Inc. #523
16490 Innovation Dr, Jupiter, FL, 33478-6428 United States
+1 561 881 7400; fax +1 561 881 1947
sales@jenoptik-inc.com; http://jenoptik-inc.com
JENOPTIK Optical Systems delivers a unique range of custom optical solutions ranging from precision assemblies to waferscale microoptics and in materials ranging from glasses, to crystals and polymers. Competencies include optical test, optical polishing, diamond turning and lithographic etching of materials for applications covering DUV to LWIR. We combine design and engineering with high volume manufacture at US and Global manufacturing sites in Germany and Israel. Contact: Ray Malcom, VP Sales & Marketing, ray.malcom@jenoptik-inc.com; Beth McDonald, Inside Sales Representative, beth.mcdonald@jenoptik-inc.com

KETEK GmbH #418
Hofer Str. 3, München, 81737 Germany
+49 89 673467 70; fax +49 89 673467 77
info@ketek.biz; http://www.ketek.net
Featured Product: KETEK presents a new SiPM series with areas 1mm to 36mm and Photon Detection Efficiency up to 60%.
KETEK, the world’s leading Silicon Drift Detector manufacturer, is now presenting a brand new Silicon Photo Multiplier (SiPM) series with active areas from 1mm to 36mm, microcell sizes from 20µm to 100µm with unprecedented Photon Detection Efficiency up to 60%, cross talk values down to 10% and low dark count rates together with a huge bias voltage range of stable operation. All KETEK SiPM modules feature reliable and cost efficient chip size packages (SMD or Pin type). Contact: Juergen Knobloch, Director Sales & Marketing, juergen.knobloch@ketek.net; Florian Wiest, R&D Manager Technology, Florian.wiest@ketek.net
L-3 Communications Corp. - Tinsley
4040 Lakeside Dr, Richmond, CA, 94806-1936 United States
+1 510 222 8110; fax +1 510 223 4534
sales@asphere.com; http://www.asphere.com
Manufacturer of custom precision optical components, assemblies and sub-systems. Fabricates complex aspheric surfaces for reflective and refractive systems from 50mm to 1.5 meters in size and a wide variety of materials, including glass, Be, Al and SiC. Founded in 1926 and also known in the industry as the “Asphere Company”, Tinsley has many years of experience fabricating precision optics in such areas as Space and Astronomy, Laser Fusion, Surveillance and Tactical applications. Contact: Clay Sylvester, Director of Contracts, Clay.sylvester@l-3com.com; John Barentine (“JB”), Director of Business Development, john.m.barentine@l-3com.com

Lake Shore Cryotronics, Inc.
575 McCorkle Blvd, Westerville, OH, 43082 United States
+1 614 891 2244; fax +1 614 818 1600
sales@lakeshore.com; http://www.lakeshore.com
Featured Product: New 8400 series AC / DC field Hall effect measurement system (HMS).
Established in 1968, Lake Shore Cryotronics is an international leader in developing innovative measurement and control solutions. Products include cryogenic temperature sensors and instrumentation, magnetic test equipment, as well as metrology system and probe stations used for characterizing the physical properties of materials. The new 8400 series Hall effect measurement system, with the unique AC field Hall measurement option, can characterize materials with mobilities down to 0.001 cm2/Vs. Contact: Sales, info@lakeshore.com

Lambda Research Corp.
25 Porter Rd, Littleton, MA, 01460-1434 United States
+1 978 486 0766; fax +1 978 486 0755
sales@lambdares.com; http://www.lambdares.com
Featured Product: TracePro 7.3, OSLO 6.6 and ScatterMaster Scatterscope will be demonstrated.
Lambda Research Corporation sets itself apart as a cost effective, single source solution for optical analysis and design. Lambda sells TracePro®, opto-mechanical software differentiated by its ease-of-use, CAD interface and accuracy in defense and security applications, OSLO®, renowned for its power and flexibility in lens design and the TracePro Bridge™, an integrated add-in for Solidworks. Lambda also distributes the ScatterScope3D™ scatterometer for fast and accurate surface measurement. Contact: Michael Gauvin, VP Sales, sales@lambdares.com

LEONI Fiber Optics, Inc.
209 Bullfants Blvd, Williamsburg, VA, 23188 United States
+1 757 258 4805; fax +1 757 258 4694
contact@leonifo.com; http://www.leonifo.com
Integrated global manufacturer of fiber optics, cables, assemblies, components, devices, class ll medical probes, switches (MM and SM), planar light channels (PLC), and Fiber Bragg Grating sensors. Concept to product, prototype to OEM, for laser, sensor, spectroscopic, test, validation, datacom, systems, or device level interconnects, from Factory Automation, Petrochem, Pharmaceutical to Wind and Solar, with manufacturing sites in the USA, Germany and China, LEONI is simply your source. Contact: Lisa Young, Industrial Sales Manager, contact@leonifo.com

Mad City Labs., Inc.
2524 Todd Dr, Madison, WI, 53713-2317 United States
+1 608 298 0855; fax +1 608 298 9525
sales@madcitylabs.com; http://www.madcitylabs.com
Mad City Labs designs and manufactures high precision, piezo based nanopositioning devices for research and industry. Our products offer innovative flexure guided designs, proprietary low drift PicoQ® sensor technology and closed loop control. System attributes include picometer precision, high speeds, real time position sensing. Suitable for inspection, metrology, microscopy, imaging and beam steering applications. Custom/ OEM specialists. Contact: Technical Sales, sales@madcitylabs.com; European Sales, sales@madcitylabs.eu

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+44 1865 843 383; fax +44 1865 843 933
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**#1223**

**Meadowlark Optics**

PO Box 1000, Frederick, CO, 80530 United States  
+1 303 833 4333; fax +1 303 833 4335  
sales@meadowlark.com; www.meadowlark.com  

**Featured Product**: RAPtor micro-thin retarder - Can be supplied on thin substrates or applied to your lens surface!

Your polarization experts for over 30 years, specializing in polarizers, retarders (waveplates), liquid crystal devices, Polarimeters, Tunable Optical Filters, and other innovative polarization technologies. We provide standard and custom solutions to your polarization needs, contact us.

sales@meadowlark.com / (303) 833-4333  
Contact: Dan Rodda, Program Manager, drodda@meadowlark.com; Chris Toomey, Sales Engineer, chris@meadowlark.com

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**MediVision Optics**

**#749**

1210 N Jefferson St Ste D, Anaheim, CA, 92807 United States  
+1 714 563 2772; fax +1 714 563 2711  
http://www.medivisionusa.com  

**Featured Product**: Micro prisms.

MediVision offers custom optics ranging from spherical, flat to multi-element systems. Sizes ranging from 0.5mm to 400mm. Our special capabilities include ground and polished aspheric lenses. Applications include industrial, medical, military, aerospace, measuring. We work with customers from prototype to production.  
Contact: Roxanne Johnson, OEM Optics Sales Manager, rjohnson@medivisionusa.com

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**Micro Laser Systems, Inc.**

**#522**

12841 Western Ave Ste H, Garden Grove, CA, 92841-4025 United States  
+1 714 898 6001; fax +1 714 897 0979  
sales@microlaser.com; http://www.microlaser.com  

**Featured Product**: Stabilized 638nm laser and Radiation Resistant Fiber Collimator.

We’re a manufacturer of high performance Free Space and Fiber Coupled Diode Laser Systems and Optical Systems ranging from 375nm to 2000nm and up to 5 Watts for OEM users or laboratory use. Narrow linewidths, very high stability and low noise define most lasers. Optical systems include Beam Expanders, Focusing optics, Isolators, Radial Polarizers and Fiber Collimators and Receivers. Custom laser-optical systems and fiber optic systems are routinely manufactured to meet your desired outcome.  
Contact: Norma Adachi, Marketing Dir., norma@microlaser.com

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**MICRONIX USA, LLC (formerly MICOS USA, LLC)**

**#634**

15375 Barranca Pkwy Ste E106, Irvine, CA, 92618 United States  
+1 949 480 0538 x701; fax +1 949 480 0538  
info@micronixusa.com; www.micronixusa.com

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**Mildex, Inc.**

**#524**

1388 Crittenden Rd, Rochester, NY, 14623-2308 United States  
+1 585 473 6540; fax +1 585 475 1971  
mildexeznet.net; http://www.mildex.com  

**Featured Product**: Trioptics OptiCentric-OptiSpheric PC-controlled optical testing and assembly workstation.

Available for demonstration is Trioptics OptiCentric, PC-controlled optical test and assembly station. The instrument can measure EFL, BFL, FFL, MTF, Radius and lens centering errors of single lenses or optical assemblies. Measurements are traceable to National Standards Institutes. Many useful optional modules are available, including automated cementing of achromats or triplets, lens thickness and air gap distance measurements of closed optical assemblies. Contact: Harvey Miller, President, mildexeznet.net

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**Mindrum Precision, Inc.**

**#1016**

10000 4th St, Rancho Cucamonga, CA, 91730-5723 United States  
+1 909 989 1728; fax +1 909 987 3709  
sales@mindrum.com; http://www.mindrum.com  

Founded in 1956, We are a Woman Owned Small Business, providing R&D to production of custom high precision components and assemblies. Current ISO 9001, ITAR Registered, AS9100 in process. We have 5-axis CNC machining and precision polishing of complex geometries, such as glass, fused silica, quartz, sapphire ceramics, aluminum, stainless steel, titanium, Inconel, copper and much more. We also do glass blowing, acid etching, Laser marking, precision assembly and packaging in a cleanroom enviro.

Contact: Linda Kondris, Technical Sales, linda@mindrum.com

---

**Minus K Technology Inc.**

**#1124**

460 S Hindry Ave Ste C, Inglewood, CA, 90301-2059 United States  
+1 310 348 9656; fax +1 310 348 9638  
sales@minusk.com; http://www.minusk.com  

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

Contact: David Platus, President, sales@minusk.com

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**MOXTEK, Inc.**

**#734**

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info@moxtek.com; http://www.moxtek.com  

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Contact: Roger Ketcheson, rketch@moxtek.com; Will Abraham, wabraham@moxtek.com
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14675 Lee Rd, Chantilly, VA, 20151-1715 United States +1 703 808 2769; fax +1 703 808 2646
nordii@nro.mil; www.nordii.westfields.net
Featured Product: NRO Director's Innovation Initiative (DII) Research & Development Funding Program.
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Contact: Gil Herlich, Program Manager, dii@nro.mil; Kevin Donaleski, Outreach, kevin.donaleski@nro.mil

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Optical Perspectives Group, LLC #742
7011 E Calle Tolosa, Tucson, AZ, 85750 United States
+1 520 529 2950
reparks@optiper.com; www.optiper.com

Featured Product: Point Source Microscope measures centering errors, alignment, roughness and film thickness.

Optical Perspectives Group, LLC is a consulting firm specializing in the hardware aspects of optical assembly, testing and alignment. In support of these functions, OPG markets three products; the Point Source Microscope (PSM) used for the alignment of optics and optical systems, the MicroFinish Topographer (MFT) for measuring surface finish and the CaliBall, an artifact used for calibrating interferometer transmission spheres using the random ball test. Contact: Bob Parks, President, reparks@optiper.com

Optical Reference Lab., Inc. #826
201 Lindo Pl, Davis, CA, 95616 United States
+1 530 753 4358
info@opticalreferencelab.com; opticalreferencelab.com

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+1 530 753 4358
info@opticalreferencelab.com; opticalreferencelab.com

Featured Product: Point Source Microscope measures centering errors, alignment, roughness and film thickness.

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3711 Market St, Philadelphia, PA, 19104-5504 United States
+1 215 966 6252
info@optofluidicscorp.com; www.optofluidicscorp.com

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+1 203 925 4600
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Photon etc. Inc. #728
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SPIE Corporate Member
3600 W Moore Ave, Santa Ana, CA, 92704 United States
+1 714 540 0126; fax +1 714 540 1482
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1090 Delacroix Cir, Nokomis, FL, 34275 United States
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convince.eo98g@g2.nctu.edu.tw

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+886 2 3366 5100
guang198983@gmail.com

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Tiruchirappalli, Tamilnadu, 620015 India
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**Northwestern Univ.**
2145 Sheridan Road, Evanston, IL, 60201 United States
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Schlossplatz 19, Karlsruhe, 76131 Germany
publicrelations@optics-karlsruhe.de; www.optics-karlsruhe.de

**Samara Student Chapter**
Karl Marks Str 20-30, Samara, Samara oblast, 443096 Russian Federation
+7 846 241 0554
lunevnn@gmail.com

**Shanghai Institute of Optics and Fine Mechanics**
Qinghe Road, Shanghai, 201800 China
+8 6159215698e 012
isaac@siom.ac.cn

**Silesian Univ. of Technology**
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+48 32 237 2902
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**Singapore Student Chapter**
Researcher Room 2(N3-b3a), 50 Nanyang Avenue, Singapore,
639798 Singapore
zh0009ui@e.ntu.edu.sg

**St. Petersburg State Univ. of Aerospace Instrumentation**
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+3734216
vasilykazakov@mail.ru

**Stellenbosch University**
Merensky str, Stellenbosch, Western Cape, 7602 South Africa
vonfotow@sun.ac.za

**Taurida National VI Vernadsky Univ.**
4 Vernadsky Av, Simferopol, 95007 Ukraine
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simplexx.87@tmail.com; www.vortex.crimea.edu/spie/index.html

**Technical University of Denmark**
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+45 4525 6252
fdro@fotonik.dtu.dk; http://www.fotonik.dtu.dk/English/Education/Studying_at_COM/SPIE%20student%20chapter.aspx

**The Pennsylvania State Univ.**
121 Electrical Engineering East, University Park, PA, 16802 United States
jty112@psu.edu; spie.ee.psu.edu
Student Chapter Exhibits

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gregorymahan@yahoo.com

Tsinghua Univ.
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px-li08@mails.tsinghua.edu.cn

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UGent
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sandeep.kalathimekkad@ugent.be

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9301 Chiselhurst Rd., 9201 University City Blvd., Charlotte, NC, 28223-0001 United States
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gbabaie@uncc.edu

Univ. Autonoma de Nuevo Leon
Av. Universidad S/N Cd. Universitaria, San Nicolas de los Garza, Nuevo Leon, NL, 66451 Mexico
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marlene.viera.gzz@gmail.com; spie-uanl.net

Univ. College Dublin
324 UCD School of Electrical, Electronic & Mech Engg UCD
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sluhi@gmail.com

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Univ. Nacional de Colombia - Medellin
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ceomede@gmail.com; www.unalmed.edu.co/-ceomedellin/

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275 Fitzpatrick Hall, Notre Dame, IN, 46556 United States
spie@nd.edu; nd.edu/~spie

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urspie@gmail.com

Vilnius University
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vytenispr@gmail.com

Vinnitsa National Technical Univ.
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spie@vstu.vinnica.ua; spie.opto.com.ua

Vrije Univ. Brussel
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spieofficers@b-phot.org; http://www.b-phot.org/www/Education-Photonics/ Studying-B-Phot/SPIE-Student-Chapter

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SPIE reserves the right to cancel a course due to insufficient advance registration.
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<tbody>
<tr>
<td><strong>Advanced Metrology</strong></td>
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<tr>
<td>SC1003 Optical Scatter Metrology for Industry (Stover) 1:30 to 5:30 pm, $410 / $485</td>
<td>SC213 Introduction to Interferometric Optical Testing (Wyant) 8:30 am to 12:30 pm, $380 / $435</td>
<td>SC017 Principles of Fourier Optics and Diffraction (Gaskill) 8:30 am to 5:30 pm, $680 / $795</td>
<td>NEW SC1080 Modeling and Simulation with Computational Fourier Optics (Voelz) 8:30 am to 5:30 pm, $575 / $690</td>
<td>SC211 Practical Interferometry and Fringe Analysis (Creath) 8:30 am to 5:30 pm, $575 / $690</td>
<td>SC492 Predicting, Modeling, and Interpreting Light Scattered by Surfaces (Germer) 1:30 to 5:30 pm, $350 / $405</td>
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<tr>
<td><strong>Atmospheric and Space Optical Systems</strong></td>
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<tr>
<td>NEW SC1071 Understanding Diffractive Optics (Soskind) 1:30 to 5:30 pm, $385 / $440</td>
<td>NEW SC468 Image Enhancement, Deblurring and Super-Resolution (Rabbani) 8:30 am to 5:30 pm, $575 / $690</td>
<td>SC916 Digital Camera and Sensor Evaluation Using Photon Transfer (Janesick) 8:30 am to 5:30 pm, $625 / $740</td>
<td>NEW SC1080 Modeling and Simulation with Computational Fourier Optics (Voelz) 8:30 am to 5:30 pm, $575 / $690</td>
<td>SC915 Radiometry Revealed (Shaw) 8:30 am to 12:30 pm, $350 / $405</td>
<td>SC567 Introduction to Optical Remote Sensing Systems (Shaw) 1:30 to 5:30 pm, $350 / $405</td>
</tr>
<tr>
<td>NEW SC967 High Dynamic Range Imaging: Sensors and Architectures (Darmont) 1:30 to 5:30 pm, $395 / $450</td>
<td>SC1043 Shaping Light, with applications in Advanced Microscopy and Optical Trapping (Dholakia, Spalding) 1:30 to 5:30 pm, $350 / $405</td>
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<tr>
<td><strong>Detectors and Imaging Devices</strong></td>
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<tr>
<td>SC504 Introduction to CCD and CMOS Imaging Sensors and Applications (Janesick) 8:30 am to 5:30 pm, $715 / $830</td>
<td>SC916 Digital Camera and Sensor Evaluation Using Photon Transfer (Janesick) 8:30 am to 5:30 pm, $625 / $740</td>
<td>SC915 Radiometry Revealed (Shaw) 8:30 am to 12:30 pm, $350 / $405</td>
<td>SC915 Radiometry Revealed (Shaw) 8:30 am to 12:30 pm, $350 / $405</td>
<td>SC567 Introduction to Optical Remote Sensing Systems (Shaw) 1:30 to 5:30 pm, $350 / $405</td>
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<tr>
<td>NEW SC967 High Dynamic Range Imaging: Sensors and Architectures (Darmont) 1:30 to 5:30 pm, $395 / $450</td>
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<tr>
<td><strong>Illumination Engineering</strong></td>
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<tr>
<td>NEW SC1071 Understanding Diffractive Optics (Soskind) 1:30 to 5:30 pm, $385 / $440</td>
<td>SC388 Non-Imaging Optics (Winston) 1:30 to 5:30 pm, $350 / $405</td>
<td>SC011 Design of Efficient Illumination Systems (Cassarly) 8:30 am to 12:30 pm, $350 / $405</td>
<td>SC915 Radiometry Revealed (Shaw) 8:30 am to 12:30 pm, $350 / $405</td>
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<tr>
<td>NEW SC1071 Understanding Diffractive Optics (Soskind) 1:30 to 5:30 pm, $385 / $440</td>
<td>NEW SC468 Image Enhancement, Deblurring and Super-Resolution (Rabbani) 8:30 am to 5:30 pm, $575 / $690</td>
<td>SC916 Digital Camera and Sensor Evaluation Using Photon Transfer (Janesick) 8:30 am to 5:30 pm, $625 / $740</td>
<td>NEW SC1080 Modeling and Simulation with Computational Fourier Optics (Voelz) 8:30 am to 5:30 pm, $575 / $690</td>
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</tbody>
</table>
# Course Daily Schedule

## NanoEngineering

<table>
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<tbody>
<tr>
<td></td>
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<td><strong>NEW</strong> SC1003 Optical Scatter Metrology for Industry (Stover) 1:30 to 5:30 pm, $410 / $465</td>
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<tr>
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<td><strong>NEW</strong> SC1082 Nanophotonics and Metaphotonics (Prasad) 2:00 to 6:00 pm, $350 / $405</td>
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## Nanoscience

<table>
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<tr>
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<tbody>
<tr>
<td></td>
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<td></td>
<td><strong>NEW</strong> SC1082 Nanophotonics and Metaphotonics (Prasad) 2:00 to 6:00 pm, $350 / $405</td>
<td>SC1043 Shaping Light, with applications in Advanced Microscopy and Optical Trapping (Dholakia, Spalding) 1:30 to 5:30 pm, $350 / $405</td>
<td></td>
</tr>
<tr>
<td>SC727 Nanoplasmonics (Stockman) 8:30 am to 5:30 pm, $575 / $690</td>
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## Optical Design and Systems Engineering

<table>
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</thead>
<tbody>
<tr>
<td>SC690 Optical System Design: Layout Principles and Practice (Greivenkamp) 8:30 am to 5:30 pm, $685 / $800</td>
<td>SC835 Infrared Systems - Technology &amp; Design (Daniels) 8:30 am to 5:30 pm, $1195 / $1450</td>
<td>SC1065 Introduction to Optical Alignment Techniques (Ruda) 8:30 am to 5:30 pm, $1050 / $1305</td>
<td>SC912 Intermediate Lens Design (Bentley) 8:30 am to 5:30 pm, $660 / $775</td>
<td><strong>NEW</strong> SC1080 Modeling and Simulation with Computational Fourier Optics (Voelz) 8:30 am to 5:30 pm, $575 / $690</td>
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<tr>
<td>SC221 Optomechanics and Tolerancing of Instruments (Hattheway) 8:30 am to 5:30 pm, $575 / $690</td>
<td>SC156 Basic Optics for Engineers (Boreman) 8:30 am to 5:30 pm, $615 / $730</td>
<td>SC947 Cost-Conscious Tolerancing of Optical Systems (Youngworth, Contreras) 8:30 am to 5:30 pm, $575 / $690</td>
<td><strong>NEW</strong> SC1080 Modeling and Simulation with Computational Fourier Optics (Voelz) 8:30 am to 5:30 pm, $575 / $690</td>
<td>SC211 Practical Interferometry and Fringe Analysis (Creath) 8:30 am to 5:30 pm, $575 / $690</td>
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<tr>
<td>SC321 Thin Film Optical Coatings (Macleod) 8:30 am to 5:30 pm, $350 / $405</td>
<td>SC017 Principles of Fourier Optics and Diffraction (Gaskill) 8:30 am to 5:30 pm, $680 / $795</td>
<td>SC003 Practical Optical System Design (Youngworth) 8:30 am to 5:30 pm, $655 / $775</td>
<td>SC915 Radiometry Revealed (Shaw) 8:30 am to 12:30 pm, $350 / $405</td>
<td>SC506 Introduction to Optical Remote Sensing Systems (Shaw) 1:30 to 5:30 pm, $350 / $405</td>
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<tr>
<td>SC388 Non-Imaging Optics (Winston) 1:30 to 5:30 pm, $350 / $405</td>
<td>SC909 Basic Optics for Non-Optics Personnel (Harding) 1:30 to 4:00 pm, $150 / $200</td>
<td>SC492 Predicting, Modeling, and Interpreting Light Scattered by Surfaces (Germer) 1:30 to 5:30 pm, $350 / $405</td>
<td>SC003 Practical Optical System Design (Youngworth) 8:30 am to 5:30 pm, $655 / $775</td>
<td>SC388 Non-Imaging Optics (Winston) 1:30 to 5:30 pm, $350 / $405</td>
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<tr>
<td>SC1003 Optical Scatter Metrology for Industry (Stover) 1:30 to 5:30 pm, $410 / $465</td>
<td>SC1043 Shaping Light, with applications in Advanced Microscopy and Optical Trapping (Dholakia, Spalding) 1:30 to 5:30 pm, $350 / $405</td>
<td>SC003 Practical Optical System Design (Youngworth) 8:30 am to 5:30 pm, $655 / $775</td>
<td>SC915 Radiometry Revealed (Shaw) 8:30 am to 12:30 pm, $350 / $405</td>
<td>SC388 Non-Imaging Optics (Winston) 1:30 to 5:30 pm, $350 / $405</td>
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</tbody>
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Legend for Education Products:
Price = SPIE Member / Non-Member
SC000 = Course Number
WS000 = Workshop Number

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### Optomechanics and Optical Manufacturing

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Schedule</th>
<th>Fee</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC014</td>
<td>Introduction to Optomechanical Design</td>
<td>Vukobratovich</td>
<td>8:30 am to 5:30 pm</td>
<td>$1050 / $1305</td>
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<tr>
<td>SC010</td>
<td>Introduction to Optical Alignment Techniques</td>
<td>Ruda</td>
<td>8:30 am to 5:30 pm</td>
<td>$1050 / $1305</td>
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<tr>
<td>SC221</td>
<td>Optomechanics and Tolerancing of Instruments (Matheway)</td>
<td>Ruda</td>
<td>8:30 am to 5:30 pm, $575 / $690</td>
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<tr>
<td>SC015</td>
<td>Structural Adhesives for Optical Bonding (Daly)</td>
<td>Ruda</td>
<td>8:30 am to 12:30 pm, $350 / $405</td>
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<tr>
<td>SC321</td>
<td>Thin Film Optical Coatings (Macleod)</td>
<td>Ruda</td>
<td>8:30 am to 5:30 pm, $575 / $690</td>
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<tr>
<td>SC218</td>
<td>Advanced Composite Materials for Optomechanical Systems (Zweben)</td>
<td>Ruda</td>
<td>8:30 am to 5:30 pm, $575 / $690</td>
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<tr>
<td>SC211</td>
<td>Practical Interferometry and Fringe Analysis (Creath)</td>
<td>Ruda</td>
<td>8:30 am to 5:30 pm, $575 / $690</td>
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<td>Ruda</td>
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### Remote Sensing

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<tr>
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<tbody>
<tr>
<td>SC835</td>
<td>Infrared Systems - Technology &amp; Design (Daniels)</td>
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<td>8:30 am to 5:30 pm, $1195 / $1450</td>
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<td>Ruda</td>
<td>8:30 am to 5:30 pm, $575 / $690</td>
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<tr>
<td>SC156</td>
<td>Basic Optics for Engineers (Boreman)</td>
<td>Ruda</td>
<td>8:30 am to 5:30 pm, $615 / $730</td>
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<tr>
<td>SC916</td>
<td>Digital Camera and Sensor Evaluation Using Photon Transfer (Janesick)</td>
<td>Ruda</td>
<td>8:30 am to 5:30 pm, $625 / $740</td>
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<tr>
<td>SC604</td>
<td>Introduction to CCD and CMOS Imaging Sensors and Applications (Janesick)</td>
<td>Ruda</td>
<td>8:30 am to 5:30 pm, $715 / $830</td>
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<tr>
<td>SC604</td>
<td>Introduction to CCD and CMOS Imaging Sensors and Applications (Janesick)</td>
<td>Ruda</td>
<td>8:30 am to 5:30 pm, $715 / $830</td>
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<tr>
<td>SC915</td>
<td>Radiometry Revealed (Shaw)</td>
<td>Ruda</td>
<td>8:30 am to 12:30 pm, $350 / $405</td>
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### Solar Energy + Technology

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<tr>
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<tr>
<td>SC321</td>
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<td>Ruda</td>
<td>8:30 am to 5:30 pm, $575 / $690</td>
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<tr>
<td>SC388</td>
<td>Non-Imaging Optics (Winston)</td>
<td>Ruda</td>
<td>1:30 am to 5:30 pm, $350 / $405</td>
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<tr>
<td>SC1003</td>
<td>Optical Scatter Metrology for Industry (Stover)</td>
<td>Ruda</td>
<td>1:30 am to 5:30 pm, $410 / $485</td>
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<tr>
<td>SC910</td>
<td>Design and Reliability of Photovoltaic Modules (Ghore, Kempe)</td>
<td>Ruda</td>
<td>8:30 am to 12:30 pm, $350 / $405</td>
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<tr>
<td>SC492</td>
<td>Predicting, Modeling, and Interpreting Light Scattered by Surfaces (Germer)</td>
<td>Ruda</td>
<td>1:30 am to 5:30 pm, $350 / $405</td>
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<tr>
<td>SC915</td>
<td>Radiometry Revealed (Shaw)</td>
<td>Ruda</td>
<td>8:30 am to 12:30 pm, $350 / $405</td>
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<tr>
<td><strong>X-Ray, Gamma-Ray, and Particle Technologies</strong></td>
<td>SC1003 Optical Scatter Metrology for Industry (Stover) 1:30 to 5:30 pm, $410 / $465</td>
<td>SC213 Introduction to Interferometric Optical Testing (Wyant) 8:30 am to 12:30 pm, $380 / $435</td>
<td>SC211 Practical Interferometry and Fringe Analysis (Creath) 8:30 am to 5:30 pm, $575 / $690</td>
<td>SC492 Predicting, Modeling, and Interpreting Light Scattered by Surfaces (Germer) 1:30 to 5:30 pm, $350 / $405</td>
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<tr>
<td><strong>Business and Professional Development</strong></td>
<td>NEW WS1058 Critical Skills for Compelling Research Proposals (Diehl) 1:30 to 5:30 pm, $125 / $175</td>
<td>WS897 Effective Technical Presentations (Doumont) 8:30 am to 12:30 pm, $125 / $175</td>
<td>NEW WS1059 Resumes to Interviews: Strategies for a Successful Job Search (Lawson, Krinsky) 8:30 am to 12:30 pm, $125 / $175</td>
<td>WS609 Basic Optics for Non-Optics Personnel (Harding) 1:30 to 5:00 pm, $150 / $200</td>
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<td>NEW WS1081 KHET in the Classroom - Teaching Optics Principles using The Laser Game: KHET 2.0 (Larson) 8:30 am to 12:30 pm, $50 / $75</td>
<td>WS611 Optics Magic - Easy Demonstrations from the PHOTON Projects (Donnelly, Magnani) 1:30 to 4:30 pm, $10 / $20</td>
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Visit Photonics for a Better World on the Exhibition Floor

San Diego Convention Center, Exhibition Hall, Booth #1323
Tuesday – Thursday, during exhibition hours.

Photonics for our future

OPTICS OUTREACH OLYMPICS 2012
See products of the future. Chapters bring their expertise and enthusiasm for their optics demonstrations.

Building the Future with Light
Hear results of the recently released National Academies study on trends and challenges in optical science including grand challenges and the impact of photonics on the U.S. economy. Q&A to follow the presentation. Open to the public.

Photonics for fun

Khet 2.0
The Laser Game
Khet is a laser game that combines lasers with classic strategy. The ultimate goal is to illuminate your opponent’s pharaoh while shielding yours from harm!
Photonics for the betterment of the global community

LASER Classroom Brings STEM to Light with products, curriculum and resources for teaching and learning about light, lasers, photonics and optics across the 9-12 grade curriculum.

Photonics explorer

Giving science teachers at Europe’s secondary schools free and up-to-date educational materials that engage, excite and educate students about the fascination of working with light.

InSPIRE

The Institute for Solar Photovoltaic Innovation, Research, and Education

Our mission is to promote research, development, workforce training, and technology commercialization within the solar and renewable energy industry in Illinois.
Panel Discussion:

Getting Hired in 2012 and Beyond
Exhibition Hall, Presentation Area
Tuesday 14 August ........................................ 2:30 to 3:30 pm
Learn about the corporate hiring process directly from professionals in the optics and photonics sector.

Career Development through SPIE Involvement
Exhibition Hall Presentation Area
Wednesday, 15 August ................................. 3:00 to 3:45 pm
Get plugged in to the SPIE community! SPIE has volunteer opportunities at all levels of the organization. Come to this informal session to learn what opportunities best match your interests and career plans.

Basic Optics for Non-Optics Personnel
WS609
Introductory, CEU .30 $100 / $150 USD, Tuesday 1:30 to 4:00 pm
This course will provide the technical manager, sales engineering, marketing staff, or other non-optics personnel with a basic, non-mathematical introduction to the terms, specifications, and concepts used in optical technology to facilitate effective communication with optics professionals on a functional level. Topics to be covered include basic concepts such as imaging, interference, diffraction, polarization, and aberrations, definitions relating to color and optical quality, and an overview of the basic measures of optical performance such as MTF and wavefront error. The material will be presented with a minimal amount of math, rather emphasizing working concepts, definitions, rules of thumb, and visual interpretation of specifications. Specific applications will include defining basic imaging needs such as magnification, depth-of-field, and MTF as well as the definitions of radiometric terms.

LEARNING OUTCOMES
This course will enable you to:
• read optical system descriptions and papers
• ask the right questions about optical component performance
• describe basic optical specifications for lenses, filters, and other components
• assess differences in types of filters, mirrors and beam directing optics
• know how optics is used in our everyday lives

INTENDED AUDIENCE
This course is intended for the non-optical professional who needs to understand basic optics and interface with optics professionals.

INSTRUCTOR
Kevin Harding has been active in the optics industry for over 30 years, and has taught machine vision and optical methods for over 25 years in over 70 workshops and tutorials, including engineering workshops on machine vision, metrology, NDT, and interferometry used by vendors and system houses to train their own engineers. He has been recognized for his leadership in optics and machine vision by the Society of Manufacturing Engineers, Automated Imaging Association, and Engineering Society of Detroit. Kevin is a Fellow of SPIE and was the 2008 President of the Society. This course is also available in online format.

Critical Skills for Compelling Research Proposals
WS1058
Introductory, CEU .35 $75 / $125 USD, Sunday 1:30 to 5:30 pm
Research costs money. The good news is that there are thousands of avenues of financial support. The bad news is that hundreds of thousands of proposals are competing for those funds. This class will teach you to craft high-quality proposals that stand out from the masses. We will focus on five fundamental skills that will bolster the substance, structure, and appearance of your proposals. Adhering to these practices will dramatically increase your odds of winning funding for your research.

LEARNING OUTCOMES
This course will enable you to:
• identify funding opportunities that align with your research goals
• develop solid research plans and believable budgets
• communicate your research to a general audience
• write in a clear, concise, and compelling manner
• format your proposal for visual appeal

INTENDED AUDIENCE
This course is intended for all scientists and engineers seeking to improve the quality of their research proposals.

INSTRUCTOR
Damon Diehl is Assistant Professor and Coordinator for the Optical Systems Technology program at Monroe Community College in Rochester, NY and also the founder and owner of Diehl Research Grant Services. He has a Ph.D. in optical engineering from the University of Rochester Institute of Optics and a B.A. in physics from the University of Chicago. His class is based on fifteen years of academic and industrial research experience.

This course is free to SPIE Student Members, but you must register to attend.

Resumes to Interviews: Strategies for a Successful Job Search
WS1059
Introductory, CEU .35 $75 / $125 USD, Tuesday 8:30 am to 12:30 pm
This course reviews effective strategies and techniques for a successful job search such as: compiling resumes, writing cover letters, and interviewing tips. The primary goal of the course is to provide creative and proven techniques for new college graduates and professionals to plan and conduct their job search and secure a job.

Creative and comprehensive job search techniques will be discussed as well as actual resume and interviewing examples and tips. Anyone who is getting ready to enter the work force who wants to answer questions such as, “when and how do I start my job search?”, “what kind of cover letter and resume gets noticed?” or “how do I sell myself in an interview?” will benefit from taking this course.

LEARNING OUTCOMES
This course will enable you to:
• start and create your job search plan
• create an online networking presence
• build and write effective cover letters and resumes that get noticed
• avoid common resume and cover letter mistakes
• interview with confidence

INTENDED AUDIENCE
This course is intended for all scientists and engineers seeking to improve the quality of their research proposals.

INSTRUCTOR
Kevin Harding has been active in the optics industry for over 30 years, and has taught machine vision and optical methods for over 25 years in over 70 workshops and tutorials, including engineering workshops on machine vision, metrology, NDT, and interferometry used by vendors and system houses to train their own engineers. He has been recognized for his leadership in optics and machine vision by the Society of Manufacturing Engineers, Automated Imaging Association, and Engineering Society of Detroit. Kevin is a Fellow of SPIE and was the 2008 President of the Society. This course is also available in online format.
Effective Scientific Papers
WS908
Introductory, CEU .35 $75 / $125 USD, Monday 1:30 to 5:30 pm
Strong writing skills are a key to success for researchers. This course proposes a methodology that will take you from scratch to an effective scientific or technical document—a question of structure, not style. The approach is applicable across languages and for a wide range of document types beyond scientific papers, too.

LEARNING OUTCOMES
This course will enable you to:
• plan your document efficiently
• create an effective abstract, introduction, and conclusion
• organize your material into an accessible structure
• construct paragraphs that get the message across
• write sentences that are easy to read

INTENDED AUDIENCE
This material is intended for anyone who must write or edit technical documents in general and scientific papers in particular. Both novice and experienced writers can expect to learn much from it.

INSTRUCTOR
Jean-luc Doumont runs lectures, workshops, and training programs in oral, written, and graphical communication for engineers, scientists, and managers worldwide. He is an engineer from the University of Louvain and a doctor in applied physics from Stanford University. This course is based on his popular lectures on oral presentations at over 15 top-ranked engineering schools (MIT, Stanford U, UC Berkeley, Caltech, Harvard, etc.).

This course is free to SPIE Student Members, but you must register to attend.

Effective Technical Presentations
WS897
Introductory, CEU .35 $75 / $125 USD, Monday 8:30 am to 12:30 pm
Oral presentation skills are a key to success for researchers. This course proposes a five-step methodology that will take you from scratch to an effective technical presentation. It also offers tips on how to manage the nervousness associated with speaking in public.

LEARNING OUTCOMES
This course will enable you to:
• plan your presentation efficiently
• organize your material into an effective structure
• create slides that get the message across
• deliver your presentation effectively, both verbally and nonverbally
• handle even the most difficult questions

INTENDED AUDIENCE
This material is intended for anyone who must prepare and deliver oral presentations. Both novice and experienced speakers can expect to learn much from it.

INSTRUCTOR
Jean-luc Doumont runs lectures, workshops, and training programs in oral, written, and graphical communication for engineers, scientists, and managers worldwide. He is an engineer from the University of Louvain and a doctor in applied physics from Stanford University. This course is based on his popular lecture on oral presentations at over 15 top-ranked engineering schools (MIT, Stanford U, UC Berkeley, Caltech, Harvard, etc.).

This course is free to SPIE Student Members, but you must register to attend.
SPIE Career Center

Career Advancement Made Easy

The SPIE Career Center offers:

- Free online job search
  All job seeker functions are available at no charge.
- Confidential resume posting
  Make your resume available to employers, and release your contact information only when you are ready.
- Job search agent
  Create a password-protected account and receive automatic email notification of new jobs that match your search criteria.
- Saved jobs capability
  Save up to 100 jobs to a folder in your account so you can come back to apply when you are ready.

SPIE Career Center makes finding the perfect job easy.

Post Your Resume Today.

spie.org/CareerCenter

Contact Sara Liebert  ·  +1 360 715 3705, JobSales@spie.org, spie.org/CareerCenter
General Information

Registration

Exhibition Hours
Convention Center, Exhibition Hall A, B1
Tuesday 14 August .................. 10:00 am to 5:00 pm
Wednesday 15 August ................. 10:00 am to 5:00 pm
Thursday 16 August .................. 10:00 am to 2:00 am

Onsite Registration and Information Hours
Convention Center, Registration Hall A, B1
Sunday 12 August .................. 7:00 am to 5:00 pm
Monday 13 August .................. 7:15 am to 5:00 pm
Tuesday 14 August .................. 7:30 am to 5:00 pm
Wednesday 15 August ................. 7:30 am to 5:00 pm
Thursday 16 August .................. 7:45 am to 4:00 pm

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.

SPIE Cashier
Registration Area
Open during registration hours

Registration Payments
If you are paying by cash or check as part of your onsite registration, wish to add a course, workshop, or special event requiring payment, or have questions regarding your registration, visit the SPIE Cashier.

Receipts and Certificate of Attendance
Preregistered attendees who did not receive a receipt or attendees who need a Certificate of Attendance may obtain those from the SPIE Cashier.

Badge Corrections
Badge corrections can be made by the cashier. Please have your badge removed from the badge holder, marked with your changes, and ready to hand to the attendant upon approaching the counter.

Food and Beverage Services

Coffee Breaks
Complimentary coffee will be served in the Exhibition Hall.
Tuesday and Wednesday .................. 10:00 am and 3:00 pm
Thursday ........................................ 10:00 am
Please check the individual technical conference listings for exact times.

Attendee Services

Internet Stations and WiFi
Internet station - Convention Center, Registration Area, Hall B1
WiFi - B1 Lobby and in Upper Level Lobbies
Complimentary wired Internet access is available; attendees can hook up their laptops or use provided workstations. Complimentary wireless access will also be available; locations and instructions will be posted onsite.

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

Sponsored by

SPIE Bookstore
Convention Center, Hall A
The SPIE Bookstore is your source for the latest SPIE Press books, proceedings, and education and professional development materials. Become an SPIE Member, explore the Digital Library, take home a free SPIE poster, or buy a souvenir (tie, t-shirt, educational toys, and more).

SPIE Education Services
Convention Center, Hall A
Browse course offerings and the other education services available: SPIE courses, videos, and CDs as well as customized in-company courses.

SPIE Press Room
Convention Center, Hall A
Open during Registration hours
For Registered Press only. The Press Room provides meeting space, refreshments, access to exhibitor press releases, and Internet connections. Press are urged to register before the meeting by emailing name, contact information, and name of publication to media@spie.org. Preregistration closes approximately 10 days before the start of the event.
General Information

SPIE Job Fair – Special 2-Day Event
Exibition Hall
Tuesday 14 August ........................ 10:00 am to 5:00 pm
Wednesday 15 August ...................... 10:00 am to 5:00 pm
For more information see page 4.

SPIE Luggage and Coat Check
Convention Center – Hall A Lobby
Sunday through Thursday
Complimentary luggage, package, and coat storage are available. Please note hours; no late pickup available.

SPIE Copy Center
Convention Center – Hall A
Open during Registration hours
San Diego Copy will provide a copy service during the week for symposium attendees. The rate is 5 cents per copy.

Business Center
FedEx Kinko’s, Convention Center, Hall A
Monday through Thursday
Services include photocopying, faxing, printing services, and shipping. Office supplies are also available. Phone 619-525-5477.

Policies

Underage Persons on Exhibition Floor Policy
For safety and insurance reasons, no one under the age of 16 will be allowed in the exhibition area during move-in and move-out. During open exhibition hours, only children over the age of 12 accompanied by an adult will be allowed in the exhibition area.

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.

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.

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