

**SPIE.** ADVANCED  
LITHOGRAPHY



INTERNATIONAL  
YEAR OF LIGHT  
2015



# ADVANCED LITHOGRAPHY EXHIBITION GUIDE.

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

MOVING TECHNOLOGY TO MARKET

Conferences & Courses  
22-26 February 2015

Exhibition  
24-25 February 2015

San Jose Marriott and  
San Jose Convention Center  
San Jose, California, USA

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# Pelliclized Reticle Cleaning System

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**LSC-4000 Large Substrate Cleaner**

## Applications

- 6"x6" Pelliclized Reticle Clean: Front and Back
- Up to 9"x9" Mask Clean
- 21"OD, 15"x15" Large Substrate Clean
- Hard to Remove Resist Strip

## Features

- Megasonic Clean
- Chemical Dispense
- Dual Drain
- N<sub>2</sub>/IR Lamp
- PC Controlled, LabVIEW Software, Safety Interlocked
- Touchscreen User Interface
- Footprint 30"D x 26"W

## Options

- Pellicle Front Side Cleaning Module
- Piranha Clean
- Ozone Clean
- CO<sub>2</sub> Ionizer
- High Speed Brush Clean
- Robotic Loading/Unloading with EFEM and SMIF Interface

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# Ion Beam Etching System

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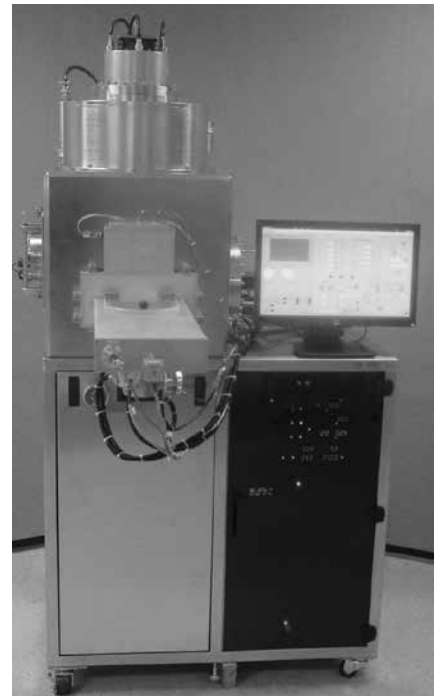
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## Applications

- Surface Cleaning
- Surface Treatment
- Gratings, Deep Trenches on Metals and Dielectrics
- Ion Beam Milling
- Ion Beam Etching with Reactive Gases (RIBE)

## Features

- 20 cm ICP Ion Source
- Ion Beam: Up to 2KV/10mA
- Ion Current Density 100-360  $\mu\text{A}/\text{cm}^2$
- +/-2% Etch Uniformity
- Auto Load Unload
- Compatible with Reactive and Non Reactive Gases (Ar, O<sub>2</sub>, CO<sub>2</sub>, CF<sub>4</sub>, Cl<sub>2</sub>)
- 5x10<sup>-8</sup> Torr Base Pressure with 1240 l/sec Turbo and Dry Scroll Pump
- Spectroscopic or SIMS End Point Detection



**NIE-4000 Ion Beam System**



**NANO-MASTER, Inc.**

Ph. 512-385-4552; main@nanomaster.com; www.nanomaster.com



# Welcome to the Exhibition

Tuesday 24 February · 10:00 AM to 5:00 PM  
Wednesday 25 February · 10:00 AM to 4:00 PM

**SPIE.** **ADVANCED  
LITHOGRAPHY**

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*Advanced Lithography 2015 Promotional Partners:*

**MEMS and Nanotechnology Exchange**  
**Solid State Technology**

SPIE would like to express its deepest appreciation to the symposium chairs, conference chairs, program committees, session chairs, and authors who have so generously given their time and advice to make this symposium possible.

The symposium, like our other conferences and activities, would not be possible without the dedicated contribution of our participants and members. This program is based on commitments received up to the time of publication and is subject to change without notice.

For information about exhibiting, sponsorship, and advertising opportunities at future Advanced Lithography events, contact: SPIE Sales at [spiesales@spie.org](mailto:spiesales@spie.org)

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Thanks to the following sponsors for their generous support of SPIE Advanced Lithography

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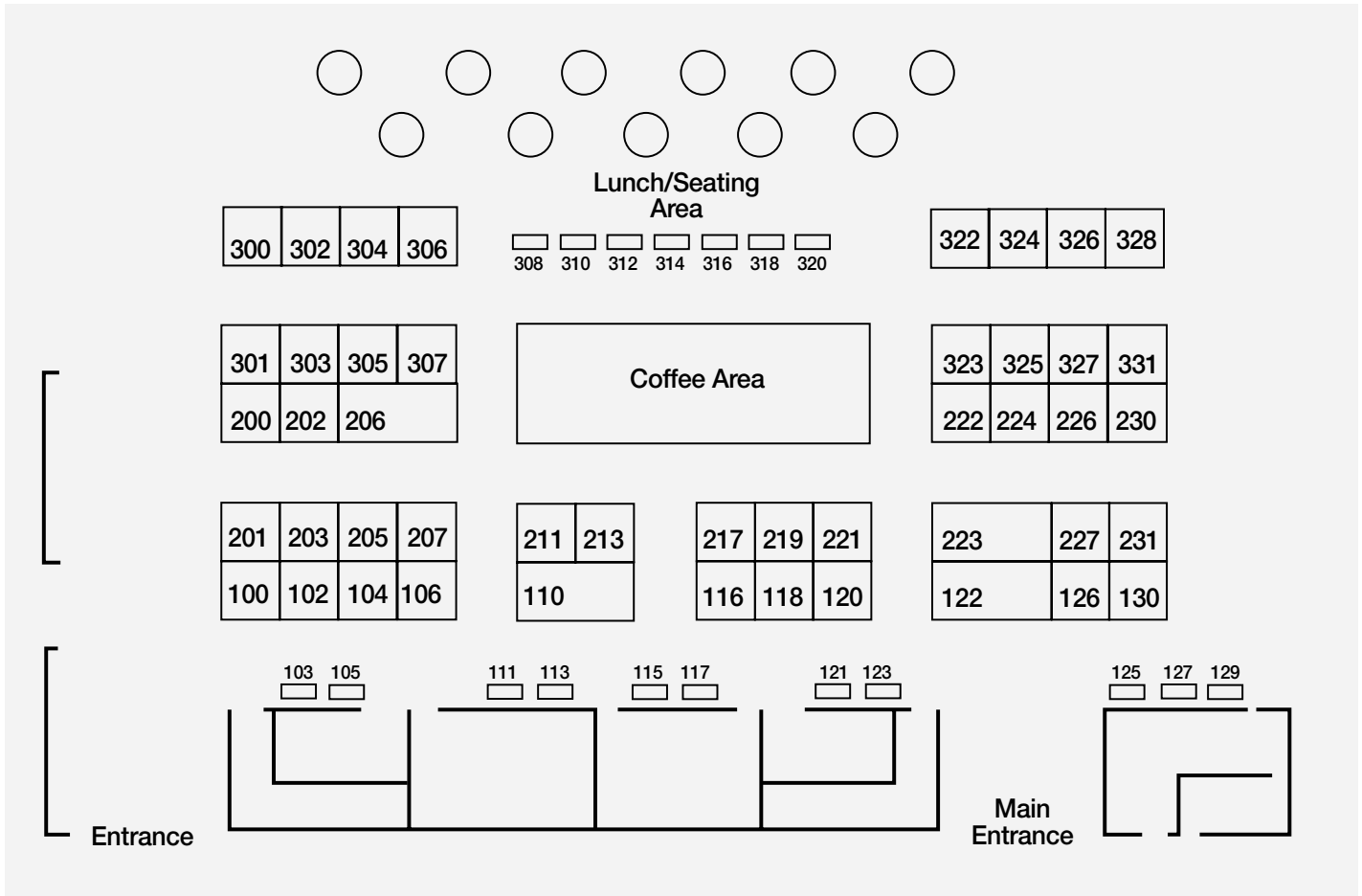
JSR Micro

NuFlare Technology, Inc.

Rigaku Innovative Technologies

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# SAN JOSE CONVENTION CENTER - EXHIBITION FLOOR



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# GENERAL INFORMATION

## Exhibition Hours

Tuesday 24 February · 10:00 AM to 5:00 PM  
Wednesday 25 February · 10:00 AM to 4:00 PM

## Registration

San Jose Convention Center

Sunday 22 February · 7:15 AM to 5:00 PM  
Monday 23 February · 7:00 AM to 4:00 PM  
Tuesday 24 February · 7:30 AM to 5:00 PM  
Wednesday 25 February · 7:30 AM to 4:00 PM  
Thursday 26 February · 7:45 AM to 4:00 PM  
(conference reg only)

## Coffee Breaks

Served daily · 7:30 AM, 10:00 AM, and 3:00 PM

Check individual conference listings for exact times and locations.

Sponsored by



## Breakfast Breads

Convention Center, Ballroom Concourse  
Monday – Thursday · 7:30 AM

Monday and Wednesday sponsored by 

## Food and Refreshments for Purchase

Exhibition Hall Concession Stand  
Tuesday – Wednesday · 11:00 AM to 2:00 PM

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

## SPIE-Hosted Lunches

Exhibition Hall  
Tuesday – Wednesday · 11:30 AM to 1:00 PM

Check individual conference listings for exact times.

Complimentary tickets for these lunches will be included with full conference registrations. Exhibitors and students may purchase tickets at the Cashier Desk.



## Desserts

Exhibition Hall  
Tuesday–Wednesday

Complimentary tickets for the dessert snacks will be included in conference attendee registration packets.

## Internet Options

Location of Internet - Convention Center Ballroom Concourse

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

Internet Pavilion sponsored by 

## WiFi

Location of WiFi – Convention Center Upper Level Concourse

WiFi sponsored by



## SPIE Bookstore

Convention Center Lobby near Registration

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).

## Underage Persons on Exhibition Floor Policy

For safety and insurance reasons:

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

## Unauthorized Solicitation Policy

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

## Restaurant Reservations and Information Desk

The San Jose Convention and Visitors Bureau operates a Restaurant Reservations and Information Desk on the street level of the Convention Center near the main entrance. The desk will be open Sunday through Thursday during core hours of the convention. For more information visit their website <http://www.sanjose.org>



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## SPIE COURSES

**SPIE STUDENT MEMBERS  
GET 50% OFF COURSES—SEE  
DETAILS AT REGISTRATION**

### SUNDAY

SC1099 **Chemistry and Lithography** (Okoroanyanwu) 8:30 am to 5:30 pm, \$700 / \$810

SC888 **EUV Lithography** (Bakshi, Ahn, Naulleau) 8:30 am to 5:30 pm, \$830 / \$940

SC101 **Introduction to Microlithography: Theory, Materials, and Processing** (Willson, Bowden) 8:30 am to 5:30 pm, \$600 / \$710

SC1155 **Key Concepts of Design Technology CoOptimization: A topological look at standard cell logic design** (Liebmann) 8:30 am to 12:30 pm, \$375 / \$430

SC116 **Lithographic Optimization: A Theoretical Approach** (Mack) 8:30 am to 5:30 pm, \$650 / \$760

SC992 **Lithography Integration for Semiconductor FEOL & BEOL Fabrication** (Lin, Zhang) 8:30 am to 5:30 pm, \$600 / \$710

SC1133 **Metrology Toolset Monitoring, Matching, Maintenance and Management** (Solecky, Adan) 8:30 am to 12:30 pm, \$375 / \$430

SC1132 **Modeling and Computational Lithography Fundamentals** (Lai) 8:30 am to 5:30 pm, \$600 / \$710

SC885 **Principles and Practical Implementation of Multiple Patterning** (Dusa, Hsu) 8:30 am to 5:30 pm, \$600 / \$710

SC1067 **Directed Self Assembly and its Application to Nanoscale Fabrication** (de Pablo, Nealey, Ruiz) 1:30 pm to 5:30 pm, \$375 / \$430

SC1158 **Metrology of Image Placement** (Starikov) 1:30 to 5:30 pm, \$375 / \$430

### MONDAY

SC1030 **Interaction of Physical Design and Lithography** (Yuan) 1:30 pm to 5:30 pm, \$375 / \$430

SC1159 **Optimization Methods for Lithographers** (Granik) 1:30 to 5:30 pm, \$375 / \$430

Get training and access to professional development courses to stay competitive and advance your career.

- Learn from the best—don't miss the opportunity for direct instruction from legends in the semi/litho industry, many of whom are pioneers in their fields
- Course topics are continually updated and aligned with current industry needs and trends
- Earn CEUs for professional continuing education requirements

### NEW COURSES

Key Concepts of Design Technology CoOptimization

Metrology of Image Placement

Optimization Methods for Lithographers

### MONEY-BACK GUARANTEE

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

### CONTINUING EDUCATION UNITS



SPIE has been approved as an authorized provider of CEUs by IACET, The International Association for Continuing Education and Training (Provider #1002091). In obtaining this approval, SPIE has demonstrated that it complies with the

ANSI/IACET Standards which are widely recognized as standards of good practice. SPIE reserves the right to cancel a course due to insufficient advance registration.



# ADVANCED LITHOGRAPHY

## Exhibition Directory

Exhibitors are listed in alphabetical order with details about products or services each is exhibiting. Companies are additionally cross-indexed by technology areas. The address of each exhibitor is also listed, making this Exhibition Guide an excellent reference tool to take back to your office and share with your colleagues.

### Abeam Technologies Inc.

#217

22290 Foothill Blvd Ste 2, Hayward, CA, 94541 USA  
+1 510 497 0222; fax +1 510 279 0076  
support@abeamtech.com; www.abeamtech.com

**Featured Product: myCD: physics based extraction of contours and CDs from SEM images; QSEM: monitoring CD-SEMs.**

Abeamtech is developing software to optimize advanced technological processes in microlithography and maskmaking. The products analyze SEM images based on physics and extract true contours, CDs and sidewall angles; monitor CD-SEMs, simulate and predict SEM images; simulate CDs and profiles in e-beam lithography and correct placement errors, as well as simulate dry etch including spacer patterning. Headquarters: in California, a subsidiary in Japan and representatives in Korea and Taiwan. Contact: Sergey Babin, sb@abeamtech.com

### Amuneal Mfg Corp.

#230

4737 Darrah St, Philadelphia, PA, 19124 USA  
+1 215 535 3000  
info@amuneal.com; www.amuneal.com

**Featured Product: Magnetic Shielding**

Since 1965, Amuneal has been serving highly technical markets, working with leaders in aerospace, electronics, cryogenics, healthcare, and research to develop cost-effective magnetic shielding strategies and products that outperform the most demanding requirements.

We offer a number of standard component shields to our clients, however, our culture and capabilities allow us to manufacture and install unique custom shields ranging from prototypes and models to full-scale assemblies. Contact: Stuart Koch, VP Technical Products, StuartK@amuneal.com



# EXHIBITOR DIRECTORY

## Coffee Break, Plenary Sponsor

### ASML

#328

**SPIE** Corporate Member

2650 W Geronimo Pl, Chandler, AZ, 85224 USA  
+1 800 227 6462  
info@asml.com; www.asml.com

ASML makes possible affordable microelectronics that improve the quality of life. We invent and develop complex technology for high-tech lithography machines for the semiconductor industry. ASML's guiding principle is continuing Moore's Law towards ever smaller, cheaper, more powerful and energy-efficient semiconductors. We are a multinational company with over 70 locations in 16 countries, headquartered in Veldhoven, the Netherlands. More information about ASML is available on: www.asml.com

### attocube systems Inc.

#201

**SPIE** Corporate Member

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

attocube offers highest precision piezo positioning systems and multi-axes interferometric displacement sensors.

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

### Benchmark Technologies

#120

7 E Kimball Ln, Lynnfield, MA, 01940-2654 USA  
+1 781 246 3303; fax +1 781 246 0308  
contact@benchmarktech.com; www.benchmarktech.com

**Featured Product: Phase Shift Focus Monitor for Immersion Lithography, OmniMatch Overlay Monitoring Software.**

Benchmark Technologies is a leading supplier of lithography test reticles for fab litho tool optimization. Reticles are available for multiple applications including focus monitoring, overlay matching, electro statics analysis and more. Overlay analysis and monitoring software is available to integrate with fab automation. Benchmark Technologies also supplies nano-imprint stamps in quartz and silicon, and gray scale masks for single exposure resist shaping. Contact: Andrew Zanzal, Vice President of Sales, azanzal@benchmarktech.com; Patrick Reynolds, President, preynolds@benchmarktech.com

### Brewer Science, Inc.

#325

**SPIE** Corporate Member

2401 Brewer Dr, Rolla, MO, 65401-7003 USA  
+1 573 364 0300  
info@brewerscience.com; www.brewerscience.com

Brewer Science is a global technology leader in developing and manufacturing materials, processes and equipment for fabrication of microdevices used in consumer electronics such as computers, smartphones, digital cameras, tv's and LED lighting. Since 1981, when its ARC® materials revolutionized lithography processes, Brewer Science has expanded its technology to include products enabling advanced lithography, thin wafer handling, 3-D integration, nanotechnology, printed/flexible electronics. Contact: Darron Jurajda, Litho Business Unit Manager, jurajda@brewerscience.com; Rick Miller, Director, Global Sales, rmiller@brewerscience.com

### Cadence Design Systems

#227

2655 Seely Ave, San Jose, CA, 95134-1931 USA  
+1 408 943 1234  
www.cadence.com

## Coffee Break, Featured Exhibitor Sponsor

### Canon USA

#202

**Featured Product: Canon high-performance & low-COO i-line, KrF, Nanoimprint & Flat-Panel Lithography Systems**

Canon USA Industrial Products supplies advanced lithography systems that provide effective & innovative solutions for leading-edge semiconductor & device applications.

Canon high-volume manufacturing lithography systems include the FPA-6300ES6a KrF scanner, the FPA-5510iZs i-line stepper & new nanoimprint lithography systems for cost-effective FEOL applications, & the large-DOF FPA-5510iV i-line stepper for advanced packaging & thick-resist applications. Contact us at Semi-info@cusa.canon.com Contact: Doug Shelton, Marketing Manager, sshelton@cusa.canon.com

## Conference Bag Sponsor

### Carl Zeiss SMS GmbH

#223

Carl Zeiss Promenade 10, Jena, 06618 Germany  
+49 3641 64 2563; fax +49 3641 64 2938  
info.sms@zeiss.com; www.zeiss.com/sms

**Featured Product: RegC® Critical Dimension Correction, Aerial Image Measurement AIMS™ 1x-193i, PROVE® Compact HR**

The ZEISS strategic business unit Semiconductor Metrology Systems (SMS) specializes in a key process in semiconductor manufacturing: verifying and repairing photomasks. With core competences in light and electron optics as well as a unique femtosecond laser technology, SMS offers products for assessing defects on masks, repairing critical defects, verifying the repair results and dedicated metrology solutions. Carl Zeiss SMS GmbH has its headquarter in Jena/Germany. Contact: James Polcyn, Sales Representative, jim.polcyn@zeiss.com; Leila Hammad, Marketing Professional, leila.hammad@zeiss.com

### Coventor, Inc.

#205

1000 Centre Green Way Ste 200, Cary, NC, 27513 USA  
+1 919 854 7500; fax +1 919 869 1472  
sales@coventor.com; www.coventor.com

**Featured Product: SEMulator3D, MEMS+, CoventorWare**

COVENTOR® - PREDICTING ACTUAL FROM VIRTUAL Coventor provides predictive 3D modeling and simulation solutions for advanced micro- and nano-fabrication technologies, including FinFETs, Flash, DRAM and MEMS. Our software tools and expertise enable our customers to simulate and optimize their fabrication processes and device designs before committing to time-consuming and costly build-and-test cycles. Contact: Dave Cook, Strategic Sales, dave.cook@coventor.com; Dinesh Bettadapur, Sr. Director of Business Dev, Semiconductor, dinesh.bettadapur@coventor.com

# EXHIBITOR DIRECTORY

## CyberOptics Corp.

#314

5900 Golden Hills Dr, Minneapolis, MN, 55416 USA  
+1 763 542 5827; fax +1 763 542 5100  
info@cyberoptics.com; www.cyberoptics.com

**Featured Product: The ReticleSense Airborne Particle Sensor (APSR) is a wireless measurement device.**

When you need the world's most efficient and effective measurement devices for semiconductor tool set-up and maintenance processes, count on CyberOptics, the global market leader in wireless semiconductor measurement devices for chamber gapping, leveling, wafer handoff teaching, vibration and airborne particle measurement that enable improvements in fab yields and equipment uptime. Contact: Allyn Jackson, Account Manager/Field Applications Engineer, ajackson@cyberoptics.com

### Conference Sponsor

## DNS Electronics

#106

820 Kifer Rd Ste B, Sunnyvale, CA, 94086-5214 USA  
+1 408 523 9140; fax +1 408 523 9150  
inquiries@dnse.com; www.dnse.com

**Featured Product: DUO 450mm; DUO 300mm; RF3S 150mm - 300mm; 60EX & 80EX 100mm - 200mm; ZI-2000 + Film Thickness**

300mm systems - high throughput DUO systems; 450mm systems - support all processes; ZI-2000 - Wafer Pattern Inspection; Spectrometric Film Thickness and Ellipsometric Film Thickness systems Contact: Laszlo Mikulas, Vice President Sales & Product Engineering, laszlo.mikulas@dnse.com; Ian Winch, Technical Account Manager, ian.winch@dnse.com

## Energetiq Technology, Inc.

#310

**SPIE** Corporate Member

7 Constitution Way, Woburn, MA, 01801-1024 USA  
+1 781 939 0763  
info@energetiq.com; www.energetiq.com

Energetiq Technology is the world's leading developer and manufacturer of ultra-bright light sources. The EUV light source, based on Energetiq's proven Electrodeless Z-pinch™ technology using Xenon gas. The EQ-10 EUV source is uniquely suited for metrology and research. Energetiq's also offers Laser-Driven Light Sources (LDLS™) based on a revolutionary technology that generates high brightness across the spectrum, with high reliability and long life.

## Entegris, Inc.

#305

129 Concord Rd, Billerica, MA, 01821-4600 USA  
+1 978 436 6500; fax +1 978 436 6735  
www.entegris.com

**Featured Product: filtration products, gas delivery systems, liquid systems & components, wafer carriers & shippers**

Entegris, Inc. (NASDAQ: ENTG) provides solutions for advanced manufacturing to the semiconductor, microelectronics and other high-technology industries. Headquartered in Billerica, Massachusetts, Entegris employs approximately 2,800 people worldwide. With R&D, customer service, analytical labs, and manufacturing, Entegris supports customers around the globe as they take technology to the next level. Contact: Sharon Harnisch, Marcom Manager and Strategic Events, Sharon\_Harnisch@Entegris.com; Andrew DePoy, Branding & MarCom, andrew\_depoy@entegris.com

## GenISys GmbH

#231

Eschenstr 66, Taufkirchen Muenchen, D-82024 Germany  
+49 89 3309197-60  
info@genisys-gmbh.com; www.genisys-gmbh.com

**Featured Product: LAB All-in-One Lithography Simulation. Enable next generation products and faster development cycles**

Based in Munich, Germany, with offices in Tokyo, Japan and San Francisco, California, GenISys develops, markets and supports flexible, high-performance software solutions for the optimization of micro and nano fabrication processes. Addressing the market for lithography and inspection, GenISys combines deep technical expertise in layout data processing, process modeling, correction and optimization with world class software engineering and a strong focus on ease of use. Contact: Roger McCay, Sales Director North America, rmccay@aol.com; Nezih Unal, Vice President, unal@genisys-gmbh.com

### Exhibitor Lounge Sponsor

## Greene, Tweed & Co.

#320

2075 Detwiler Rd, Kulpville, PA, 19443 USA  
+1 215 256 9521; fax +1 215 256 0189  
info@greenetweed.com; www.gtweed.com

**Featured Product: Chemraz® FFKM elastomers, integrated with high performance plastics, bonding & coating technologies.**

Greene, Tweed applies vast expertise in formulating elastomer and elite thermoplastic materials, and integrating unique processing capabilities, to provide effective and reliable solutions. We collaborate closely with the world's leading fabs, foundries, and equipment manufacturers to meet the rapidly changing needs of critical wafer process applications. Greene Tweed has served the leaders of demanding industries for 150 years, with over 20 years dedicated to the semiconductor industry. Contact: Barry Kitazumi, Engineering Manager, bkitzumi@gtweed.com

## Gudeng Precision Industrial Co., Ltd. #104

No 2 Sec 4 Zhongyang Rd., Tucheng, 9F, New Taipei City, 236 Taiwan  
+886 2 2268 9141; fax +886 2 2269 1943  
sales@gudeng.com; www.gudeng.com.tw

## Halocarbon Products

#207

**SPIE** Corporate Member

887 Kinderkamack Rd, River Edge, NJ, 07661 USA  
+1 201 262 8899; fax +1 201 262 0019  
info@halocarbon.com; www.halocarbon.com

**Featured Product: Fluorinated chemicals and monomers for semiconductor industry**

Halocarbon Products is one of the world's leading producers of specialty fluorochemicals. Halocarbon's products include aliphatic fluorochemicals for pharmaceutical and agricultural chemical manufacturing, inhalation anesthetics for the human and veterinary markets, inert lubricants and other specialty products. Halocarbon is headquartered in River Edge, New Jersey, and its state-of-the-art manufacturing plant is in North Augusta, South Carolina, USA. Contact: Ron Epstein, Sales Director, repstein@halocarbon.com; Anthony Nigro, Manager of New Product Development, anigro@halocarbon.com

**Heidelberg Instruments Inc.**

#327

**SPIE** Corporate Member

2807 Oregon Ct Unit E2, Torrance, CA, 90503-2635 USA  
 +1 310 212 5071; fax +1 310 212 5254  
 contact@himt.us; www.himt.us

**Featured Product: MicroPG Desktop pattern Generator, DWL66, DWL2000/4000 Laser Lithography systems and VPG Systems**

Heidelberg Instruments is a global leader in design, development and manufacturing of complex laser based maskless lithography systems. These systems are critical to fabrication of advanced photomasks and direct write solutions in the areas of Advanced Electronic Packaging, Flat Panel Display, MEMS, Integrated Optics and other micro and nano based applications. Our customers include major nano and micro technology based corporations along with leading research and development organizations. Contact: Niels Wijnaendts van Resandt, Director Sales North and South America, nie@himt.us

**ibss Group, Inc.**

#322

**SPIE** Corporate Member

1559B Sloat Blvd Ste 270, San Francisco, CA, 94132-1222 USA  
 +1 415 566 5774; fax +1 415 566 9779  
 admin@ibssgroup.com; www.ibssgroup.com

**Featured Product: The GV10x Downstream (DS) Asher is the new paradigm in situ cleaner for vacuum chambers.**

Developed and produced by ibss Group in cooperation with the inventor of a unique, patented plasma source, the GV10x is the new generation in situ Downstream Asher. Competitively priced, the GV10x Downstream Asher reduces carbon & hydrocarbon contamination 10 to 20 times more effectively than traditional methods at vacuum pressures safe for turbo molecular pump (TMP) operation. Contact: Elena Grankina, Office Manager, elena.grankina@ibssgroup.com

**Inko Industrial Corp**

#308

695 Vaqueros Ave, Sunnyvale, CA, 94085-3524 USA  
 +1 408 830 1040; fax +1 408 830 1058  
 sales@pellicle-inko.com; www.pellicle-inko.com

**Featured Product: pellicle**

INKO, a U.S. based company, manufactures a complete line of pellicles for applications ranging from ASIC production to high volume memory production. From 248nm/193nm DUV lithography to I/G line lithography, we have the right pellicles for your needs. Contact: Joe Mac, customer service manger, joemac@pellicle-inko.com; Feng Ye, QA manager, ye@pellicle-inko.com

**Inspectrology LLC**

#316

**SPIE** Corporate Member

, 144 North Rd Ste 1450, Sudbury, MA, 01776 USA  
 +1 978 897 1775; fax +1 978 897 1787  
 info@inspectrology.com; www.inspectrology.com

**Featured Product: IVS 200 CD and Overlay Metrology System for Semiconductor, MEMS, LED, Waveguides, Compound Semi, Etc**

Inspectrology provides Metrology and Wafer Inspection System sales and services to fabs in a wide range of market sectors including Semiconductor, Microelectromechanical systems (MEMS), Waveguides, Compound Semiconductor (GaAs, GaN, SiC, Quartz, SOI etc), LED (Light Emitting Diode) and Solar. Inspectrology also provides wafers for NIST traceable calibration of all dimensional Metrology systems. Contact: Paul Knutrud, Vice President of Marketing, pknutrud@inspectrology.com; Mike Kessler, VP Sales, mkessler@inspectrology.com

**Integrated Micro Materials**

#102

8141 Gateway Dr Ste 240, Argyle, TX, 76226 USA  
 +1 940 228 2219; fax +1 940 228 2234  
 sales@imicromaterials.com; www.imicromaterials.com

**Featured Product: Photoresists, developers, and anti-reflective coatings**

Distributor of advanced lithography and semiconductor processing materials and equipment. Services include microfabrication process consulting, photomasks, and clean room dip tube exchange. Contact: Ron Eakin, Business Development Manager, roneakin@imicromaterials.com.

**J.A. Woollam Co., Inc.**

#126

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

**Featured Product: Spectroscopic Ellipsometers**

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.

**General Sponsor****JSR Corporation**

#122

**SPIE** Corporate Member

1280 N Mathilda Ave, Sunnyvale, CA, 94089-1213 USA  
 +1 408 543 8800; fax +1 408 543 8872  
 www.jsrmicro.com

**Featured Product: Leading-edge photoresists, developers, packaging materials and specialty chemicals.**

JSR Micro, Inc. manufactures the industry's most innovative family of photoresists, developers, and specialty chemicals for trilayer, immersion materials, and chemical shrink, from the company that perfected the art of customer collaboration. JSR is also a leader in materials for packaging. Our unique THB series of negative tone resists and WPR series of dielectric materials are ideal for next generation WL-CSP (wafer level chip scale packaging) technologies that facilitate higher performance. Contact: Rich Rennels, rrennels@jsrmicro.com; Missy Bindseil, mbindseil@jsrmicro.com

**LouwersHanique**

#123

Energieweg 3A, Hapert, 5527 AH Netherlands  
 +31 497 339 696; fax +31 497 386 372  
 info@LouwersHanique.com; www.louwershanique.com

**Featured Product: Ultra High Vacuum electrical / optical Feedthroughs / Precision glass & ceramic parts and assemblies**

LouwersHanique has been a leading specialist in the manufacturing of technical glass and ceramic components as well as assembly technologies for a wide variety of high-tech industries for almost 60 years. LouwersHanique is your international supply chain partner in the field of total integrated solutions for a wide range of applications. Our state of the art equipment and clean room facilities allow the precision manufacturing of parts and assemblies with tolerances into the (sub)micron region. Contact: Carel van de Beek, Account Manager, carel.van.de.beek@louwershanique.com

# EXHIBITOR DIRECTORY

## Mad City Labs., Inc.

#302

**SPIE** Corporate Member

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

Mad City Labs, Inc. designs & manufactures high precision, piezo nanopositioning systems suitable for inspection, metrology, microscopy, imaging and beam steering applications. We offer innovative flexure guided stage designs, proprietary low noise PicoQ<sup>®</sup> sensors, closed loop control and outstanding technical support. We provide a line of standard products as well as custom and OEM designs. Products: lens nanopositioners, high load piezo positioners, beam steering nanopositioners. Contact: Technical Sales - worldwide, sales@madcitylabs.com; European Sales Office, sales@madcitylabs.eu

### Promotional Partner

## MEMS & Nanotechnology Exchange #105

1895 Preston White Dr Ste 100, Reston, VA, 20191-5434 USA  
+1 703 262 5368; fax +1 703 262 5367  
cshort@mems-exchange.org; www.mems-exchange.org/

**Featured Product: MEMS & Nanotechnology design and fabrication services.**

The MEMS and Nanotechnology Exchange (MNX) provides design and fabrication services to the USA research community. Our team of PhD level engineers offer a complete range of technical expertise to assist researchers at any project phase, including device design, prototype fabrication, low-volume manufacturing, and transition to high-volume production work at commercial foundries. Contact: Christy Short, Business Manager, cshort@mems-exchange.org; Michael Huff, Director, mhuff@mems-exchange.org

### Lanyard Sponsor

## Mentor Graphics

#304

**SPIE** Corporate Member

8005 SW Boeckman Rd, Wilsonville, OR, 97070-7777 USA  
+1 503 685 7000; fax +1 503 685 1543  
mentor@calibre.com; www.mentor.com

**Featured Product: Calibre MDP, Calibre OPC**

The challenges of developing advanced lithography flows require a strong partner. With a complete platform for Immersion Lithography, EUV & DSA - Mentor is the ideal partner for semiconductor manufacturing success. We offer best-in-class technology, comprehensive solutions, development & production support, and continuous innovation. That is why more than 30 fabs choose Mentor as their partner. Find out how a partnership with Mentor can accelerate your success. Get more info at www.mentor.com. Contact: Gandharv Bhatara, Product Marketing Manager, gandharv\_bhatara@mentor.com

## MGN International, Inc.

#331

41984 Rio Nedo Ste 200, Temecula, CA, 92590 USA  
+1 951 719 2910; fax +1 951 719 2920  
info@mgninternational.com; www.mgnintl.com

## Micro Lithography, Inc.

#219

1257 Elko Dr, Sunnyvale, CA, 94089-2211 USA  
+1 408 747 1769; fax +1 408 747 1978  
www.mliusa.com

**Featured Product: Pellicles**

MLI is featuring pellicles formulated to yield high rates of transmission and long lifetimes for UV exposure. Our complete line of pellicle films ranges from broadband, g-/i-line to DUV (KrF-248nm and ArF-193nm). MLI's DUV pellicles have the lowest outgassing materials available in the market today. Contact: Kevin Duong, Customer Service Manager, kevin.duong@mliusa.com; Corbin Imai, Sales Representative, corbin@zysancorp.com

## micro resist technology GmbH

#303

Koepenicker Str. 325, Berlin, 12555 Germany  
+49 30 64 16 70 100; fax +49 30 64 16 70 200  
mrt@microresist.de; www.microresist.de

**Featured Product: Resists for UV-, laser-, X-ray, DUV- and E-beam lithography, Nanoimprint Lithography, Hybrid Polymers**

Since 1993 micro resist technology develops, produces & sells photoresists & special polymers for micro- and nanolithography applications. The highly specialized products are used in semiconductor industry, nanotechnology, MEMS as well as for sensor electronics. The distinctive competency of mrt is to offer its global customers tailored products and technological solutions to specific technical requirements. Technology services are offered such as the structuring of customer's substrates. Contact: Arne Schleunitz, Technology Management, a.schleunitz@microresist.de; Anja Voigt, Director Photoresists, a.voigt@microresist.de

## MicroChem Corp.

#222

200 Flanders Rd, Westborough, MA, 01581 USA  
+1 617 965 5511; fax +1 617 965 5818  
mcc@microchem.com; www.microchem.com

**Featured Product: photoresists and ancillary materials such as SU-8, KMPR, PMMA, PMGI and LOR.**

MicroChem Corp is a manufacturer of innovative chemical solutions for MEMS and microelectronics. Our PMGI and LOR lines are widely used for bi-layer lift off applications. We provide our SU-8 epoxy based thick resists for MEMS and other applications and KMPR resists for plating or DRIE. Due to our 20 year association with Dow Chemicals we are the only distributor licensed to supply the full range of Dow microelectronic, packaging and BCB materials. Come see our newest product offerings Contact: Rob Hardman, Inside Sales Manager, rhardman@microchem.com; Bob Andrews, Distribution Sales Manager, bandrews@microchem.com

## Mirero Inc.

#125

120 Heungdeok Jungang-ro Giheung-gu, #2905 U-Twr, Yongin-si, Kyonggi, 446-908 Korea, Republic of  
+82 31 215 2905; fax +82 31 216 2905  
callas09@mirero.co.kr; www.mirero.co.kr

### Featured Product: OPTICA, VIMS

OPTICA - Defect Inspection Optical Simulator Description: OPITCA is a fast, scalable Defect Inspection oriented FDTD simulation SW and capable of (EUV) Mask Inspection tool simulation. With its quantitative and visual results, you can better control your tool vendors with adjusting, honing the tool settings VIMS-Virtual Inspection & Metrology System VIMS offers Defect Detection using high resolution SEM images, CD, Overlay Measurement for in-cell, in-field real patterns and Hot Spot Monitoring Contact: Bernard Liu, Regional Manager, jaekliu@mirero.co.kr; JONGKYU LEE, Director, callas09@mirero.co.kr

## Mitsui Chemicals America, Inc.

#121

2099 Gateway Pl Ste 300, San Jose, CA, 95110-1017 USA  
+1 408 487 2891; fax +1 408 453 0684  
info@mitsuichem.com; www.mitsuichemicals.com

### Featured Product: Mask Pellicle

Since 1986, Mitsui has been the industry leader in providing pellicles to the semiconductor industry. Mitsui's ISO 9001 certified full automated plant produces Mitsui Pellicle, which transmits more than 99% of exposed light with excellent uniformity and longevity. Mitsui Pellicle, manufactured by rigorous selection of all materials and with more than 25 years accumulated expertise of non-dust structure, contributes to maximum production yields by eliminating pellicle related particle generations. Contact: Yurie Mizuno, Asst. Sales Manager, Y.mizuno@mitsuichem.com; Hiromi Tsuboi, Sales Manager, H.tsuboi@mitsuichem.com

## Nanoscribe GmbH

#200

Hermann-von-Helmholtz-Platz 1, Eggenstein-Leopoldshafen, 76344 Germany  
+49 721 60828840; fax +49 721 60828848  
info@nanoscribe.de; www.nanoscribe.de

### Featured Product: 3D laser lithography system Photonic Professional GT

The global market leader Nanoscribe provides maskless lithography and additive manufacturing on the micrometerscale in one device. The laser lithography system Photonic Professional GT is unique due to its speed and resolution. Empowered by unprecedented 3D nano-/micro-fabrication capabilities, the two-photon polymerization driven 3D printer sets new standards in a multitude of applications in science and industry, e.g. photonics, MEMS, micro-optics, micro-fluidics or tissue engineering. Contact: Wanyin Cui, Sales Manager, sales@nanoscribe.de

## OPTO DIODE CORP

#213

SPIE<sup>Corporate</sup>  
Member

1260 Calle Suerte, Camarillo, CA, 93012 USA  
+1 805 499 0335; fax +1 805 499 8108  
sales@optodiode.com; www.optodiode.com

### Featured Product: HIGH POWER LEDs, SILICON PHOTODETECTORS & HIGH LEVEL ASSEMBLIES

Opto Diode designs & manufactures high-quality standard and custom silicon photodiodes, LEDs, IR LEDs & LED arrays. With the acquisition of IRD and the merger of CalSensors, Opto Diode offers industry-leading performance detectors from the extreme UV to the mid-infrared. The IRD product line detects high energy particles and photons in the UV and X-ray regions. The CSI detectors provide superior sensitivity to discriminate trace gases or detect heat, sparks or flames in the mid-IR spectrum. Contact: Stan Duda, US Sales Manager, sduda@optodiode.com; Renee Dulfer, International Sales Manager, rdulfer@optodiode.com

## Owens Design

#224

47427 Fremont Blvd, Fremont, CA, 94538-6504 USA  
+1 510 659 1800; fax +1 510 659 1896  
sales@owensdesign.com; www.owensdesign.com

Owens Design -Your Design and Build Partner developing unique advanced technology production equipment for over 30 years. Specializing exclusively in design and manufacture of custom advanced technology production systems. We have focused specifically on the Semiconductor, Solar Photovoltaic, Mobile Electronic, Medical Device, and Pharmaceutical industries. Our unique equipment development process has made us very successful in delivering next generation systems and has attracted a world-class customer base in markets that demand custom production tools with high precision, high reliability and high performance. Contact: Fabiola Petersen, Sales Support, fpetersen@owensdesign.com; Mark Danna, VP Sales & Marketing, mdanna@owensdesign.com

## Pall Corporation

#221

25 Harbor Park Dr, Port Washington, NY, 11050-4605 USA  
+1 516 484 5400  
microelectronics@pall.com; www.pall.com

### Featured Product: The Xpress™ filter, which guaranteed cleanliness is now available in all lithography filter sizes.

Pall has extended the Express filter cleanliness option to larger filter configurations. The XPress option is designed for the most advanced patterning chemistries. The new Xpress filter option represents one for the cleanest bulk lithography filters available. Pall offers a complete line of filtration, purification and separation technologies for all lithography processes. Pall has demonstrated that these innovative technologies can significantly reduce defectivity. Contact: Michael Mesawich, VP Strategic Marketing, michael\_mesawich@pall.com

# EXHIBITOR DIRECTORY

## PHASICS Corp.

#318

**SPIE** Corporate Member

169 11th St, San Francisco, CA, 94103 USA  
+1 415 610 9741

contact@phasics.com; www.phasicscorp.com

### **Featured Product: Full characterization of laser beams and optics in UV and IR with high resolution wavefront sensors**

Phasics offers high resolution wavefront sensors from UV (193 nm) to IR (14µm). They provide complete beam characterization of UV and CO<sub>2</sub> lasers. Their compactness enables in situ monitoring and precise alignment of complex optical set-up. They also apply to UV and IR optics quality control, measuring both aberrations and MTF at once. Their patented technology ensures accurate measurement (high resolution and high sensitivity) and ease of use (compactness, measurement with no relay lens). Contact: Yoann PRIOL, Sales manager USA, priol@phasics.fr

## Philips Innovation Services

#111

High Tech Campus 7, Eindhoven, 5656 AE Netherlands  
+31 40 27 48060

innovationservices@philips.com;  
www.innovationservices.philips.com

### **Featured Product: Delivering robust solutions to reduce particle contamination, increase accuracy and throughput**

As an innovation service provider, we want you to be successful in delivering innovations to the market, where they can matter to your customers and the society as a whole. Our mission is simple: to accelerate our customer's innovation. With our unique width of competencies in development, engineering, industrialization and the supply chain we deliver solutions throughout your innovation process. Are you looking for new solutions? Let's talk! Contact: Marcel Renkens, Senior System Architect, m.j.m.renkens@philips.com; Brett Bernhardt, Sales Manager, brett.bernhardt@philips.com

## PI (Physik Instrumente) L.P.

#324

**SPIE** Corporate Member

16 Albert St, Auburn, MA, 01501-1304 USA  
+1 508 832 3456; fax +1 508 832 0506  
info@pi-usa.us; www.pi-usa.us

PI - leader in sub-nanometer precision motion control and piezo ceramic nanopositioning stages, Products for OEM & research. ISO 9001, ITAR compliant, US custom design. PRODUCTS: Non-Magnetic Positioners, UHV / EUV Compatible Positioners, Piezo Stages, Microscope Stages; Nanopositioning Systems; Hexapod 6-Axis Alignment Systems, Piezo Actuators; Non- Magnetic Motors, Servo / Stepper Motorized Stages, Digital Motion Controllers. 40 Years Experience. Contact: Jim Gareau, VP Sales, jimg@pi-usa.us; Stefan Vorndran, VP Marketing, marcom1@pi-usa.us

## Pozzetta

#323

3121 S Platte River Dr, Englewood, CO, 80110-2139 USA  
+1 303 783 3172; fax +1 303 374 7342

customerservice@pozzetta.com; www.pozzetta.com

### **Featured Product: Photomask Boxes and Pods, Wafer Shippers and Process Carriers**

Companies around the world trust Pozzetta to create secure environments for the handling, storage, and transport of photomasks, reticles, and wafers. Pozzetta will protect your valuable products from particles, ESD damage, outgassed components, and high costs Contact: Artemis Vasiliades, Account Executive, artemis@pozzetta.com; Scott Reese, Account Executive, scott.reese@pozzetta.com

## Qoniac GmbH

#100

Fetscherstr 72, Dresden, Saxony, 01307 Germany  
+49 351 4189 3340; fax +49 351 41893341  
info@qoniac.com; www.qoniac.com

## Raith America, Inc.

#226

1377 Motor Parkway, Suite 101, Islandia, NY, 11749 USA  
+1 631 738 9500; fax +1 631 738 2055  
sales@raithusa.com; www.raith.com

Raith is a leading precision technology manufacturer for focused ion beam (FIB) nanofabrication, electron beam lithography (EBL), nanoengineering, and reverse engineering. With sub-10 nm patterning performance, our instruments are enabling researchers in both academic and industry environments to continuously advance their applications in applied nanotechnological research and areas of industry that use nanotechnology for product applications or produce components from compound semiconductors. Contact: Andre Linden, Sales Manager, andre.linden@raithamerica.com

### **Panel Discussion and General Sponsor**

## Rigaku Innovative Technologies, Inc. #117

1900 Taylor Rd, Auburn Hills, MI, 48326-1740 USA  
+1 248 232 6400; fax +1 248 232 6500  
info@rigaku.com; www.rigaku.com/components

### **Featured Product: Multilayer Optics and Coatings for EUV Lithography**

Rigaku Innovative Technologies is at the forefront of multilayer optic technology for EUV Lithography. As Osmic Inc. we were the first to commercialize multilayer technologies for use in the X-ray Sciences. Our early efforts in EUV optics with global innovators have provided over ten years of real world applications and tests results that show the highest reflectivity and resolution for multilayer EUV Illumination optics. Come see us at SPIE Advanced Lithography Booth #117. Contact: Bill Bowman, Sales Engineer, bill.bowman@rigaku.com; Jim Rodriguez, Vice President, Business Development, jim.rodriguez@rigaku.com

## SAES Pure Gas

#116

4175 Santa Fe Rd, San Luis Obispo, CA, 93401-8115 USA  
+1 805 541 9299; fax +1 805 541 9399  
spg@saes-group.com; www.SaesPureGas.com

**Featured Product: Advanced gas purification solutions for EUV, Immersion, Dry Lithography and Metrology applications.**

SAES Pure Gas has been working for more than 15 years with leading edge OEMs and end users in the lithography and metrology field. SAES Point of Use purifiers, automatically regenerable bulk purifiers, and microcontamination inspection Service are the industry standards for optics, masks, wafers and reticle purging and protection. OEM Qualified solutions are available for CDA, H<sub>2</sub>, N<sub>2</sub>, Ar and CO<sub>2</sub>. Impurities removed include H<sub>2</sub>O, Acids, Bases, and Organics to single digit pptV levels. Contact: Steve Wallace, Sales, steve\_wallace@saes-group.com

## Sage Design Automation, Inc.

#203

**SPIE** Corporate Member

2075 De La Cruz Blvd. Ste 105, Santa Clara, CA, 95050 USA  
+1 408 727 6234; fax +1 408 727 6288  
info@sage-da.com; www.sage-da.com

**Featured Product: iDRM Platform: Design rule development, definition, validation, analysis and check generation**

Sage-DA makes software tools for design rule development. The iDRM design rule platform ensures consistency and closure between process data, their respective DRM representation and their DRC runset implementation. iDRM enables non-programmers to quickly and formally capture design rules and generate correct-by-definition checks and analyses for new process technologies. In addition, iDRM automatically generates QA test suites for validating 3rd party DRC decks, ensuring full systematic coverage Contact: Coby Zelnik

## SAGEM REOSC

#300

Ave de la Tour Maury, Saint Pierre Du Perray, 91280 France  
+33 169 8972 00; fax +33 169 8976 50  
reosc@sagem.com; www.reosc.com

**Featured Product: Low roughness, high precision DUV & EUV optical components and systems for lithography**

REOSC (subsidiary of SAGEM) aims to design and create high-performance optical components or systems for the semiconductor industry, space, astronomy and large-scale lasers (Ignition & Multi PW Facilities). We manufacture: high-performances, spherical, aspherical, on- or off-axis optic units or components; using glass ceramic, silicon carbide (SiC), silicon or metal lightweighted optics; active or adaptive optics; size up to 8m; precision: ångström; laser coatings (from DUV to IR). Contact: Slimane DJIDEL, Sales Manager, slimane.djidel@reosc.com

## Shin-Etsu MicroSi

#130

10028 S 51st St, Phoenix, AZ, 85044-5203 USA  
+1 480 893 8898; fax +1 480 893 8637  
info@microsi.com; www.microsi.com

Shin-Etsu, the world's No. 1 supplier of semiconductor silicon wafers and a leading supplier of essential electronic materials. Shin-Etsu's product portfolio includes, photomask blanks, EB resists, pellicles, synthetic quartz, semiconductor advanced resists along with numerous specialized thermal interface materials. Contact: Ed Nichols, Marketing Manager, enichols@microsi.com

## Promotional Partner

## Solid State Technology

#113

1786 18th St, San Francisco, CA, 94107 USA  
+1 415 255 0390; fax +1 415 255 9214  
info@electroi.com; www.electroi.com

**Featured Product: Solid State Technology**

Reach the largest, most qualified community of decision makers for semiconductor and electronics manufacturing worldwide through the magazine, email newsletters, website, webcasts and The ConFab Conference & Networking event. Topics include Advanced Packaging, MEMS, LEDs and Displays as well as all the current topics trending in the industry. Contact: Kerry Hoffman, khoffman@extensionmedia.com for advertising information or Sabrina Straub, sstraub@extensionmedia.com for The ConFab or webcasts.

## Sumika Electronic Materials, Inc.

#307

3832 E Watkins St, Phoenix, AZ, 85034-7254 USA  
+1 602 659 2500; fax +1 602 438 2277  
customerservice@sumikamaterials.com;  
www.sumitomo-chem.co.jp

Sumika Electronic Materials, Inc., A subsidiary of Sumitomo Chemical, is a leading supplier to the semiconductor, PV, Thin Film and MEMs industries. Products include photoresists (1-line, KrF, ArF, Immersion, Double Patterning, EUV, and E-Beam), EBR solvents, post CMP cleaners, Targets, Etchants and Strippers. In Addition, Sumika manufactures GaAs EPI wafers for the global Semiconductor market and supplies engineered resins to the electronics and automotive industries. Contact: Joe Daggett, U. S. Sales Manager, jdaggett@sumikamaterials.com; Gary Smith, Regional Manager, gsmith@sumikamaterials.com.

## SwissLitho AG

#301

**SPIE** Corporate Member

Technoparkstrasse 1, Zürich, 8005 Switzerland  
+41 774347363  
info@swisslitho.ch; www.swisslitho.com

**Featured Product: Go beyond E-Beam with the NanoFrazor, your tool for rapid prototyping of high quality nanostructures**

SwissLitho offers the NanoFrazor, the first alternative to conventional mask-less lithography technologies. Patterning resolution and speed are similar to high resolution e-beam lithography, however, the novel technique enables direct 3D lithography and in-situ metrology with markerless overlay with sub-5 nm accuracy. Recently, sub-20 nm patterns have been fabricated in silicon and metals. The first NanoFrazor lithography systems have been installed in Europe and America in 2014. Contact: Felix Holzner, CEO and founder, holzner@swisslitho.com; ZhengMing Wu Hawellek, Senior Sales Engineer/Manager, wu@swisslitho.com

# EXHIBITOR DIRECTORY

## Synopsys Inc

#206

**SPIE** Corporate Member

690 E Middlefield Rd, Mountain View, CA, 94043 USA  
+1 650 584 5000  
info@synopsys.com; www.synopsys.com

**Featured Product: Proteus ILT, Proteus LRC, CATS, Sentaurus Lithography**

Synopsys provides industry-proven EDA solutions to meet the demands of today's advanced IC manufacturing processes while setting the standard in platform flexibility to enable innovative solutions for next generation technology nodes. Synopsys' comprehensive Mask Synthesis, Mask Data Preparation, TCAD and Yield Management tools provide leading-edge performance, accuracy, quality, and cost of ownership for all your production and development needs. Contact: Manufacturing@synopsys.com

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## Tokyo Electron

#326

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www.tel.com

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## Tokyo Ohka Kogyo America, Inc. (TOK America Inc)

#110

**SPIE** Corporate Member

190 Topaz St, Milpitas, CA, 95035-5429 USA  
+1 408 956 9901; fax +1 408 956 9995  
user@tokamerica.com; www.tokamerica.com

TOK America manufactures and markets ultra high-purity photo resists and auxiliary chemicals used in the fabrication of integrated circuits. TOK America is a US subsidiary of Tokyo Ohka Kogyo Co., Ltd., in Kawasaki, Japan, a world leader in the manufacture of photo resists, auxiliary liquid chemical products, and process equipment for the semiconductor circuit, semiconductor packaging, image sensor/ MEMS, 3D packaging and display technology materials industries.

**Featured Exhibitor, Floor Plan Logo Sponsor**

## TRIOPTICS GmbH

#118

**SPIE** Corporate Member

2223 W San Bernardino Rd, West Covina, CA, 91790 United States  
+1 626 962 5181; fax +1 626 962 5188  
sales@trioptics-usa.com; www.trioptics-usa.com

**Featured Product: OptiSurf: 0.15  $\mu$ m measurement accuracy for center thicknesses and air gaps**

TRIOPTICS is the leading manufacturer of precise and automatic optical measurement, alignment and assembly instruments. For applications in microlithography TRIOPTICS recommends: OptiCentric MAX UP: Centration measurement with almost unlimited measurement range OptiCentric® MAX UP Bonding Stations are designed for high-precision alignment, bonding and centration tests of lenses (weighting up to 1200 kg) in a mount. OptiSurf UP: 0.15  $\mu$ m measurement accuracy for center thicknesses and air gaps Contact: Byron Seabolt, Regional Sales Manager, byron.seabolt@trioptics-usa.com

## Vermont Photonics Technologies Corp. #312

**SPIE** Corporate Member

22 Browne Ct Unit 110, Brattleboro, VT, 05301 USA  
+1 802 275 5210  
mail@vermontphotonics.com; www.vermontphotonics.com

**Featured Product: ELCOMAT autocollimators down to +/-0.01 arcsec! Automatic GONIOMAT for prisms down to +/-0.4 arcsec!**

Angular measurement instruments from Möller-Wedel Optical GmbH. We have been the U.S. agent for Möller-Wedel Optical for nearly 30 years. We can calibrate all the instruments we sell or we can use them to calibrate your artifact. Come see what accuracy and reliability means for angular metrology! Contact: Christian Guertin, Physicist, cguertin@vermontphotonics.com; Michael Mross, President, mmross@vermontphotonics.com

## Vistec Electron Beam GmbH

#211

Ilmstr. 4, Jena, 07743 Germany  
+49 3641 7998 0; fax +49 3641 7998 222  
electron-beam@vistec-semi.com; www.vistec-semi.com

**Featured Product: Vistec SB254 / Vistec SB3055**

As a long-standing equipment supplier, Vistec Electron Beam GmbH is providing leading technology solutions for advanced electron-beam lithography. Based on the Variable Shaped Beam (VSB) principle, the electron-beam lithography systems are mainly utilized for semiconductor applications and advanced research as silicon direct write, compound semiconductor, mask making, integrated optics and several new emerging markets. Vistec maintains service & support centers in Europa, Taiwan and in the US. Contact: Ines Stolberg, Manager Strategic Marketing, electron-beam@vistec-semi.com

## XEI Scientific, Inc.

#115

**SPIE** Corporate Member

1755 E Bayshore Rd Ste 17, Redwood City, CA, 94063-4153 USA  
+1 650 369 0133; fax +1 650 363 1659  
info@evactron.com; www.evactron.com

**Featured Product: Evactron De-Contaminator**

The Evactron De-Contaminator removes carbon from high vacuum systems and improves SEM performance by using remote RF plasma ashing to oxidize and remove carbon in electron microscopes and other vacuum chambers. Safe and compliant to CE, RoHS, c NRTL us, and SEMI -S2. XEI has products for cleaning localized areas, analytical specimens, and large and small vacuum chambers Over 1300 sold for scanning electron microscope cleaning. Visit XEI Scientific at www.Evactron.com and on Facebook. Contact: Daniel Kleinen, Vice President-International Sales, dan@evactron.com

## Zygo Corporation

#306

**SPIE** Corporate Member

Laurel Brook Rd, Middlefield, CT, 06455-1291 USA  
+1 860 347 8506; fax +1 860 347 8372  
inquire@zygo.com; www.zygo.com

For over 40 years, Zygo Corporation is a leading global provider of comprehensive metrology solutions, precision optics, and electro-optical design and manufacturing services for both research and production applications. The company designs and manufactures some of the world's most advanced noncontact 3D measurement systems providing unmatched performance, versatility, reliability, and value. Contact: Kurt Redlitz, Executive Director PPS, Kurt.Redlitz@ametec.com; Marc Tricard, Director Precision Optics, Marc.Tricard@ametec.com



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SAGEM REOSC  
TRIOPTICS GmbH  
Vermont Photonics Technologies Corp.

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attocube systems Inc.  
Heidelberg Instruments Inc.  
Mad City Labs., Inc.  
micro resist technology GmbH  
PHASICS Corp.  
SwissLitho AG  
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## COMPUTING SYSTEMS, DATA PROCESSING

attocube systems Inc.

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Vermont Photonics Technologies Corp.

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## DEFENSE, SECURITY, LAW ENFORCEMENT

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Vermont Photonics Technologies Corp.

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Entegris, Inc.

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Vermont Photonics Technologies Corp.

## EDUCATION AND TRAINING

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SwissLitho AG

## FIBER OPTICS AND ACCESSORIES

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## LASER COMPONENTS AND ACCESSORIES

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Nanoscribe GmbH  
PHASICS Corp.  
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## LASER INDUSTRY

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PHASICS Corp.

## LASERS AND SYSTEMS

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micro resist technology GmbH

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Carl Zeiss SMS GmbH  
DNS Electronics  
Entegris, Inc.  
Heidelberg Instruments Inc.  
LouwersHanique  
Mad City Labs., Inc.  
micro resist technology GmbH  
Nanoscribe GmbH  
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Raith America, Inc.  
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micro resist technology GmbH  
Nanoscribe GmbH  
Vistec Electron Beam GmbH

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SAES Pure Gas

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Vermont Photonics Technologies Corp.  
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- International Centre for Theoretical Physics (ICTP) Winter College
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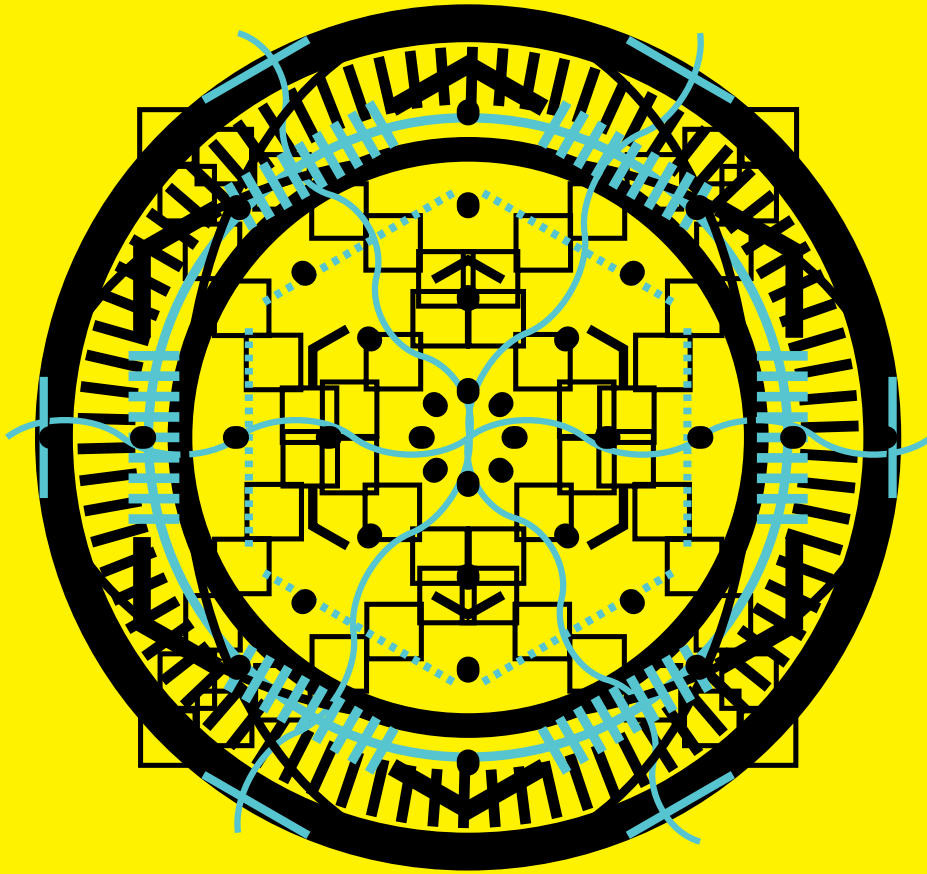
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