



## Exhibitors

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Products Division

ANCORP

Anderson Dahlen – Applied  
Vacuum Division

Applied Diamond, Inc.

CAEN Technologies, Inc.

CINEL Strumenti Scientifici SRL

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

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McCrone Microscopes &  
Accessories

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Quantum Detectors

Raptor Photonics

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**Aerotech, Inc.**  
101 Zeta Drive  
Pittsburgh, PA 15238  
Tel: 412-963-7470  
[www.aerotech.com](http://www.aerotech.com)



Since 1970, Aerotech has designed and manufactured the highest performance motion control and positioning systems for our customers in industry, government, science, and research institutions around the world. Aerotech's precision motion control products provide the critical performance for today's demanding applications in markets such as research and development, laser processing and micromachining, aerospace and defense, medical device and life sciences, semiconductor and flat panel, photonics, automotive, data storage, electronic manufacturing and test, assembly, and others requiring high precision, high-throughput motion solutions. Aerotech manufactures motion control and positioning systems and components including automated direct-drive and piezo nanopositioners; hexapods; planar and rotary air-bearing stages; high-speed gantries; mechanical-bearing linear, rotary, and lift stages; brushless linear and rotary servomotors and drives; stand-alone and software-based motion controllers; goniometers; galvanometers; and gimbals/optical mounts. Our expertise and ability to provide custom motion components and systems is unmatched. Our custom manufacturing capability is further augmented by our long history of providing vacuum-prepped and cleanroom-ready positioning systems and components. Aerotech has full sales and service facilities in the U.S., U.K., Germany, Taiwan, and China, as well as representatives across the globe.

**Agilent Technologies, Vacuum Products Division**  
121 Hartwell Ave.  
Lexington, MA 02421  
Tel: 781-861-7200  
[www.agilent.com/chem](http://www.agilent.com/chem)



Welcome to Agilent Technologies, Vacuum Products Division. We understand the demands of vacuum coating systems. Agilent Technologies' Vacuum Products Division (formerly Varian, Inc.) provides a wide array of robust, cost-effective, and easy-to-use vacuum pumps and systems for demanding industrial uses. From high throughput HS Diffusion Pumps to cost-effective DS, MS, and RPS Rotary Vane Pumps, and from reliable, high performance TwisTorr FS Turbo high vacuum pumps to clean, quiet IDP Dry Scroll primary pumps to precise, easy to use HLD Leak Detectors, Agilent delivers the tools you need to achieve your vacuum system productivity.

**ANCORP**  
707 SW 19<sup>th</sup> Ave.  
Williston, FL 32696  
Tel: 352-528-4100  
[www.ancorp.com](http://www.ancorp.com)



Manufacturer of high- and ultra-high vacuum components since 1965, ANCORP offers an extensive line of vacuum flanges, fittings, feedthroughs, traps, viewports, valves, chambers, and custom fabrications to researchers, OEMs, and industrial users around the world. ANCORP products are designed to meet or exceed the standards required by our customers, such as those involved with thin film deposition, surface analysis, laser devices, cryogenics, and the aerospace industry.

**Anderson Dahlen - Applied Vacuum Division**  
9850 Sunwood Dr. NW  
Ramsey, MN 55303  
Tel: 781-2299-0657  
[www.appliedvacuum.com](http://www.appliedvacuum.com)



Anderson Dahlen's capabilities for metal forming, large scale machining, and critical welding are ideal for manufacturing vacuum chambers. Our engineering and manufacturing resources support customers involved in a variety of vacuum applications; especially vacuum coating systems for ALD, CVD and large-area coating. Applied Vacuum Technology, LLC is a specialized product division focused on high and ultra-high chambers, assemblies and components produced from Stainless Steel, Aluminum, Titanium and other specialty alloys. AVT's products tend to be smaller in scale and typically designed for higher vacuum ranges, extending into extreme vacuum (XHV) applications. Visit [www.appliedvacuum.com](http://www.appliedvacuum.com) for more info. Having two production facilities located near Minneapolis helps us collaborate and share Engineering, Manufacturing and other resources. Together we offer a total solution for our customers and produce a variety of vacuum products ranging from critical components and assemblies, to one-of-a-kind research chambers for National Labs and R&D groups, to production chambers for world-class equipment manufacturers. Our team is dedicated to providing custom vacuum products to your specifications; while maintaining excellent workmanship and quality standards, delivering your product when you need it.

**Applied Diamond, Inc.**  
3825 Lancaster Pike, Suite 200  
Wilmington, DE 19805  
Tel: 302-999-1132  
[www.usapplieddiamond.com](http://www.usapplieddiamond.com)



Synthetic diamond, made by Chemical Vapor Deposition (CVD), is a fast growing, cost effective material. Delivering the superior properties of diamond in larger sizes, at a lower cost and with increased post-processing capabilities; CVD Diamond has replaced less effective materials in existing industries and become the chosen material for challenging next generation applications. Applied Diamond fabricates parts from Single Crystal and Polycrystalline Diamond for a variety of industrial applications. Applied Diamond grows diamond tailored to the specific application. Products tailored to synchrotrons include filters, detectors, lens parts, brazed windows, windows and fluorescent screens. After the growth, we have a variety of processes we can apply. Diamond polishing equipment makes the surface finish of materials highly smooth. Additional post-processing capabilities include metallization for bonding, mounting to a flange for vacuum and pressure applications and brazing. We can use dry etching to make thin parts even thinner. The lasers can cut parts to a different shapes and sizes.

**CAEN Technologies, Inc.**  
1140 Bay Street, #2C  
Staten Island, NY 10305  
Tel: 718-981-0401  
[www.caenels.com](http://www.caenels.com)



CAEN Technologies Inc. is the North America branch for the family of CAEN companies and products. The CAEN ELS product line offers solutions as digital magnet power supplies, 4-channel digital picoammeters for detector readouts and beamline positioning, as well as various carrier boards and FMC options for MTCA.4. CAEN SpA develops and markets a wide range of high/low voltage power supply systems, as well as front-end/data acquisition modules for nuclear and particle physics detectors.

**CINEL Strumenti Scientific S.R.L.**  
Viale dell'Artigianato 14/14A  
Vigonza 35010  
Italy  
Tel: 49725022  
[www.cinel.com](http://www.cinel.com)



CINEL Strumenti Scientifici (<http://www.cinel.com>) is an established supplier of components and integrated systems for synchrotrons, XFEL light sources and particle accelerators. We provide innovative and tailored solutions into integrated UHV systems, complete beamlines, beamline main and ancillary components (mirror systems, monochromators, slits, shutters etc.). Our combination of in-house expertise in precision design and engineering, metrology, assembly and integration, vacuum and, last but not least, our high-precision machining capabilities allowing us to manufacture in-house every single part of our instruments, make CINEL the right partner for the most challenging and state-of-the-art instruments for your beamlines.

**DECTRIS USA, Inc.**  
325 Chestnut Street, Suite 800  
Philadelphia, PA 19106  
Tel: 267-361-5486  
[www.dectris.com](http://www.dectris.com)



DECTRIS develops and manufactures the most accurate x-ray and electron cameras to spark scientific breakthroughs around the world. While CCD and CMOS cameras capture and integrate x-rays indirectly, DECTRIS hybrid-photon-counting detectors count individual photons directly. DECTRIS systems have revolutionized x-ray detection at synchrotron beamlines with their high performance and simple operation. We are the technology and market leader at synchrotrons, and we provide hybrid photon counting solutions also for laboratory equipment, plasma research, and electron microscopy. We support researchers everywhere from our offices in Switzerland, the United States, and Japan.

**FMB Oxford Limited**  
Unit 1 Ferry Mills  
Osney Mead  
Oxford OX2 OES  
United Kingdom  
Tel: +44 (0)1865 320300  
[www.fmb-oxford.com](http://www.fmb-oxford.com)



FMB Oxford is a leader in the supply of beamlines and beamline components to the scientific community, specializing in the design, assembly, test, installation and commissioning of the high value systems. With over 20 years' experience in the synchrotron and FEL industries, FMB has built an extensive product range. Developments in their novel approach ensures they can provide the equipment to meet the ever-demanding needs of the scientific community. Continual investment in new production, test and design facilities, together with the recruitment and development of key staff, ensures that FMB Oxford remains at the forefront of beamline system supply. Range of services include:

- Feasibility studies
- Engineering and design support including FEA, vibration studies and full integration testing
- Ray tracing
- Project Management
- ISO 6 cleanrooms for particle free assembly
- In-house manufacturing and test capabilities
- World-wide installation, commissioning and customer service

FMB Oxford - Engineering science for a brighter tomorrow.

**JTEC Corporation**  
 2-5-38 Saito-Yamabuki  
 Ibaraki Osaka 567-0086  
 Japan  
 Tel: +81-72-655-2786  
[www.j-tec.co.jp](http://www.j-tec.co.jp)



At JTEC Corporation, we have been fabricating OSAKA MIRROR's since 2005, using EEM, nano-fabrication, and RADSI and MSI, nano-measurement, technologies of Osaka University. The number of our x-ray mirrors delivered worldwide reaches approximately 1000. Learn more about our fabrication and production technology, our potentiality, and OSAKA MIRROR.

**KOHZU Precision & LAB Motion Systems c/o Daniel F Crews, LLC**  
 PO Box 2804  
 Evergreen, CO 80437  
 Tel: 303-944-1082  
[www.dfcrews.com](http://www.dfcrews.com)



KOHZU Precision Co. manufactures industry-leading scientific & experimental equipment for synchrotrons and laboratories including monochromators, diffractometers, measurement equipment along with high-precision, linear stages (X), rotary axes (R), vertical lift stages (zed axis, Z), stacked XY, swivel or goniometer stages (tip/tilt) for atmospheric or vacuum environments. Stages are available with manual micrometers or stepper motors (motorized). KOHZU also manufactures 6-axis alignment stations perfect for metrology & synchrotron beamline systems. LAB Motion Systems manufactures world-class air bearing products including rotary air bearings, linear air bearings and multi-axis air bearing systems. LAB's rotary air bearings offer nano-precision in compact, high-performance systems. The RT150U has unmatched performance.

**Kurt J. Lesker Company**  
 1925 Route 51  
 Pittsburgh, PA 15025  
 Tel: 412-387-9200  
[www.lesker.com](http://www.lesker.com)



We are a global leader in plasma and thin film deposition technology and vacuum coating. Complete solutions with expertise in magnetron sputtering, electron beam deposition and thermal evaporation, organic electronics, and atomic layer deposition (ALD) for your research challenges. Extensive global inventory of sputtering targets and evaporation materials available for same-day shipment; TORUS® magnetron sputtering sources; and HiPIMS IMPULSE power supplies. Visit [lesker.com](http://lesker.com) for all your vacuum components: pumps/oils, vacuum hardware/components, and custom manufactured vacuum chambers. High quality sample motion and manipulation devices from UHVD Design Ltd. Try our free VacuCAD file downloading service and our Chamber Builder™ program.

**McCrone Microscopes & Accessories**  
 850 Pasquinelli Drive  
 Westmont, IL 60559  
 Tel: 630-887-7100  
[www.mccrone.com](http://www.mccrone.com)



The McCrone Group is internationally recognized as a world leader microscopy and microanalysis and includes McCrone Associates, McCrone Microscopes & Accessories and Hooke College of Applied Sciences. McCrone Associates, Inc. is focused on solving the most difficult materials and particle identification problems along with the day-to-day analysis needs of clinical laboratories, scientific researchers, business organizations, and government agencies worldwide. McCrone Microscopes & Accessories, LLC is the authorized dealer for Nikon microscopes, Linkam high temperature and x-ray stages including the new Modular Force stage, the new JEOL JCM-7000 benchtop SEM with EDS, HiROX Digital Microscope Systems, digital imaging systems, and a variety of laboratory supplies. The technical sales representatives at McCrone Microscopes are trusted advisors to scientists worldwide. Hooke College of Applied Sciences provides education and training to scientists worldwide, specializing in SEM instruction. Topics covered include light and electron microscopy, spectroscopy, sample preparation, chemistry and laboratory safety, and image analysis.



**Mirion Technologies**

1218 Menlo Drive  
 Atlanta, GA 30318  
[www.mirion.com](http://www.mirion.com)



**MIRION**  
 TECHNOLOGIES

Our organization is comprised of over 2,300 talented professionals, passionate about delivering world class products, services, and solutions in the world of radiation detection, protection and measurement. In partnership with our customers in nuclear power plants, military and civil defense agencies, hospitals, universities, national labs, and other specialized industries, Mirion Technologies strives to deliver cutting edge products and services that constantly evolve based on the changing needs of our customers. Combining state-of-the-art technology with exceptional customer service, Mirion Technologies is dedicated to providing an unmatched experience in radiation detection and instrumentation.

**MiTeGen**

95 Brown Road  
 MS 1034, Suite 183  
 Ithaca, NY 14850  
 Tel: 607-266-8877  
[www.mitegen.com](http://www.mitegen.com)



MiTeGen engineers, manufactures and distributes a full range of products for the expression, crystallization, crystal harvesting, x-ray diffraction and Cryo-EM data collection of proteins, viruses, and small molecule/inorganic compounds. These innovative tools measurably improve the ease, reproducibility, and quality of experiments and data collection. Founded in 2004 by Cornell Professor Rob Thorne, MiTeGen's first products were developed to offer improvements to work being performed in crystallography laboratories, which included a focus on improving crystal harvesting (MicroMounts), room temperature diffraction screening (MicroRT System), and micro-sample manipulation (MicroTools). Shortly thereafter, MiTeGen developed Reusable Bases (or goniometer caps) that allow scientists to avoid use of epoxy and to change loops easily. Today, MiTeGen carries over 3,000 products for X-ray Crystallography and Cryo-EM, and has developed instrumentation for rapid, reproducible cryocooling with NANUQ™, a Hyperquenching Cryocooler, and Watershed™, a Humidity Controlled Workstation. The company has evolved with a full line of products for Cryo-EM, including Gen2 Cryo-EM Pucks to simplify handling, organization, and transport of Cryo-EM samples. Our customers include industrial, academic, medical, pharmaceutical, and government laboratories in more than 45 countries. MiTeGen is based in Ithaca, NY. More information can be found at: [mitegen.com](http://mitegen.com) or by calling us at 607-266-8877.

**OMS Motion, Inc.**

15201 NW Greenbrier Pkwy  
 Suite B1  
 Beaverton, OR 97006  
 Tel: 503-629-8081  
[www.OMSmotion.com](http://www.OMSmotion.com)



OMS Motion (aka Oregon Micro Systems and OMS) has been successfully producing motion control products and services for more than 35 years. Single axis integrated controls with drives as well as complete multi-axis controllers that can coordinate and synchronize up to 10-axes on a single controller. Founded in the early 80's OMS Motion evolved from patented technology that provides advantages in the motion control industry. In the mid 90's OMS was acquired by a publicly traded company with a focus on the medical device markets. OMS continued the motion control business as a subsidiary, while supporting the medical device product development. In early 2017 OMS Motion separated from the public company, under the original leadership of the company's beginnings, and has regained its focus on motion control business. Great effort has gone into the development of the controls and the functionality continuously evolves as more and more unique applications utilize the controllers. OMS products are used in numerous markets worldwide, including semiconductor, lab automation, life sciences, factory automation, large- and small-scale research facilities/projects, and others. OMS controllers are versatile and capable. OMS Motion fosters the philosophy that "there is no success without the customers' success," and they demonstrate this through their commitment to the customers application lifecycle. OMS has earned a strong reputation and is trusted throughout the world.

**Pfeiffer Vacuum**

24 Trafalgar Square  
 Nashua, NH 03063  
 Tel: 603-578-6524  
[www.pfeiffer-vacuum.com](http://www.pfeiffer-vacuum.com)



Pfeiffer Vacuum is one of the world's leading providers of vacuum solutions. In addition to a full range of hybrid and magnetically levitated turbopumps, the product portfolio comprises backing pumps, leak detectors, measurement and analysis devices, components as well as vacuum chambers and systems. Ever since the invention of the turbopump by Pfeiffer Vacuum, the company has stood for innovative solutions and high-tech products that are used in the Analytics, Industry, Research & Development, Coating and Semiconductor markets. Founded in 1890, Pfeiffer Vacuum is active throughout the world today. The company employs a workforce of some 3,300 people and has more than 20 sales and service companies as well as 10 manufacturing sites worldwide.

**PI (Physik Instrumente) LP**

16 Albert Street  
Auburn, MA 01501  
Tel: 508-832-3456  
[www.pi-usa.us](http://www.pi-usa.us)



PI is a leading manufacturer of precision motion control and piezo nanopositioning equipment for big physics experiments and beamline instrumentation. Solutions include 6-DOF hexapod alignment systems, vacuum compatible positioning stages, non-magnetic piezoelectric motors and actuators, air bearing positioning stages, high precision nanopositioning stages and EtherCat compatible motion controllers. At PI, specialists with many years of engineering experience work with scientists to push boundaries together and develop the best possible solution: Unique in its features, repeatable in performance. Beamline Instrumentation focuses on the optimum motion and positioning equipment for beam preparation optics, sample manipulation, detector positioning, be it single components or full endstation instrumentation. Beamline Instrumentation is your partner of choice for the design, manufacturing, qualification, and commissioning.

- 50 Years Experience
- Design and Manufacturing Centers in USA, Europe and Asia
- ISO 9001 certified

**Quantum Detectors**

R104, RAL  
Harwell OX11 0QX  
United Kingdom  
Tel: +44 (0)1235 445 795  
<https://quantumdetectors.com>



Quantum Detectors has provided novel technology to the APS for several years, with the first installation of an Xspress 3 detector readout system in 2014. Since then, several more systems have been installed around the ring enabling higher throughput, wider dynamic range, and faster experiments. As well as advanced detector readout systems we've also installed several MerlinX detectors at the APS. A 55µm energy resolving detector with up to eight thresholds in Colour Mode and employing a Medipix3 ASIC to achieve rates of 1200 Hz in 12-bit mode, MerlinX is a high-performance x-ray imaging detector that requires no supplementary cooling system. Additionally, we have Hexitec: A fully spectroscopic hard x-ray imaging detector which measures the energy and position of every incident photon in the 4-200 keV range. If you'd like to hear how we could provide better usability, enable faster throughput and in some cases offer a completely new mechanism for detection at your beamline, drop us a line to learn more!

**Raptor Photonics**

3020 Business Park Drive  
Suite F  
Norcross, GA 30071  
Tel: 877-230-4836  
[www.raptorphotonics.com](http://www.raptorphotonics.com)



Raptor Photonics is a leading developer and supplier of next generation, high-performance digital camera solutions for the Scientific, Surveillance and Aerospace markets. Raptor offers a range of CCD, EMCCD and InGaAs solutions. As well as standard products, Raptor provides custom solutions to OEM and Instrumentation companies around the world.

**RaySpec Ltd.**

1 The Valley Centre  
Gordon Road  
High Wycombe HP136EQ  
United Kingdom  
Tel: 01628533060  
[www.rayspec.co.uk](http://www.rayspec.co.uk)



RaySpec Ltd is a specialist manufacturer of customized Silicon Drift Detectors (SDD) and signals processing electronics for x-ray fluorescence applications. Detectors are available with a wide range of active areas in single and multi-sensor designs. RaySpec supplies original equipment manufacturers and specialist end-users in beamline and research facilities all over the world. unique capabilities satisfy the most demanding of specialized requirements.

**SAES Group**

1122 East Cheyenne Mtn. Blvd.

Colorado Springs, CO 80906

Tel: 719-576-3200

<https://www.saesgetters.com/products/technical-library/application-neg-pumps/particle-accelerators>

SAES Group is the global leader in Non-Evaporable Getter (NEG) pumps and NEG coating used in various high, ultra-high, and extreme-high vacuum applications. From storage rings to front ends to experimental end stations, SAES NEG pumps and NEG coating provide compact and powerful discrete or distributed pumping solutions for synchrotrons around the world. With the advent of the ZAO getter material, SAES NEG pumps can also operate in high vacuum and particle sensitive applications, providing significantly higher pumping speeds and more capacity than other getter materials. Specifically, the ZAO getter pumps are used in particle sensitive applications, such as the warm sections between SRF cavities and mirror and monochromator chambers in beamlines. SAES Group offers many different pumping solutions for a wide range of synchrotron and accelerator applications. SAES Group's NEG coating, flangeless pumps mounted directly in chambers, and traditional CF flanged pumps have provided of pumping power for synchrotrons and accelerators worldwide for decades. SAES Group will continue this tradition of innovation in NEG coating and NEG pumps for decades to come.

**Sydor Technologies**

78 Schuyler Baldwin Dr.

Fairport, NY 14450

Tel: 585-278-1168

<http://sydortechologies.com>

Sydor Technologies is a leading global provider of advanced x-ray detectors and diagnostic instrumentation for critical science missions and fundamental research. Sydor's commercial engineering expertise transforms cutting-edge technology into complex measurement solutions that generate critical results for advanced high energy density physics experiments occurring at synchrotrons and fusion research facilities around the world. Established in 2004, Sydor Technologies is headquartered in Rochester, NY and supplies systems and support in over 33 countries. For additional information, please visit [www.SydorTechnologies.com](http://www.SydorTechnologies.com).

**Teledyne SP Devices**

Teknikringen 6

Linköping 58330

Sweden

Tel: +46 13 465 06 00

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

Teledyne SP Devices designs and manufactures world-leading modular data acquisition and signal generation instruments. Our products utilize patented calibration logic, the latest data converters, and FPGA technology resulting in an unrivalled combination of high sampling rate and resolution. Products are available with a range of application-specific features and embedded, real-time signal processing. This helps our customers to overcome performance bottlenecks, shortens time-to-market, and provides system-level advantages within a wide range of application areas. SP Devices' products are employed across a wide variety of industries, including analytical instruments, remote sensing, scientific instrumentation, medical imaging, and more.

As part of the instrumentation segment of Teledyne Technologies, SP Devices expands its technology access, engineering excellence, and critical know-how thereby strengthening its position as a world-leading long-term supplier of high-performance instrumentation and system-level solutions.

**Televac – The Fredericks Company**

2400 Philmont Ave.

Huntingdon Valley, PA 19006

Tel: 215-938-4437



The Televac brand of The Fredericks Company designs and manufactures vacuum sensors, gauges, and control instrumentation for a variety of vacuum measurement applications. We offer full range measurement solutions from 1E-11 Torr to 1E4 Torr, primarily based on thermocouple/convection and cold cathode technology. Our industry-leading cold cathode gauges have high bakeout temperatures and quick ignition at ultra-high vacuum (UHV), and our 7FCS cold cathode is specifically designed for national lab and research applications. Televac guarantees customer satisfaction and our "not too big, not too small" operation is what enables us to offer a true partnership experience. Our heritage of support goes back more than 85 years, working side-by-side with customers across the world in numerous markets and literally hundreds of applications. In that time, we've amassed a great deal of knowledge about vacuum measurement, and advanced manufacturing techniques for the vacuum industry, and our team of designers and engineers are available to bring that experience to bear for you. We'll develop high quality, cost-effective vacuum products that are critical to solving your most challenging design problems. Fredericks is proud to be a Woman Owned Small Business (WOSB). We are ISO 9001:2015 certified and registered with the U.S. State Department as ITAR compliant. All of our products are designed and manufactured at our facility in Huntingdon Valley, PA.

**VACOM USA LLC**  
1074 6<sup>th</sup> Avenue North  
Naples, FL 34102  
[www.vacom.us](http://www.vacom.us)



Founded 1992 in the Thuringian (Germany) scientific and high tech center Jena, VACOM is one of the European market leaders for vacuum technology and recently expanded to the USA. Our core areas of expertise are standard and fully custom Vacuum Hardware, Electrical Feedthroughs, Vacuum Measurement and Vacuum Optics for applications from high vacuum to extreme high vacuum. Since its foundation with 2 employees, VACOM has grown continuously and employs today around 400 staff members around the globe. More than 20 scientists and technicians work in our research center. We manufacture on latest machinery in our 50,000 sq. ft. production and technology center with adjacent 8,000 sq. ft. clean room facilities to meet highest demands on the required cleanliness and particle freedom of products. A highly contemporary logistics system guarantees the smooth and real-time controlled flow of goods.

**X-Spectrum GmbH**

Notkestraße 85  
Hamburg 22607  
Germany  
Tel: 585-278-1168  
<https://x-spectrum.de/virtualbooth>



Spectrum GmbH is dedicated to the scientific advancement through research utilizing synchrotron radiation. We provide the LAMBDA system, a dedicated x-ray camera that is unique in its capabilities. X-Spectrum not only provides the camera itself, but also dedicated IT equipment and software for seamless integration into the most common synchrotron beamline control systems. We firmly believe that detectors can be easy to use, plug and play devices. Our team is experienced in setting up detector on many different beamlines and we believe in support to the experimentalist. We want our cameras to be the workhorses at the experiments, and we are working hard at making them suitable for this challenging task. For x-ray crystallography and scattering experiments, LAMBDA offers the highest resolution you can buy today. AMBER is the vacuum-enabled variant of LAMBDA, which is perfect for electron and X-ray detection in electron microscopy. Amber can also be used for x-ray experiments in vacuum to minimize air scattering. X Spectrum can draw on a sustained innovation cycle due to a strong cooperation with DESY. Initially the company, as well as the production, was placed on the premises of DESY because the available infrastructure is sufficient to fulfill the needs of X Spectrum during the first years. As production exceeds the existing capabilities, X-Spectrum is looking forward to moving to the innovation center "Start-up Labs Bahrenfeld" next to the DESY campus in 2021.

**XIA LLC**

31057 Genstar Road  
Hayward, CA 94544  
Tel: 510-401-5760  
[www.xia.com](http://www.xia.com)



*Instruments That Advance The Art*

XIA LLC invents, develops and markets advanced digital signal processing and data acquisition systems for high-rate x-ray spectroscopy at synchrotron facilities and other radiation detector applications in university research, national laboratories and industry. Our core technology of high rate digital pulse processing is applied to a diverse range of products from large multi-channel systems, to benchtop units and compact low power processor cards for handheld instrumentation. Our product features include high-rate elemental fast mapping, and data output rates in excess of 4 Mcps (FalconX8). In addition to x-ray detector electronics, XIA offers a parallel product line of high-speed digital pulse processors for gamma detectors used for spectroscopy, timing and coincidence measurements. XIA is based in Hayward, California, on the east side of San Francisco Bay. Our multi-lingual staff currently supports product sales in over 30 countries on six continents.

**XOS**

15 Tech Valley Drive  
East Greenbush, NY 12061  
Tel: 518-880-1500  
[www.xos.com/oem](http://www.xos.com/oem)



XOS is a global leading provider of advanced optics and OEM sub-systems that greatly improve the measurement speed, precision, and sensitivity of X-ray analytical instrumentation. XOS' polycapillary optics can be used in many applications, including plating thickness, forensics, cultural heritage, and elemental mapping— such as on the Mars 2020 rover, where an XOS polycapillary optic is playing a critical role in the search for past life on Mars. flex-Beam™, our latest compact X-ray generator solution, combines a low-powered X-ray source and precisely aligned polycapillary optic to deliver a bright X-ray beam for advanced material analysis. The innovative optic mounting and alignment design enables an easy X-ray tube and/or optic replacement, making it a user-friendly tool for both OEMs and end users.