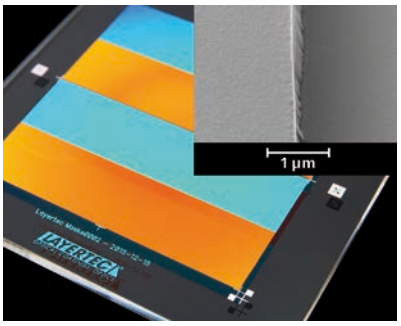
Segmented Optical Components

Manufacturer: LAYERTEC.
Product: Expanding range of customer-specific structuring of layer systems using lithography. Segmented components can be used for lateral phase and / or amplitude modulation and are therefore suitable, for example, for mode selection or beam splitting. The structured components are designed for use in high-power laser systems, the edges of the structures are laser-resistant up to the kW range.
Features: Fused silica (plane) up to a size of currently 8 inches is used as the standard substrate material. On request, other materials are possible. Dielectric or metallic layers can be combined and applied in segments according to customer requirements. Depending on the layer design, structure sizes



down to the µm range are possible as well as edge sharpness down to the single-digit µm range. The portfolio includes high-volume fabrication as well as flexible prototype manufacturing. –

LAYERTEC was founded in 1990 as the first spin-off from the Friedrich Schiller University in Jena. Today, 30 years later, the company employs more than 300 people and operates worldwide. The company runs 40 coating chambers with different technologies and sizes for sputtering and evaporation. The in-house fine optics facility produces customer-specific plane, spherical, aspherical and free-form optics.

LAYERTEC GmbH
Ernst-Abbe-Weg 1
99441 Mellingen, Germany
Phone: +49 (0)36453 744-0
Fax: +49 (0)36453 744-40
E-mail: info@layertec.de
Website: www.layertec.de

Diaphragm Pumps for Clean Fore-Vacuum

Manufacturer: VACUUBRAND.
Product: Variable-speed diaphragm pumps of the "VARIO" series as backing pumps for modern turbo pumps which is particularly advantageous for high-purity processes in analytics or for applications with corrosive gases. Diaphragm pumps run completely oil-free. Compared to rotary vane pumps, this avoids the risk of contamination of the high-vacuum system with hydrocarbons. In addition, oil changes and the disposal of waste oil are no longer necessary.
Features: In diaphragm pumps, there are no frictional components inside the pumping chamber and thus no abrasion occurs. Consequently, contamination of the high vacuum area or the environment at the pump outlet due to particles is excluded. Chemistry diaphragm pumps in which all wetted parts are made of fluoropolymers are particularly suitable for applications with corrosive gases. They provide an almost universal chemical resistance. The diaphragm pumps are characterized by an unmatched degree of reliability in continuous operation: With lifetimes of more than 40,000 h in continuous operation, the ultimate vacuum remains stable over the entire test period. The adaptation of the motor speed to the gas load results in an increase in the lifetime of the diaphragms and extends the service intervals even further. Additionally, noise, energy consumption, and vibration are reduced significantly.
The variable-speed vacuum pumps in combination with the "VACUU·SELECT" controller offer a perfect combination of modern control electronics and software with powerful mechanics. The innovative controller offers the option of configuring customer specific vacuum processes and provides a unique "Turbo Backing Pump" application: The patented optimization of the motor speed improves the attainable final vacuum and thus provides the best conditions for using the diaphragm pump as backing pump for turbo molecular pumps.

VACUUBRAND GMBH + CO KG
Alfred-Zippe-Straße 4
97877 Wertheim, Germany
Phone: +49 (0)9342 808-5550
Fax: +49 (0)9342 808-5555
E-mail: info@vacuubrand.com
Website: www.vacuubrand.com

imec and Park Systems Sign a Joint Development Project

Park Systems, global leader and innovator of Atomic Force Microscopy and Metrology solutions, and *imec*, world-leading R&D and innovation hub in nanoelectronics and digital technologies, have signed a Joint Development Project for new in-line AFM metrology solutions for the wafer semiconductor sector. A former collaboraration enhanced possibilities of inline automated AFM in semiconductor research, such as surface roughness, critical dimension (CD) and sidewall roughness. The new project targets multiple strategic developments to address the current metrological challenges of continuously downscaling the geometrical dimensions of devices and 3D assembly stacking on a time horizon of four years. With a strong focus on practical problem-solving applications of the new project, the partners aim to deliver innovative 3D-metrology features for market challenges of ever smaller semiconductor devices.

Park Systems Europe GmbH
Janderstraße 5
68199 Mannheim, Germany
Phone: +49 (0)621 490896-50
Fax: +49 (0)621 490896-66
E-mail: pse@parksystems.com
Website: www.parksystems.com

Laser Rack Systems

Manufacturer: TOPTICA Photonics.
Supply: New series of quantum-technology-approved laser modules for industrial rack integration: narrow-linewidth tunable diode lasers, amplified or frequency-converted diode lasers, frequency combs, and related accessories. The different modules are housed in the "T-RACK" high quality, rugged 19" cabinet with modular power entry unit, professional cable and heat management.
Features: All of these laser modules consist of a laser head with fiber-coupled optical output and are equipped with the renowned digital laser controller DLC pro. They are conveniently and reliably operated, easily remotely controlled and offer ultimate performance, previously only possible for operation in research-grade laboratories on optical tables. They have a fiber-coupled optical output of 330 to 1625 nm and offer complete solutions based on different subsystems including frequency stabilization. Based on its expertise in quantum technology, *TOPTICA* also offers complete rack laser systems: dedicated or customized solutions that work perfectly together from day one.

TOPTICA Photonics AG
Lochhamer Schlag 19
82166 Gräfelfing, Germany
Phone: +49 (0)89 85837-0
Fax: +49 (0)89 85837-200
E-mail: info@toptica.com
Website: www.toptica.com

Coherent Passes 50,000 "Sapphire" Laser

Coherent has now passed the milestone of 50,000 units shipped for the company's "Sapphire" family of compact CW visible lasers. As the first solid-state alternative to bulky and energy inefficient gas lasers at the critical 488 nm wavelength, "Sapphire" lasers enjoyed early strong success mainly in life sciences and related instrumentation. However the unique power scaling and wavelength scaling inherent to the optically pumped semiconductor laser (OPSL) technology has enabled the company to continuously expand the product lineup with new wavelengths and power levels over the series' 20-plus year history to meet the demands of new and changing applications. For example, "Sapphire" is currently offered with a choice of nine different standard wavelengths between deep blue (458 nm) and orange (594 nm) to support new applications in metrology and other techniques in diverse industries including semiconductors. Yet all of these compact lasers still feature exactly the same form and fit, which has proved a particularly popular advantage for OEM customers with products often tied to quite different life cycles. In addition to standard products, custom versions of "Sapphire" with unique wavelengths and other output properties continue to be developed for OEM customers.

Coherent Shared Services B.V.
Dieselstr. 5b
64807 Dieburg, Germany
Phone: +49 (0)6071 968-0
Fax: +49 (0)6071 968-499
E-mail: sales.germany@coherent.com
Website: www.coherent.com

Multi-Wavelength Laser Diode Modules

Manufacturer: Akela Laser.
Distribution: Frankfurt Laser Company.
Product: Unique multi-wavelength fiber-coupled diode laser modules with individually addressable high-power diode lasers. They can deliver up to eight wavelengths in 450 nm to 1800 nm range and optical power from 3 W to 40 W via a common fiber, making it convenient for use in both the R&D and OEM markets.
Features: The module can easily be integrated in systems, and with the optional blast shield, fiber interlock, and the choice of red or green aiming beams, it meets stringent industrial or medical requirements. The laser diode modules boast the broadest selection of operating wavelengths and the highest output power that meet the toughest challenges of machine vision applications
Applications: Due to the possibility to combine various wavelengths, these modules are useful for both the R&D and OEM markets. They can also serve as light engines for fluorescence microscopy, as well as RGB projectors for entertainment and advertising.

Frankfurt Laser Company
An den 30 Morgen 13
61381 Friedrichsdorf, Germany
Phone: +49 (0)6172 27978-0
Fax: +49 (0)6172 27978-10
E-mail: sales@frlaserco.com
Website: www.frlaserco.com

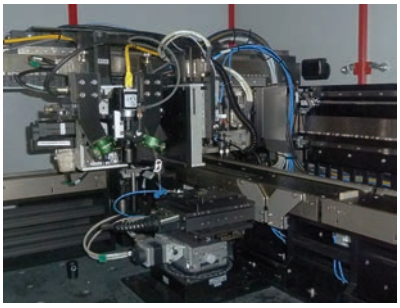
NanoScientific Forum Europe on SPM Research

The 3rd NanoScientific Forum Europe (NSFE 2020) invites scientists and researchers working in the field of Scanning Probe Microscopy to Ireland: The event is to be held on **September 23 – 25, 2020** at Trinity College Dublin. The scientific focus lies on energy storage and nanoscale functional materials, such as organics, organic/inorganic hybrid semiconductors, nano- and biomaterials, as well as the development of novel nanometrology methods.
The NSFE 2020 will be hosted by Kim McKelvey, Trinity College Dublin, and by Brian Rodriguez, University College Dublin. The event is co-hosted and supported by *Park Systems Europe* and *AMBER*, Advanced Materials and BioEngineering Research Centre Dublin. It will included keynote and contributed lectures on different SPM applications, poster sessions, and practical live hands-on-sessions on Park Systems AFM instruments. More information: https://live.parksystems.com/nsfe2020/

Park Systems Europe GmbH
Janderstraße 5
68199 Mannheim, Germany
Phone: +49 (0)621 490896-50
Fax: +49 (0)621 490896-66
E-mail: pse@parksystems.com
Website: www.parksystems.com

Pick and Place Station

Manufacturer: nanosystec.
Supply: Pick and place station "NanoPlace" for demanding micro assembly tasks that uses various precision assembly technologies like gluing, eutectic bonding, soldering, welding, etc.
Features: The gantry configuration offers a large unobstructed working area with easy access for loading the components to be processed. In order to achieve the most productive solution, the design and process flow will be tailored to the application: *Gluing* with epoxy and subsequent UV curing is widely used for the permanent placement of lenses, prisms, mirrors, VCSEL's and similar elements. The resin is dispensed by either time/pressure units, jetting dispensers or volumetric instruments. – *Eutectic bonding* combines the precise placement with high thermal conductivity. Typical examples for such devices include opto-electronic chips which are sensitive to temperature changes, such as modulators, Silicon Photonics assemblies



or semiconductor laser dies. – *Selective laser soldering* is the right choice for attaching extremely thin wires to miniature contact pads or insert heat-sensitive components into PC boards. – *Laser welding* joins two parts without filling material. This joining technology provides maximum mechanical strength and is widely used for space applications. – *Micro ablation* can be integrated into the process flow as an additional inline process.
The powerful machine vision capability allows for measuring the position of the objects in all dimensions with less than 1 µm error. The motion control elements match this performance: Linear optical encoders provide 5 nm resolution for controlling the linear motors. Depending on the processes, the station changes the tooling automatically. A variety of device grippers allow for the ideal adaptation to the respective gripping task: pneumatic or electrical parallel grippers with two jaws, vacuum grippers or combinations of these.

nanosystec GmbH
Marie-Curie-Straße 6
64823 Groß-Umstadt, Germany
Phone: +49 (0)6078 782540
E-mail: sales@nanosystec.com
Website: www.nanosystec.com

Mid-IR Quantum Cascade Laser Modules

Manufacturer: mirSense.
Distribution: Frankfurt Laser Company.
Product: Quantum Cascade Laser Modules (QCLs) for the mid-IR Region. The high-powered diodes with an output typically on watt-level emit in the main transmission bands of the atmosphere (4.0 µm, 4.6 µm, 4.8 µm, 9.x µm).
Features: The Fabry-Perot laser sources operate in the quasi-CW regime (pulsed operation down to few tens of nanoseconds and high frequency above MHz) at room temperature. Due to their high average power and wall-plug efficiency, they are perfectly suited for counter-measure and other defense applications. The portfolio comprise a full range of ITAR-free products from chip on submount manufacturing to full turnkey systems. For OEM system integrators, mirSense manufactures a packaged diode plugged to a top-notch PCB driver that includes laser control, thermal management and security and safety. This packaged diode is the so-called "POEM" system (POEM stands for PowerMir OEM system).

Frankfurt Laser Company
An den 30 Morgen 13
61381 Friedrichsdorf, Germany
Phone: +49 (0)6172 27978-0
Fax: +49 (0)6172 27978-10
E-mail: sales@frlaserco.com
Website: www.frlaserco.com

Excimer Laser Lidar Systems on Zugspitze Mountain eye the Stratosphere

To investigate long-term temperature changes, climate researchers on Germany's highest mountain Zugspitze can for the first time measure the distribution of the most important greenhouse gas in climate-relevant air layers using a high-performance laser system. Powerful global networks of lidar systems for remote sensing of natural and man-made atmospheric trace gases in our atmosphere are becoming increasingly important against a background of global warming. The Raman lidar method is used to explore the important greenhouse gas water vapor. A UV-laser pulse is emitted into the atmosphere and its resulting backscattering signal, which is influenced by the water molecules, is captured by a collecting mirror. The signal is measured in a time-resolved manner, so that the height from which the signal originates can be determined. Since the Raman scattering intensity decreases strongly with increasing height, UV lasers with limited output can only eye the troposphere.

With the aim to extend the height profile of the water vapor concentration into the stratosphere for the first time and thus to investigate its possible influence on global warming, the scientists of the environmental research station Schneefernerhaus on the Zugspitze mountain use a particularly powerful 350-W UV-excimer laser from Coherent. They modified the excimer laser to generate linear-polarized UV pulses with small line width and reduced beam divergence. The remaining narrow-band laser emission with an average power of 180 W is still 10 times that of a powerful UV-Nd:YAG laser system. In combination with four times larger collection optics, a 40 times improved signal-to-noise ratio could be achieved compared to the Raman lidar systems available so far. This means that, for the first time, the greenhouse gas water vapor can now be detected more accurately, quantitatively and by a factor of 10 faster and further into the atmosphere than ever before, namely up to a height of over 22 km.

Coherent Shared Services B.V.
Dieselstr. 5b
64807 Dieburg, Germany
Phone: +49 (0)6071 968-0
Fax: +49 (0)6071 968-499
E-mail: sales.germany@coherent.com
Website: www.coherent.com

Turbomolecular Pumps with Increased Pumping Speeds

Manufacturer: Edwards.
Supply: Two larger variants of the "nEXT" turbomolecular pump series, delivering faster pumping speed performance and outstanding compression ratios for increased improved cycle times and low ultimate pressures.
Features: The "nEXT730" and "nEXT930" offer pumping speeds for nitrogen of 730 l/s and 925 l/s, respectively. These pumps are ideally suited to customers requiring increased performance, improved cycle times and reduced operational pressures. The pumps will operate in any orientation for flexibility of use and are, with the compact design and integrated controller, are easily to install. They are fully compatible with the "TIC" and "TAG" controllers and feature the same control and monitoring capability and interface as the existing "nEXT" range. They are also fully compatible with Edwards Support PC software for monitoring, configuration and control options, making systemisation into any new or existing vacuum system easy.
Applications: The introduction of the larger variants will extend the benefits of the range into new applications, including specialty coating, and other sectors such as heat treatment, furnaces, electron beam welding, ion implantation, degassing and cylinder evacuation.

Edwards GmbH
Philipp-Hauck-Straße 2
85622 Feldkirchen, Germany
Phone: 0800 000 1456
Fax: + 49 (0)89 99191888
E-mail: DEvertrieb@edwardsvacuum.com
Website: www.edwardsvacuum.com

New Solid-State Laser Light Sources for Advanced Imaging Applications

Manufacturer: Lumencor.
Distribution: AHF analysentechnik.
Product: Next generation light engines "CELESTA" and "ZIVA" that are equipped with seven individually addressable solid-state laser light sources.
Features: The "CELESTA" provides about 1 W and "ZIVA" about 100 mW output power from each laser source (total: 7 W and 700 mW). The laser outputs are allied to sophisticated control and monitoring systems to deliver the performance needed for advanced imaging applications. The control system of the light engines features an onboard computer with an embedded command library. These commands give access not only to the basic control functions of light source selection, on/off switching and output intensity adjustment, but also to an extensive panel of operating status reports and preference settings. A GUI resident on the onboard computer, and viewed using a web browser via a LAN connection, provides convenient access to many of the command library functions. TTL trigger inputs are provided for all seven output lines for applications requiring fast (10 microseconds) switching. Long-term output stability is sustained by active stabilization. – AHF also provides laser filter sets which match perfectly to the new light sources.
Applications: "CELESTA" can be used for spinning disk confocal microscopy, optogenetics, MERFISH, super-resolution, FRAP, DNA-PAINT. The "ZIVA" is designed for structured illumination (SIM) and other super-resolution imaging techniques due to its optimized multimode laser array for coupling into narrow bore optical fibers.

AHF analysentechnik AG
Kohlplattenweg 18
72074 Tübingen, Germany
Phone: +49 (0)7071 970901-0
Fax: +49 (0)7071 970901-99
E-mail: info@ahf.de
Website: www.ahf.de

Mini Spectrometer for the NIR Range

Manufacturer: Hamamatsu Photonics.
Product: "C14384MA" mini spectrometer with a highly sensitive image sensor and improved NIR sensitivity that is about 50 times higher than the one of the previously available "MS" series mini spectrometers. Compared to the existing range of mini spectrometers of the "MS" series, the new device has about 1/40 of the size and 1/30 of the weight. The return structure, based on a special optical design technology, reaches a size of 11.7 × 4 × 3.1 mm and weighs less than 0.3 g. In the same wavelength range, the smaller "SMD" spectrometer achieves 50 times higher sensitivity. This makes the spectrometer ideal for applications where real-time on-site measurement is required.
Features: The grating spectrometer consists of light entrance slit, primary reflection mirror, secondary reflection mirror, diffraction grating and image sensor. The light entering through the entrance slit is collimated by a primary reflection mirror and guided onto the grating by the secondary reflection mirror. The light is then split by the grating into

its wavelengths and these are focused on the pixels of the image sensor. The image sensor outputs electrical signals corresponding to the light intensity at each wavelength. Reducing the size of the spectrometer required increasing the curvature of the concave surface and shortening the distance to the image sensor. However, it is extremely difficult to produce a grating on a curved concave surface. Therefore, a return structure consisting of a primary and a secondary reflection mirror is used.

Costs were significantly reduced by reducing the number of parts used in production. Specifically, the grating is formed directly on the inside of the package; the entrance slot, the secondary reflection mirror and the image sensor are integrated on the same chip. As a result, it fits into various types of equipment where the size and weight of the components to be assembled is limited, such as portable analytical instruments, quadrocopters and drones.

Hamamatsu Photonics Deutschland GmbH
Arzbergerstr. 10
82211 Herrsching, Germany
Phone: +49 (0)8152 375-100
Fax: +49 (0)8152 375-111
E-mail: info@hamamatsu.de
Website: www.hamamatsu.de

Laser Power Meter for High Power and High Power Densities

Manufacturer: Primes.
Supply: Laser power meter "Cube M" that enables measurements up to a power density of 250 kW/cm2 at power levels ranging from 25 W to 2 kW.
Features: This device is designed to measure laser power of high quality lasers even in the smallest of spaces that usually do not accommodate a measurement device. It does not require water cooling. It comes with an easy, single button operation while the Bluetooth interface enables a convenient and wireless control with a smartphone or tablet PC. Thus, the operation even in a mechanically closed environment is possible. The Cube App enables the graphical display and interpretation of measured values, as well as the definition of presets for measurement series.
Applications: The power meter enables measurements in the working plane of an AM machine, close to focus position. Additionally, deviations of the beam incidence of ± 20° in relation to the vertical are viable. Thus, the Cube M is perfectly suited for quality assurance, for example in additive manufacturing or micro machining applications.

Primes GmbH
Max-Planck-Str. 2
64319 Pfungstadt, Germany
Phone: +49 (0)6157 9878-0
Fax: +49 (0)6157 9878-128
E-mail: info@primes.de
Website: www.primes.de

New Fiber Optic Fault Locator, Optionally With Battery Operation

Manufacturer: IMM Photonics.
Product: Different fiber test devices including adapters and fiber cleaners for the localization of fiber breaks, for continuity testing or for the identification of stressed fiber areas. The proven fiber optic fault locator "Fiberpoint ET" is now available in two further product variants. In addition to the conventional device with red laser light and battery power, it is now also available in a version with green and red laser light, both battery-powered and equipped with rechargeable batteries.
Features: Optically, the fiber testers differ in their clip color, allowing for quick and easy use of the tools. The "Fiberpoint ET G" with green clip operates at 520 nm (green light source), the "Fiberpoint ET" with red clip operates at 650 nm (red light source). The optical output power is < 400 µW.
Unlike the "Fiberpoint ET" with blue clip, the new continuity testers feature rechargeable batteries. As with all fiber optic fault locators of the series, customer-specific inscription is possible, e. g. with a company logo.

All three devices boast a laser class 1 certification, hence no laser protection measures are required. The production takes place exclusively in Germany.

IMM Photonics GmbH
Ohmstr. 4
85716 Unterschleißheim, Germany
Phone: +49 (0)89 321412-0
Fax: +49 (0)89 321412-11
E-mail: sales@imm-photonics.de
Website: www.imm-photonics.de