

NEW PRODUCTS

Focus on photonics, spectroscopy, and spectrometry

The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers. PHYSICS TODAY can assume no responsibility for their accuracy. For more information about a particular product, visit the website at the end of its description. Please send all new product submissions to ptpub@aip.org.

Andreas Mandelis



Tunable laser for Raman spectroscopy

Hübner Photonics has announced that its C-Wave laser series has qualified for use with the TriVista spectrometer system from S&I Spectroscopy & Imaging. The companies expect that the combination of

Hübner's widely tunable CW single-frequency lasers, which cover wavelengths from 450 nm to 3.5 μm , with S&I's triple-grating TriVista will lead to advances in resonance Raman spectroscopy and microscopy, especially for the challenging low-frequency Raman range of less than 10 cm^{-1} . Most tunable lasers require elaborate filtering to suppress unwanted amplified spontaneous emission (ASE) that can cover the weak Raman signals. During qualification, the C-Wave revealed no detectable ASE. The C-Wave's narrow linewidth, stable emission frequency, and high spectral purity allow for recording low-frequency Raman bands at or below 5 cm^{-1} from the excitation wavelength even without filtering the excitation beam. **Hübner Photonics Inc**, 2635 N 1st St, Ste 202, San Jose, CA 95134, <https://hubner-photonics.com>

Laser source for nonlinear microscopy

Light Conversion developed its Cronus-3P laser source specifically for advanced nonlinear microscopy. Based on optical parametric amplifier technology, the Cronus-3P provides μJ -level sub-85 fs pulses at repetition rates of up to 2 MHz. It is tunable from 1.25 μm to 1.8 μm , which covers the biological transparency windows at 1.3 μm and 1.7 μm for three-photon microscopy. The source features integrated group-delay-dispersion control to ensure optimal pulse duration at the sample, automated beam resizing and collimation, and optional automated beam steering for laser-pointing stability. **Light Conversion**, Keramiku St 2B, LT-10233 Vilnius, Lithuania, <https://lightcon.com>



Large-array cameras for astronomy

Teledyne Princeton Instruments, a business unit of Teledyne Digital Imaging, has brought to market its Cosmos large-format, backside-illuminated CMOS cameras optimized for astronomy. Specific applications include time-domain astrophysics, orbital-object tracking, and exoplanet research. The cameras incorporate Teledyne's proprietary LACera image-sensor technology, which delivers greater than 90% quantum efficiency for high sensitivity and proprietary low-noise architecture with up to 18-bit readout. According to the company, that level of performance was not previously available in wafer-scale sensors. Cosmos is offered in three sensor sizes: 3000 $\times$ 3000 pixels, 6000 $\times$ 6000 pixels, and 8000 $\times$ 8000 pixels. It provides more than 50 frames/s for capturing dynamic events, global shutter, glow-reduction technology, 0.7 e^- read noise for detection of faint objects, and deep cooling to ensure low dark current. **Teledyne Princeton Instruments**, 3660 Quakerbridge Rd, Trenton, NJ 08619, www.princetoninstruments.com



Chromatographic analysis of metal-sensitive compounds

Waters has introduced its Arc Premier System, the first liquid chromatography system optimized for chromatographic separations on 2.5–3.5 μm columns to also feature Waters's new MaxPeak High Performance Surfaces (HPS) technology. The hybrid organic–inorganic surface technology, exclusive to the company's MaxPeak Premier Systems and Columns, forms a barrier between the sample and metal surfaces. Without compromising performance, it mitigates or eliminates nonspecific adsorption and maximizes reproducibility and efficiency of separations. The new system complements the company's MaxPeak Premier Columns to eliminate time-consuming and costly passivation and deliver high-quality, accurate sample data. The removal of analyte-to-metal interactions can result in up to a fivefold improvement in detector sensitivity, depending on the degree of metal sensitivity, and a tenfold improvement in assay-to-assay precision. **Waters Corporation**, 34 Maple St, Milford, MA 01757, www.waters.com



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NEW PRODUCTS



High-power visible Raman fiber amplifiers

MPB Communications now offers single-frequency (SF) visible Raman fiber amplifiers (VRFAs) that achieve output powers of up to 4 W in the 525–650 nm spectral

range. The VRFAs provide a diffraction-limited beam with excellent pointing stability, low-phase and low-intensity noise, and minimal spectral broadening. The system consists of a polarization-maintaining Raman fiber amplifier (RFA) pumped by an ytterbium fiber laser. They are housed in a compact, air-cooled platform. High-power SF emission from the RFA is frequency-doubled by a single-pass, second-harmonic generator (SHG). To eliminate vibration transfer and simplify experimental setup, the SHG and RFA can be mounted away from the pump laser. The SHG output can be either fiber coupled or free space. The higher-power VRFAs systems address the evolving needs of quantum physicists studying quantum degeneracy, atomic clocks, ultracold atomic clouds, and trapped Rydberg ions. They also have applications in spectroscopy, atomic interferometry, optics, lithography, and gravitational measurements. *MPB Communications Inc*, 147 Hymus Blvd, Pointe-Claire, QC H9R 1E9, Canada, www.mpb.com

Raman system with remote probes

The latest version of Renishaw's Virsa Raman system includes features designed to expand the use of Raman spectroscopy to new samples, applications, and environments. Remote fiber-optic probes let users analyze samples away from the laboratory microscope. LiveTrack focus-tracking technology and the new Monitor software module allow for easy real-time analysis on large samples that have irregular surfaces, change shape as they undergo phase changes, or move. Windows-based Raman Environment (WiRE) software, version 5.5, adds two features that, used with the Monitor module, complement the Virsa system: Live reaction monitoring allows users to process and analyze a constant flow of Raman data in order to observe changing chemical concentrations or other sample properties; the partial least squares (PLS) analysis module allows users to generate and test PLS models and predict values in real time for materials that exhibit a spectral change, such as in concentration or crystallinity. *Renishaw plc*, 1001 Wesemann Dr, West Dundee, IL 60118, www.renishaw.com



Updated electronics for spectrometers

Ibsen Photonics has presented new electronics for its Freedom 305 and 315 OEM spectrometers. The electronics convert the analog video signal from the diode-array detector to a robust digital signal that can be read out over a standard interface such as USB or serial peripheral interface (SPI). The digital image sensor board DISB-315 offers a frame rate that is six times as fast as the previous versions. It supports the low-noise S10420 BT-CCD detector arrays from Hamamatsu, features programmable lamp and shutter control, and comes with the same SPI as the company's other DISBs, which makes it easy to integrate into instruments. If the spectrometer requires the use of a standard FTDI FT4222H chip, a compact DISB-USB bridge can be added and stacked on top of the DISB-315. *Ibsen Photonics A/S*, Ryttersmarken 17, DK-3520 Farum, Denmark, <https://ibsen.com>

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LED illuminator



Excelitas has added the X-Cite NOVEM to its fluorescence illumination product line. The LED illuminator is suitable for complicated imaging applications that require high excitation power and individual wavelength control. Those applications include slide scanning, live-cell imaging, fluorescence *in situ* hybridization, ratiometric imaging, and general fluorescence microscopy. The light-guide-coupled, nine-channel, wavelength-switching X-Cite NOVEM illuminator offers spectral ranges for applications from 340 nm to 785 nm. Preinstalled filters simplify system setup, and the device's high power reduces scan time for multiplex imaging. Available in four standard wavelength combinations, the X-Cite NOVEM features individual LED control, efficient cooling, and quiet operation, even when running at full capacity. Excelitas's patented LaserLED Hybrid Drive technology provides increased excitation in the 500–600 nm band range. **Excelitas Technologies Corp.**, 200 West St, 4th Flr E, Waltham, MA 02451, www.excelitas.com



Hyperspectral light-field cameras

With the release of its Ultris X20 and X20 Plus models, Cubert has upgraded its 3D hyperspectral Ultris cameras to cover a wavelength range of 350–1000 nm. The innovative cameras, which are based on light-field technology, now offer UV, visible, and near-IR coverage. That capability may enable such applications as plant-water detection for vegetation analysis, real-color characterization, bathymetry, and water-quality and fluorescence analysis. Weighing less than 350 g, the lightweight Ultris X20 is also suitable for mapping applications by unmanned aerial vehicles. It offers scan rates of more than 3200 lines/s, a constant full width at half maximum of 10 nm across all channels, more than 160 spectral bands, and a native image resolution of 410×410 pixels. The high-resolution Ultris X20 Plus features a pan sensor, which allows the camera to achieve an image resolution of more than 1800×1800 pixels. **Cubert GmbH, Science Park II, Lise-Meitner Str 8/1, D-89081 Ulm, Germany**, <https://cubert-gmbh.com>

PT



For our location in Zeuthen we are seeking:

Senior Scientist Accelerator Physics – Tenure Track

Limited: initially limited to 5 years with the possibility of conversion to a permanent position | Starting date: earliest possible | ID: APMA016/2021 | Deadline: 01.09.2021

DESY, with its more than 2700 employees at its two locations in Hamburg and Zeuthen, is one of the world's leading research centres. Its research focuses on decoding the structure and function of matter, from the smallest particles of the universe to the building blocks of life. In this way, DESY contributes to solving the major questions and urgent challenges facing science, society and industry. With its ultramodern research infrastructure, its interdisciplinary research platforms and its international networks, DESY offers a highly attractive working environment in the fields of science, technology and administration as well as for the education of highly qualified young scientists.

The Photo Injector Test facility at DESY in Zeuthen (PITZ, near Berlin) develops high-brightness electron sources for Free-Electron Lasers (FELs) like FLASH and European XFEL. The PITZ facility will be expanded to advance the research and development of tumor therapies with short irradiation durations at high dose rates as well as high electron beam energy (so-called FLASH and VHEE radiotherapies). The extremely wide parameter space of the electron beams generated at PITZ and the high flexibility of the facility allow unique research opportunities for most advanced radiation biological studies and future tailored applications at humans. We are looking for a scientist with strong accelerator experience, who will perform and coordinate extensive beam dynamics studies supporting the experimental program at PITZ.

About the role:

- Work in one of the world-leading international groups of physicists and engineers for further developments of high-brightness electron sources and their applications
- Perform and coordinate detailed beam dynamics simulations, including start-to-end simulations for radiotherapy
- Analyze experimental data and perform benchmark simulations
- Participate in the operation of the PITZ accelerator, coordinate dedicated measurement programs

To be successful in this role:

- Master's degree in physics with PhD or equivalent qualification
- Strong background in space charge dominated beam dynamics simulations
- Profound experience in development and operation of accelerator facilities and their applications
- Very good command of English, knowledge of German is a benefit
- Experience in radiation biology or radiation therapy and similar accelerator applications is advantageous

Good reasons to join:

Look forward to a unique working environment on our international research campus. We attach particular importance to appreciative cooperation and the well-being of our DESY employees. You will benefit from our family-friendly and collegial atmosphere, our established health management and occupational pension provision.

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For further information please contact Dr. Frank Stephan at +49 33762 7-7338 (frank.stephan@desy.de).

Applications (in German or English) should include a detailed curriculum vitae, publication list, explanations and evidence of experience background and 3 names for references.

DESY promotes the professional development of women and therefore strongly encourages women to apply for the position to be filled. In addition, severely handicapped persons with equal aptitude are given preferential consideration. The advertised positions are basically suitable for part-time employment.

You can find further information here: www.desy.de/career

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