

# 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](mailto:ptpub@aip.org).

**Andreas Mandelis**

### Optical spectrum analyzer

The FTE-8100-C optical spectrum analyzer (OSA) from Terahertz Technologies is one of the most cost-effective mini-OSAs on the market, according to the company. The full-featured instrument offers such functions as “power tilt” for dense wavelength division multiplexing channel equalization, “gain tilt” to adjust erbium-doped fiber-amplifier gain flatness, and file-based user configurations. The rugged unit is available with up to 98 channels in the C band with 50 GHz or 100 GHz channel spacing. Its touch screen and twice-a-second scan capability make it fast and simple to use. The one-button auto-test feature and full set of selectable scale limits and thresholds let users easily zero in on channel measurements. For flexibility, the channel numbers are selected in wavelength or frequency. Users can set pass/fail thresholds and store up to 1000 tests that can be downloaded via the USB PC port. **Terahertz Technologies Inc.**, 169 Clear Rd, Oriskany, NY 13424, [www.teratec.us](http://www.teratec.us)



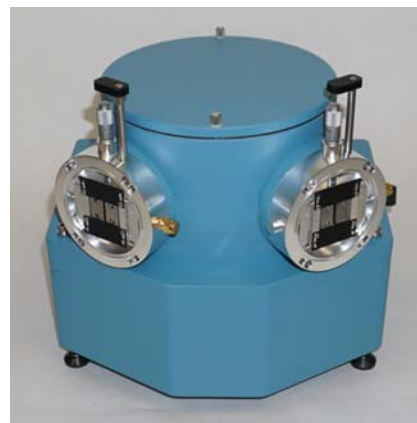
### UV Raman spectrometer

Wasatch Photonics has added a compact, cost-effective UV Raman spectrometer to its family of modular Raman spectroscopy products for research and industry. The use of UV excitation makes the WP 248 suitable for fluorescence-free Raman and UV resonance

Raman (UVR) spectroscopy to enhance sensitivity and selectivity. Applications include gas detection, materials analysis, and UVR studies of structure and dynamics in biomolecules such as proteins and nucleic acids. The stand-alone WP 248 covers a 400–3200  $\text{cm}^{-1}$  range with 14  $\text{cm}^{-1}$  resolution and uses a UV-enhanced CCD for detection. It offers free space input and an  $f/2.0$  numerical aperture for superior signal collection and high-throughput detection. Designed for use with a compact 248.6 nm neon-copper laser, it comes with a triggering cable to synchronize acquisition with the laser. **Wasatch Photonics**, 808 Aviation Pkwy, Ste 1400, Morrisville, NC 27560, <https://wasatchphotonics.com>

### Near-IR Raman spectrometer

Optimized for performance in the near-IR region, the TPIR-785 Raman spectrometer from Teledyne Princeton Instruments has ultrahigh sensitivity and is suitable for use in such areas as biological, medical, and life sciences research. The system uses an  $f/2$  spectrograph with lens optics designed to provide high light throughput and imaging quality. Users can tailor the instrument's performance for an optimal spectral resolution up to 5  $\text{cm}^{-1}$  or an optimal spectral range up to 80–3650  $\text{cm}^{-1}$ . The system includes a 785 nm Raman probe, a universal fiber adapter, a manual adjustable slit, and a high-power, temperature-stabilized 785 nm laser. A proprietary CCD delivers near-IR quantum efficiency greater than 70% at 1000 nm. The “super-deep-depletion” sensor has a  $1340 \times 400$  array composed of 20  $\mu\text{m}^2$  pixels. It can be thermoelectrically cooled to  $-90^\circ\text{C}$  for ultralow dark current, which allows integration times from 10  $\mu\text{s}$  to hours. The detector provides spectral rates higher than 1 kHz, offers readout speeds up to 16 MHz, and uses two readout ports. **Teledyne Princeton Instruments**, 3660 Quakerbridge Rd, Trenton, NJ 08619, [www.princetoninstruments.com](http://www.princetoninstruments.com)



### Monochromator for UV spectroscopy

McPherson has upgraded its compact model 234/302 monochromator for UV spectroscopy: The internal surfaces now have an optimized ultrablack low-scatter finish, the range of masterpiece gratings has been expanded, and spectrograph accessories and an improved turret are available. The enhancements improve efficiency and spectral resolution from the deep UV and vacuum UV (VUV) to the visible and near-IR. The model 234/302 can be equipped with a grating turret that allows users to broaden the accessible wavelength range without breaking vacuum or purge. With a digital grating drive for precise wavelength selection and positioning, the compact VUV spectrometer is easy to use as a scanning monochromator or as a spectrograph with a microchannel plate intensifier or a CCD detector. **McPherson Inc.**, 7A Stuart Rd, Chelmsford, MA 01824, <http://mcphersoninc.com>



## Shortwave-IR laser

Beyond Photonics has launched its compact piezo-tunable Swift single-frequency short-wave IR (SWIR) laser. The rugged, solid-state laser is suitable for lidar and laser spectroscopy applications that require very stable high-power reference and seed lasers. It is initially offered in the range of 2050 nm, but it can be adapted to many other near- and shortwave-IR wavelengths. The Swift is optimized for use in coherent and direct-detection eye-safe lidar systems or other SWIR applications that require ultralow short-term frequency stability and broad, fast tunability. With its high CW output power—greater than 35 mW standard and up to 100 mW optional—and less than 10 kHz/ms short-term frequency jitter, the Swift is suitable for use as a master and local oscillator source in lidar systems. Fast and broad mode-hop-free frequency tuning en-

ables next-generation spectroscopic applications, such as pollution monitoring and greenhouse gas measurements that use differential absorption lidar techniques. **Beyond Photonics LLC**, 6205 Lookout Rd, Ste B, Boulder, CO 80301, [www.beyondphotonics.com](http://www.beyondphotonics.com)

## Positioning stage for photonic applications

Physik Instrumente (PI) now offers a compact, modular, five-axis stage with closed-loop motors for precision alignment and positioning of photonics and optics components, such as fibers, waveguides, and lenses. The F-122 5DOF stage consists of a three-axis linear module with linear encoders for direct position measurement and PI's WT-85 and WT-100 goniometers. The goniometers are combined with a shared pivot point to perform high-precision angular motion with resolution to 3.5  $\mu$ rad. Submicron precision is ensured by highly accurate mechanical components and encoder feedback for closed-loop operation. A multiaxis controller and software with automated alignment functionality are available. With programming interfaces, including LabVIEW and MATLAB, users can integrate a PI controller into their own programs. **Physik Instrumente LP**, 16 Albert St, Auburn, MA 01501, [www.pi-usa.us](http://www.pi-usa.us)

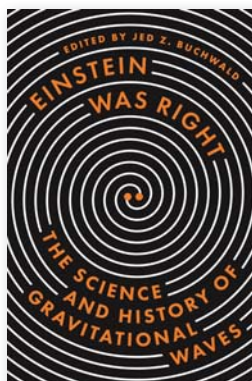






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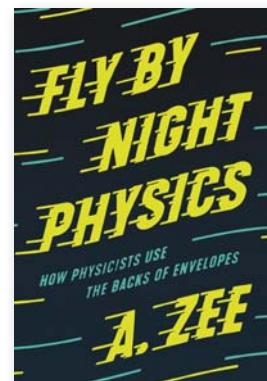


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### Multispectral *in vivo* IR imaging

According to Photon Etc, its IR VIVO preclinical imager provides noninvasive spectral imaging in the first (NIR) and second (NIR-II) biological windows, from 900 nm to 1620 nm. It combines micron-scale spatial resolution, real-time imaging, and full multispectral coverage for *in vivo* research on small animals or other living organisms. With fast acquisition speed, multicolor imaging, and good penetration depth—10 times as great as traditional visible optical systems, the company claims—the IR VIVO captures both structure and function. Because it uses near- and shortwave-IR, the imager benefits from reduced scattering and minimal tissue absorption and autofluorescence, which allows deeper, clearer imaging than can be achieved with standard optical systems. Emission of several fluorophores can be isolated with a high-efficiency tunable filter and ultralow-noise scientific-grade indium gallium arsenide camera. **Photon Etc**, 5795 Ave de Gaspé, #222, Montreal, QC H2S 2X3, Canada, <http://photonetc.com>

### Spectrophotometer for turbid media

The novel SphereSpectro 150H system from Gigahertz-Optik simultaneously discriminates and quantifies both the spectral absorption coefficient and the spectral effective scattering coefficient of scattering media. The spectrophotometer uses an integrating sphere to measure the total reflected and transmitted light of an illuminated sample.

From those two quantities, the absorption coefficient and the effective scattering coefficient are calculated based on the radiative transfer equation. The SphereSpectro 150H covers the wavelength range between 200 nm and 2150 nm, with modular versions available for subranges within that spectral range. The compact tabletop device offers fast, precise, and absolute measurements; simple operation; and a large sample chamber with an optimized sample holder. Applications include materials analysis, biophotonics, and quality assurance. **Gigahertz-Optik Inc**, Boston North Technology Park, Bldg B, Ste 205, Amesbury, MA 01913, <https://light-measurement.com>



### Compact Q-switched laser

Hübner Photonics has introduced the Cobolt Tor XE compact Q-switched laser at 1064 nm and with 0.5 mJ/pulse. It delivers short pulse lengths of less than 3.5 ns at kHz repetition rates and high pulse-to-pulse stability—jitter is less than 2  $\mu$ s—in a TEM<sub>00</sub> beam. The advanced, integrated control electronics use external or internal signals to trigger the emission from single pulses up to 1 kHz pulse trains or bursts of pulses. The Cobolt Tor XE is manufactured using proprietary HTCure technology; according to the company, the resulting hermetically sealed package improves the laser's reliability under varying environmental conditions. It can be used in laser marking, laser-induced breakdown spectroscopy, micro-machining, and photoacoustic microscopy applications. **Hübner Photonics Inc**, 2635 N 1st St, Ste 202, San Jose, CA 95124, <https://hubner-photonics.com>



HÜBNER Photonics



### Tube-below WDXRF spectrometer

Due to its tube-below optics, the ZSX Primus IVi wavelength-dispersive x-ray fluorescence (WDXRF) spectrometer from Rigaku optimizes the measurement of typical gravity-loaded samples such as liquids and analyzes alloys and plated metals. According to the company, the new model improves on previous systems by having the smallest footprint in its class and an efficient new drive sequence that decreases the time between multiple high-speed, precision measurements. It includes new sample film corrections, and a redesigned control system optimizes movement sequences. The ZSX Primus IVi spectrometer has a patented vacuum partition system for analyzing liquids. Because the spectroscopic chamber is separated from the sample chamber when the helium gas is being changed, the conversion from vacuum to helium atmosphere can be completed in less than 2 minutes. **Rigaku Americas Corporation**, 9009 New Trails Dr, The Woodlands, TX 77381-5208, [www.rigaku.com](http://www.rigaku.com)





## High-speed camera

According to Vision Research, its Phantom T1340 high-resolution camera doubles the capabilities of other 4 MP cameras in its class. It captures images up to 13 GP/s. Its  $2048 \times 1952$  pixel low-noise sensor and compact size make the camera suitable for demanding measurement applications such as object tracking, flow visualization, and microscopy and for modern imaging techniques such as digital image correlation. A binned mode provides higher throughput and a sensitivity boost at 1 MP and below. Because the T1340 includes Phantom CineMag V compatibility for an ultrafast, secure workflow and for direct recording of long-duration events, the camera can be used in outdoor environments. A 10 GB ethernet option is available for

fast file downloads, so users can continue shooting with reduced downtime. **Vision Research Inc**, 100 Dey Rd, Wayne, NJ 07470, [www.phantomhighspeed.com](http://www.phantomhighspeed.com)

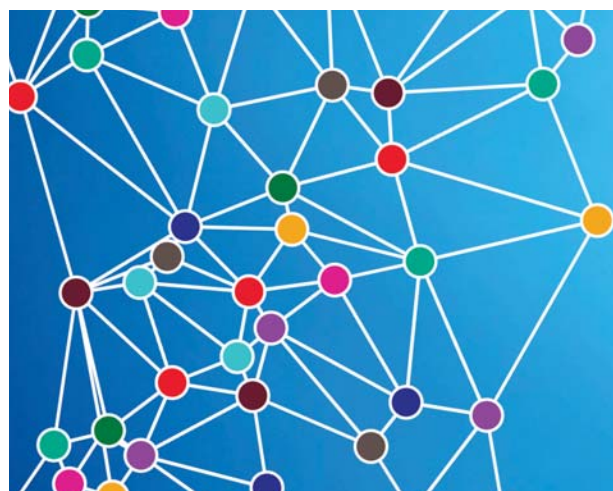
## Programmable IR spectrometer

The PEAK XNIR, a novel high-throughput OEM spectrometer from Ibsen Photonics, combines Ibsen's high-efficiency fused-silica transmission gratings with DLP Pico technology from Texas Instruments. It provides a dimension of spectral programmability that, according to the company, has not been possible with other available spectrometer technology: Users can control the relative power and exposure time independently for each wavelength in a spectrum. The PEAK XNIR's retroreflective advanced optical design allows for a compact form factor with high resolution, sensitivity, and environmental ruggedness. It features a wavelength range of 1650–2400 nm, 10 nm resolution, and a high numerical aperture of 0.22. The PEAK XNIR is suitable for process analytical technology because it offers real-time in-line monitoring and measurements for near-IR spectroscopy.

**Ibsen Photonics A/S**, Ryttermarken 17, DK-3520 Farum, Denmark, <https://ibsen.com>

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