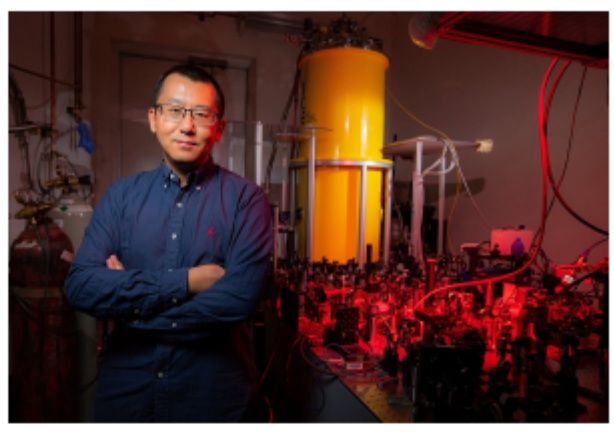
Tuesday, December 13, 2022

MICROSCOPY TECH PULSE

Microscopy Tech Pulse is a special edition newsletter from Photonics Media and Mad City Labs covering key developments in microscopy technology.

Nanoscope Offers Views Into Quantum Computations



A newly developed microscope housed at the U.S. Department of Energy's Ames National Laboratory is poised to help researchers understand — and ultimately develop — the inner workings of quantum computing. The microscope, called a Cryogenic Magneto-Terahertz Scanning Near-Field Optical Microscope (cm-SNOM) by Iowa State University professor and Ames Lab senior scientist Jigang Wang, is based at Ames' Sensitive Instrument Facility.

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Needle-Shaped Beam Bolsters Range of Depth to Photoacoustic Method

Researchers at Caltech have introduced an approach to photoacoustic microscopy (PAM) that uses a needle-shaped laser beam to extend the depth of field associated with the microscopy method. The technique, named NB-PAM (needle-shaped beam photoacoustic microscopy), delivered a depth of field that is nearly 14× greater than was previously achievable with PAM. With an increased depth of field, NB-PAM users acquired high-resolution images of samples even when their surface was uneven, and clearly imaged objects over a greater range of depths.

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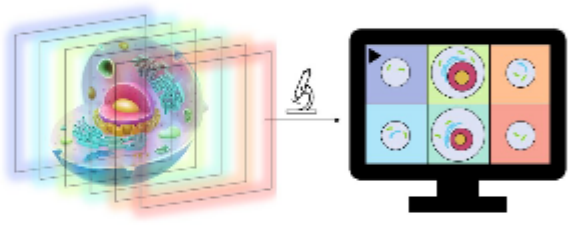
Microscope Enables 3D High-Speed Image Capture of Living Cells



Researchers from UiT The Arctic University of Norway and the University Hospital of North Norway developed a multifocus microscope to image larger samples in a more natural environment, as well as in 3D. With the technology, according to Florian Ströhl, a researcher at UiT, the researchers managed around 100 fps with the device.

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University of Illinois Center Convenes Leading Microscopists

Researchers from the University of Illinois Urbana-Champaign will use funding from the National Institute of Biomedical Imaging and Bioengineering to establish a national collaborative Biomedical Technology Research Resource to develop label-free optical imaging technologies for medical and biological applications.

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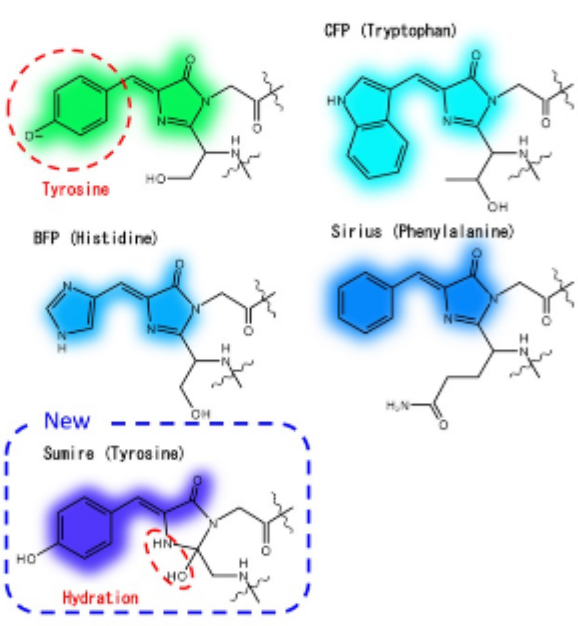
Shorter Wavelength Expands Fluorophore's Role in Monitoring Cell Dynamics



A genetically modified fluorescent protein has exhibited the shortest fluorescence emission wavelength to date, researchers at Osaka University reported. The fluorophore, named Sumire, emits 414-nm violet fluorescence from a hydrated chromophore. The development of Sumire will make it possible for scientists to track a larger number of biomolecules at the same time, increasing their ability to simultaneously monitor a cell's many dynamic processes.

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Multimodal Microscopy Provides Window into Viruses' Beginnings

To better understand how viruses breach the protective layers of cells that line the airways and gut, Duke University researchers used multimodal microscopy to capture real-time video footage of viruses as they approach their cellular targets. Using the technique, called 3D Tracking and Imaging Microscopy (3D-TrIm), the researchers observed previously unobserved phenomena in the early stages of the virus-cell interaction, including skimming contact events at the millisecond timescale.

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