

# MICROSCOPY

## Tech Pulse



September 2019

Microscopy Tech Pulse is a special edition newsletter from Photonics Media and Prior Scientific Inc. covering key developments in microscopy technology. Manage your Photonics Media membership at [Photonics.com/subscribe](http://Photonics.com/subscribe).

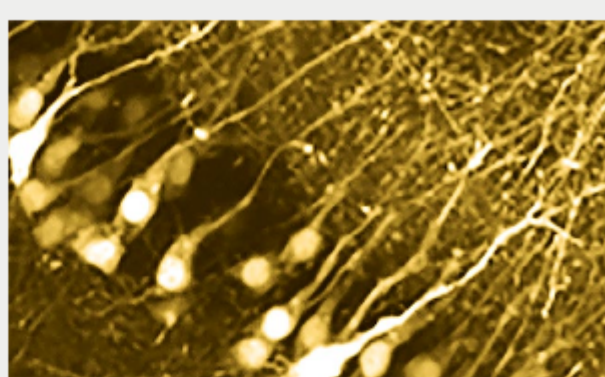
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### Correction Systems for Deep Imaging Drive More Precise Views

Multiphoton microscopy is widely regarded as the primary technique for deep imaging in live tissue. However, image brightness and resolution are typically poorer at deep sites because of increased optical spherical aberration compared to superficial locations. Automated spherical aberration correction systems are addressing the problem.



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#### NanoScan OP400 Objective Positioner

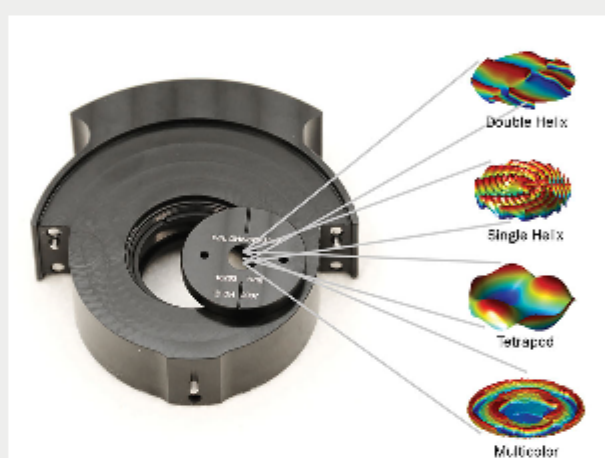
The NanoScan OP400 objective positioner provides the fastest step and settle time of any objective positioner available. Its market leading positioning accuracy and resolution originates from its unique mechanical design and integral capacitive feedback sensors. The OP400 is compatible with most microscopes and objective lenses, has a range of optimized settings for different objective sizes, weights, and performance needs — the user simply selects the best setting for their application. The NanoScan OP400 is designed to deliver market leading positioning with the fastest step settle and recovery time between Z-stacks providing enhanced time resolution. Coupled with the Prior/Queensgate NPC-D-6110 digital controller the system is easy to use and quick to set up using standard 0-10V analogue input and output.



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### Optical Advancements Enable High-Precision 3D Imaging

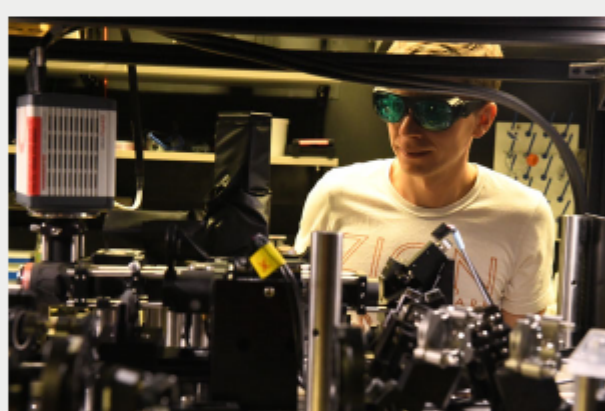
Advancements in engineered point spread function (E-PSF) technology are allowing manufacturers to incorporate high-resolution 3D imaging for improved object and feature inspection. These E-PSFs can be realized in the form of optical phase plates that can be incorporated into existing imaging systems.



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### Two-Photon Microscope Captures Brain Activity at Record Speed

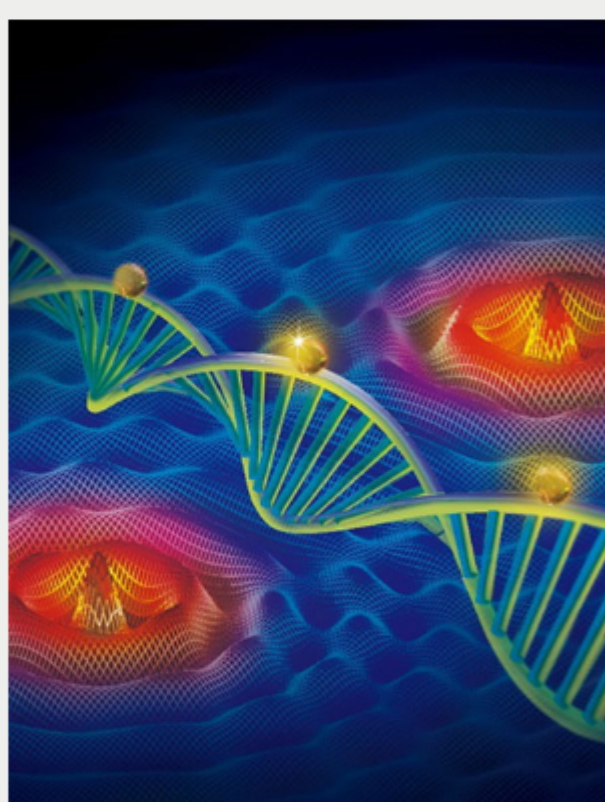
A new two-photon microscope from scientists at Howard Hughes Medical Institute's Janelia Research Campus can record footage of brain activity 15 times faster than once believed possible, the team said, revealing voltage changes and neurotransmitter release over large areas and monitoring hundreds of synapses simultaneously.



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### Repetitive Optical Selective Exposure Could Improve Single-Molecule Localization Microscopy

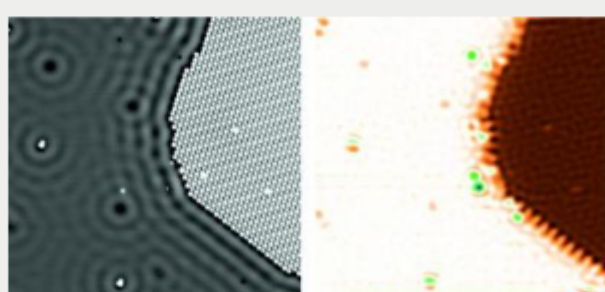
An interferometric, single-molecule localization method for superresolution fluorescence microscopy, developed by scientists at the Institute of Biophysics of the Chinese Academy of Sciences, could significantly improve localization precision compared with conventional centroid fitting methods. The new approach is called Repetitive Optical Selective Exposure (ROSE). It was developed by professors Tao Xu and Wei Ji.



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### Quantum Dot Microscope Can Measure Electric Surface Potentials of Single Atoms

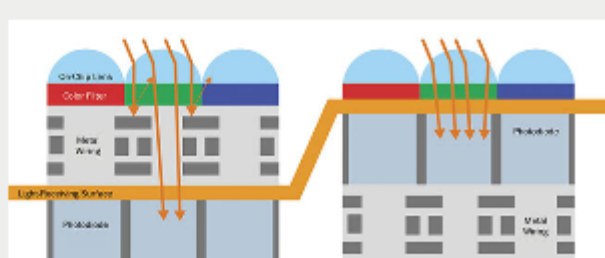
A new scanning quantum dot microscopy method can measure the electric potential of a sample at atomic accuracy. The new technique has potential application for chip manufacturing and the characterization of biomolecules.



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### Fluorescence Microscopy: Getting the Picture Right

Fluorescence microscopy is a very broadly used term covering numerous applications. It can be quite complex to design an optical imaging system that perfectly fits a specific application. And at the same time, instrument manufacturers are facing pressure to keep the costs down in the medical and life sciences markets.



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