Tuesday, November 8, 2016

MICROSCOPY Tech Pulse

PHOTONICS MEDIA

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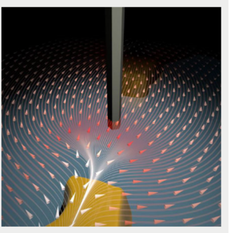
Microscopy Tech Pulse is a special edition newsletter from Photonics Media and Mad City Labs Inc. covering key developments in microscopy technology.

Nanowire Sensors Could Expand Use of AFM

An atomic force microscope (AFM) that uses nanowires as sensors has demonstrated the ability to measure force size as well as force direction. Due to slight asymmetries in geometry, a nanowire's flexural modes are split into doublets vibrating along orthogonal axes at nearly the same frequency. When the nanowires are integrated into an AFM, the changes in the vibrations caused by different forces can be measured. Essentially, the nanowires can be used as tiny mechanical "compasses" that point out both the direction and size of the surrounding forces.



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PROMOTED CONTENT

Mad City Labs Inc.

High-resolution, Low Cost AFM

Mad City Labs' SPM-M kit is ideal for both materials research and biophysical research. The assembled SPM is a closed loop, scanning resonant probe microscope with atomic step resolution. The SPM-M kit includes the MadPLL® digital phase lock loop controller, Nano-SPM200 closed loop nanopositioner (XY), Nano-OP30...

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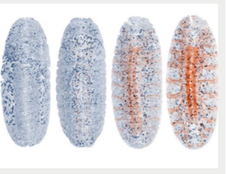
Light-Sheet Microscope Automatically Adjusts to Optimize Image Quality

A light-sheet microscope has been developed that can automatically adapt to the dynamic optical conditions of large living specimens. The smart microscope combines a novel hardware design with a software system that can analyze a specimen continuously and automatically adjust the settings to maximize image quality. Called the AutoPilot framework, this development could enable long-term adaptive imaging of entire developing embryos and improve the resolution of light-sheet microscopes up to five-fold.



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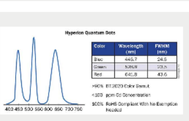
Optical Materials of Tomorrow

From silicon photonics and quantum dots to metamaterials and carbon nanotubes, innovative materials promise a faster, brighter and more integrated future. While some materials have already enjoyed a measure of commercial success, for others, the future promises anything from niche applications right up to market disruption and displacement of existing technologies.



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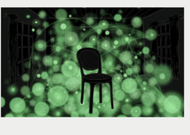
Superresolution Microscope Builds 3D Images by Mapping Negative Space

Thermal noise imaging, a novel method for making 3D images of biological structures at high resolution and under natural conditions, may offer insight into how cells communicate with one another, helping to further the development of artificial organs such as skin or heart tissue.



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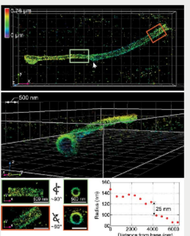
Ultrahigh-Resolution Microscope Images Whole Cells in 3D

A novel superresolution nanoscope allows 3D imaging of an entire mammalian cell and its cellular constituents at a resolution that is 20 to 50 times higher than conventional microscopy, with imaging depth improved approximately tenfold over state-of-the-art iPALM and 4Pi-SMSN implementations. Until now, resolving details at this level was only possible using electron microscopy, which requires samples to be treated.



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