Wednesday, October 09, 2019

MICROSCOPY Tech Pulse

October 2019

Microscopy Tech Pulse is a special edition newsletter from Photonics Media and Mad City Labs Inc. covering key developments in microscopy technology. Manage your Photonics Media membership at Photonics.com/subscribe.

Open-Source Photon Counting Advances Biological Research

Functional imaging at the cellular level in the living brain is commonly achieved with two-photon laser-scanning microscopy (TPLSM), which enables researchers to face the challenges imposed by scattering of turbid media. Although TPLSM has become the gold standard for imaging under these challenging conditions, overcoming existing trade-offs inherent with this technique will expand the scope of the scientific questions that could be asked.

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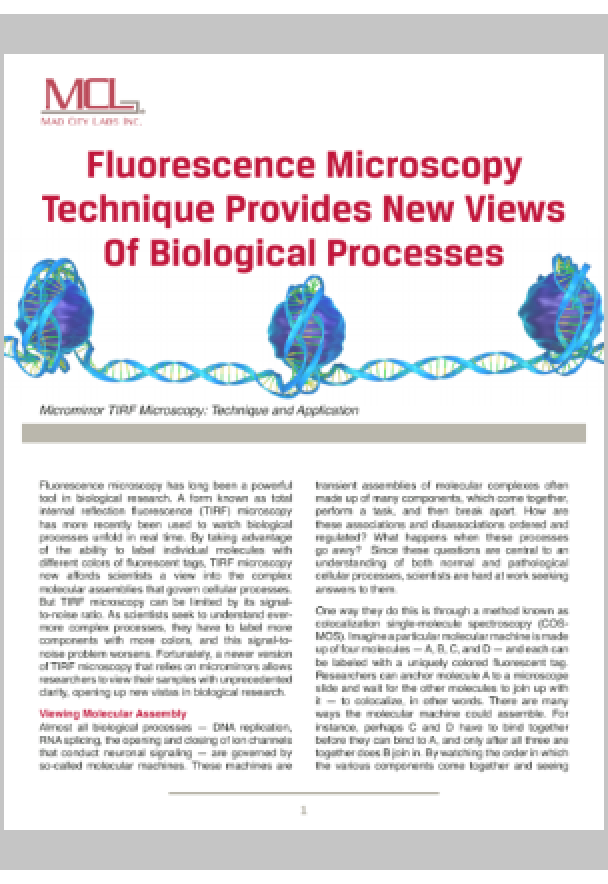
Fluorescence Microscopy Technique Provides New Views of Biological Processes

PROMOTED CONTENT



Introduction to the technique of MicroMirror TIRF (total internal reflection fluorescence) microscopy. The MicroMirror TIRF microscopy technique offers significant signal-to-noise ratio improvements compared to dichroic based TIRF microscopy when using multiple wavelength light sources. Short overview of the types of biological processes that can be studied via this method. Mad City Labs is the only commercial provider of a MicroMirror TIRF microscope.

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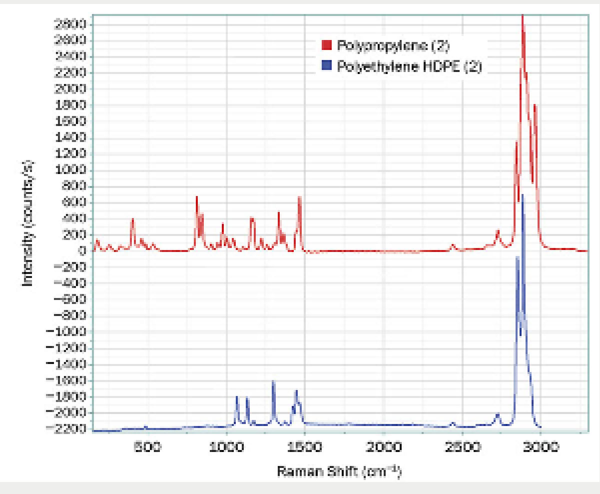
Characterizing Microplastics with Raman Spectroscopy



Raman microscopy combines Raman spectroscopy and optical microscopy, and is one of the most efficient and effective ways to identify polymers. It allows researchers to analyze microscopic pieces of plastics by focusing a laser beam onto a small spot to obtain Raman spectra.

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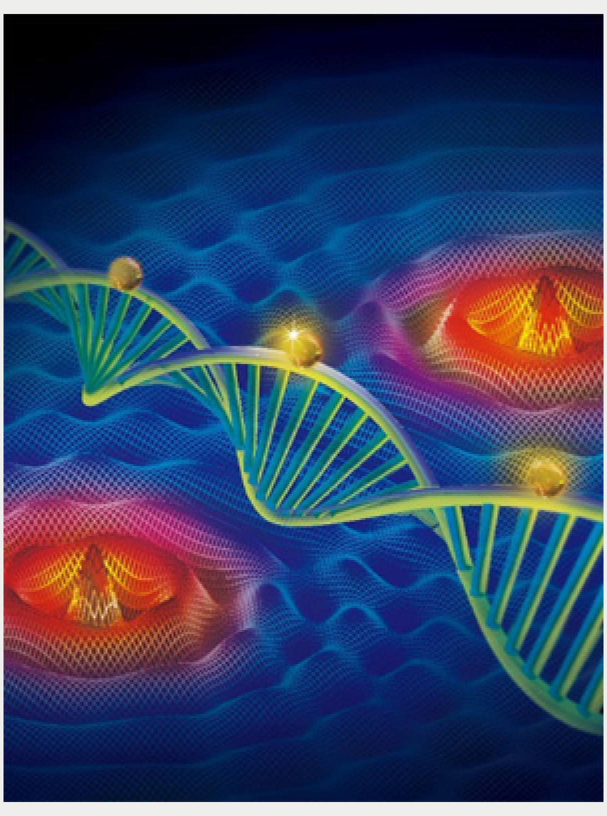
Repetitive Optical Selective Exposure Could Improve Single-Molecule Localization Microscopy



An interferometric, single-molecule localization method for superresolution fluorescence microscopy could significantly improve localization precision compared with conventional centroid fitting methods. The new approach is called Repetitive Optical Selective Exposure (ROSE).

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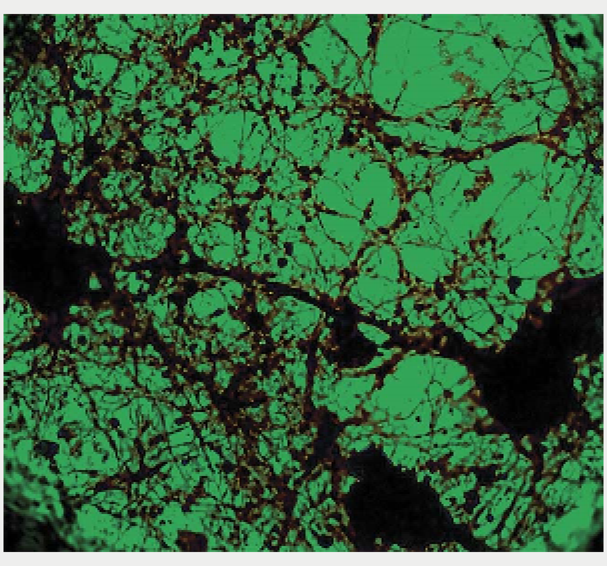
Coherent Diffraction Imaging Expands Researcher Tool Set



Nanoscale imaging with light in the intermediate range has been neglected, primarily because of a gap in available tools and techniques, so thus far the potential for progress has been relatively untapped. However, recent advancements in suitable lab-scale light sources as well as in computational imaging approaches now make it possible to measure structures and features at <15-nm resolution and with unique contrast sensitivity.

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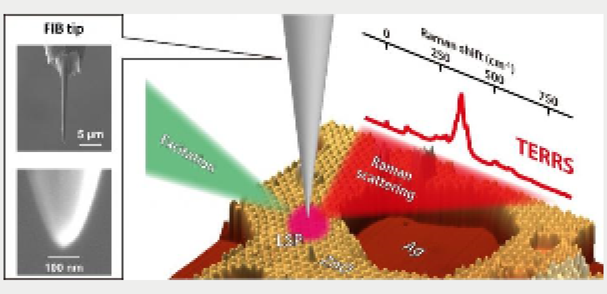
Tip-Enhanced Raman Spectroscopy Provides 1-nm Resolution



Tip-enhanced resonance Raman spectroscopy (TERRS) has been demonstrated by a research team at Fritz-Haber Institute, and the results suggest that TERRS could offer a new approach for the atomic-scale optical characterization of local electronic states.

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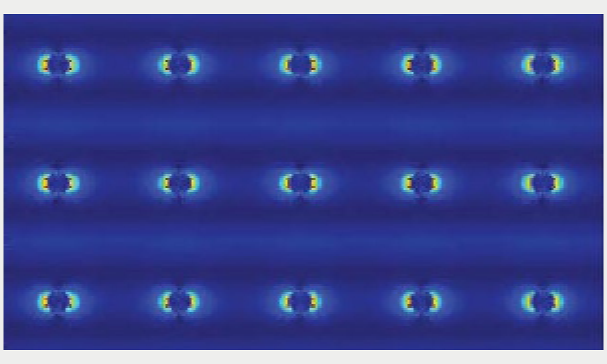
Bio Nanolaser Proves Fully Functional in Living Tissue



Researchers at Northwestern University have created a nanolaser that can be used in living tissues without harming them. Developed in conjunction with a team from Columbia University, the nanolaser can be 50 nm to 150 nm thick, which allows it to fit and fully function inside living tissues.

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