

MICROSCOPY


Tech Pulse



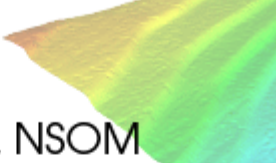
March 2020

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The Microscope Enters the Digital Age

Since its early development, the microscope has undergone little change in optical design, while the optical resolution theoretical limit was already achieved many decades ago. But change is happening, as augmented reality (AR) is being incorporated into the way microscopes are used in the laboratory setting.



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Is a DIY Microscope for you?

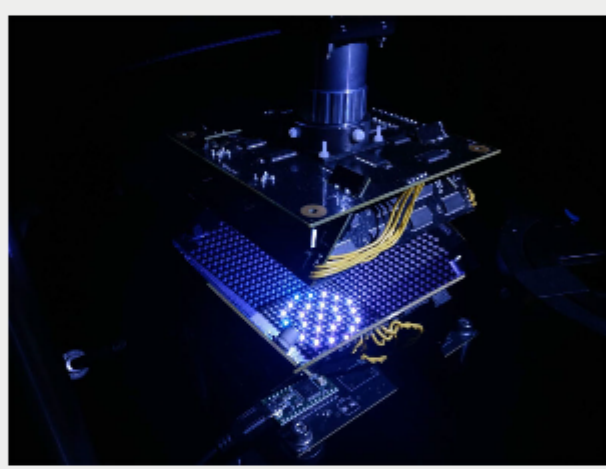
Recently, it has become very popular for researchers to explore building their own microscopes. Budgetary and technical specifications are among the motivations for this approach. However, there is a spectrum of solutions within the DIY microscope space. This article helps readers determine whether a do-it-yourself (DIY) microscope is the appropriate solution for their application and how to procure the right instrument.



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Smart Microscope Teaches Itself Settings for Diagnosing Disease

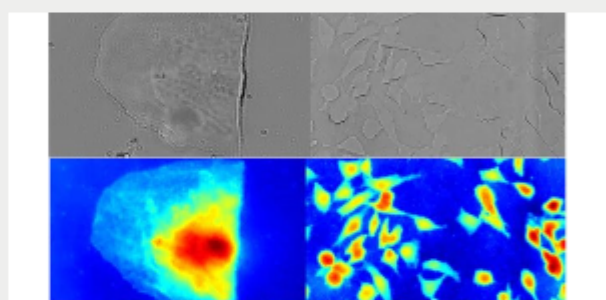
Engineers at Duke University used machine learning to develop a microscope capable of adapting its lighting angles, colors, and patterns while teaching itself the optimal settings needed to complete a diagnostic task.



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Microscope Lens Innovation Enables Simultaneous Imaging

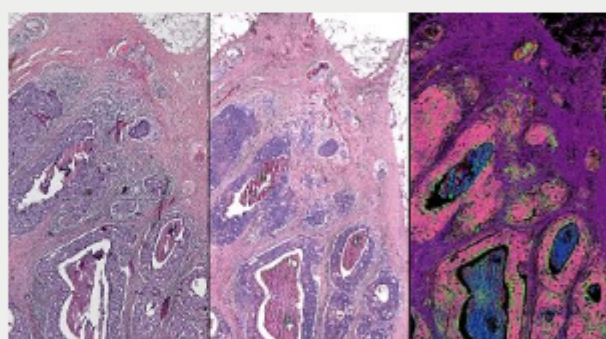
Researchers from King Abdullah University of Science and Technology have designed a microscope lens that is able to take both quantitative phase images and bright-field images in a single measurement.



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Hybrid Microscope Improves Tissue Pathology

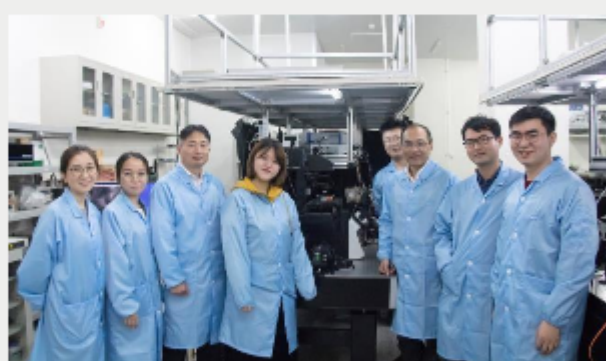
Researchers at the University of Illinois at Urbana-Champaign have paired infrared capabilities with high-resolution optical microscopy and machine learning to bring cancer diagnostics into the digital era.



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Ghost Imaging Speeds Up Superresolution Microscopy

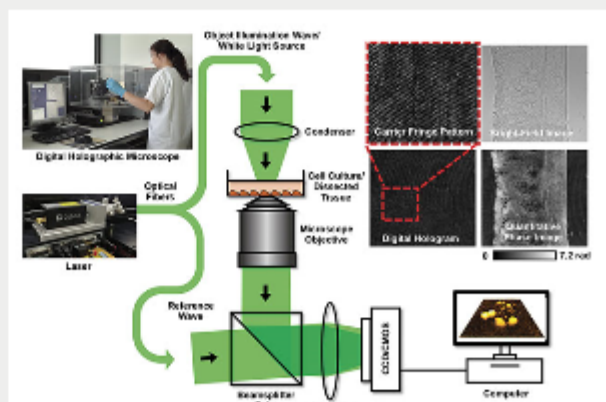
Scientists from the Chinese Academy of Sciences have developed a new imaging technique that produces nm-scale resolution using significantly fewer images than traditional nanoscopy techniques. The scientists used ghost imaging to enhance the imaging speed of their technique.



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Digital Holographic Microscopy Enhances Cytometry and Histology

In recent years, quantitative phase imaging has been continuously improved for purposes of high-resolution, label-free quantitative microscopy. Label-free imaging has received increased attention as a minimally invasive way to observe proteins and cells, and to study the behavior and properties of biological specimens with minimized modification and sample preparation.



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Marriage of Microscopy Techniques Reveals Cells' 3D Ultrastructure

Scientists at the Howard Hughes Medical Institute have combined superresolution fluorescence microscopy and electron microscopy to shed new light on the structures and organizations within cells.

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