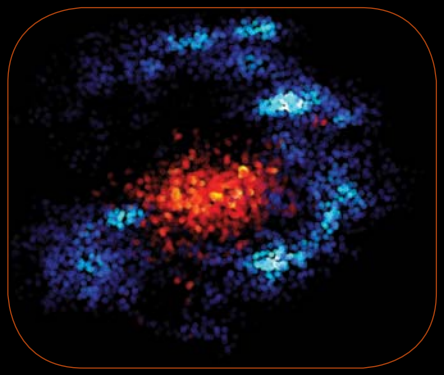
Adaptive optics for Microscopy



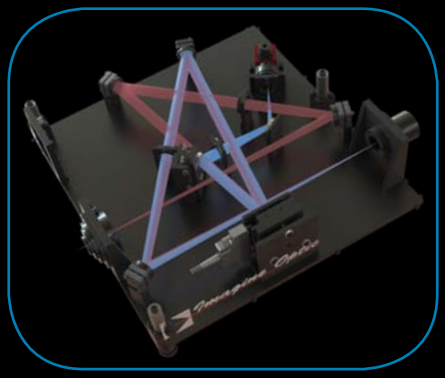
Look inside to learn about how adaptive optics can enable you to see better and delve deeper with your current microscope assembly.

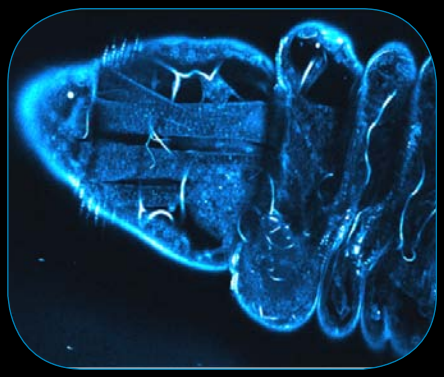
What is it?

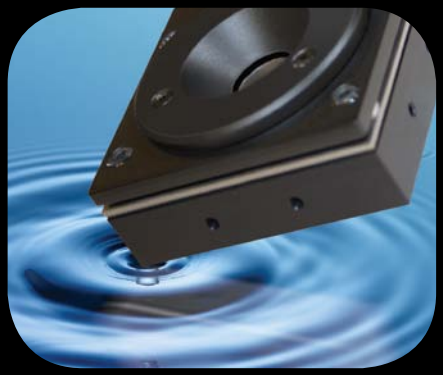
What will it do for me?

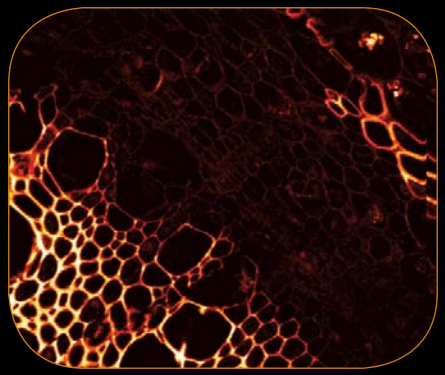
How does it work?

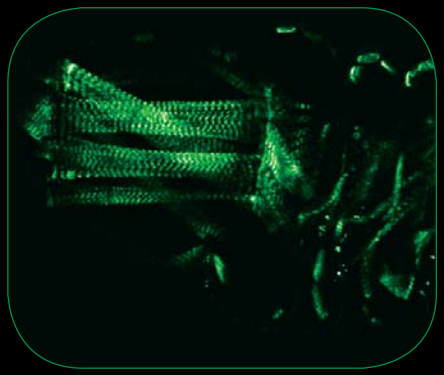
Is it difficult?









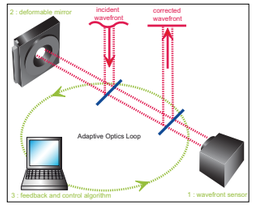


Imagine Optic™

What is adaptive optics?

A technique that corrects for optical distortions

Adaptive optics is a term employed to describe a combination of optical and technological components that can measure and compensate for distortions in light waves, or wavefront aberrations, that are caused as they pass through a heterogeneous medium. It was originally developed to improve the vision of ground-based telescopes because images were deformed by heat and other atmospheric anomalies. Over the past decade, adaptive optics has become a polyvalent technology that has found its way into many applications, one of which is life-sciences microscopy.



A closed-loop adaptive-optics system.

What will it do for me?

Enhance the quality of your microscope's images

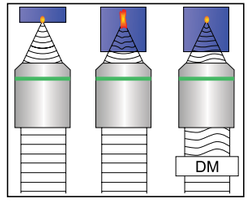
Whether you use wide-field fluorescence, confocal, multiphoton, structured light illumination (SIM), PALM/STORM super-resolution or other optical microscopy techniques, adaptive optics can compensate for aberrations caused by the flaws in the microscope's own optical system, the cover slip, the immersion medium or the biological sample itself. This enables you to perfect your source's focal spot and:

- Increase the signal-to-noise ratio
- Augment lateral and transverse resolution
- Obtain clearer images deeper inside samples

How does it work?

A deformable mirror reshapes the source's focal point

All adaptive-optics systems are comprised of at least one active component that reshapes light to restore its original properties and software to calculate the corrections. In microscopy, the active component of choice is generally a deformable mirror. As the name implies, a deformable mirror is capable of changing its form with extreme precision to the inverse shape of the distortion.



Adaptive optics perfects focal spot at different depths.

Is it difficult?

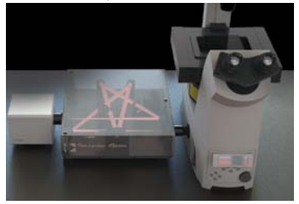
It doesn't have to be.

Imagine Optic offers two unique adaptive-optics solutions that respond to individual users' needs. MicAO™ 3DSR is a plug-and-play solution dedicated for PALM/STORM super-resolution methods that functions with all commercially available inverted microscopes. It enables anyone familiar with microscope operation to easily benefit from adaptive optics without having any specific knowledge. For the adventurous that want to build their own microscopy platforms, the AOKit™ – Bio lets users choose the components they want to create their proper systems.

Better, sharper, deeper imaging... choose your solution!

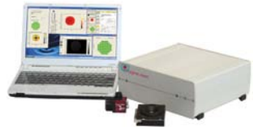
MicAO™ 3DSR

MicAO 3DSR is the first product to put the power of adaptive optics into the hands of any researcher familiar with PALM/STORM single molecule localization techniques. Its compact size hides a powerful adaptive-optics system with the mirao 52-e deformable mirror as its active component. Installation is fast: simply plug MicAO 3DSR in to the camera port in between the imaging system and the microscope. Compatible with a wide variety of commercially available high NA 100x objectives, calibration is easy and only needs to be performed the first time a new objective is used. To ensure compatibility with the widest possible range of hardware/software configurations, the software interface for MICAO functions as a driver-like plug-in.

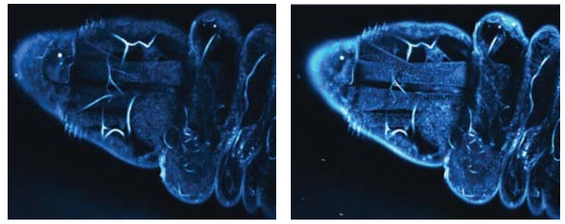

MicAO plugged in between the microscope and the camera, ready to be used.

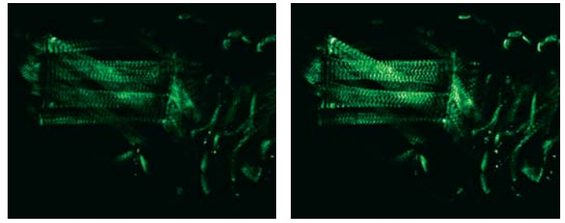
AOKit™ – bio

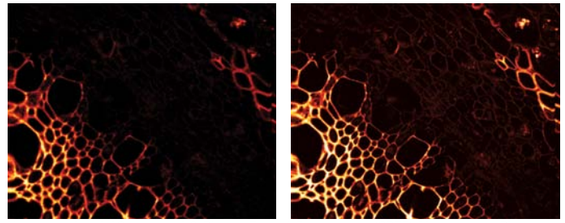
Available in a variety of configurations for open and closed-loop use, the AOKit – Bio is the solution for researchers that want to incorporate adaptive optics into their proper imaging system. At its core is our mirao 52-e deformable mirror that provides unrivalled stroke to correct for the complex aberrations found in microscopy. When combined with the precision of our HASO™ wavefront sensors and our easy-to-use software, the AOKit – Bio is your key to successful imaging.

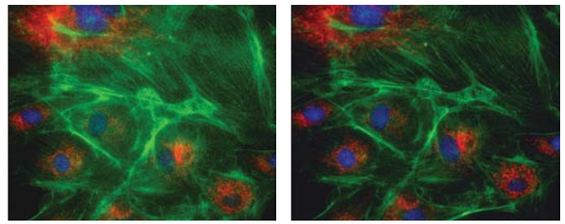


From out-of-the-box, plug-and-play installation customized adaptive-optics solutions, Imagine Optic's products are known around the world for their quality and reliability. Our unequalled experience in getting researchers up and running quickly ensures that you achieve excellent results. For more information, and to find the office or distributor nearest you, visit imagine-optic.com/find.


Uncorrected and AO corrected Third Harmonic Generation (THG) Microscopy of Drosophila larva - Drs. Beaurepaire, Débarre & Olivier, Ecole Polytechnique, LOB (CNRS-INSERM), France.


Uncorrected and AO corrected Second Harmonic Generation (SHG) Microscopy - Drosophila larva - Drs. Beaurepaire, Débarre & Olivier, Ecole Polytechnique, LOB (CNRS-INSERM), France.


Uncorrected and AO corrected 2-Photon-Excited fluorescence (2PEF) Microscopy - Plant tissue - Drs. Beaurepaire, Débarre & Olivier, Ecole Polytechnique, LOB (CNRS-INSERM), France.


Uncorrected and AO corrected with MicAO widefield fluorescence microscopy - BPAE cells

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