

Hinds Instruments has applied the power and versatility of the Photoelastic Modulator (PEM) to produce a birefringence imaging microscope. As the world leader in PEM technology, Hinds has manufactured and developed PEMs for over 40 years. For more than 15 years Hinds has built birefringence measurement solutions, marketed under the Exicor® brand. The superior polarization modulation capabilities of the PEM have delivered the highest sensitivity birefringence measurement solutions on the market.

### Birefringence Imaging Microscope

The Exicor Birefringence Microlmager offers researchers in academia and industry the ability to evaluate birefringence of both biological and industrial materials. With a digital resolution of 0.7 $\mu$ m, a detection limit (noise floor) of 0.1nm and a measurement range of beyond 3500nm, the Microlmager offers quick and reliable measurements in an integrated system package that includes camera, optics, electronics, sample stage hardware and software.

The system offers a choice of 3 Color or 4 Color configurations: red, amber, green or blue light sources, and a choice of either a 2X (5 micron resolution) or 5X (2 micron resolution) objective. Additional objectives may be added as options, including 2X, 5X, and 10X objectives. The Microlmager is compatible with all 3 available objectives and the user can switch between them.

The Exicor Microlmager system is also offered with a phase unwrapping option for determination of magnitude of high birefringence samples (i.e. >300nm). The phase unwrapping software uses a proprietary algorithm to estimate the true retardation magnitude (up to 2400nm for RGB systems and 3500nm+ for RAGB systems). The system can also be customized to use other wavelength sources (contact Hinds for details).

The Hinds Birefringence Imaging Microscope is ideal for measuring birefringence in biological structures (see Figure 1), glass, crystals, and many other organic and inorganic samples.

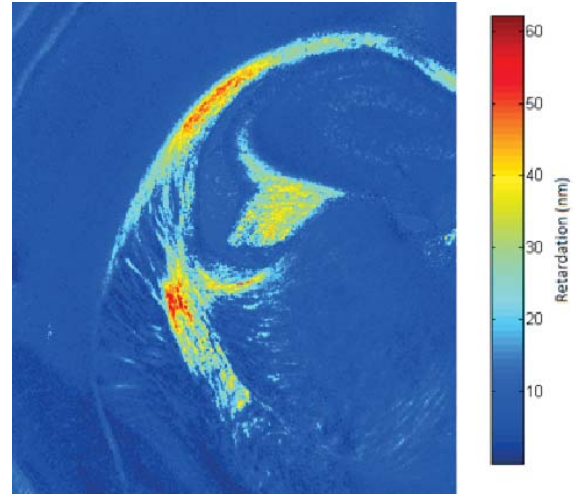


Figure 1. Myelinated White Matter in a mouse brain.



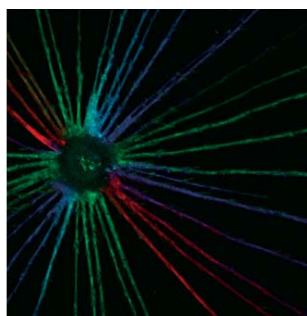
Figure 2. The Exicor Birefringence Microlmager.  
Footprint is 12 inches X 10 inches (30.5 cm X 25.4 cm)  
Height is 27 inches (68.5 cm)

## FEATURES

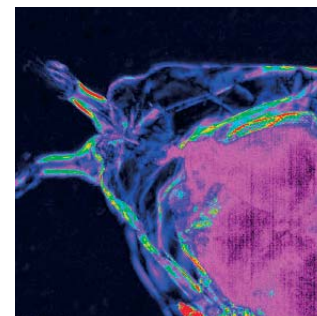
- ◆ No Dyes or Fluorescent labels required
- ◆ Measures retardation, angle and intensity
- ◆ Images retardation, angle and intensity
- ◆ Allows color maps to be customized by user for optimal display of data
- ◆ Allows maximum, average, and standard deviation over entire image and in user-selected areas or lines
- ◆ View data by intensity, birefringence/retardation, angle, or combination
- ◆ Histograms for statistical analysis
- ◆ User calibration
- ◆ Export of data in .csv and binary formats
- ◆ Export of data from user selected areas
- ◆ Export images in bit, png or tiff formats
- ◆ Compatibility with third party analysis tool, ImageJ

## OPTIONS

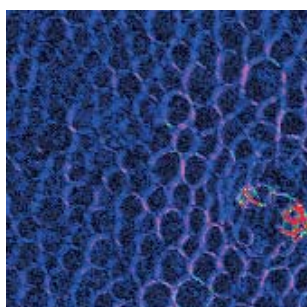
- ◆ Phase Unwrapping Option. For highly birefringent samples - up to 3500nm with 4 color configuration and up to 2400nm with 3 color configuration



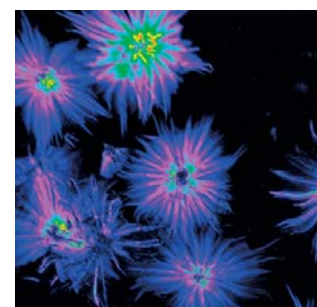
DANDELION FUZZ 10X  
RETARDATION AND ANGLE



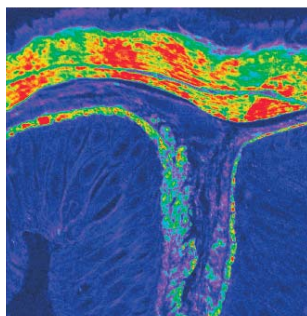
DROSOPHILA 10X  
RETARDANCE



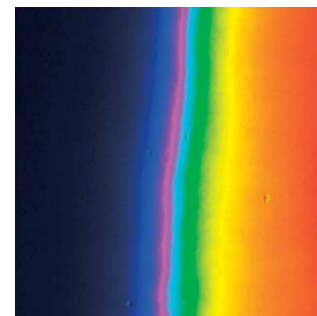
RANUNCULUS ROOT, C.S. 10X  
RETARDANCE



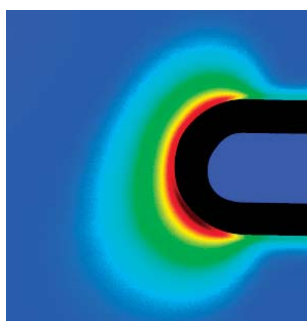
SILVER BERRY SCALY HAIR 10X  
RETARDANCE



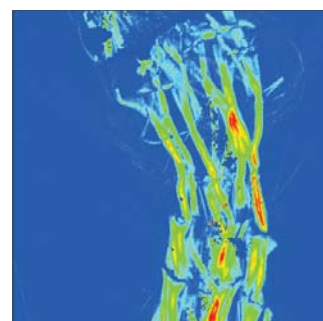
DOG COLUMBAR EPIHELUM 10X  
RETARDANCE



MULTI TAPE SAMPLE  
RETARDANCE



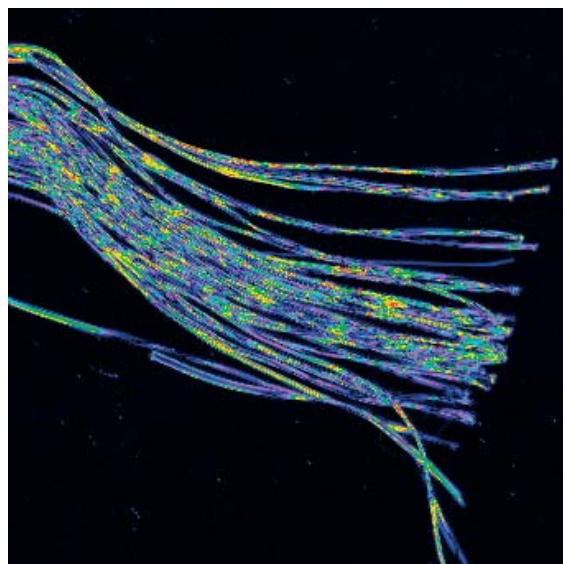
CELL PHONE COVER  
RETARDANCE



MOSQUITO LARVAE 5X  
RETARDANCE

SPECIFICATIONS	
Retardation Repeatability	$\leq 0.6\text{nm}$ ( $3\sigma$ )
Wavelengths	Red (630nm) Amber (590nm) Green (530nm) Blue (475nm)
Retardation Measurement Range <sup>1</sup>	0 - $0.5\lambda^2$ above $0.5\lambda$ , optional phase unwrapping to 3500nm
Measurement Speed	nominal 7 sec
Dimensions	Footprint 30.5 cm x 25.4 cm
	Height 68.5 cm
Stage Travel (x, y)	75 mm, 56 mm

RESOLUTION AND FIELD OF VIEW		
Imager	Resolution	2048 nm x 2048 nm
	Bit-Depth	12 bits
Objective	Resolution	Field of View
2X	5 micron	5.6 mm x 5.6 mm
5X	2 micron	2.2 mm x 2.2 mm
10X	1 micron	1 mm x 1 mm



SILK FIBERS SET  
 RETARDANCE

