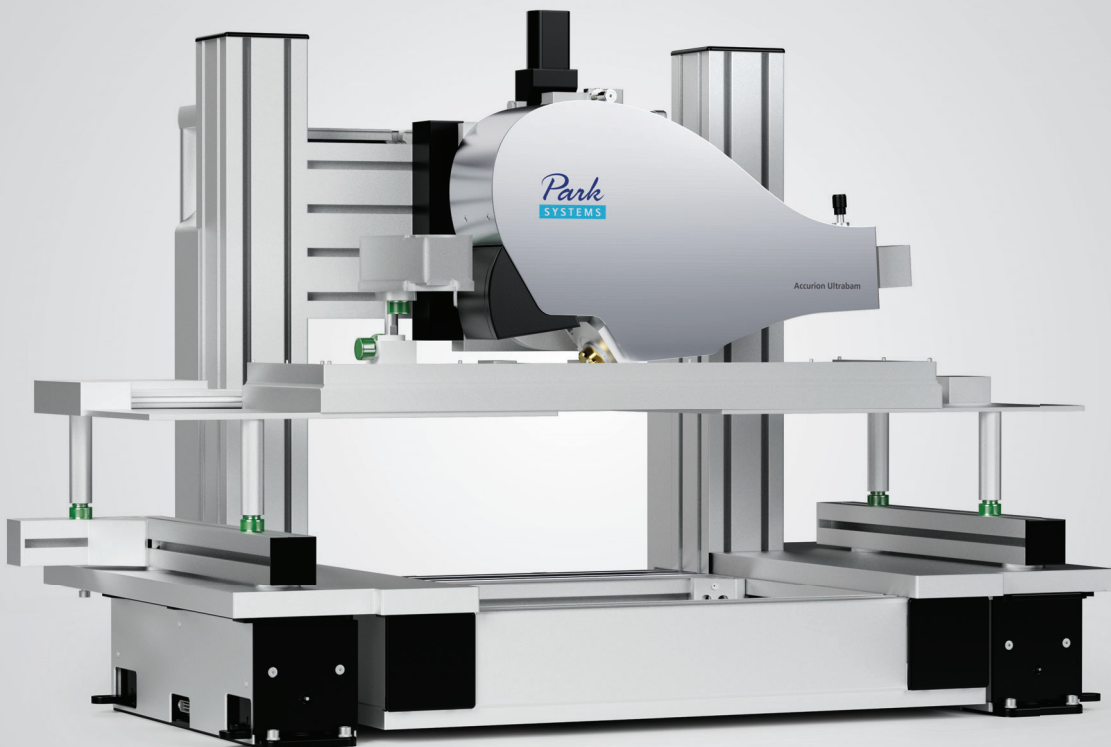


*Enabling Nanoscale Advances*



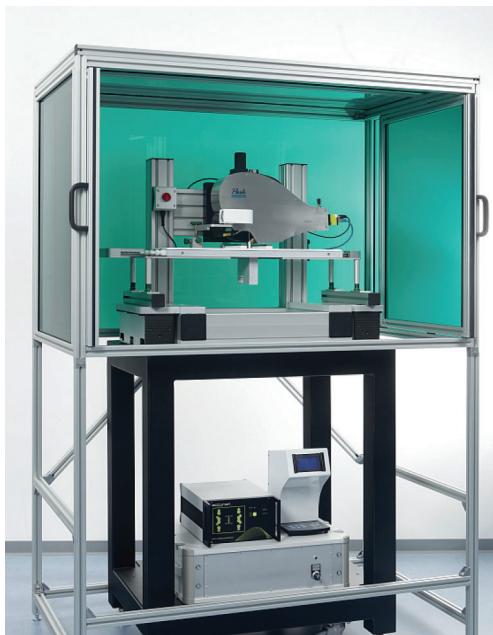
# Accurion UltraBAM

## Brewster Angle Microscope



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## Brewster Angle Microscope



Accurion UltraBAM with trough, laser safety cabinet and support frame

The Accurion UltraBAM is the ultimate Brewster Angle Microscope designed for the air/liquid interface. It allows the direct visualization of Langmuir monolayers or adsorbate films. It also works on dielectric substrates like glass, quartz or similar materials.

The Accurion UltraBAM combines high resolution and overall focused real-time imaging. Advanced imaging optics provide fully focused images at 20-35 frames per second. A high performance camera and specific calibration algorithms enable quantitative measurements of reflectivity. Thus adsorption kinetics or thickness variations can be monitored.

The motorized analyzer offers the visualization of optical anisotropy, that is e.g. caused by long range molecular orientation order in monolayers.

The Accurion UltraBAM is designed to match most troughs available. Regarding best performance and simple handling the large trough is recommended. Vertical position changes of the instrument head are performed by a highly precise motorized lift.

## Features & Benefits

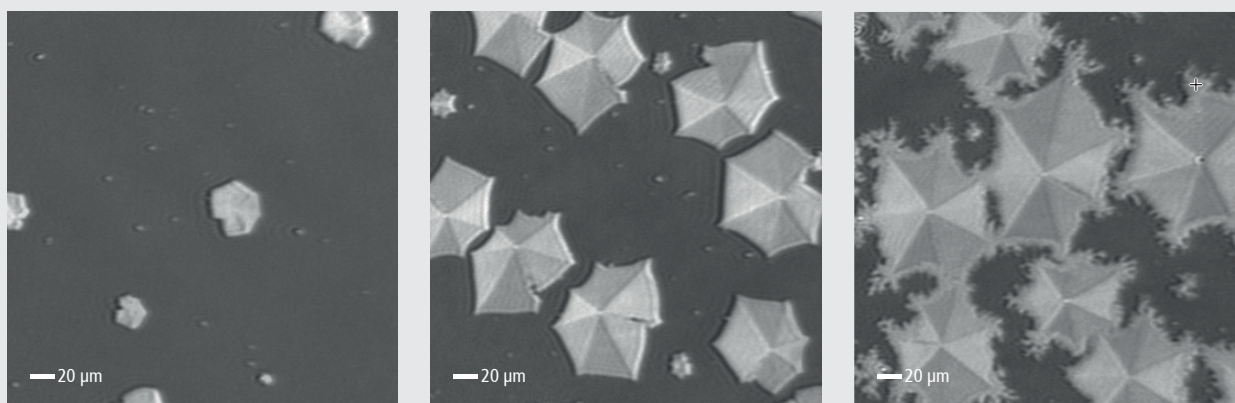
- Real-time overall focused images without focus scanner
- Direct visualization of the sample
- Lateral resolution down to 2  $\mu\text{m}$
- Imaging of anisotropic layers
- Designed for the air/liquid interface, but also works on dielectric substrates
- Variable angle-of-incidence ranging from 52° to 57°
- Large field of view
- On-line image processing
- AVI recorder
- Software interface for major trough systems
- Image files contain trough data
- Active vibration isolation system included

## Applications

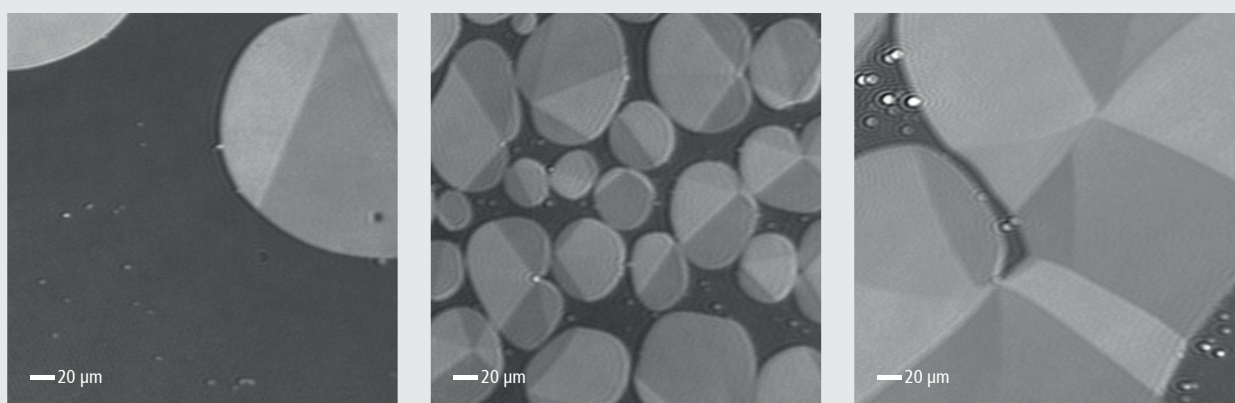
- Domains and order phenomena
- Transformation of monolayers into multilayered structures
- Photochemical reactions (e.g. photoisomerization)
- LB-films on solid structures
- Polymers and other materials that cannot be detected by fluorescence microscopy
- Adsorption kinetics
- In-situ polymerization in monolayers
- Phase separation
- Influences of subphase compositions (counter-ions) on monolayer structures
- Quality and homogeneity of LB-films
- ... and many more



Graphical user interface of the Accurion UltraBAM

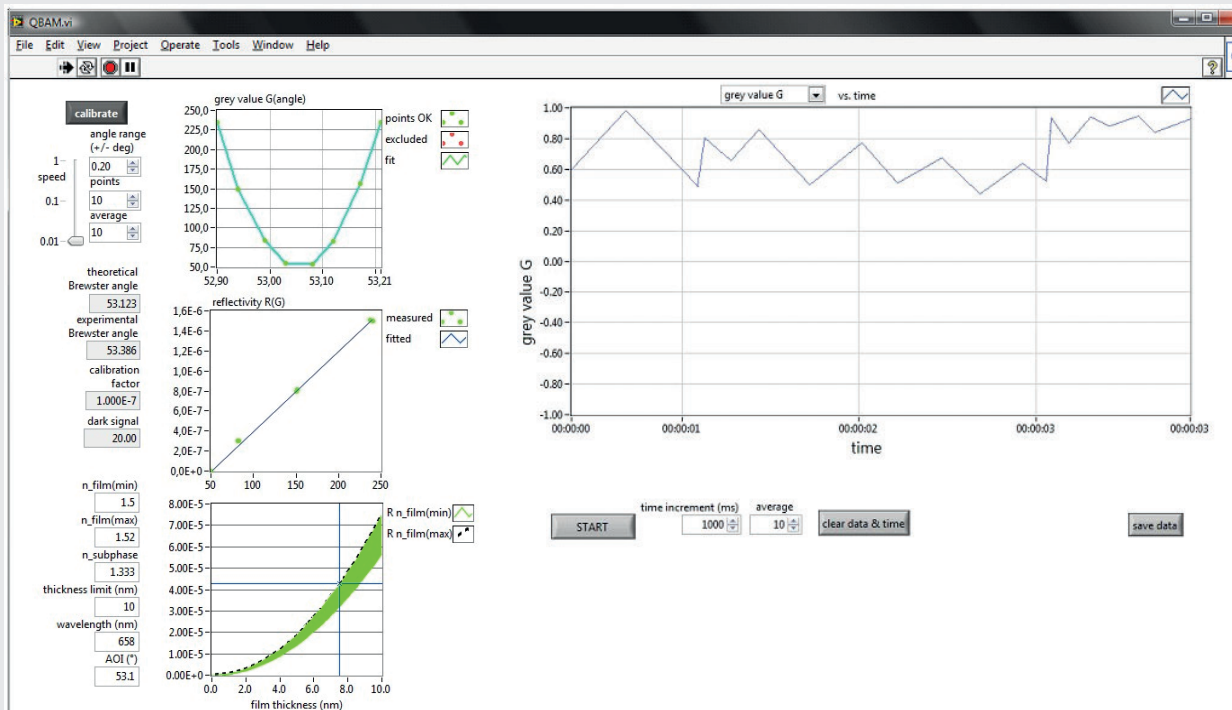


Monolayer of 2-Monopalmitoleoyl-rac-glycerol at different surface pressure (left:  $\pi = 3,06$  mN/m, middle:  $\pi = 4,30$  mN/m, right:  $\pi = 5,86$  mN/m)

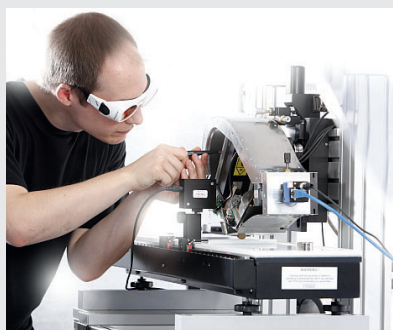


Monolayer of 1-Monopalmitoleoyl-rac-glycerol at different surface pressure (left:  $\pi = 2,68$  mN/m, middle:  $\pi = 4,35$  mN/m, right:  $\pi = 7,94$  mN/m)

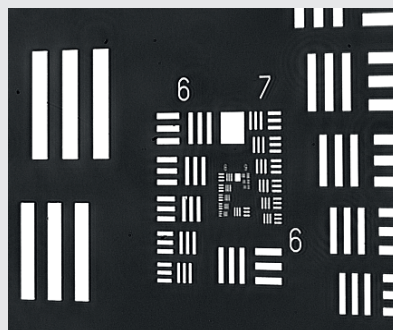




QBAM tool used for quantitative Brewster angle microscopy studies



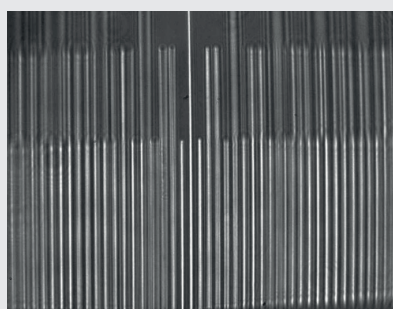
Calibration of the laser



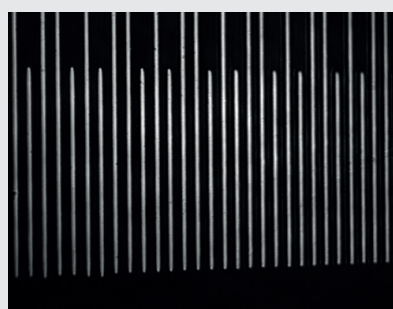
Resolution of the imaging system according to USAF 1951 test target



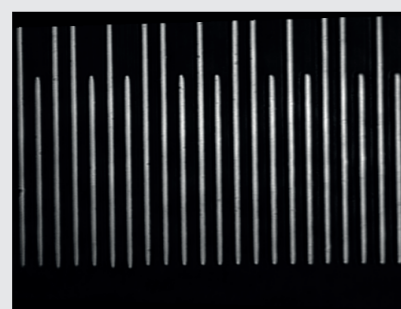
Monolayer experiment with NIMA trough



Conventional imaging system with line focus



Sophisticated imaging system used in Accurion UltraBAM



Geometrical correction

## Accessories and Options

- Laser safety cabinet
- Steel support frame
- Several types of troughs
- Manual sample stage

Specifications	UltraBAM
Type	Brewster Angle Microscope
Angle-of-incidence range	52° - 57° (equivalent to Brewster angle for substrates with $n = 1.3 \dots 1.54$ ), motorized, 0.001° resolution
Light source	50 mW, 658 nm class IIIb broadband laser source for reduced interference fringes (other light sources on request)
Imaging optics	True 2 micrometers resolution (horizontal image direction) according to Rayleigh's criterion; effective resolution of the camera 0.7 $\mu\text{m}/\text{pixel}$ (valid @ 53.1° AOI)
Field of view	720 x 400 $\mu\text{m}$
Polarizer	High quality Glan-Thompson prism, motorized, 0.001° resolution
Analyzer	Advanced high quality thin film polarizer, motorized, 0.001° resolution
Camera	High performance CCD camera, 1360 x 1024 pixels, 2 x 2 binning mode for increased sensitivity, 20 fps (max: 35 fps @ 2 x 2 binning), 12 bits, GigE interface, variable exposure time and gain
Mounting	Variable vertical position of the instrument head (alternative mounting options on request). Two-axis horizontal alignment of instrument head by fine-thread screws
Z-Lift	Precise motorized positioning of the instrument head, range 40 mm, adjustable lower end switch for safety reasons
Vibration isolation	Accurion Vario Basic 40: High performance active vibration isolation system (stable support structure and solid floor are included)
Image processing	Automatic background compensation, geometric image correction for unskewed images, contrast enhancement and image filtering, images contain trough data and BAM settings, AVI video recorder, including AccurionServer environment for simple access to measurement data
Control	Accurion UltraBAM control software for simple access to all motorized components, camera etc.; Interface to KSVNIMA trough to import data on surface pressure etc.; Calibration routines for quantitative Brewster angle microscopy
Electronics	Based on Accurion EP4 electronics with embedded Linux controller
Power supply	100 - 240 V, 50/60 Hz
PC and monitor	Up-to-date PC with Windows 7® operating system, pre-installed software - ready to use, LCD display 23" or larger

\*Technical specifications may change without notice. The Accurion UltraBAM does not include the trough shown in the pictures.

## Park Systems GmbH - Accurion

Park Systems GmbH previously known as Accurion GmbH is a leading provider of high-end, state of the art imaging ellipsometry and active vibration isolation products. Accurion was merged into Park Systems Corporation in 2022 to boost its R&D resources and expand its sales network to better serve its customers.

Park Systems is a world leading manufacturer of nano metrology-microscopy solutions including the atomic force microscopy (AFM), white light interferometry and infrared spectroscopy systems.

It provides complete range of nano metrology and microscopy products for researchers and engineers in the chemistry, materials, physics, life sciences, semiconductor, and data storage industries.

Prior to merger with Park Systems, Accurion was previously known as Nanofilm Technology GmbH, a spin-off from the Max Planck Institute for biophysical chemistry in Goettingen. In 1991, the company began designing the Brewster angle microscope for the characterization of ultrathin films. In 1996, the company's division of active vibration isolation was established. In 2009, Halcyonics GmbH, a specialist in active vibration isolation solutions, merged with Nanofilm Technology GmbH to form Accurion GmbH.

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