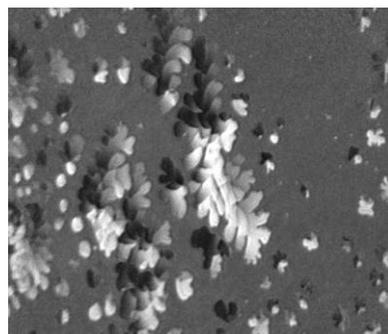


## NANOPTICUM

### Our new Brewster angle microscope: High resolution and fully focused images in real time

- New product: nanofilm\_ultrabam – High resolution and fully focused Brewster angle microscopic images in real time opening a new chapter in LB - science
- Current applications of Brewster angle microscopy: from nanoparticles to lung surfactants
- halcyonics\_silencer: after work...
- 1<sup>st</sup> in-house conference “New application of imaging ellipsometry and Brewster angle microscopy”



nanofilm\_ultrabam: Fully focused images without focus scanning. To get an impression of the real improvement, please look one of the videos at:

[www.accurion.com/nanofilm\\_bam](http://www.accurion.com/nanofilm_bam)

Dear Sir or Madame,

This month, we will focus our Nanopticum on Brewster angle microscopy, because we want to introduce our new Brewster Angle microscope nanofilm\_ultrabam that offers fully focused Brewster angle microscopic images in real time. The new optical Pathway is based on a modified Scheimpflug set up (patent is pending). In this context we will focus the view on literature to current applications of Brewster angle microscopy. One of the first opportunities to see the nanofilm\_ultrabam at work will be during our inhouse conference in June and at the LB13 in July.

And after work, the halcyonics\_silencer takes the audiophile connoisseur, one gigantic step closer to the goal of an absolutely authentic rendition of music – by the use of active vibration isolation.

Please enjoy the new state of the art in Brewster angle microscopy.

Best regards

Yours,

*Accurion team*

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Fax: +49 551 999 60-10

[www.accurion.com](http://www.accurion.com)  
[info@accurion.com](mailto:info@accurion.com)

## April 2010

Bunsentagung, Bielefeld University, Germany,  
May 13<sup>th</sup> – 15<sup>th</sup>.

[www.bunsen.de](http://www.bunsen.de)

ICSE-V, Albany, NY USA, 23-28 May 23<sup>th</sup> -28<sup>th</sup>

[www.icse-v.org](http://www.icse-v.org)

1<sup>st</sup> INHOUSE CONFERENCE

“New application of imaging ellipsometry and Brewster angle microscopy” Göttingen, Germany, 9<sup>th</sup> and 10<sup>th</sup> June 2010

LB13 Meeting - Québec, Canada, 18th – 21th  
July 2010

[www.lb13quebec.ca/](http://www.lb13quebec.ca/)

## NEW PRODUCTS: nanofilm\_ultrabam

It enables the visualization of Langmuir monolayers or adsorbate films. A unique imaging optic system provides fully focused images at 20-35 frames per second.

By this, for the first time in a commercial instrument **high resolution AND overall focused real time imaging** of monolayers becomes possible. It also works on popular dielectric substrates like glass, quartz or similar. The UltraBAM is mounted on an aluminum frame. The vertical position of the UltraBAM can be changed to fit to most troughs available, a precise motorized vertical lift allows fine positioning to focus the water surface. Automatic vertical position tracking is included to follow water level changes. Because of the vibration sensitivity of Brewster Angle Microscopy, the UltraBAM by default includes a Halcyonics active vibration isolation system.

The pictures show a monolayer of DMPE during the first-order phase transition with contrast in domains caused by long range orientational order. Please have also a look on the videos at [http://www.accurion.com/nanofilm\\_bam](http://www.accurion.com/nanofilm_bam).

## VIEW ON LITERATURE: CURRENT APPLICATION OF BREWSTER ANGLE MICROSCOPY

The morphological study of monolayers has led to more detailed understanding of the two-dimensional condensed phase structure of monolayers. Brewster angle microscopy (BAM) [1] is the most informative method for such study [2]. BAM can be used to directly observe the compression of monolayers in a Langmuir trough. The advantage over epifluorescence and AFM is that no markers are required and that the film need not be transferred to a solid substrate. BAM is an effective visualisation method for substructures with long range orientational order. To obtain a contrast between subdomains of different molecule orientation an analyzer is positioned in the reflected beam path. Typical applications are monolayer phases, domains, and ordered phenomena as well as the transformation of monolayers into multilayered structures, photochemical reactions (e.g. photoisomerization), LB-films on solid structures or the influence of various subphase compositions (e.g. counterions) on monolayer structures. BAM was also used in characterize biological liquids such as tear fluids or, more in detail, Meibomian gland secretion or lung Surfactants in/from pulmonary fluid.

Langmuir-Blodgett techniques in general also offer the promising possibility of "bottom-up" self-assembly methods to realize new 2D-structures. Current examples are using self-assembled monolayers at the air/water interface. Chen and Berman used Langmuir monolayers of diacetylene lipids with a cytosinyl head-group (PDC), mixed with an alcohol derivative of the same lipid (PDOH). They followed the surface with Brewster angle microscopy and at the end, the complex and very beautiful structures were fixed by *in situ* UV polymerization [3]. Currently, nanoparticles at the air/water interface are used in an increasing number of applications for example to produce 2D colloidal crystals or nanowires. [4]

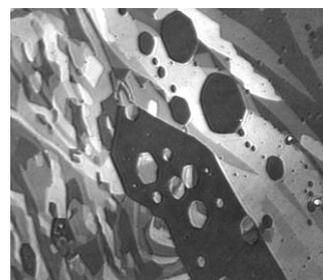
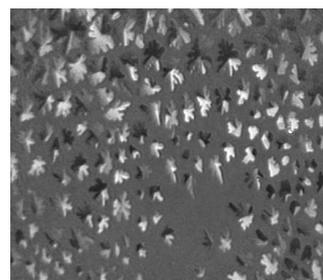
- [1] D. Hönig, D. Möbius (1991) *J. Phys. Chem.*, **95**, 4590–4592.
- [2] D. Vollhardt (1996) *Advances in Colloid and Interface science* **64**, 143-171
- [3] J. Chen, A. Berman (2004) *Nanotechnology* **15**, 303–315.
- [4] R. Volinsky, R. Jelinek (2009) *Angew. Chem. Int. Ed.* **48**, 1 – 4

## AFTER WORK – THE halcyonics\_silencer

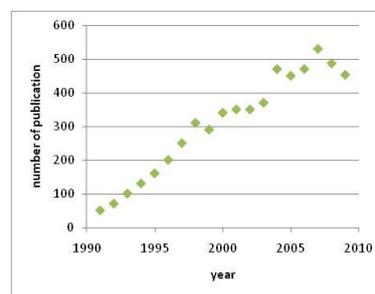
People who possess high-end audio systems are fastidious. They demand an absolutely authentic rendition of their music. The Silencer takes you one gigantic step closer to this goal. The disturbing influence of vibration has its origins in buildings, in people moving through the room and also in airborne sound input from the loudspeakers. All these sources of disturbance lead to a distorted rendition of audio signals.

The Silencer's active damping system suppresses these disturbances masterfully, delivering spectacular results that are simply not available with passive vibration isolation systems. The Silencer focuses on high grade, analogue record players, CD-players, power amplifiers as well as other audio components sensitive to vibration. And it offers you a new kind of absolute sound – the ultimate listening experience!

The halcyonics\_silencer  
[www.accurion.com](http://www.accurion.com)



Images of the month: Fully focused BAM images – more impressive are the videos at [www.accurion.com/nanofilm\\_bam](http://www.accurion.com/nanofilm_bam)



Number of publication in the field of Brewster angle microscopy (source: google scholar)



NANOPTICUM - A new Brewster angle microscope: High resolution and fully focused images in real time

## 1<sup>ST</sup> IN-HOUSE CONFERENCE “NEW APPLICATION OF IMAGING ELLIPSOMETRY AND BREWSTER ANGLE MICROSCOPY”

We would like to invite you to our first inhouse conference. We will separate the conference in five sessions and are looking forward to additional contributions



- Applications in biophysics, from supported bilayers to living cells
  - A. Janshoff, University of Göttingen
  - M.C. Howland, University of California - Davis
- New developments and current applications of Brewster angle microscopy
  - D. Möbius, MPI Göttingen
  - D. Hönig, Accurion GmbH, Göttingen
- Imaging ellipsometry in Materials Science
- Advanced coatings: Adsorption, layer by layer, smart polymers,
  - V. Körstgens, TU München
- Sensors, smart surfaces and SPR in the ellipsometric mode
  - K. Oehse, IBA Heiligenstadt

The aim of the conference is to bring together users from different application fields and we would be happy to offer young scientists a platform to discuss their scientific results with colleagues using the same technology.

The conference fee will be 180 €. Please have in mind that the conference dinner is included.

We are looking forward to meeting you in Göttingen

Best regards

*Accurion team*

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Fax: +49(0) 551 – 999 60-10

### Registration form

I will participate at the at the 1<sup>st</sup> In-house conference (conference fee 180 €, including conference dinner)

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Last name

First name

Title

--

Company/Institution/Agency

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Street Address

--	--

City State

Province Zip/Postal Code  
Country

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e-mail

phone

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fax

\_\_\_\_\_

Date

\_\_\_\_\_

signature

I would like to give a presentation/poster at the Accurion In-house conference “New application of imaging ellipsometry and Brewster angle microscopy”

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Title of the paper

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Authors

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To whom correspondence should be addresses. E-Mail: