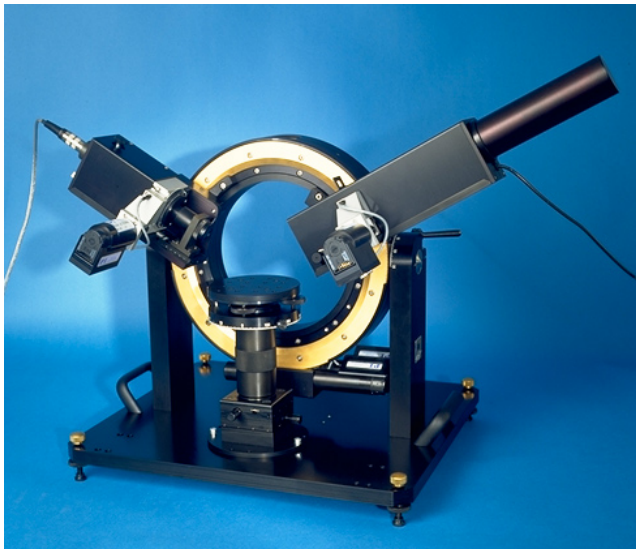


OPTREL GbR
WWW.OPTREL.DE



THE MULTISKOP is a powerful surface analytical tool. It incorporates several well established optical techniques in a single set-up. The modular design offers a choice of different configurations, the full version enables:

- Ellipsometry
- Surface plasmons (SPS)
- Waveguide modes
- Brewster Angle Microscopy
- Imaging Ellipsometry
- SPS Microscopy
- **New!** *Contact angle module*

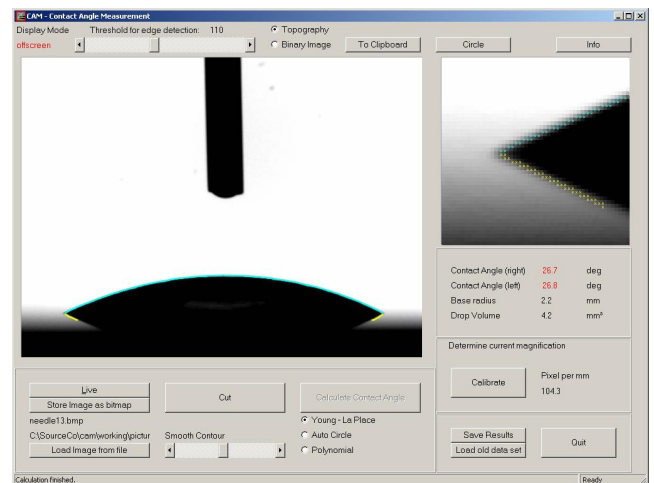
Up until now, different expensive set-ups have been used for each of the above mentioned techniques. The fact that each requires similar components lead Optrel to the concept of THE MULTISKOP - a single, truly modular system which combines all techniques for a price of a commercially available single system. The basic concept of the system is discussed in: "Description of a single modular optical set-up for ellipsometry, surface plasmons, waveguide modes, and their imaging techniques including Brewster angle microscopy" H.Harke, R. Teppner, O.Schulz, H.Orendi, H. Motschmann, Rev.Sci.Instrum. 68(8), 1997.

THE MULTISKOP

The most recent extension is the contact angle module. The contour of a sessile drop is analyzed and fitted to the Young-Laplace equation. The module uses many existing hardware components of THE MULTISKOP such as framegrabber, CCD-camera, sample stage, computer etc. and is therefore a consequent extension of its capabilities.



A contact angle measurement requires the precise determination of the location of the three phase contact point. Many commercial programs demand further user input to solve this task but not our program CAM. The implemented contour tracing algorithm is smart enough to distinguish between drop and mirror image. The contact angle is then calculated at the intersection of mirror and drop contour. This is fast, accurate and user friendly.

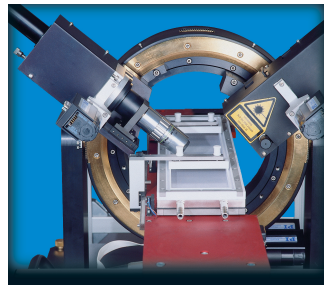
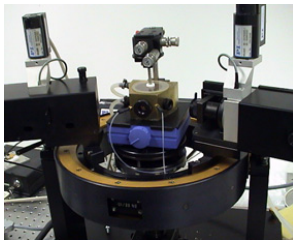


THE MULTISKOP system enables novel measurement schemes which are advantageous for the measurement of contact angles on rough or heterogeneous solid surfaces. In this case the three phase contact line possesses irregularities and a contact angle determined by the tangent at the three phase contact point is of dubious value. The better strategy relies on an analysis of the top view of the drop. The contact angle is then calculated on the basis of the drop volume and average drop diameter leading to reliable results due to an averaging over the drop contact area.



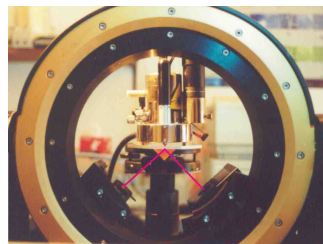
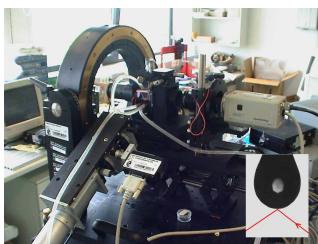
THE MULTISKOP provides a maximum of flexibility in the manner in which you can perform your particular experiment.

Have a look at the following experiments:



Left: Adsorption measurements THE MULTISKOP goniometer can be tilted and fixed in any desired position to meet the requirement imposed by your experiment. The full two circle goniometer provides additional degrees of freedom.

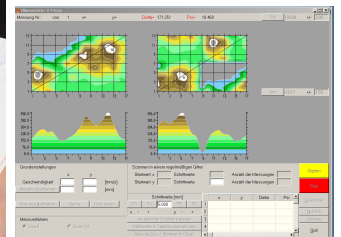
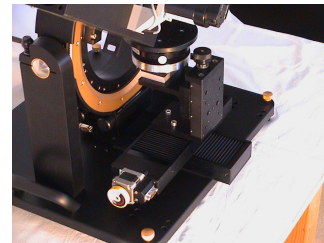
Right: THE MULTISKOP operated in Brewster mode. The trough is supplied by Riegler & Kirstein LTD / Berlin and possesses optimized dimensions for our system. Riegler & Kirstein LTD (www.rieglerkirstein.de) offers a wide variety of custom made troughs. The software works together with the Multiskop control program. Both programs use different channels of the same AD converter.



Left: Combining ellipsometry and drop shape analysis. A pendant drop can be regarded as a small Langmuir trough. The evaluation of the drop shape allows the determination of the surface tension and surface area. A change of the volume of the drop leads to a change in the surface area and enables the measurement of π/A isotherms. This arrangement is in particular useful if you are using very precious material such as certain biomolecules or if you want to measure at elevated temperature. The drop- and bubble profile analysis tensiometer PAT 1 of Sintech, Berlin (<http://www.sintech-berlin.de>) has been used for this experiment. The software has been optimized for this purpose.

Right: Combination of AFM and Ellipsometry, Microscopy with a resolution exceeding the diffraction limit

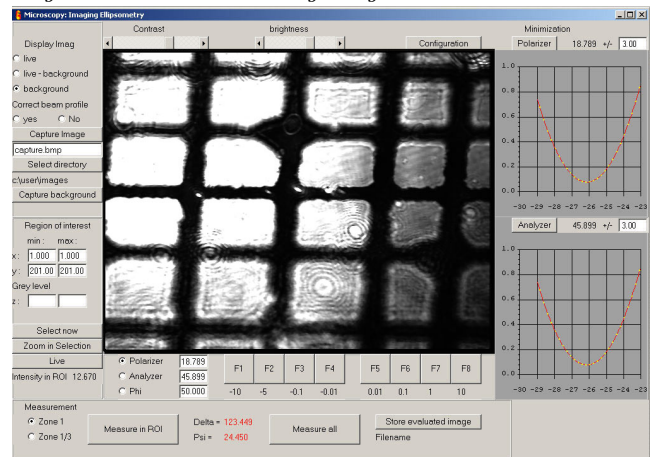
Optrel offers useful accessories such as thermo controller, adsorption cells, plasmon holder or automatic sample holder for the measurement of ellipsometric x,y maps of patterned surfaces.



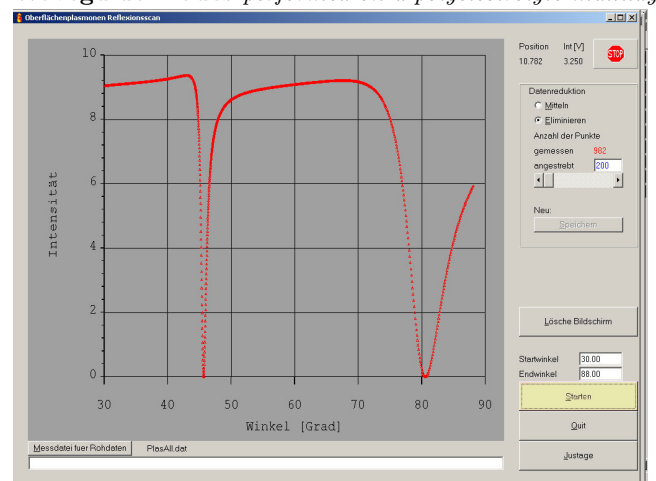
Ellipsometric xy-map of an inhomogeneous sample

The Multiskop comes with powerful software. It has been written by scientists who are using these techniques in their daily research. This avoids gimmicks and guarantees an ergonomic layout of all programs. The user has an online control on all decisive functions.

Imaging ellipsometry A monolayer of a silan on a silicon wafer has been patterned with UV light. The difference in height between dark and bright regions is about 0.8 nm.



Waveguide modes performed on a polyelectrolyte multilayer



Please check out our homepage WWW.OPTREL.DE or contact us for further information.

