

# SARFUS Mapping AIR

**A complete system for measuring the optical thickness of nano-films**

## What is SARFUS Mapping AIR?

SARFUS Mapping AIR is a complete system dedicated to the observation of nano-objects in real-time and the measurement of ultra-thin film optical thickness.

Each component of this product has been carefully chosen to ensure the image quality of your samples as well as the accuracy of the nanometric measurement.

Like all of the other SARFUS products, SARFUS Mapping AIR is based on the patented SEEC<sup>[1]</sup> microscopy (Surface Enhanced Ellipsometric Contrast).

It uses novel non-reflecting substrates optimized for cross-polarized reflected light microscopy. Note that they function well in bright field too, in particular for thin film characterization. These – commonly referred to as Surfs in Nanolane jargon – bring about a contrast enhancement of about 2 orders of magnitude. Any sample present at their surface is thus rendered visible, even the tiniest!

Thickness measurements are made possible thanks to Sarfusoft<sup>TM</sup>, our proprietary software that correlates the interference colors of a sample with a set of traceable step height standards.

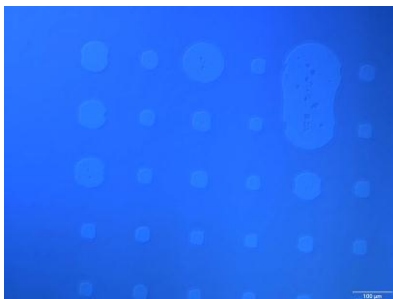
[1]: *Optics Express*, Vol. 15, Issue 13, pp. 8329-8339 (2007)

## SARFUS Mapping AIR Applications

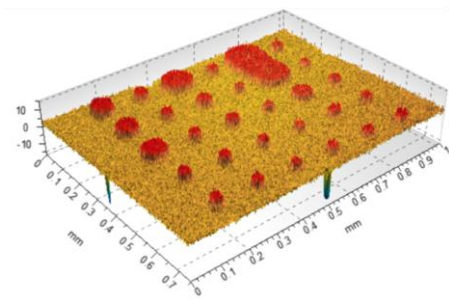
- ❑ **Thin films & Surface treatment**
  - Langmuir-Blodgett films
  - Self-Assembled Monolayers (SAMs)
  - Polymer
  - Liquid Crystal
  - ...
  
- ❑ **Life Science**
  - Biochips
  - Soft-lithography / Patterns
  - Biological layers
  - ...



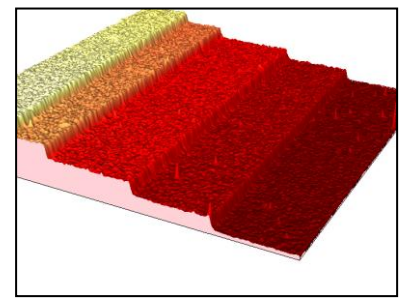
## Examples



DOPC patterns by Dip Pen Nanolithography  
2D image / Scale Bar: 100 μm

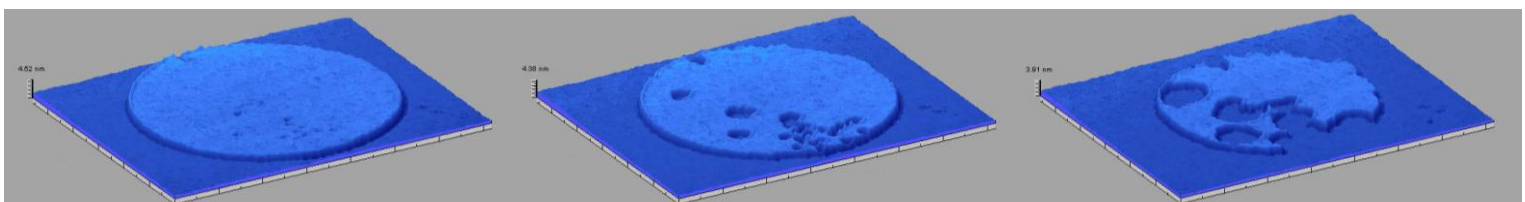


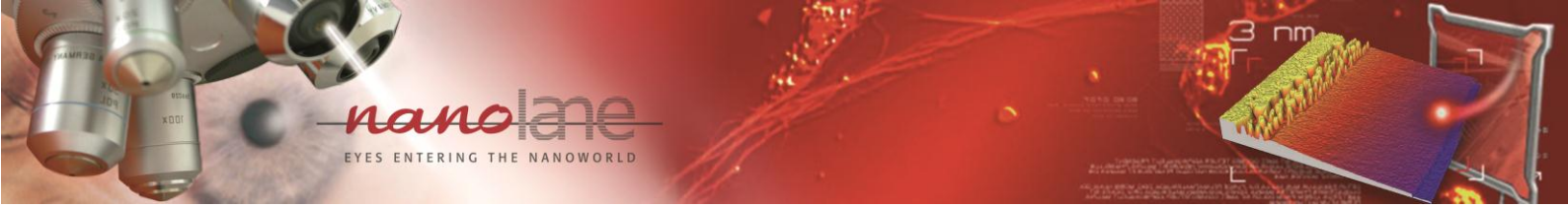
DOPC patterns by Dip Pen Nanolithography  
3D image / z-scale in nanometers



Organic steps with Langmuir-Blodgett films  
Step height: 6 nm

Dynamic evaporation of an 8CB precursor film at room temperature



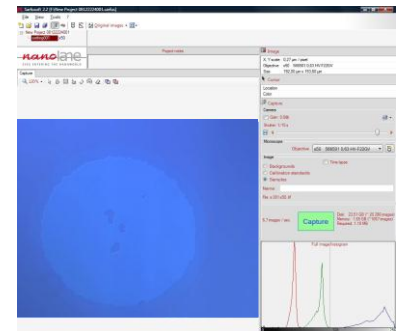


## SARFUS Mapping AIR Features

- ❑ **High sensitivity (z-axis)**
  - 1-D nano-object (film): down to 0.1nm
  - 2-D nano-object (tube/wire): down to 2nm across
  - 3-D nano-object (particle): down to 10nm across
- ❑ **Large field of view**
  - 1150µm x 870µm [10x]
  - 230µm x 170µm [50x]
  - Other magnifications available
- ❑ **Direct Acquisition & Real Time**
  - HD images [1360 x 1024] pixels
  - Time-lapse (up to 15 images per second)
  - Live video acquisition
- ❑ **Non destructive and non-invasive**
- ❑ **User friendly & Fast processing**
  - Familiar technology (optical microscope)
  - No need for specific training
- ❑ **Fluorescence compatible**
- ❑ **Lateral resolution** - down to 350nm
- ❑ **Measurement range: 1nm to 60nm**
- ❑ **Repeatability: 0.2 nm** (according to ISO 17025)

## How to use it?

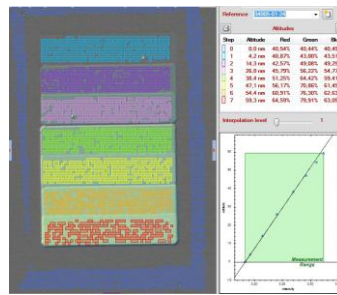
- 1 Deposit your sample be it a solid or a liquid onto a SiO<sub>2</sub> Surf by spin-coating, dip-coating, evaporation, imprinting, lithography, etc...
- 2 Place the Surf under the microscope objective
- 3 Focus on your sample, and take images with 'Sarfusoft'
- 4 Take an image of a set of step height standards
- 5 Determine the calibration curve
- 6 Build-up your 3-dimensional image and process topographic data (step-height measurements, cross-sections, roughness ...)



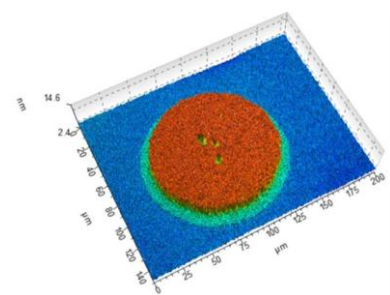
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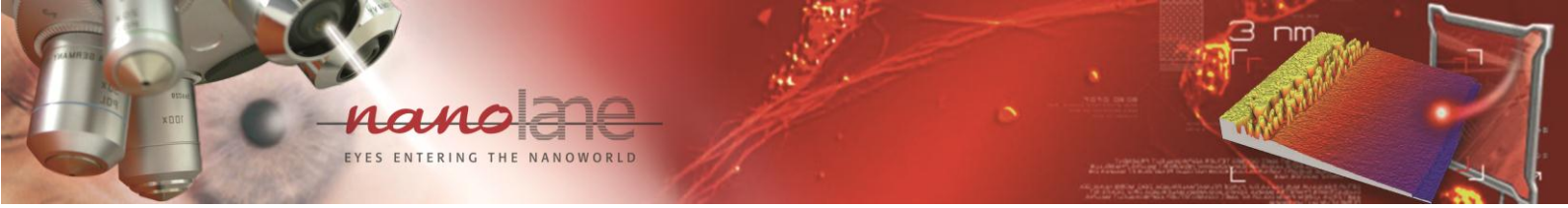
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# SARFUS Mapping IMM

## Thickness measurement of nano-films in WATER

### What is SARFUS Mapping IMM?

SARFUS Mapping IMM is a complete system dedicated to the observation of nano-objects in real-time and the measurement of the ultra-thin film optical thickness in aqueous solution.

Each component of this product has been carefully chosen to ensure the image quality of your samples as well as the accuracy of the nanometric measurement.

Like all of the other SARFUS products, SARFUS Mapping IMM is based on the patented SEEC<sup>[1]</sup> microscopy (Surface Enhanced Ellipsometric Contrast).

[1]: Optics Express, Vol. 15, Issue 13, pp. 8329-8339 (2007)

It uses novel non-reflecting substrates optimized for cross-polarized reflected light microscopy. These – commonly referred to as Surfs in Nanolane jargon – bring about a contrast enhancement of about 2 orders of magnitude. Any sample present at their surface is thus rendered visible, even the tiniest!

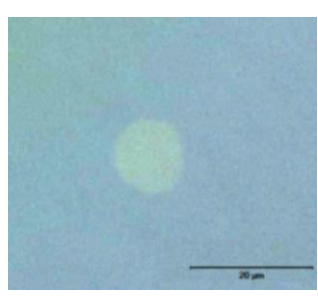
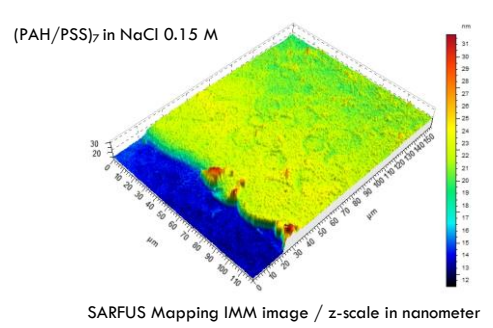
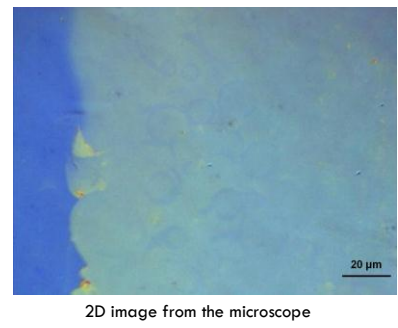
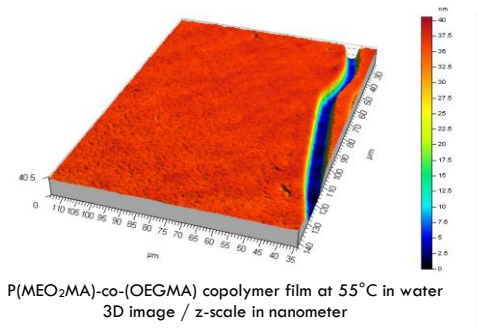
Thickness measurements are made possible thanks to Sarfusoftware™, our proprietary software that correlates the interference colors of a sample with a set of traceable step height standards.

### SARFUS Mapping IMM Applications

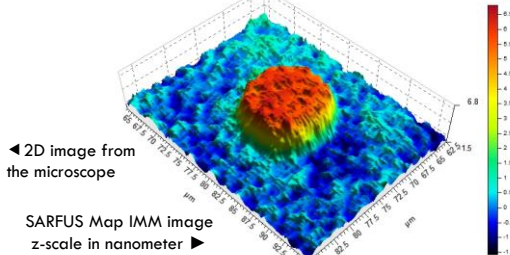
- Polyelectrolytes
- Sensitive layers (thermo, iono, pH, ...)
- Polymer Patterns
- Biochips
- Lipid Bilayers
- Nano-objects
- Biological objects



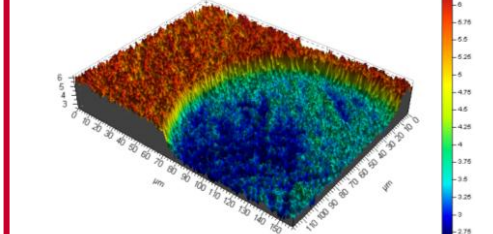
### Examples

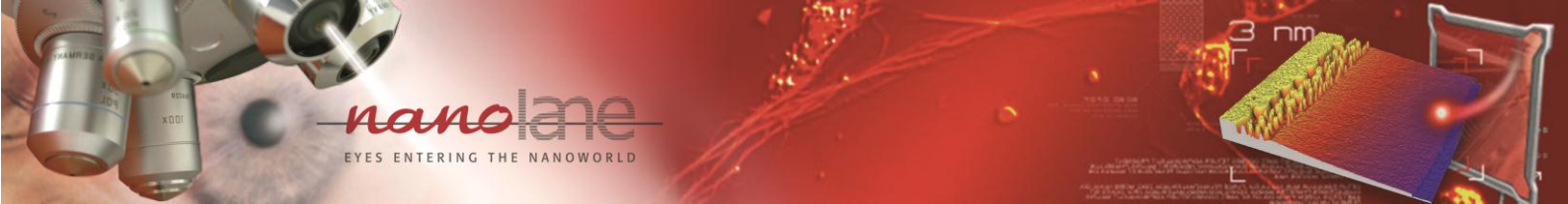


Lipid bilayer (5nm) obtained from a vesicle blown up on a Surf by addition of salt in a glucose solution



Pattern of octyl-trisiloxane (OTS) monolayer deposited on a Surf by soft-lithography and measured by SARFUS Mapping IMM at 2nm



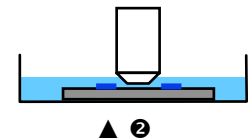


## SARFUS Mapping IMM Features

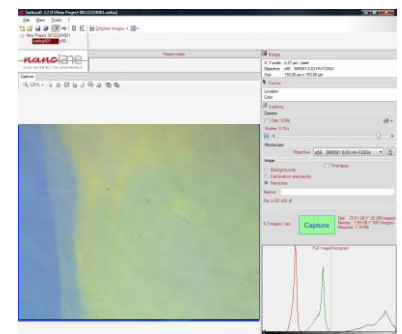
- ❑ **High sensitivity (z-axis) in water**
  - 1-D nano-object (film): down to 0.2nm
  - 2-D nano-object (tube/wire): down to 2nm across
  - 3-D nano-object (particle): down to 20nm across
- ❑ **Large field of view**
  - 251µm x 189µm [40x]
  - 159µm x 120µm [63x]
- ❑ **Direct Acquisition & Real Time**
  - HD images [1360 x 1024] pixels
  - Time-lapse (up to 15 images per second)
  - Live video acquisition
- ❑ **Non destructive and non-invasive**
- ❑ **User friendly & Fast processing**
  - Familiar technology (optical microscope)
  - No need for specific training
- ❑ **Fluorescence compatible**
- ❑ **Lateral resolution** - down to 350nm
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## How to use it?

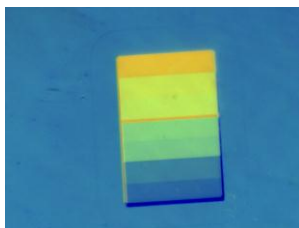
- 1 Deposit your sample, be it a solid or liquid, on an Immersion Surf
- 2 Place the Surf inside a Petri dish
- 3 Focus on your sample, and take images with 'Sarfusoft'
- 4 Take an image of a set of step height standards
- 5 Determine the calibration curve
- 6 Build-up your 3-dimensional image and process topographic data (step-height measurements, cross-sections, roughness ...)



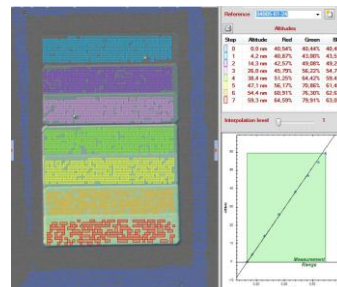
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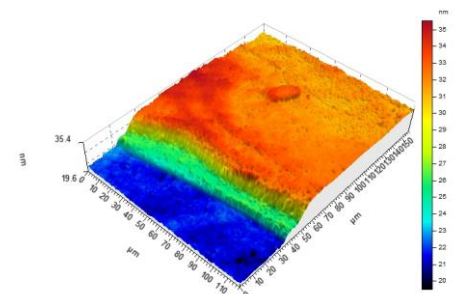
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