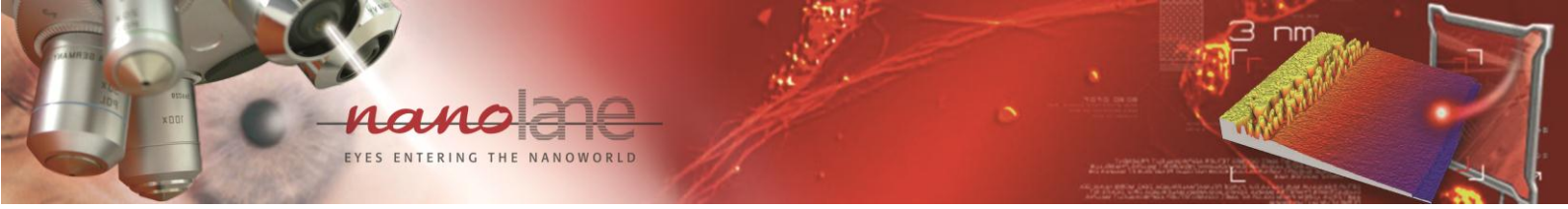


SEEC Microscopy

BOOST your optical microscope for the NANOWORLD

What is SEEC Microscopy?

SEEC – Surface Enhanced Ellipsometric Contrast – Microscopy is dedicated to the observation of nano-objects in real-time. It allows direct visualization or localization of nanometric films (down to 0.1 nanometer) and/or isolated nano-objects **with your own optical microscope**!!

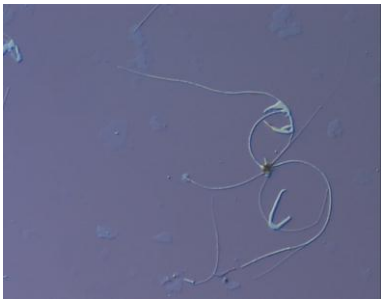
SEEC microscopy [1] uses novel non-reflecting surfaces for cross-polarized reflected light microscopy. These – commonly referred to as *Surfs* in Nanolane jargon – bring about a contrast enhancement of about 2 orders of magnitude, extending the fields of application of optical microscopy to the nanoworld.

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

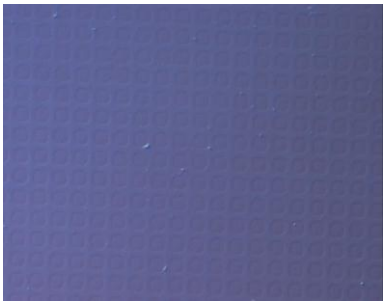
SEEC Microscopy Features

- **High sensitivity (z-axis)**
  - 1-D nano-object (film): down to 0.1nm
  - 2-D nano-object (tube): down to 2nm across
  - 3-D nano-object (particle): down to 10nm across
- **Large field of view**
  - From (70x70)µm^2 to several mm^2
  - Easily change scale by switching objectives without trading off sensitivity
- **Direct Acquisition & Real Time**
  - No scanning
  - Dynamic study
- **Lateral resolution** (down to 350nm)
- **User friendly & Fast processing**
  - Familiar technology (optical microscope)
  - No need for specific training
- **Compatibility**
  - Combine your AFM or RAMAN studies with Surfs for easily locating targets
  - Combine Fluorescence and SEEC images to explore your labelled objects' environment
- **Non-destructive and non-invasive**

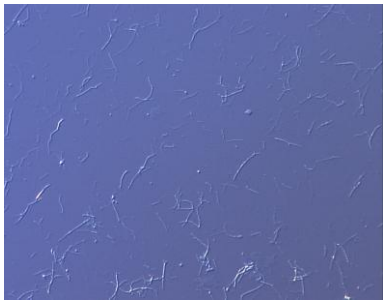
Examples



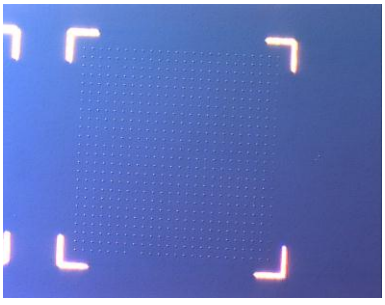
Double Wall Nanotube Bundles
Diameter less than 10nm – Image size: 160 µm



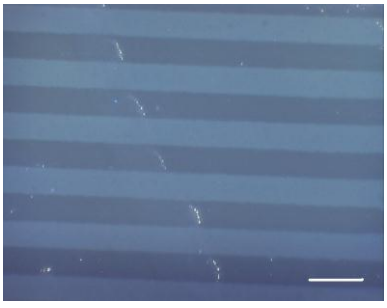
Pattern of streptavidin by Soft lithography
(grid of 4 µm x 4 µm / 4 nm-thick)



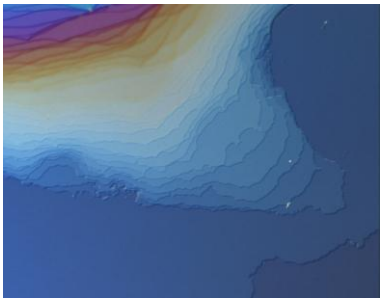
Suspension of ß-chitin deposited on a Surf
Diameter: from 10 to 80 nm – Image size: 80 µm



Gold dots by nanolithography
Dot size: (50 nm)^3 – Image size: 160 µm



Polymer brushes by Soft lithography in Water
(70 nm-thick)



Liquid Crystal (8CB) bilayers spreading on a Surf
Step height: 3.3 nm

How to get SEEC Image?

❶ Check out your Optical Microscope

You can use an upright or an inverted microscope but always with reflected light, ideally in D.I.C mode (Differential Interference Contrast), or failing that between crossed polarizers.
If you do not trust your configuration, we can assist you with in examining your microscope.

Diagram for upright microscope

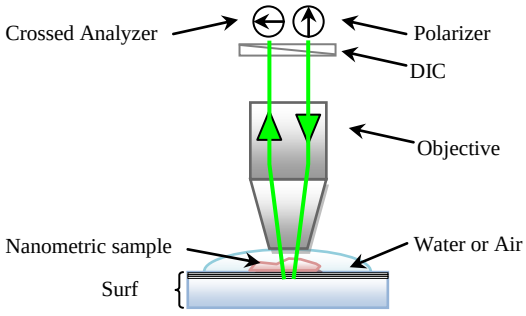
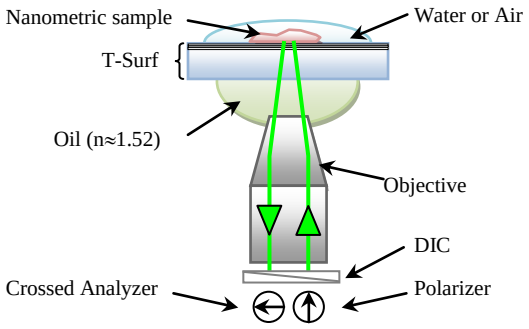
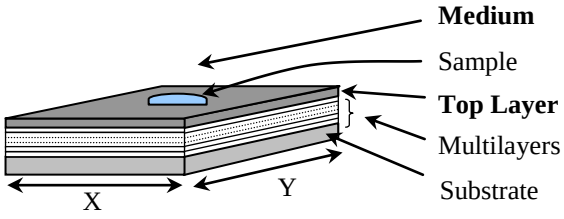


Diagram for inverted microscope



❷ Choose the correct Surf for your application



A Surf is a substrate with specific optical properties. It is a multilayered structure on which you need to deposit your sample (the sample deposition process is the same as on any substrate, i.e. spin-coating, dip-coating, imprinting …).

The stack being used depends: on the medium surrounding the sample (air, water, or aqueous solutions), on the nature of the top layer that directly supports the sample, and on the microscope configuration (*Surf* for an upright microscope; *T-Surf* for an inverted microscope). A variety of Surfs are being manufactured at our facility for our customers to use. Pick the one that meets your needs for a particular application! Please note that we can routinely provide Surfs with a surface treatment (additional coatings such as SAMs or polymer). Feel free to ask us for further information.

Model	Sample medium	Top layer	Name	Reference
Surf	AIR	SiO_2 [(a)]	Standard Surf	SAUS
	AIR	SiO_2 [(a)]	Marked Surf [(b)]	PAUS
	AIR / WATER	TiO_2	TiO_2 Surf	SWUT
T-Surf	AIR / WATER	SiO_2 [(a)]	Standard T-Surf	GWIS

[(a)]: SiO_2 surface can be activated by O_3 treatment, O_2 plasma or Piranha treatment
[(b)]: Surf with addressable location labels

All Surfs are available in Boxes of 49 (10mm x 10mm each) or in pre-cut, 150mm across, wafers (surf size of our customers' choosing), except for the T-Surfs only available in pre-cut 140mm x 140mm sheet (surf size of our customers' choosing).

❸ Contact us

Go to www.nano-microscopy.com, choose your Surf model and the packaging, and purchase them directly (through PayPal system) or print a Pro Forma Invoice.

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