

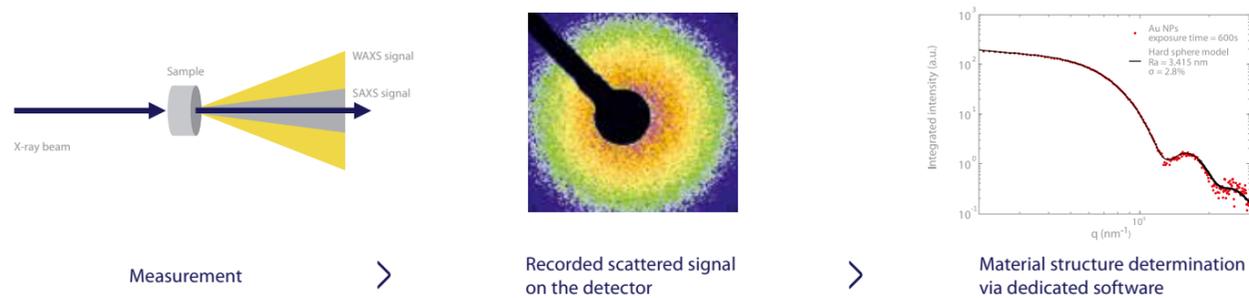


# Nano-inXider<sup>x</sup>

SAXS made easy

# Nano-inXider<sup>®</sup>

Your gateway to the SAXS/WAXS technique



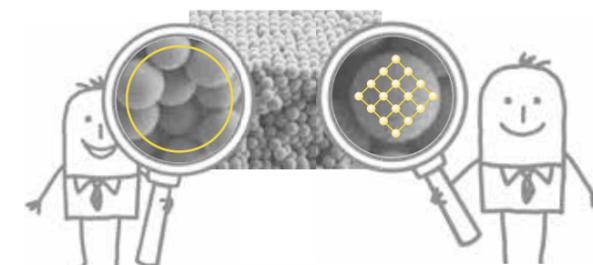
## 1. Principles

SAXS/WAXS, or Small and Wide Angle X-ray Scattering is a non-destructive technique that provides structural information on materials from few hundred nanometers down to the sub nanometer scale.

This technique uses the scattered X-rays from a sample at different angles to provide information about its structure at the nanoscale.

The collected scattered signal at very low angles (typically between 0.05 to 10°) will give information on the structure of the material at a scale between 1 to few hundred nanometers, whereas the signal collected at wider angles (>10°) will provide information about the crystalline phase of the material.

With SAXS you can determine the size, size distribution, shape & surface-to-volume ratio of nanostructures up to few hundred nanometers



With WAXS you can get information on the crystalline phase of materials.

## 2. Advantages

Running a SAXS/WAXS experiment requires minimal sample preparation.

Measurements are easily performed on solids, liquids (even real processed objects or systems in native conditions such as proteins in solutions). In situ measurements of samples under variable conditions such as temperature,

tensile stress, humidity are no problem for the Nano-inXider.

The SAXS/WAXS technique will provide you with statistically relevant information about the probed volume of sample, making it an ideal complement to other techniques which provide only localized information (such as electron microscopy).

With the Nano-inXider you take full benefit from the SAXS/WAXS technique.

# Nano-inXider<sup>×</sup>

## Your window to the most hidden face of materials

The Nano-inXider is a comprehensive solution for the characterization of nanomaterials. Benefiting from the unique technology developed for the Xeuss 2.0, the Nano-inXider features unparalleled performance and ease of use in a compact package for simple integration into any lab environment.



### 1. Easy to use

Large sample environment for easy access and sample manipulation. Automatic alignment and change of settings.

### 2. High performance

Unique proprietary clean-beam-technology from Xenocs. Advanced in-vacuum hybrid pixel detection from Dectris.

### 3. Compact design

All-in-vacuum vertical-beamline architecture. Smallest footprint on the market.

### 4. Adapted to your application

A wide range of sample environments available.

SAXS/WAXS measurements have never been as easy as with the Nano-inXider.

*“The Nano-inXider finds its roots in the unique clean beam technology developed by Xenocs over the years. Making this technology available in such a compact system represented a major challenge to our team.*

*But at the end of the day, the technology is not what matters, but what the system can offer to the user and how easy it is to operate.*

*We can proudly say that with the Nano-inXider we have been able to achieve a unique combination of performance, ergonomics, compactness and ease of use.*”

**Blandine Lantz**  
Product Manager





# Nano-inXider<sup>x</sup>

## Comprehensive and easy to use software

The unique performance of the Nano-inXider is enhanced by a comprehensive and easy to use software suite for data acquisition, processing and analysis.



*The quality of data processing is a key step in the performance of a SAXS/WAXS measurement. Nano-inXider relies on advanced data processing algorithms that were developed in the synchrotron environment. Thanks to the beam architecture of the Nano-inXider, no desmearing post treatment is necessary, avoiding any loss of information and thereby providing more accurate data.*

*Predefined acquisition and data processing routines, easily controlled through the intuitive graphical user interface, help the user to easily access key information about their samples.*

**Dr. Manuel Fernández**

Application Scientist and former Post-doctoral researcher at ID02 SAXS beamline at the European Synchrotron Radiation Facility (ESRF)

### System control and data acquisition software

The Nano-inXider control and data acquisition software features an intuitive graphical user interface for ease of system operation.

The software enables the complete monitoring of data acquisition parameters. Acquisition in single or batch mode can be controlled in just a few clicks.

Auto alignment of the complete system, automatic change of measurement settings and control of various sample environments are all available.

With comprehensive features and advanced ergonomics, the Nano-inXider control and data acquisition software ensures maximum measurement throughput.

### Data processing and analysis software

The data processing and analysis software of the Nano-inXider enables easy treatment of 2D and 1D data for both SAXS, WAXS and SWAXS, through its intuitive graphical user interface.

Through predefined treatment routines, this software allows easy processing of single or large sets of 2D images, masking, subtracting and 1D integration in azimuthal or polar coordinates over the complete pattern or on a predefined region of interest.

Preliminary structure parameters such as the radius of gyration can be determined.

The Nano-inXider software suit is designed for smart interfacing with the most advanced data analysis software packages such as SASfit and ATSAS through generation of fully compatible output data files. Preliminary training on such advanced software is provided at installation.

# Nano-inXider<sup>✕</sup>

## The right solution for your application

The Nano-inXider brings new characterization capabilities in the lab, opening new perspectives in many research fields.



With the Nano-inXider you can look at:



Consumer care & Food science

surfactants, colloidal dispersions, emulsions, nanoparticles shape, size and distribution



Drug discovery

Protein shape determination, biological membranes, drug delivery systems



Petrochemicals

Specific surface area of catalysts, polymerization, polymer structure and crystalline phase, colloidal dispersions in paint



Renewable energy

Catalysts for fuel cell, membranes, PV cell heterojunctions



Electronics

Liquid crystal display, nano devices characterization, thin film block copolymer



Composite materials

Carbon nanotubes, synthetic fibers, ceramics, metal alloys



Low noise flow cell for diluted systems



Capillaries



Temperature stage



Multiple sample holder for solid samples

# Nano-inXider<sup>®</sup>

## Comprehensive service for quick access to the SAXS/WAXS technique

New to the SAXS/WAXS technique? We are here to help. The Nano-inXider is supported by a comprehensive training and application consultancy team, that will work with you to ensure that you are able to realize the full potential of the system.

### Onsite installation and commissioning

Our team of engineers works in close collaboration with each customer together with our local agents to ensure smooth installation and quick start of the system.

### Operational training & scientific support

Comprehensive operational and scientific training programs both on-site and online are available to get you up and running quickly, provide continuous support and guidance with data analysis.

### Customer support

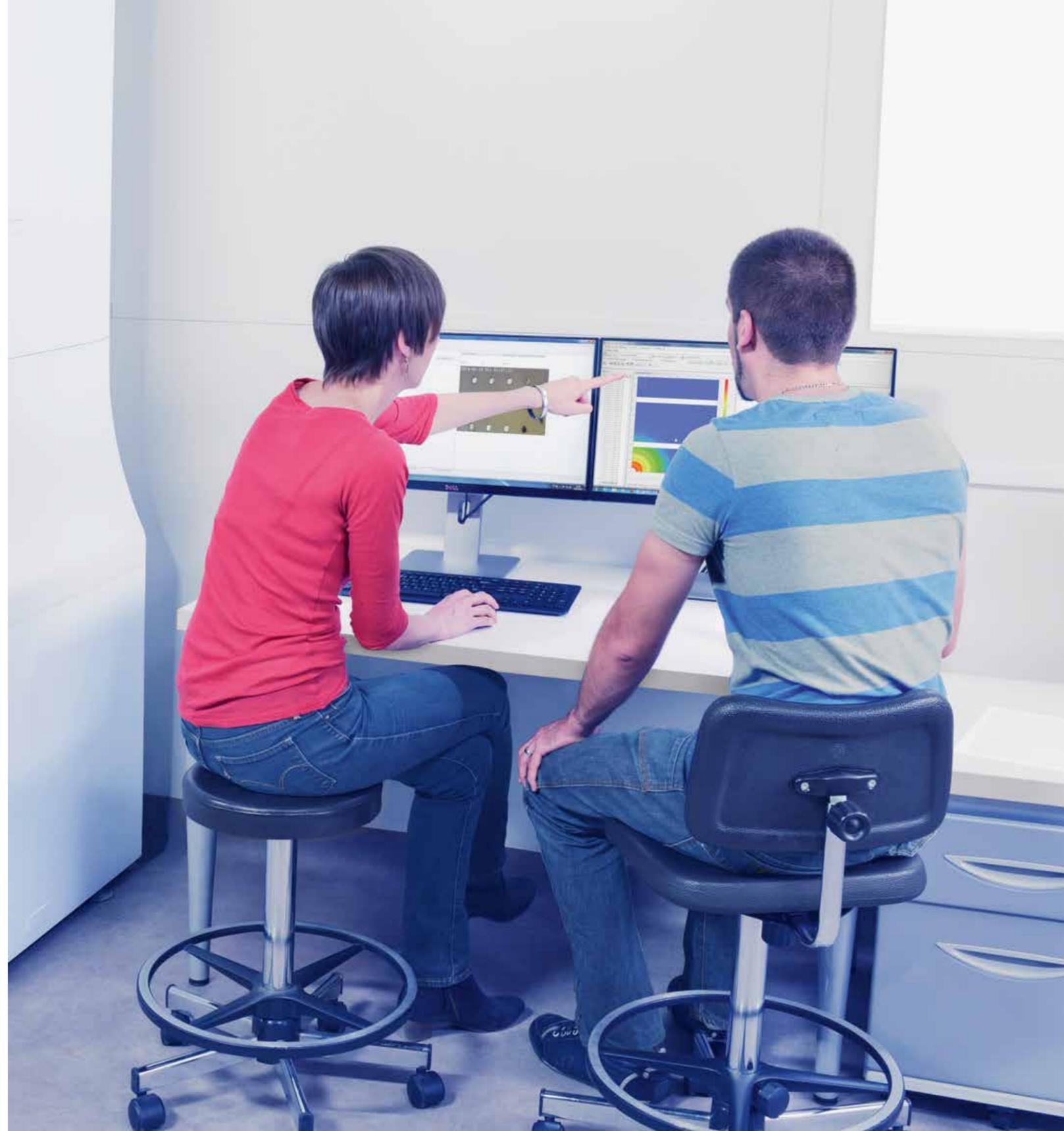
A large choice of customer support programs are available to ensure that each customer is able to take full benefit of the system. Direct support from Xenocs engineers through our hotline for both software and hardware issues coupled together with regional support by our local agents enables us to provide a 24 hour response time.

*Our mission is to ensure our customers full satisfaction for the complete lifetime of the system.*

*The Nano-inXider was designed as a low maintenance, and highly reliable instrument simplifying SAXS/WAXS experiments with maximized uptime.*

*As an ISO9001 certified company, we have implemented a customer support policy based on reactivity, comprehensive explanation, and regular follow-up.*

**Éric Danger**  
Customer Support Engineer



## Specifications

### X-ray beam delivery system

Source	Microfocus sealed tube - Cu 30 W/30 μm, or Mo 50W/50μm
Optic	Single Reflection multilayer optic with 2D collimation
Collimation	Scatterless collimation with automatic change of settings

### Sample stage

X-Z stage	Motorized X-Z stage for remote multiple sample analysis and sample mapping
Phi stage	In plane sample rotation for azimuthal averaging of scattered signal
GISAXS stage	Module to be mounted on X-Z stage with Omega (incidence angle tilting)

### Sample holder

Sample holder base	Pre-aligned sample base plug-in for fast change of sample holder.
Liquid sample	Multicapillary holder (6 slots) Capillary flow cell Low noise flow cell
Solid sample	Multiple sample holder (16 slots) for powder, paste and solid samples Sample holder for large objects
Thin film	Thin film transmission sample holder GISAXS sample holder for large samples
Temperature units	Linkam HFSX350 temperature stage for transmission and GISAXS Temperature range: -196 to +350°C
Tensile units	Linkam TST350 tensile stage with temperature control Tensile force range 0.01N to 20N or 0.1 to 200N
Robot sampler for liquid loading	Unit for automatic injection of multiple samples for remote solution scattering measurements

### Detectors

SAXS	Dectris Pilatus3 hybrid pixel detectors
WAXS	Dectris Pilatus3 hybrid pixel detectors allowing simultaneous and continuous SAXS and WAXS measurement up to 2θ 60°

### Resolution and Q range

	Minimum q value (nm <sup>-1</sup> )	Maximum q value (nm <sup>-1</sup> )	Minimum d value (nm)	Maximum d value (nm)
With Cu K-α	0.029	41.30	0.15	216.66
With Mo K-α	0.063	89.58	0.07	99.88

### Software

System control and data acquisition with graphical user interface
Data processing and analysis software

### Facilities

Power consumption	< 3000 W
Total footprint	87 cm x 93 cm (Width x Length) and 240cm height All facilities are housed inside the enclosure
Weight	520 kg



People  
behind the  
Nano-inXider

Xenocs provides solutions for nanomaterial characterization using Small and Wide Angle X-ray Scattering technique.

Since its creation in 2000, Xenocs has built a strong reputation for its expertise in X-ray technology, the performance of its products and the quality of its customer support.

Today's solutions are based on key components and technologies which are the fruit of more than 14 years of research and development in the company.

Thanks to unique product concepts and proprietary technologies, Xenocs brings an unparalleled level of performance, opening new perspectives for advanced SAXS/WAXS measurements in the lab.

Our enthusiastic team of scientists and engineers with strong backgrounds in X-ray technology and specifically in the SAXS/WAXS technique is dedicated to offer, leading edge solutions for nanomaterial studies with top quality service.

Do not hesitate to contact our sales team to learn more how our solutions can help you.

2000

Launch of Xenocs as a spin off company from the Laue Langevin Institut

2007

Introduction of unique scatterless slits technology and highly collimated beam delivery system

2010

Introduction of first generation Xeuss SAXS/WAXS system based on unique proprietary clean beam technology

2014

Introduction of Xeuss 2.0 and Nano-inXider embedding 14 years of experience and key technologies developed by Xenocs

Next?

Watch this space – we have only just begun...



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