

TriLambda40-XRM

Highest performance 3D x-ray microscope/Nano-CT

Highest resolution 3D x-ray microscope
Multi-energy flexibility for accelerating
research in advanced laboratories



TriLambda40-XRM

Highest performance 3D x-ray microscope/Nano-CT

TriLambda is zoneplate-based to achieve unprecedented resolutions
High resolution mode: 40 nm spatial resolution | 10 nm voxel
Large field of view mode: 120 nm spatial | 40 nm voxel

What can the TriLambda™ offer your lab?
The TriLambda provides essential correlative capabilities by fulfilling the critical gap between light microscopy and electron microscopy analysis.

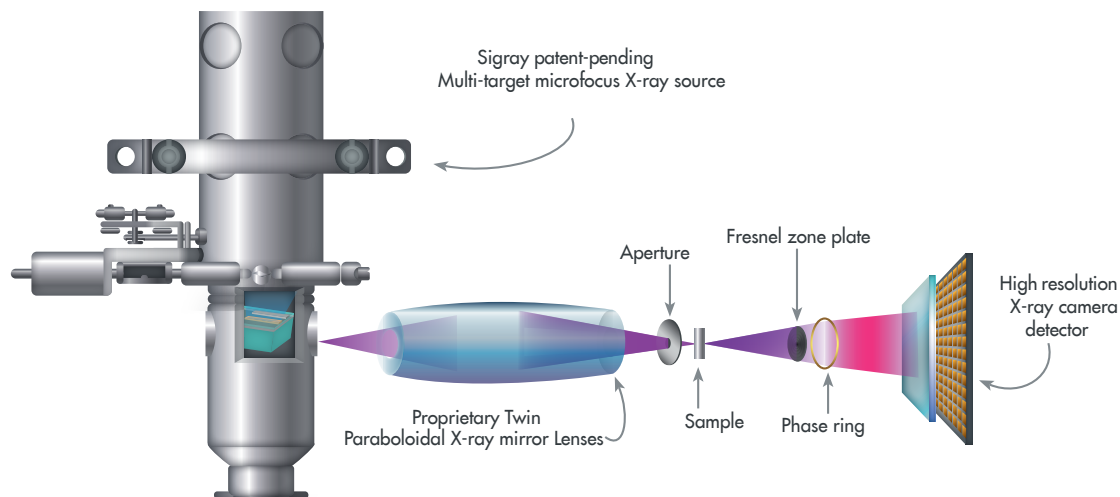
The range of applications enabled by the TriLambda include:

Application	
Biology	Correlative cellular mapping and nano particle distribution
Materials science	Structural characterization of battery electrode analysis In situ and time-based understanding of microstructural evolution
Geology	Nanoporosity in shales and carbontes Dual energy analysis for mineralogy
Semiconductor	Metrology and failure analysis of advanced packaging (e.g. TSVs, etc)

TriLambda40-XRM

Highest performance 3D x-ray microscope/Nano-CT

TriLambda relies on innovative, patent-pending technology to surpass other x-ray microscopes



Bring synchrotron XRM capabilities to your lab

Highest resolution x-ray microscope with multi-energy capabilities

Tri Lambda™-40 3D nano x-ray microscope is the highest resolution (40 nm) laboratory x-ray microscope in the world, with the power to image internal nano-structure and optimized performance in a wide range of samples, spanning everything from cells and polymers to geological samples and metals.

What sets the Tri Lambda apart?

The Trilambda is a tri-energy system that provides the highest resolution on the market. It is one of two zone-plate-based nanoCTs on the market, both developed by Dr. Wenbing Yun, who is well-recognized as a pioneer in x-ray microscopy and was the founder of Xradia (now the x-ray microscope division of Carl Zeiss). The system features significant improvements over previous technology, including better resolution, increased field of view (FOV), and multi-energy capabilities for faster data acquisition and increased contrast.

Patent-pending X-ray technology: source & optics

Achieving the unparalleled performance of the Tri-Lambda requires major innovations in key component technology.

Sigray has developed an ultrahigh brightness x-ray source featuring an x-ray target comprised of multiple materials in close thermal contact with a diamond substrate. Software selection of the target material enables rapid switching between different characteristic x-ray energies of each material, for example: 5.4 keV (Cr), 6.4 keV (Fe), 8 keV (Cu), and more. The flexibility in energy choice overcomes the trade-off of other systems in which only a single operational x-ray energy must be selected upfront.

Coupled to the source are twin paraboloidal microfocusing x-ray optics, a type of optic exclusively fabricated by Sigray. Compared to ellipsoidal capillaries, these optics provide uniform illumination of the zone plate and increased imaging performance.

TriLambda40-XRM

Highest performance 3D x-ray microscope/Nano-CT

Highest resolution, rapid throughput 3D x-ray microscope for accelerating research in advanced laboratories



Tri-

Lambda is zoneplate-based to achieve unprecedented resolutions
 High resolution mode: 40 nm spatial resolution | 10 nm voxel
 Large field of view mode: 120 nm spatial | 40 nm voxel

TriLambda advantages at a glance

- Highest resolution 3D XRM, with **40 nanometer spatial resolution**
- **Patent-pending x-ray source** with multiple x-ray source target materials for unique advantages including dual energy imaging and optimization of acquisition speed
- Optimized throughput for time-based (4D) & in-situ studies
- Designed by the world's **foremost** experts on x-ray microscopes

Parameter	Specification
High resolution mode	
Resolution	40 nm
Voxel	13 nm
Field of view	18 µm
Sample size	15 - 25 µm preferred
Large field of view mode	
Resolution	120 nm
Voxel	40 nm
Field of view	60 µm
Sample size	60 - 100 µm preferred
Contrast mode	Absorption and phase contrast
Source	Sigray high brightness microfocus source
Target material	Dual energy (standard): Cr (5.4 keV) and Cu (8.0 keV) Additional targets include: Fe (6.4 keV), Au (9.7 keV), others available on request
Power	100 W
X-ray optics	
Condenser	2 sets of Sigray twin paraboloidal x-ray optics matched to zone plates
Focusing objective	Fresnel diffraction zone plate lens system
Phase ring	Zernike phase shift ring
X-ray detectors	High efficiency x-ray detector system, CCD 2048 x 2048 pixel
Footprint [L x W x H]	2.3 x 1.3 x 1.5 m, 2000 kg
Maximum load	1 kg
Stage	High precision tomography stage with 12 x 10 x 12 mm travel XYZ