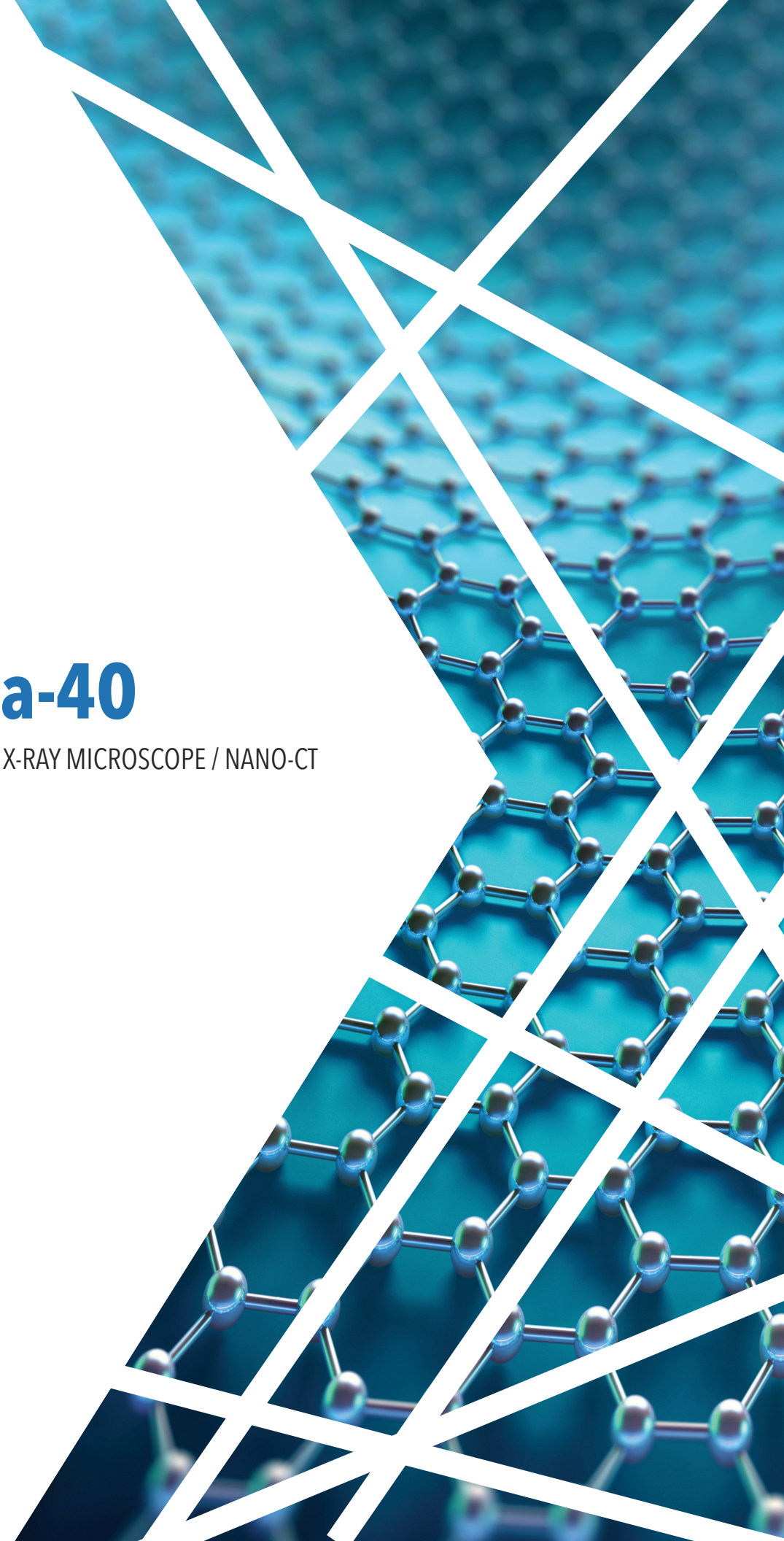
SIGRAY

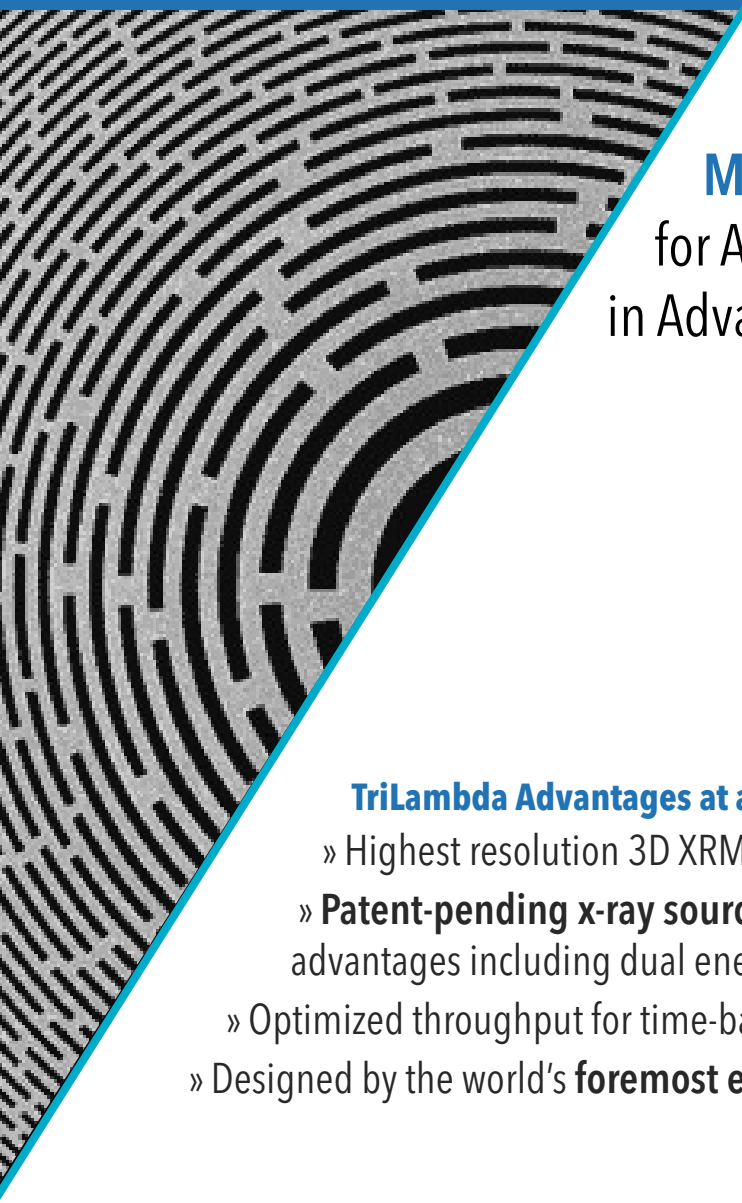
TriLambda-40

HIGHEST PERFORMANCE 3D X-RAY MICROSCOPE / NANO-CT



Sigray, Inc.
5750 Imhoff Drive, Suite I
Concord, CA 94520 USA
P: +1-925-446-4183
www.sigray.com
info@sigray.com

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



Highest Resolution 3D X-ray Microscope, with Multi-Energy Flexibility for Accelerating Research in Advanced Laboratories

TriLambda Advantages at a Glance

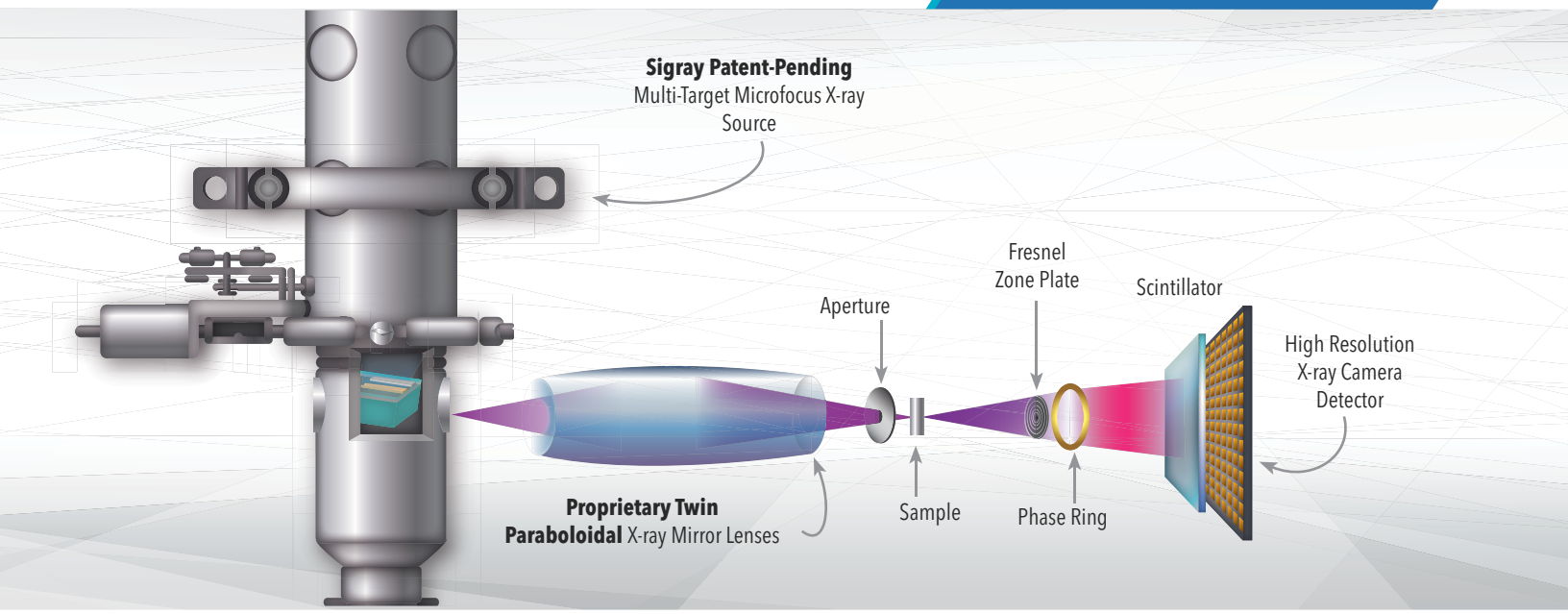
» Highest resolution 3D XRM, with **40 nanometer spatial resolution**

» **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

Sigray's 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

Sigray's TriLambda™-40 3D nano x-ray microscope is the highest resolution (reaching 30nm for 2.7 keV) laboratory x-ray microscope in the world, with the power to image internal nanostructure and optimized performance in a wide range of samples, spanning everything from cells and polymers to geological samples and metals.

What sets the TriLambda apart?

The TriLambda is a tri-energy system that provides the highest resolution on the market. It is one of two zoneplate-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 TriLambda 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: 2.7 keV (Rh), 5.4 keV (Cr), 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.

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, 3D organelle imaging, and polymer blends
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)

TriLambda™-40: Specifications

Parameter	Specification
High Resolution Mode	
Resolution | Voxel	40 nm resolution @ most energies, 30nm resolution for 2.7 keV | 16 nm voxel
Field of View | Sample Size	32 µm FOV @most energies | 15-25 µm sample size preferred
Large Field of View Mode	
Resolution | Voxel	140 nm resolution | 65 nm voxel
Field of View | Sample Size	130 µm FOV | 60-100 µm sample size preferred
Contrast Modes	Absorption and Phase Contrast
Source	Sigray High Brightness Microfocus Source
Target Material	Tri Energy (standard): Rh (2.7 keV), 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	3 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	2.3 x 1.3 x 1.5 meters (L x W x H) | 2000 kg
Maximum Load	1 kg
Stage	High precision tomography stage with 12 x 10 x 12 mm travel XYZ

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