

# Nanoscale X-ray Imaging: Explore at the Speed of Science.



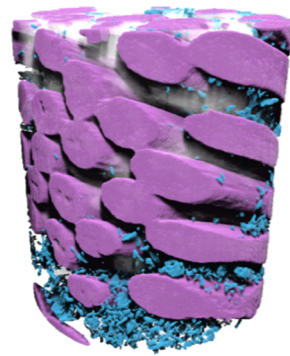
**ZEISS Xradia Ultra Family**



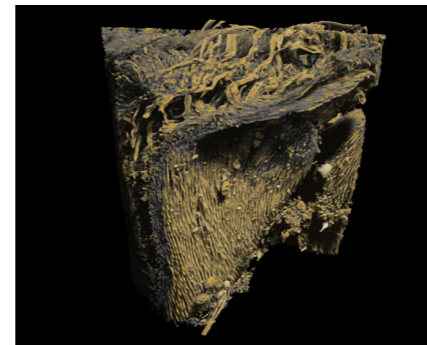
# ZEISS Xradia Ultra Family

## Your Synchrotron-quality Nanoscale 3D X-ray Microscope

With ZEISS Xradia Ultra you benefit from nanoscale imaging, superior contrast and lab accessibility.



Carbon gas diffusion layer fibers and microporous layer material from polymer electrolyte fuel cell, sample width 65  $\mu\text{m}$ . Imaged with ZEISS Xradia 810 Ultra.



Suction cup musculature and pillae from dipteran fly *Hapalothrix lugubris*, sample width 65  $\mu\text{m}$ . Imaged with ZEISS Xradia 810 Ultra.

Experience unparalleled performance and flexibility with the non-destructive 3D imaging that plays a vital role in today's research. Employ unique non-destructive *in situ* and 4D capabilities for studying material evolution over time. Extend the limits of X-ray imaging in materials science, life sciences, natural resources, and industrial applications. The innovative Xradia Ultra architecture, with ZEISS X-ray optics adapted from synchrotron technology, features absorption and Zernike phase contrast imaging modes to an unparalleled 50 nm resolution.

### ZEISS Xradia 810 Ultra

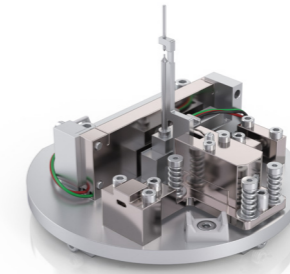
Xradia 810 Ultra increases the throughput of nanoscale, three-dimensional X-ray imaging by up to a factor of 10. This innovative X-ray microscope (XRM) operates at 5.4 keV, delivering optimized contrast and image quality for medium to low Z samples and other materials used throughout science and industry.

### ZEISS Xradia 800 Ultra

Xradia 800 Ultra combines a high-flux 8 keV laboratory X-ray source with highly specialized and proprietary ZEISS X-ray optics to create a standalone ultra-high resolution X-ray microscope that is optimized for high Z samples.

### In Situ Experiments at the Nanoscale

Bridge the *in situ* testing gap with Xradia Ultra that is uniquely suited to *in situ* experiments and imaging at the nanoscale. It lets you image 3D structures non-destructively in your lab with dedicated solutions for nanomechanical testing and sample heating. Study the evolution of interior structures in 3D, either under mechanical load, or at elevated temperatures while imaging down to 50 nm resolution.



Ultra Load Stage for *in situ* nanomechanical testing in compression, tension and indentation mode (optional).



Norcada Heating Stage for ZEISS Xradia Ultra (optional).

### Features:

- Integrated visible light microscope for sample inspection and alignment
- Comprehensive software suite for data acquisition, reconstruction and visualization including a Python API for highly-customizable control and acquisition
- Best in class GPU-accelerated tomographic reconstruction
- ORS Dragonfly Pro: advanced 3D data visualization and analysis software package (optional)

### Benefits:

- Lab-based XRM delivering nano-scaled resolution with synchrotron-like quality
- Non-destructive 3D imaging down to 50 nm resolution
- Dedicated *in situ* and 4D research capabilities enabling the study of microstructural evolution over time under varying external conditions
- Correlative imaging allowing to bridge the gap between micro-CT and destructive high-resolution imaging e.g., FIB-SEM or TEM
- Absorption and Zernike phase contrast for imaging a variety of materials with varying densities

### Applications:

#### Materials Research:

- Study and design functional materials and obtain realistic 3D microstructure data to improve computational models for bottom-up design of materials

#### Natural Resources:

- Non-destructively extend the description of carbonates, tight sand and shale reservoirs down to 50 nm resolution

#### Life Sciences:

- Study the properties of soft and hard tissue, or nanoparticle distribution in organic materials

#### Electronics:

- Optimize package development processes through nanoscale visualization, defect analysis and modeling



Xradia Ultra utilizes ZEISS X-ray optics for unparalleled resolution and performance.

# Technical Data

## ZEISS Xradia Ultra Family

ZEISS Xradia Ultra Family offers:

Imaging	High Resolution Mode (HRES)	Large Field of View Mode (LFOV)
Spatial resolution	50 nm	150 nm
Field of view	16 $\mu$ m	65 $\mu$ m
Voxel size	16 nm	64 nm
Absorption contrast	Standard	Standard
Zernike phase contrast	Optional	Optional

X-ray Source	ZEISS Xradia 810 Ultra	ZEISS Xradia 800 Ultra
Source type	Rotating anode	Rotating anode
Target material	Chromium	Copper
X-ray photon energy	5.4 keV	8.0 keV

**Carl Zeiss Microscopy GmbH**

07745 Jena, Germany  
microscopy@zeiss.com  
zeiss.com/microscopy