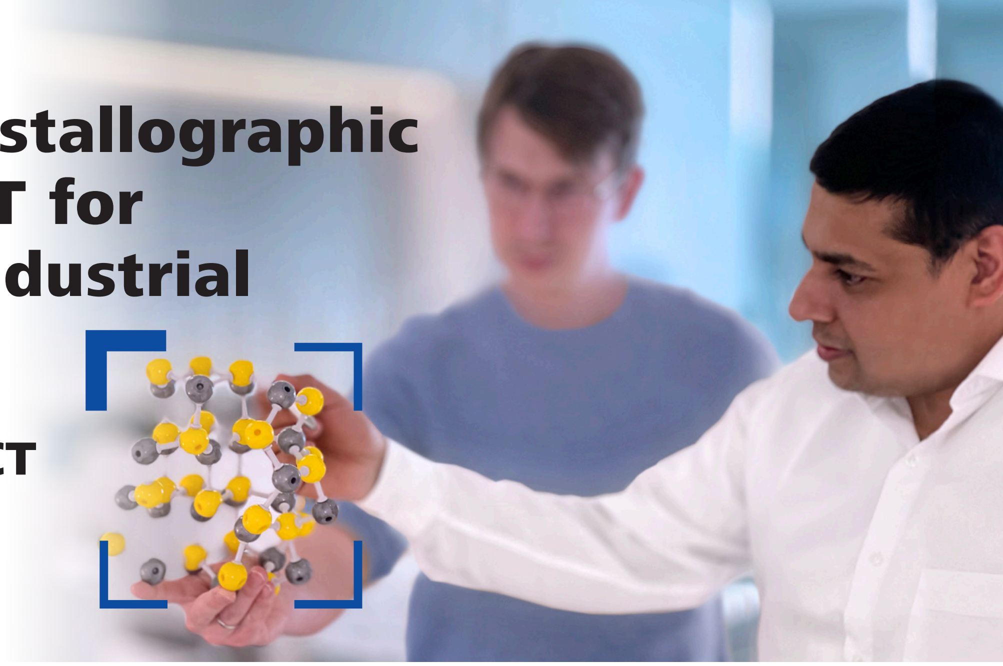
World's first crystallographic imaging microCT for academic and industrial applications.

ZEISS Xradia CrystalCT



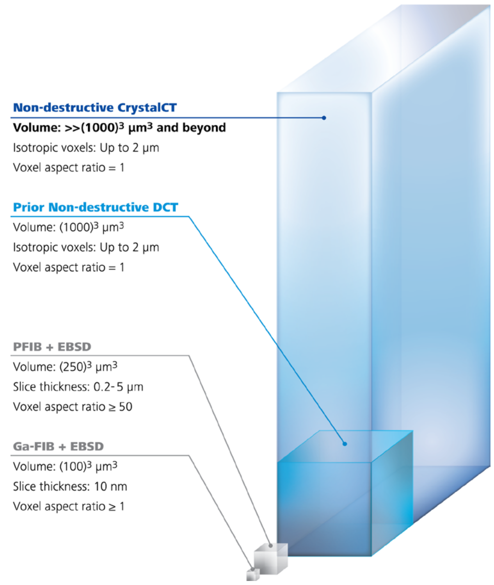
4D grain map of an Armco iron sample imaged at various annealing steps. t_0: initial state; t_1: after annealing at 880 °C for 8 hrs; t_2: after annealing at 880 °C for 16 hrs. By imaging the sample at three temporal states, the abnormal grain growth of the top, pink-colored grain is captured. Courtesy of Prof. Burton R. Patterson, University of Florida, United States.

Best-in-class MicroCT with Unique Diffraction Contrast Tomography (DCT)

ZEISS Xradia CrystalCT is the first commercially available crystallographic imaging microCT system that uniquely augments the powerful technique of computed tomography with the ability to reveal crystallographic grain microstructures, transforming the way polycrystalline materials (such as metals, additively manufactured parts, ceramics, etc.) can be studied, leading to newer and deeper insights into materials research.
ZEISS Xradia CrystalCT with its large field of view flat panel detector and 3D grain mapping, developed in collaboration with Xnovo Technology ApS, addresses a wide spectrum of imaging needs in research and industrial applications. Non-destructive CT also enables *in situ* and 4D studies to understand practically the impact of varying conditions over time.
The ZEISS Xradia imaging system combines its proven hardware architecture with state-of-the-art stability and drift compensation features. It is because of the superior stability of this renowned platform that ZEISS Xradia CrystalCT consistently surpasses one's comprehension of what a microCT can achieve.

Sample Representivity with Advanced Scan Modes

Virtual materials testing leads to rapid materials discovery, important for continuously evolving industries like aerospace, automotive, energy, and construction.
To enable this research, large volumes of real data are required to create high fidelity computational models, requiring good data representivity.
Traditional grain characterization techniques such as EBSD are destructive in nature and confined to low data volumes due to 2D surface-only data, leading to poor volume representivity. ZEISS Xradia CrystalCT overcomes these challenges by providing large volumes of 3D data non-destructively. Innovative DCT acquisition modes remove the sample size limitations providing you with the ability to research diverse sample types.



ZEISS

Seeing beyond

Technical Specifications

X-ray Absorption Imaging	
Minimum Achievable Voxel [a]	0.5 µm
Spatial Resolution [b]	0.95 µm
Achievable Voxel at Working Distance [a,c]	0.5 µm at 0.5 mm; 0.8 µm at 2.5 mm; 2.5 µm at 12.5 mm; 4.0 µm at 25 mm; 12.1 µm at 100 mm

[a] Voxel is a geometric term that contributes to but does not determine resolution and is provided here only for comparison. ZEISS specifies resolution via spatial resolution, the true overall measurement of instrument resolution. [b] Spatial resolution measured with ZEISS Xradia 2D resolution target. [c] Working distance defined as clearance around axis of rotation. This value can be interpreted as the radius of the sample.

Crystallographic Grain Imaging (X-ray Diffraction Contrast Tomography), powered by Xnovo Technology	
Grain Detectability	20 µm
Grain Orientation Angular Resolution	0.1°
Crystal Symmetries	Cubic, Hexagonal, Trigonal, Tetragonal, Orthorhombic, Monoclinic, Triclinic
DCT Advanced Acquisition Modes	Three advanced DCT modes, including Helical Phyllotaxis-Scanning, Helical Phyllotaxis-Raster, and Helical Phyllotaxis-HART
DCT X-ray Source Apertures	Set of three self-aligning DCT apertures
DCT Detector Beamstops	Set of six zero-order beamstops
DCT Reconstruction and Visualization	Xnovo Technology GrainMapper3D
X-ray Source	
Type	Spot Stabilized, Sealed Transmission
Tube Voltage Range	30 – 160 kV
Maximum Output	10 W
Detector System	
High Speed, Large Array CMOS Flat Panel	3072 × 1944 pixels
Single Field of View (diameter / height)	140 mm / 93 mm
Maximum Field of View (diameter / height)	140 mm / 165 mm
Features	
Scout-and Scan Control system	Vertical stitching, ZEISS SmartShield, XRM Python API
Optional modules	ZEISS Autoloader, *In Situ* Interface Kit, ZEISS OptiRecon, ZEISS DeepRecon Pro, ZEISS ZEN Intellesis, ORS Dragonfly Pro

Benefits

- Non-destructive 3D X-ray imaging
- Absorption and diffraction contrast imaging
- Best-in-class resolution and image quality
- Crystallographic grain structure characterization
- Large field of view imaging with fast scan times
- Industry-leading 4D and *in situ* capabilities for flexible sample sizes and types
- SmartShield for sample protection and seamless set-up
- Scout-and-Scan control system for easy-to-use workflow set-up, ideal in multi-user environments
- Automated precision sample positioning for seamless 3D imaging and navigation
- XRM Python API for customized instrument control
- Program up to 14 samples at a time to run sequentially with optional Autoloader
- Continuous access to optional advanced reconstruction technologies such as OptiRecon and DeepRecon Pro for enhanced performance (e.g., up to 10× throughput, superior image quality)
- Field convertible to industry leading ZEISS Xradia 3D X-ray microscopes

Field of Application

Materials Research
Characterize crystallographic grain orientation and microstructural features including pores, cracks, voids, and other subsurface defects.

Battery and Energy Storage
Failure analysis, quality inspection of separator and electrodes for defects and inclusions, track aging mechanisms.

Electronics and Semiconductors
Image and characterize regions of interest during failure analysis on intact packages before cutting or polishing.

Natural Resources
Characterize crystallographic orientation and texture of minerals, metals, and alloys. Research the effect of processing variables to improve materials performance.

Manufacturing Technology
Analyze internal tomographies of 3D printed parts, perform *in situ* mechanical testing.

Life Sciences
Visualize and characterize tissues, cells, and microstructures within entire plants and fixed small animal models.

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GrainMapper3D™ *powered by* xnovotech