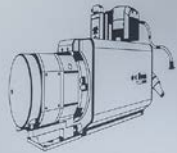




Fraunhofer
EZRT

Development Center X-ray Technology
at Fraunhofer Institute for
Integrated Circuits IIS

 ntCT



Forward-Thinking Nano CT

ntCT

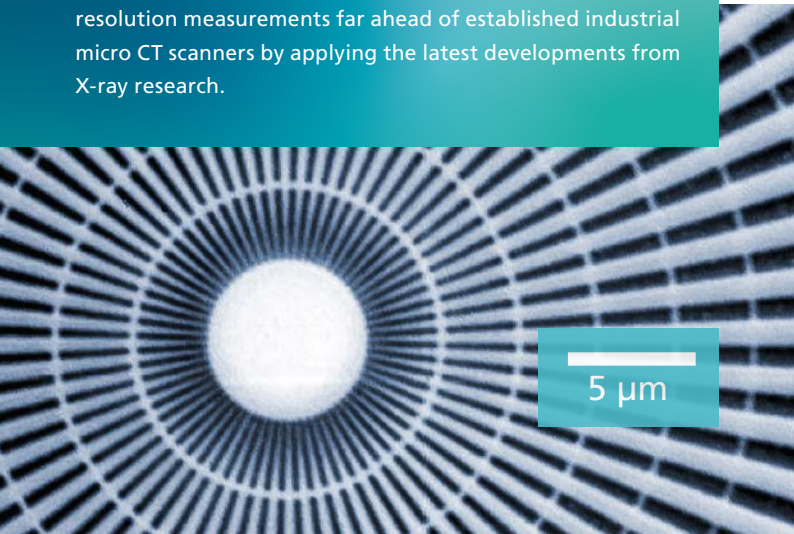
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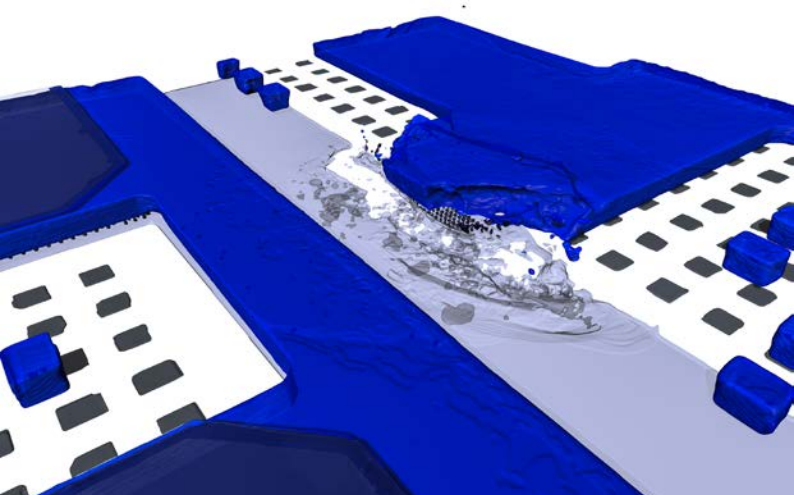
Easy-to-handle nano computed tomography system for resolutions down to 150 nm

The Fraunhofer ntCT makes modern laboratory technology available for industrial applications.

The functional features of novel material systems are often based on their complex inner structures, which are not accessible by established non-destructive analysis methods. The fabrication of microelectronics and micromechanics becomes more and more complex, packed and 3D. After decades of successful miniaturization, industry now produce structures too small for established process control, hindering further improvements. Moreover, biological investigations would require more detailed 3D information of hidden inner structures in order to understand the morphology of various organisms, but such samples often provide too low material contrast.

The ntCT provides a unique solution for all these high-resolution measurements far ahead of established industrial micro CT scanners by applying the latest developments from X-ray research.





The failure analysis of a power semiconductor after failure visualizes significant damage in the various layers of the microchip.

State-of-the-art components merged into a unique synthesis

Our experience in both hardware and software design enables us to perfectly adapt systems to your individual needs. Besides using only high-precision components, we also develop state-of-the-art reconstruction algorithms.

The Swedish company Excillum is a specialized manufacturer of high performance X-ray sources. Excillum's NanoTube N3, a 110 kV (160 kV upgrade possible upon request) X-ray tube with latest tungsten-diamond transmission target technology, automatic e-beam focusing and astigmatism correction, ensures that the smallest possible, truly round X-ray spot is achieved.

The Swiss company DECTRIS is the most experienced company in photon counting X-ray detectors, which feature several advantages compared to commonly used flat-panel detectors. Most importantly, zero readout noise and zero dark current enable an optimum signal-to-noise ratio. Thus, the dynamic range of our X-ray radiographies is not limited by the detector. Moreover, dual energy discrimination enables digital spectrum adjustment.

Left:

Siemens Star Test Pattern. Even the smallest features of 150 nm lines and spaces can be successfully resolved.

Passion for nano systems

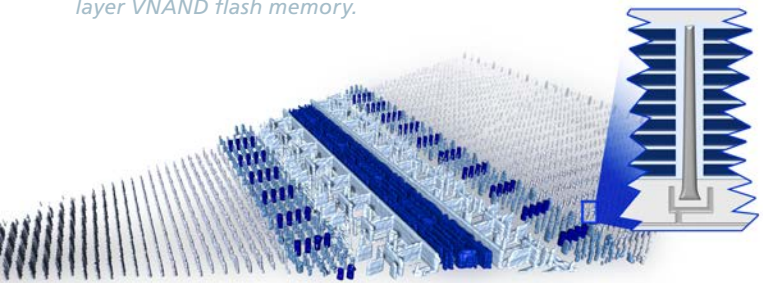
The Fraunhofer Nano CT Systems group located in Würzburg is a team of passionate scientists with many years of experience in system design and algorithm development. Our latest ntCT combines novel developments in component technology and advances in system integration, enabled by strong partnerships with other world-leading X-ray experts.

Please see our website for further details

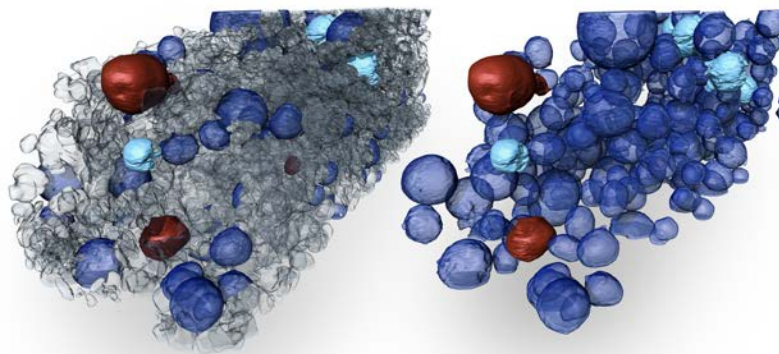


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Visualization of the vias (100 - 200 nm diameter) in a 48-layer VNAND flash memory.



3D reconstruction with 105 nm sampling of the particles in the active phase of the electrode in a lithium-ion battery. The colors of the NCA particles indicate the aging state determined in the analysis.





- Min. voxel sampling 50 nm
In 3D with a magnification of 1500
- True 150 nm resolution in 2D (Siemens star)
175 nm resolution in 3D (FSC)
- Full spectrum imaging 5–110 keV
Suitable for both low and high absorbing samples
- Photon counting detector
Virtually noise free
- Variable field of view
100 μ m–10mm
- Automatic alignment
Easy to use workflow
- State-of-the-art reconstruction
Advanced algorithm
- Compact design
Small footprint of 2.2m \times 1.2m
- Fully customizable
Software and hardware

Development Center X-ray Technology EZRT
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