Naturally Taking You through Setting up an X-ray Scan.
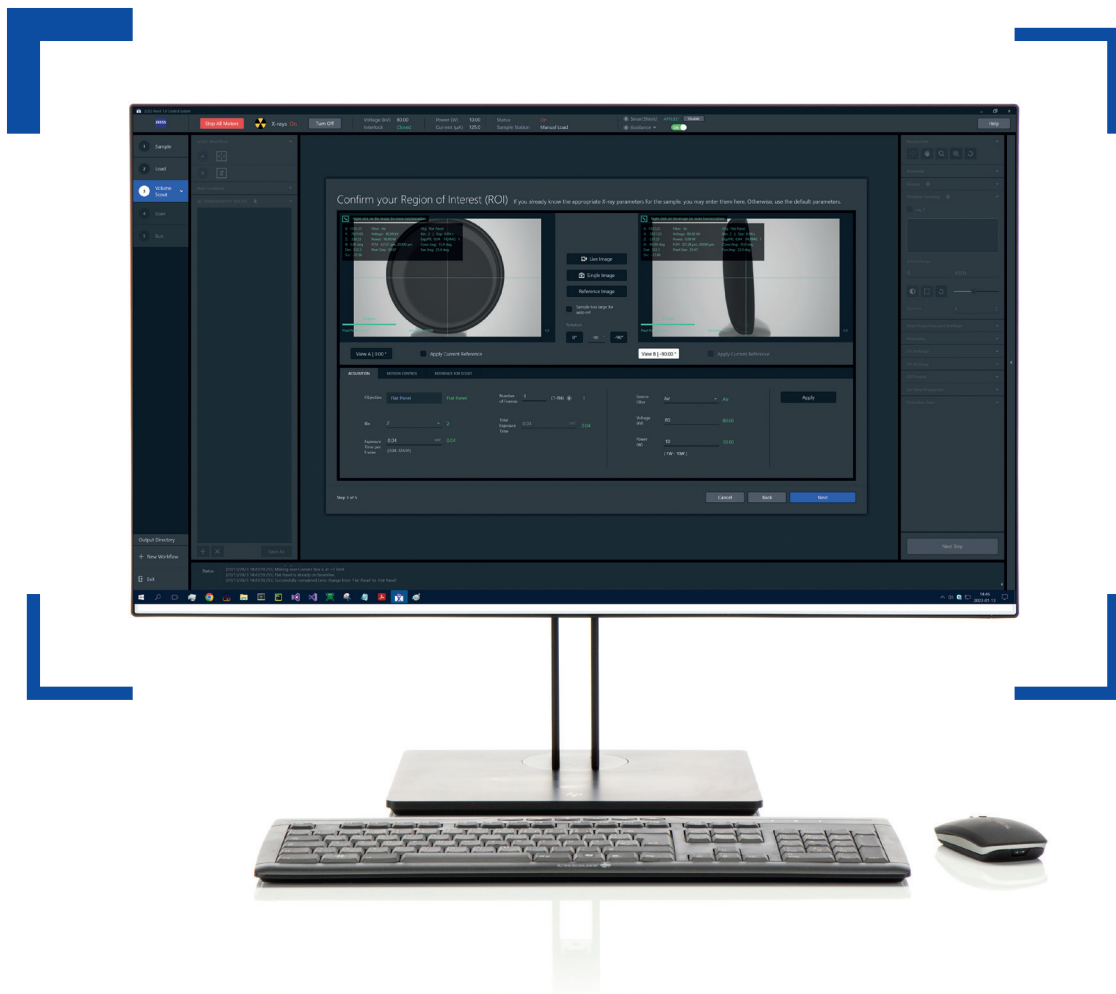

ZEISS NavX

Intuitive Software for ZEISS 3D X-ray Microscopes

Seeing beyond

ZEISS NavX
Intuitive Software for
ZEISS 3D X-ray Microscopes

Novel X-ray imaging can be complex. In order to set up a scan, users need to define parameters for the field of view, number of projections and many others. Often, novice and expert users alike have to apply for instrument time on 3D X-ray microscope (XRM) in a research lab or imaging facility – making the need to work efficiently a necessity to achieve the best possible results as fast as possible.

What if there was a way to gain scientific data more easily and efficiently? NavX offers an intuitive software guiding users through automated workflows with intelligent system insights and making even the newest user immediately productive while allowing experienced users to explore the full versatility of a ZEISS Xradia Versa XRM.

Evolving the user experience

After having studied user habits, dove into their challenges, and employed human-centered design (HCD) principles, ZEISS developed NavX to enable even the newest user in a busy lab to immediately become productive. When setting up an X-ray scan, a number of choices have to be made.

Now, ZEISS NavX naturally takes you through those choices as all that guidance is embedded into the software. A series of prompts and suggestions to set up an experiment more easily and efficiently is given. Additionally, the NavX File Transfer Utility (FTU) takes the data that is being produced by the microscope and automatically transfers it to other locations so that users have their data where they need it when they need it.

Unlock the full versatility of ZEISS Xradia Versa using NavX
Benefit from:
- The reimagined and redesigned user experience providing a new way to interface with advanced XRM technology, reducing the training overhead, and rapidly bringing the power of XRM imaging to a wider user base.
- A sample-specific automation and workflow visualization offering a streamlined path to results for beginners and experts alike.
- Performing demanding correlative workflows. Work easily with multiple platforms supported by seamless coordinate transfer.

User Interface based on
Human Centered Design
Accelerate Productivity for All Users
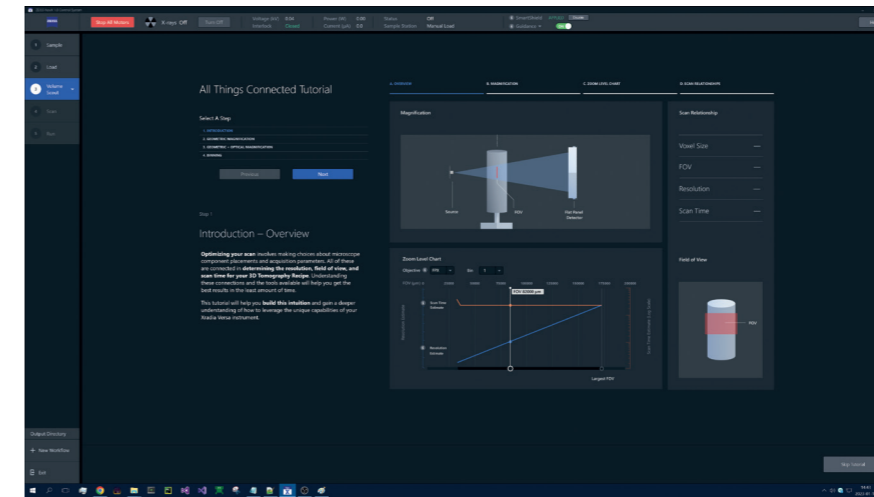
Intuitive user interface of ZEISS NavX, showing tutorials

Here is how NavX, your microscope control system, enables new insights to users. It helps you to get started and simultaneously builds a foundation of system intuition that ensures a successful set up.

In-built tutorials guide you through the initial steps. Sample and system awareness are generated and combined with augmented reality to protect both the microscope and the sample.

The intuitive user interface is designed for workflow automation. It suggests parameters that are part of the integrated navigation. With the help of this embedded guidance, you will be more productive, achieve more consistent data and build your own user intuition.

Microscope users of all skill levels can access cutting edge capabilities of the instrument.

Expand access, improve productivity and extend your capabilities with 3D X-ray microscopy
Extract all information from your sample by leveraging the unique spatial resolution, up to 450 nm, with ZEISS Xradia 630 Versa, enabled by RaaD 2.0 (resolution at a distance) over large fields of view across the full range of 30 kV to 160 kV.

**Understand your sample better than ever with the help of AI-powered image reconstruction**
Use Deep Learning-based reconstruction with ZEISS DeepScout and ZEISS DeepRecon Pro, modules of ZEISS ART (Advanced Reconstruction Toolbox).
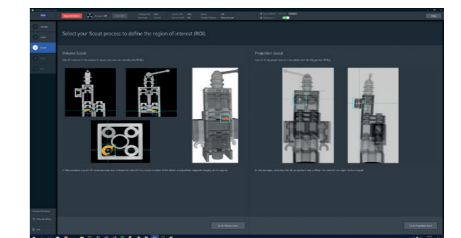

Workflow selection

NavX, the FTU and the performance of ZEISS Xradia Versa now unlocks the ability to study an unprecedented range of samples in the fields of materials science, battery research, advanced electronics, and life sciences.

Augmented Reality Helps
Understand How Parameters Affect Each Other
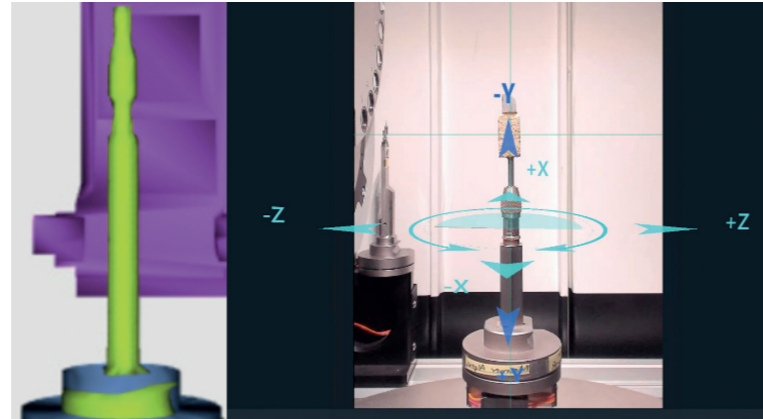
Augmented reality helps to position the sample and avoid collisions with instrument parts (right). The software automates the workflow by suggesting parameters (bottom).
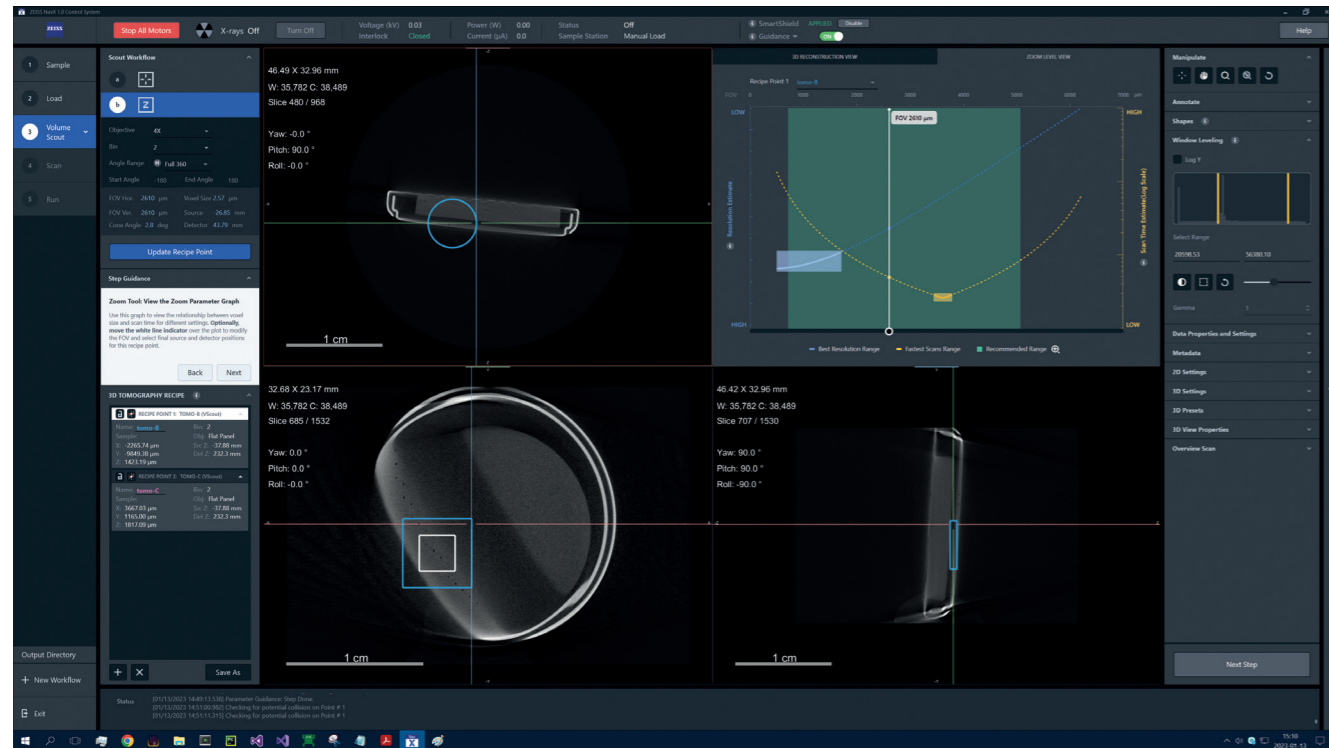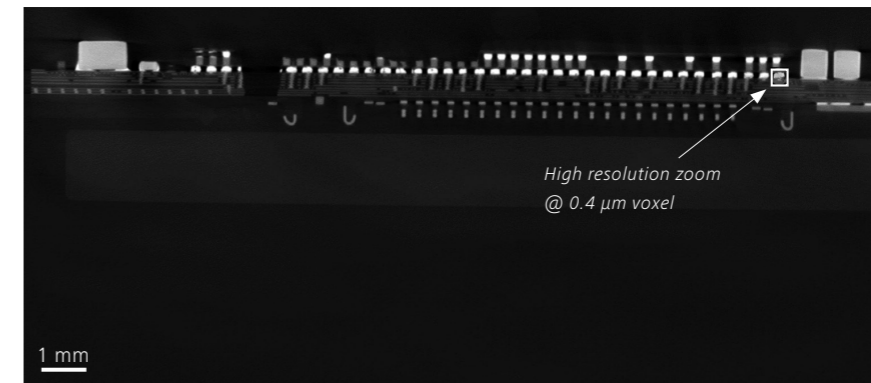

NavX also provides a special visualization capability utilizing augmented reality that helps you to understand the trade-offs between parameters, e.g., source-sample distance and throughput.

Additionally, NavX integrated Volume Scout is a capability to streamline your access to RaaD using a 3D volume of your sample to pinpoint and identify regions of interest (ROI) and execute higher resolution imaging subsequentially.

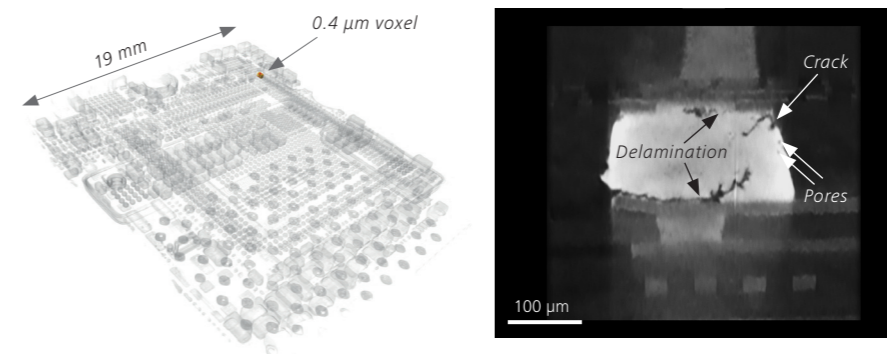**NavX intuitive navigation follows the evolution of the XRM user base**
It revolutionizes X-ray navigation and control with seamless and integrated workflows to provide access to advanced correlative workflows.

Study an unprecedented range of samples. Performing experiments on ZEISS Xradia Versa with its novel capabilities and using NavX enables scientists in academia and industry with prime access to multiple fields of applications.

High resolution zoom
@ 0.4 µm voxel

1 mm

19 mm

0.4 µm voxel

Crack

Delamination

Pores

100 µm

3D X-ray microscopy data of an electronics sample, an intact A12 processor with dense metal solder bumps and interconnects. Top: Overview scan capturing details across the entire sample. Details indicate failures and reveal information how to optimize designs. (White box indicates detail image shown on bottom right.) Bottom left: 3D rendering of the total processor giving an idea of the scope of scale differences, with the small high resolution region highlighted in red. Bottom right: Detail of a 2D virtual slice from the red zoom region (from bottom left image) after AI-based reconstruction. New features can be seen, e.g. cracks, or pores.

Researchers in Materials Science request high resolution imaging that is not constrained by sample type, and intuitive, flexible capabilities.

As the majority of users access XRM instruments through core facilities, accessibility and efficiency of work are key considerations. *In situ* experiments demand high throughput for additional test points and a broad field of view to capture heterogeneity.

For semiconductor applications, FA (failure analysis) requires the fastest workflow to set-up an internal ROI (region of interest) for highest resolution scanning with minimum user interaction or wasted time. Initial faster scan capability for fastest ROI setup supported by NavX will improve productivity in FA labs.

Geoscience and Raw Materials imaging requires the ability to capture large amounts of data across many length scales quickly and intuitively.

Contrast and resolution are the highest requirements for mainstream Life Sciences research – especially for the heavily funded brain imaging and vasculature research fields.

Expand Your Possibilities
Select and Configure
Your X-ray Microscope

Expand your horizon with ZEISS Xradia Versa 3D X-ray microscopes. Achieve excellent resolution performance and take accessibility to the next level with an intuitive user experience. Accelerate your productivity with both faster throughput and faster time-to-results. And leverage game-changing AI.

X-ray Microscope	
Xradia Versa Family	Xradia 630 Versa, with a spatial resolution of 450 nm, minimum voxel size 40 nm
Features	
NavX with FTU	Intuitive user interface with file transfer unit, offering navigational guidance and enabling novice and expert users to access all instrument capabilities easily
Volume Scout	Streamlines access to RaaD using a 3D sample volume to pinpoint and identify ROIs
SmartShield	Protects sample and microscope, avoids collisions with instrument parts
In Situ Interface Kit	*In situ* rigs such as high pressure flow cells, tension, compression and thermal stages
Recommended Software	
ZEN core AI Toolkit	Package for AI applications including integrated training interfaces and the modules ZEN Intellesis Segmentation and Object Classification based on machine learning algorithms
ORS Dragonfly Pro	3D visualization and analysis software
Advanced Reconstruction Toolbox	
ART AI Supercharger	Contains DeepRecon Pro & DeepScout, deep learning-based reconstruction algorithms for enhancement of throughput or image quality in repetitive workflows and for high resolution over large fields of view
ART Recon Package	Contains DeepRecon Pro & OptiRecon (deep learning and iterative reconstruction for enhanced throughput or image quality)
ART Contrast Packages	Contains PhaseEvolve & MARS: Material Aware Reconstruction Solution to enhance image quality by reducing beam hardening artifacts and a smart algorithm to enhance image quality by removing propagation phase contrast fringes