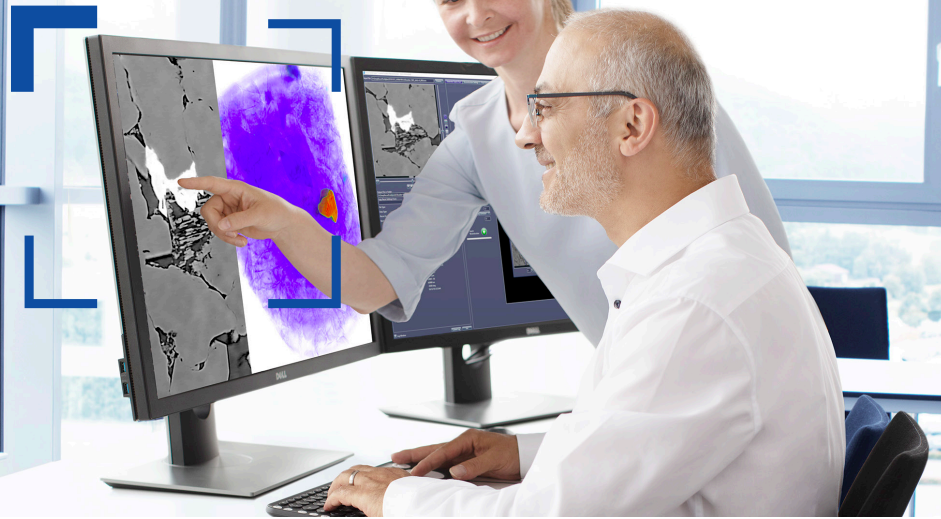


Reveal contrast that has never been seen before

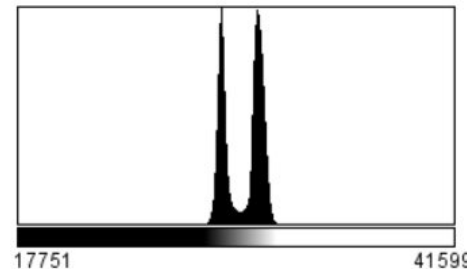
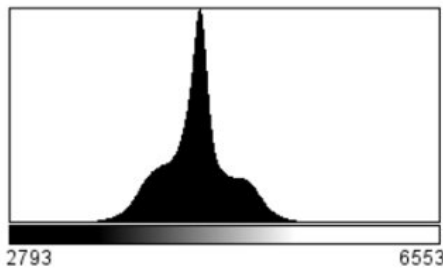
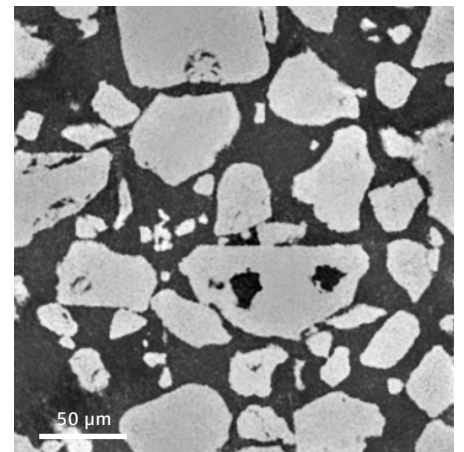
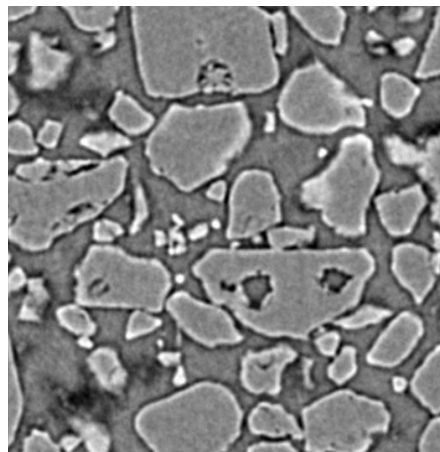
ZEISS PhaseEvolve



Process your high resolution 3D phase contrast datasets to further enhance contrast. Clearly distinguish different parts of your low contrast samples. PhaseEvolve, one module of ZEISS Advanced Reconstruction Toolbox (ART), enables easier and faster 3D segmentation of phase contrast data acquired on ZEISS X-ray microscopes.

Propagation-based phase contrast tomography is a powerful and highly effective X-ray microscopy technique that reveals fine features such as cracks, voids and other micrometer-scaled structures in low absorbing materials. However, the distinct phase fringes that decorate these small features often make it hard to distinguish material phases, further challenging the process of image segmentation required for quantitative 3D analysis.

PhaseEvolve is your software solution to remove the phase fringes from phase contrast tomography data and produce artifact free, superior quality data that is easily segmented and quantified. Use the easy-to-use guided user interface to post-process your reconstructed 3D tomograms and get cleaner, phase-free data allowing you to focus on the smallest microstructural features that are critical to your needs.



Lactose carrier particles from an inhalation blend imaged using phase contrast mode on the ZEISS Xradia Versa 620. Reconstructed 2D slice from the scan volume along with corresponding histograms are shown for raw (left) and PhaseEvolve processed (right) tomography data. Processed data provides artifact free high contrast data with a histogram that is enables easy segmentation.



Seeing beyond

Highlights

- Readily obtain superior-quality phase-retrieved 3D tomography data.
- Simplified GUI with an easy-to-use workflow suited for all users.
- Instantaneous visual preview of phase retrieved data.
- Process existing data to gain new insights.
- Combining propagation-based phase contrast data acquisition on ZEISS Xradia Versa and post-processing with PhaseEvolve eliminates the use of cumbersome, challenging, and expensive grating-based phase contrast techniques.

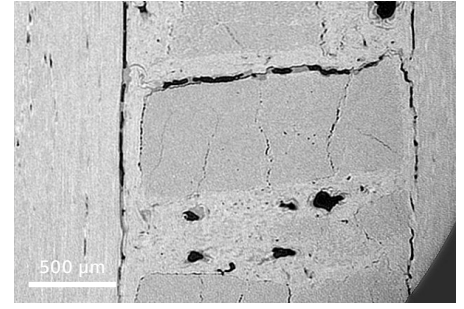
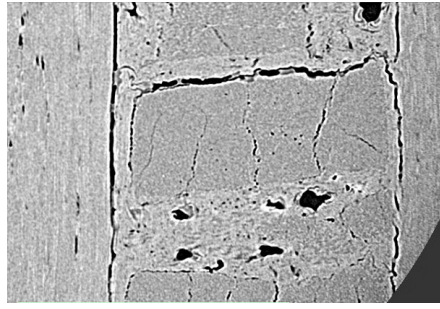
Faster Results in Three Easy Steps

- PhaseEvolve has a workflow-based user interface with easy-to-use parameter tuning that does not require specific expertise in tomographic reconstruction. Novice users can typically tune the PhaseEvolve parameters in less than ten minutes.

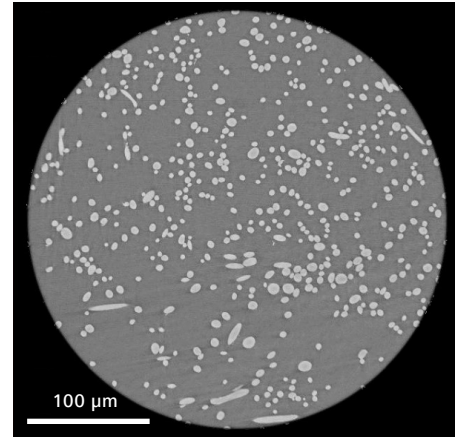
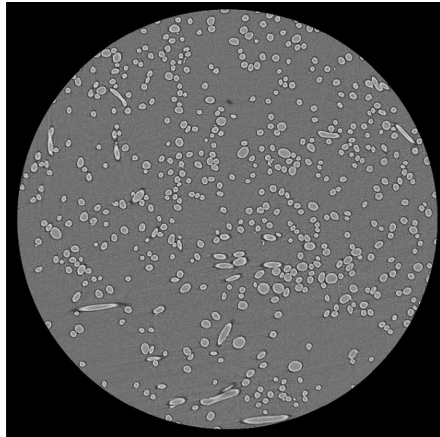
1. Select dataset
2. Perform phase retrieval parameter optimization for phase amplitude and strength
3. Reconstruct

Maximize Your Output

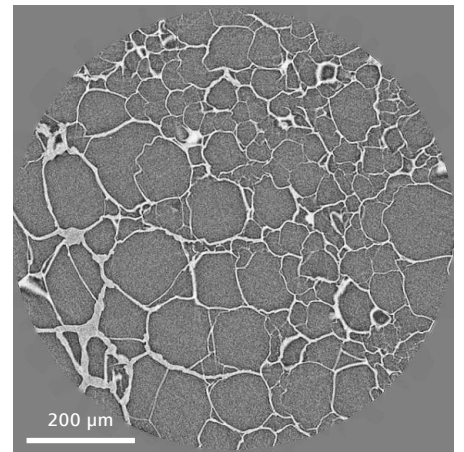
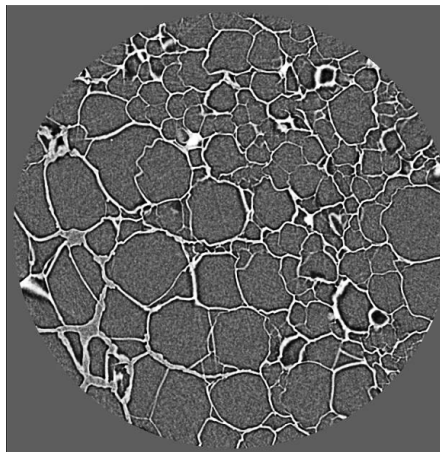
- Using PhaseEvolve you can discern differences between materials with low absorption contrast
- Reduce phase artifacts at the boundaries of voids, pores and cracks
- Improve dynamic range to ease segmentation
- Improve image quality of low absorbing granular materials such as powders, aggregates and other loose media
- Improve accuracy of 3D quantitative analysis of porous, fibrous and granular materials.



Fiber tows in a layered ceramic matrix composite specimen. 2D reconstructed slice from unprocessed (left) and processed (right) data.



High resolution scan of Yak hair imaged at 0.3 μm/voxel. 2D reconstructed slice from unprocessed (left) and processed (right) data.



High resolution scan of a dry hydrogel network imaged at 0.7 μm/voxel. 2D reconstructed slice from unprocessed (left) and processed (right) data.

Research Areas

- Composite materials
- Fibers, paper and textiles
- Hydrogels and Aerogels
- Polymers
- Battery materials
- Biomaterials
- Life Sciences
- Pharmaceuticals

PhaseEvolve is available for immediate upgrade on existing ZEISS Xradia Versa and Context microscopes, enhancing the capability of installed systems and new microscopes alike.

