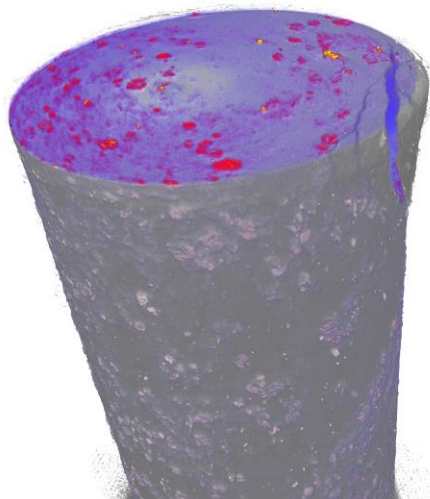


GE phoenix v|tome|x s 240 X-ray tomography device

The device, which was installed in June 2017, is the most powerful X-ray tomography device installed in Finland so far. 240 kV accelerating voltage enables imaging of, e.g., complete drill core samples. The device produces a 3D density map of a sample, that can be used to analyze, e.g., grain orientation or thickness of sediment layers. One can also determine e.g. amounts and volume fractions of precious metals in a sample.



Tomography device in the GTK laboratory.



Rock sample before (gray) and after (red-blue) fracturing.

Technical details

Microfocus tube:

- Max. accelerating voltage **240 kV**
- Max. power **320 W**
- Min. resolution **5 µm**

Nanofocus tube:

- Max. accelerating voltage **180 kV**
- Max. power **15 W**
- Min. resolution **900 nm**

Sample size:

- Max. diameter **26 cm**
- Max. height **41 cm**
- Max. weight **10 kg**
- Field of view ~ resolution * 2000

Deben sample stage:

- Compression or tension max. **5 kN**
- Cooling or heating **-20 - 160 °C**
- Sample length **~55 mm**
- Sample diameter max. **40 mm**

Software:

- **FEI PerGeos** (development line of Avizo)
- Noise filtering
- Segmentation
- Analysis
- Visualization

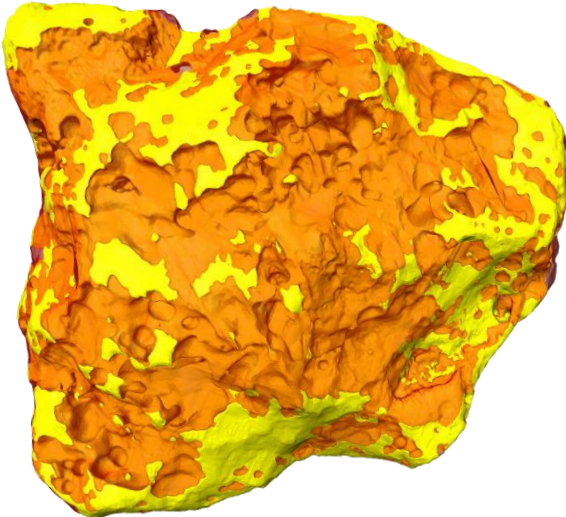
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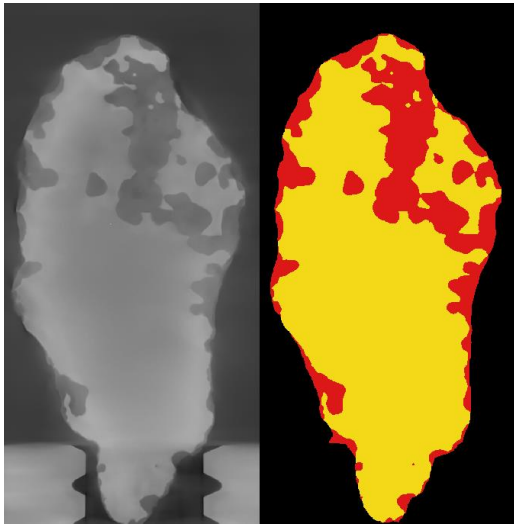




Photograph of the Lieksa iron meteorite. K. A. Kinnunen.



3D tomographic image of the Lieksa iron meteorite. Iron is shown in yellow, silicates in orange.



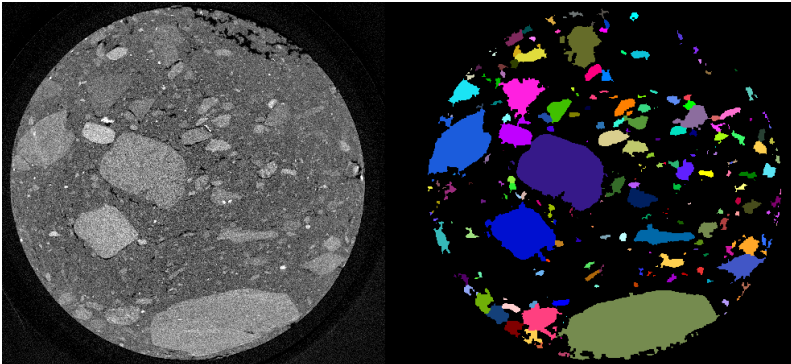
2D tomographic cross section of the Lieksa iron meteorite as is (left) and segmented (right).



Badminton racket.



Drill chuck and goniometer as a split 3D tomographic visualization.



2D cross section of a gravel sample (left) with the grains segmented for orientation analysis (right).

Geological Survey of Finland

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