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Multimodal Imaging capabilities at MLZ

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The imaging group at MLZ operates the instruments ANTARES and NECTAR. ANTARES provides a cold neutron spectrum and is suitable for high spatial resolution imaging, capable of detecting small compositional changes in millimeter to centimeter sized samples. NECTAR is a fission neutron-imaging instrument, suitable for investigating large samples with sample sizes up to several tens of centimeters.
To complement both techniques, cold and fission neutron imaging, ANTARES is being upgraded with an X-ray source placed perpendicular to the neutron beam to allow for simultaneous X-ray and neutron tomography to complement the cold neutrons. At NECTAR, with the production of fission neutrons, gamma rays are inherently produced as by-products and can be utilized for multimodal imaging by using gamma-sensitive scintillator screens in place of the neutron scintillators, viewed by the same camera. Similarly, thermal neutrons at NECTAR can also be utilized for imaging applications.
With multi-modal imaging capability upgrades at both instruments, we present the current state of these developments, including detailed insight to the setups along with first application examples.

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