



Contribution ID: 83

Type: **Poster**

## Status and perspectives of the neutron imaging instrument suite at MLZ

*Friday 9 December 2022 15:30 (1h 30m)*

MLZ successfully operates the two neutron imaging beam lines NECTAR and ANTARES. NECTAR provides fast fission neutrons, thermal neutrons and gammas, which can be combined for multi-modal characterization of larger samples with spatial resolution down to  $\sim 100\text{ }\mu\text{m}$ . ANTARES offers a spectrum with a thermal maximum, extended towards cold neutrons, providing higher sensitivity and spatial resolutions down to  $\sim 20\text{ }\mu\text{m}$ .

Many applications, such as studying the water management within membranes of fuel cells of only a few  $\mu\text{m}$  thickness or lithium transport phenomena and dendrite growth in batteries, require high spatial resolution for small samples combined with a high flux cold neutron spectrum. Moreover, many scientific questions requiring modern and advanced imaging techniques (e.g. grating interferometry, Bragg edge imaging) would strongly benefit from a broader spectral range and a colder spectrum.

We propose to build a complementary neutron imaging instrument at a neutron guide end position, providing a small beam cross section and a cold neutron spectrum combined with an extremely low background. The instrument will be optimized for applications requiring high spatial resolution down to the single  $\mu\text{m}$  range and applications using advanced imaging techniques that will benefit most from the broad spectral range and the low background at a neutron guide, adding world-wide unique capabilities to the portfolio of neutron imaging applications at MLZ.

**Primary author:** SCHULZ, Michael

**Co-authors:** SCHILLINGER, Burkhard; LOSKO, Adrian (Technische Universität München, Forschungs-Neutronenquelle MLZ (FRMII)); TARTAGLIONE, Aureliano (Technische Universität München, MLZ (FRM2))

**Presenter:** SCHULZ, Michael

**Session Classification:** Poster Session

**Track Classification:** Neutron Methods