

KURF: The Kimballton Underground Research Facility

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NF Topical Groups:

- (UF01) Underground Facilities for Neutrinos
- (UF02) Underground Facilities for Cosmic Frontier
- (UF03) Underground Detectors
- (UF04) Supporting Capabilities
- (UF05) Synergistic Research
- (UF06) An Integrated Strategy for Underground Facilities and Infrastructure

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Abstract:

The Kimballton Underground Research Facility (KURF) is an underground lab in southwest Virginia, just 40 minutes from the Virginia Tech campus. The lab provides a venue for R&D activities requiring reduced cosmic ray flux.

The Kimballton Underground Research Facility (KURF) is situated 40 minutes by car north of the Virginia Tech's main campus. It is in an active limestone mine owned by Lhoist North America (Ripplemead, VA). The underground lab has horizontal, drive-in access (maximum gradient is $< 10\%$) and the primary access tunnel has 6 m vertical and 13 m horizontal clearances throughout. Various R&D experiments have been hosted at KURF in the past several years which have focused on particle physics research involving neutrinos and rare event searches.

The Virginia Tech physics department maintains and operates four research spaces at KURF: one on the surface just outside the main mine entrance, one close to the mine entrance that offers an overburden of approximately 300 m.w.e., a deeper space, situated near the bottom of the mine at 1,450 m.w.e. (currently closed), and a new one being developed at 700 m.w.e..

The lab close to the surface (300 m.w.e.) is equipped with an ORTEC HPGe detector for low background counting. The 700 m.w.e. lab is currently under construction and is expected to be ready by Spring 2021. The cavern, which is approximately $100\text{ m} \times 12\text{ m} \times 10\text{ m}$ (L×W×H), is quiet and well isolated from mine activity. The space will include a lab building to host a dilution refrigerator (DR) for R&D on cryogenic bolometers for double beta decay. The DR is currently being commissioned at the main Virginia Tech campus. In addition to the lab building, there is dedicated *agile* space which will be able to host mobile research trailers to accommodate varied user R&D needs. Potential users are welcome to apply to the above mentioned point of contact.