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First ultracold neutrons for TUCAN

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The TRIUMF UltraCold Advanced Neutron (TUCAN) collaboration is completing a new ultracold neutron (UCN) source, which aims to be the world's strongest, with an instantaneous production rate of 1.6×10^7 UCN/s.

High-energy neutrons are produced by a spallation target irradiated by a proton beam from the TRIUMF cyclotron, then moderated in heavy water and liquid deuterium. UCNs are subsequently produced in superfluid helium-4 by phonon production.

The source was commissioned and produced its first detectable UCNs in June 2025, and the results were found to be in reasonable agreement with expectations. Additional data-taking campaigns are planned over the course of the year.

I'll present the results of these campaigns, including UCN production, source UCN storage time, and source performance under different beam currents and heat loads. The results bode well for the completion of a neutron electric dipole moment experiment, the flagship physics project for the source.

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