



PPD Seminar

The ISIS Neutron and Muon Source

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22 Oct 2025, 11:30

R61 CR03 (RAL)

When ISIS began operation 40 years ago it was the most intense pulsed proton source in the world and to this day it is perhaps the most productive. ISIS delivers a pulsed beam of protons for the production of neutrons and muons which are used for a comprehensive programme to study materials and medicines addressing the UK's science priorities, from supercharging new battery concepts to unfolding the secrets of DNA. At the heart of the ISIS facility is a powerful proton accelerator that accelerates H^+ ions up to 70 MeV. Charge-exchange injection allows ISIS to cheat the laws of physics and superimpose more than 100 proton pulses on top of each other. Despite the strong self-destructive forces that work against the beam containment, the protons are accelerated in just a few ms to 800 MeV and delivered to neutron and muon targets. A suite of instruments enables precise measurement of the impact of the secondary neutron and muon beams on a huge variety of samples. Through techniques such as neutron diffraction or muon spin resonance spectroscopy, we can study these substances to deliver an extensive science programme. Beyond discussing the existing facility, I will go on to introduce recent and ongoing upgrades to the linac, target and detectors which will improve the beam and instrumentation still further. I will also present the ambitious proposed major facility upgrade, ISIS-II, which will be the UK and Europe's next-generation neutron and muon source.

