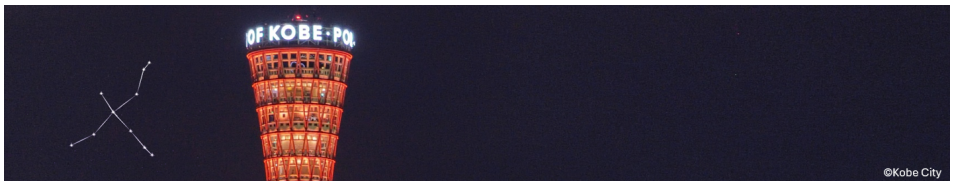

Contribution ID: **16** Type: **not specified**

Characterising Backgrounds in the Search for the Migdal Effect with gas TPCs

Wednesday, 25 February 2026 14:10 (25 minutes)

This presentation focuses on the primary background processes inherent in the direct search for the Migdal effect using fast neutron beams with a low-pressure time projection chamber (TPC). We will discuss the simulation, characterisation, and rejection of three primary backgrounds that can mimic this signal. First is the challenge of neutron inelastic scattering on the detector target and surrounding materials, which produces prompt gamma-rays that can generate Compton electrons near the NR vertex, mimicking the Migdal electron. Second is the potential misidentification of secondary nuclear recoils as Migdal electrons. Finally, we will address an additional background that is present in argon and xenon gas mixtures, particularly Particle-Induced X-ray Emission (PIXE), which can produce localised energy deposits that mimic the target signal.

Presenter: MARLEY, Timothy (Imperial College London)

Session Classification: Migdal search