

## **First Results From ARIADNE: A 1-ton dual-phase LArTPC with optical readout.**

*Friday, 2 November 2018 16:40 (20 minutes)*

ARIADNE is a 1-ton two-phase liquid argon (LAr) time projection chamber (TPC) featuring a novel optical readout method. The detector uses a Thick Gas Electron Multiplier (THGEM) in the extraction region to generate secondary scintillation light which is imaged using 4 Electron-Multiplying (EM)CCD cameras to produce high resolution images of particle interactions within the detector.

This approach has many potential improvements over current readout techniques. A combination of the high level of gain achievable in the THGEM and the single-photon sensitivity of the EMCCDs give's sensitivity at low energies. The EMCCDs have 1 million pixels each giving the detector its high resolution.

Using optical readout also allows the readout electronics to be positioned externally to the cryostat, reducing the need for cold electronics and giving easy access for live maintenance and upgrades.

ARIADNE underwent testing and commissioning runs in Liverpool at the end of 2017, followed by a beam line test at the CERN East Area in 2018. This was the first beam line test of an optical dual phase TPC for a detector of this scale. Initial results from these tests will be presented.

<http://hep.ph.liv.ac.uk/ariadne>

**Primary authors:** Mr ROBERTS, Adam (University of Liverpool); Dr MAVROKORIDIS, Kostas (University of Liverpool)

**Presenters:** Mr ROBERTS, Adam (University of Liverpool); Dr MAVROKORIDIS, Kostas (University of Liverpool)

**Session Classification:** Detector parallel