

## Upgrades of the ARIADNE 1-ton dual-phase optical liquid argon TPC

*Wednesday 8 September 2021 16:54 (18 minutes)*

ARIADNE, a state-of-the-art 1-ton dual-phase Liquid Argon Time Projection Chamber (LAr TPC), features a game-changing photographic readout utilising ultra-fast photon sensitive TPX3 cameras to image the secondary scintillation light produced in THGEM holes. ARIADNE underwent testing at the T9 beam line, CERN East Area. ARIADNE is the first dual-phase LAr TPC with photographic capabilities to be positioned at a charged particle beamline, and we successfully imaged beautiful LAr interactions with 1 mm track resolution at momenta between 0.5 GeV to 8 GeV. With this technology we have now created a dream TPC in which you can take videos of particle interactions with ns time resolution and mm spatial resolution just based on light. The system is ideal for colossal dual-phase LAr neutrino detectors at much lower cost and as such is now considered as an option for the fourth module of DUNE. Results using the upgraded system at Liverpool will be presented detailing the many benefits and capabilities of this technology. Additionally, a future larger scale detector using the ARIADNE technology is in the pipeline within the CERN neutrino platform program and will also be discussed.

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

### Working group

WG6

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**Session Classification:** WG6