

An Imaging detector for noble liquid experiments

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- We are developing an optical system that collects the **scintillation light** produced by charged particles in **noble liquid elements** (LAr, LXe) to perform a **fast 3D reconstruction** of events, as an alternative or complement to Time Projection Chambers.
- The basic unit of this system is a camera that consists in a **coded aperture mask** and a Silicon Photomultiplier (SiPM) matrix.
- We developed a **3D reconstruction algorithm** based on a weighted back-propagation approach that reconstructs a map of the deposited energy in the volume. This algorithm improves on the performances of traditional techniques when a low number of photons is detected.
- Full simulation and reconstruction of neutrino events have been performed in a ~1 ton LAr cryostat geometry, equipped with 76 coded aperture mask cameras.
- We are building a **prototype** with 3 cameras based on available SiPM matrices on the market, and with cryogenics electronics. First tests in Liquid Argon are expected in Q2 2023.