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LArPix and LightPix: Scalable electronics for very large detectors

Future neutrino experiments and rare event searches require exceptionally large detectors with high granularity. I will discuss LArPix, which provides an integrated detector system (amplification, triggering, digitization, and multiplexed readout) that has been designed to scale in excess of 10^6 channels. Results from the production of 0.5 million LArPix channels and performance in a ton-scale liquid argon time-projection chamber will be presented. To achieve this we had to overcome issues in noise, waste heat, cryogenic-compatibility, reliability, and scalability. I will also discuss progress with LightPix, a variant designed to support scalable readout of large arrays of silicon photomultipliers in cryogenic environments.

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