

## Remote: UV hybrid photon detector based on GaN photocathodes and Si low gain avalanche diode

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Photon detectors featuring single-photon sensitivity play a crucial role in various scientific domains, including high-energy physics, astronomy, and quantum optics. Fast response time, high quantum efficiency, and minimal dark counts are the characteristics that render them ideal candidates for detecting individual photons with exceptional signal-to-noise ratios, at frequencies in the range of hundreds of MHz. Here, we report on our first design and operational results on a Hybrid Photon Detector (HPD) that combines the high quantum efficiency of a Gallium Nitride (GaN) photocathode and the low noise characteristics of a Si-based Low-Gain Avalanche Diode (LGAD). This hybrid detection scheme has the potential to reach single-photon detection sensitivity with high quantum efficiency, low noise levels and capable of operating at hundreds of MHz repetition rates.

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