

## **CosmicWatch: The Desktop Muon Detectors**

### **Abstract**

CosmicWatch is an outreach program that is being designed to provide students the ability to build their own in-expensive muon detector. The CosmicWatch detector consists of a 5×5×1 cm slab of solid plastic scintillator instrumented with a silicon photomultiplier (SiPM) to detect light emitted from charged particles as they pass through the scintillator. The signal from the SiPM is sent through a custom designed printed circuit board (PCB) which shapes the signal such that a micro-controller can measure the time and amplitude of the SiPM signal. We use an Arduino Nano to measure the pulse amplitude and record the count number, time of the event, pulse amplitude, and detector dead time. The threshold for a signal from the SiPM to trigger the data acquisition can be tuned in the provided Arduino software. The detector can be powered by a mini-USB to USB connector.