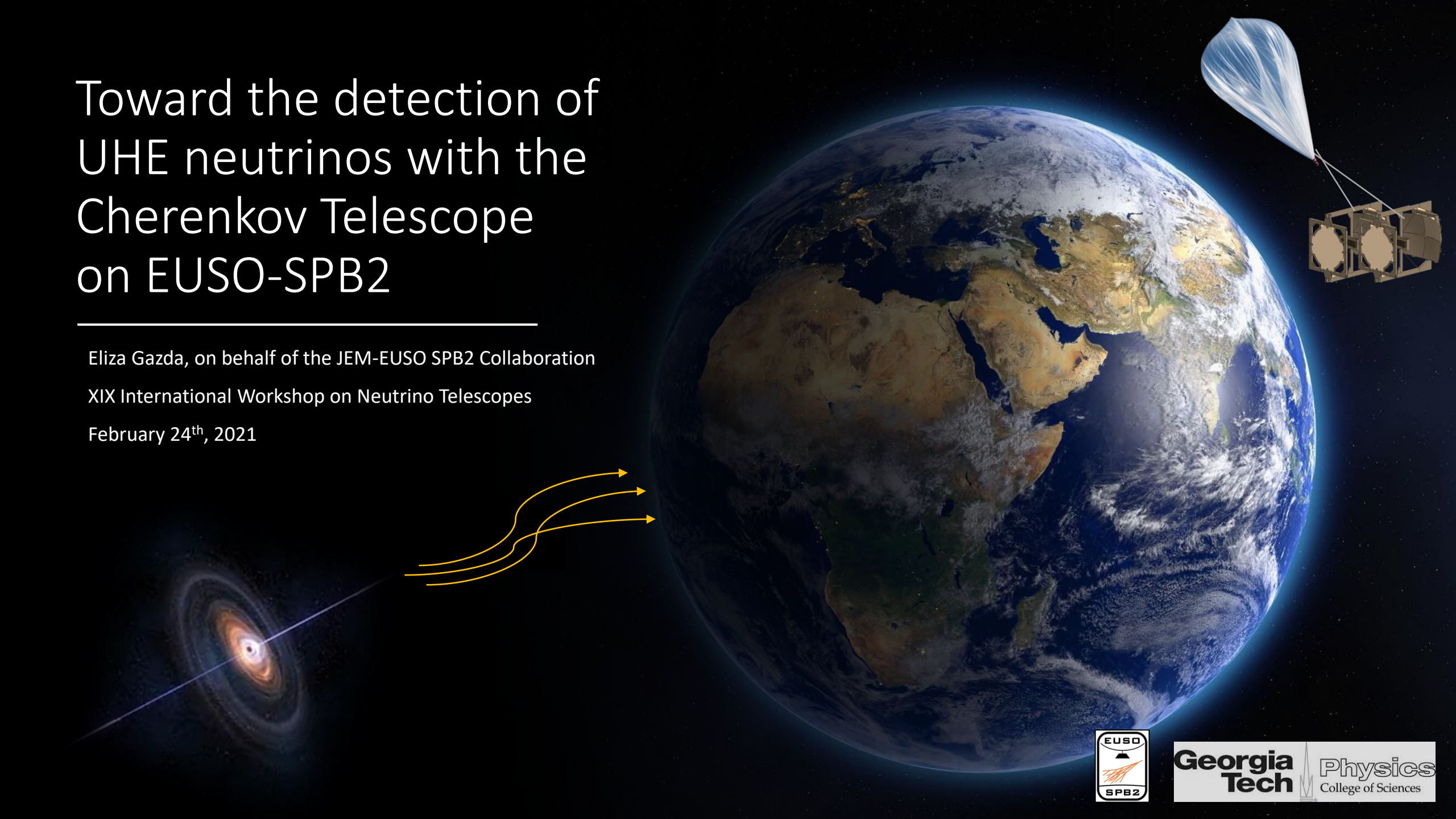
Toward the detection of UHE neutrinos with the Cherenkov Telescope on EUSO-SPB2

Eliza Gazda, on behalf of the JEM-EUSO SPB2 Collaboration

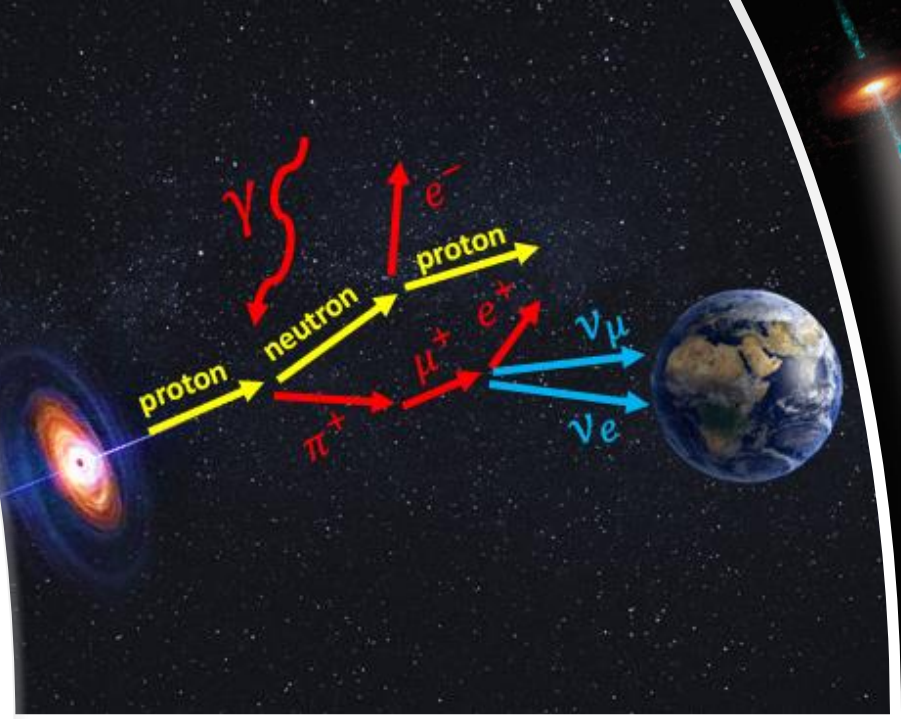
XIX International Workshop on Neutrino Telescopes

February 24th, 2021

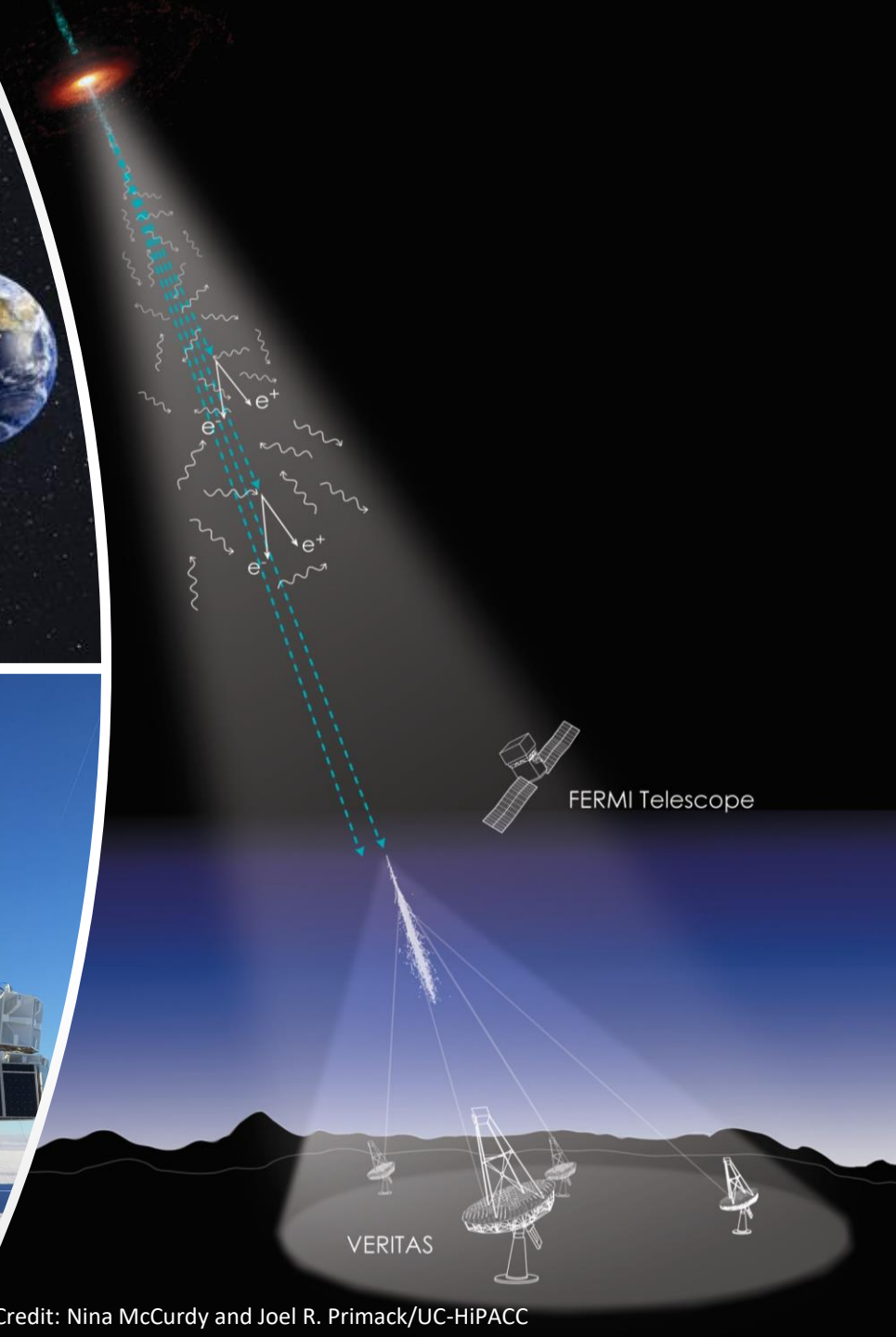


- Sources of Cosmic Rays are unknown
- Acceleration mechanisms of ultra-high energy particles are unknown
- We have a chance to explore “beyond standard model” particle physics, exploring events like ANITAs

First search of Ultra High Energy neutrinos from near-orbit altitude with the Air Shower Imaging Cherenkov Technique!

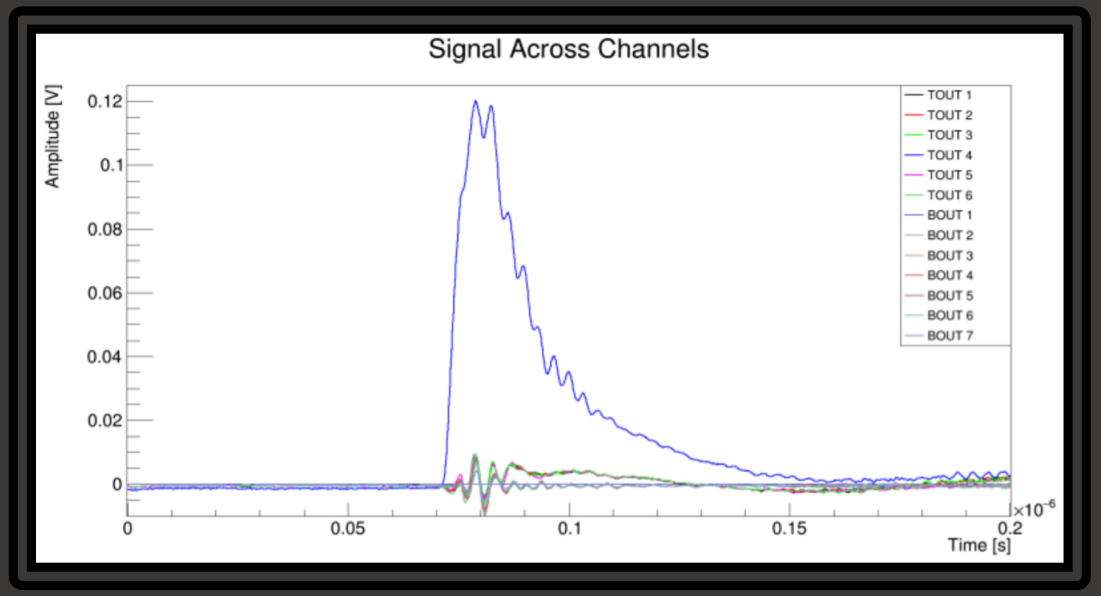


Credit: https://stratocat.com.ar/fichas-e/2014/MCM-20141218.htm

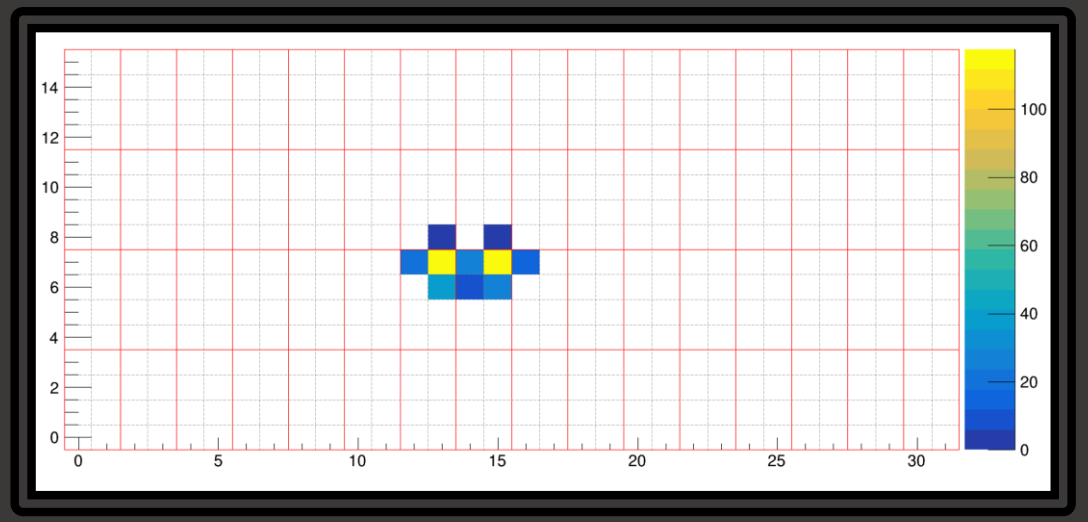


Credit: Nina McCurdy and Joel R. Primack/UC-HiPACC

The Earth Skimming Technique

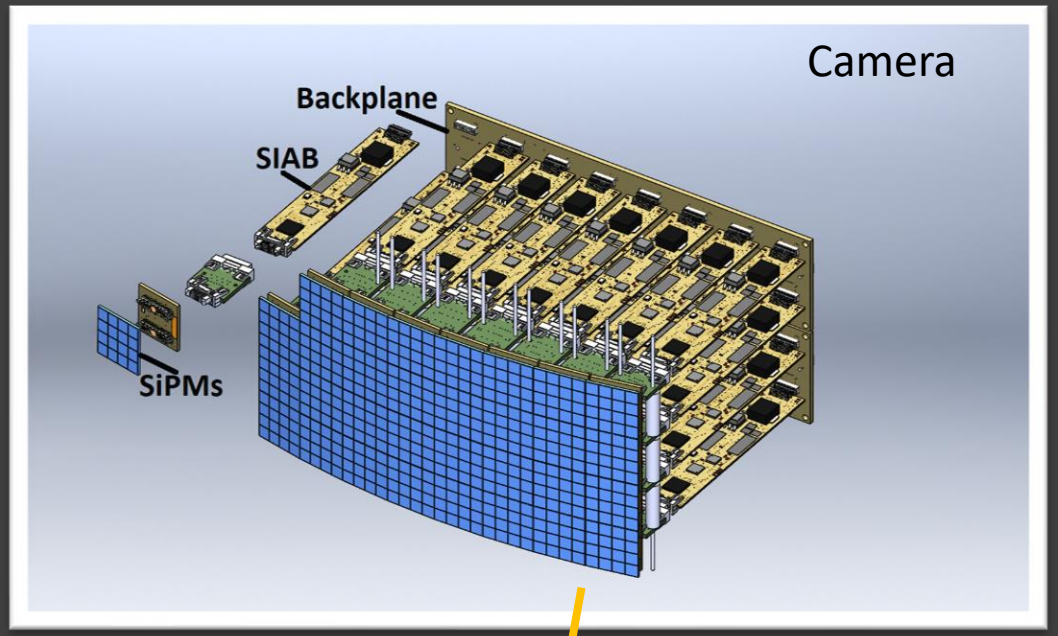


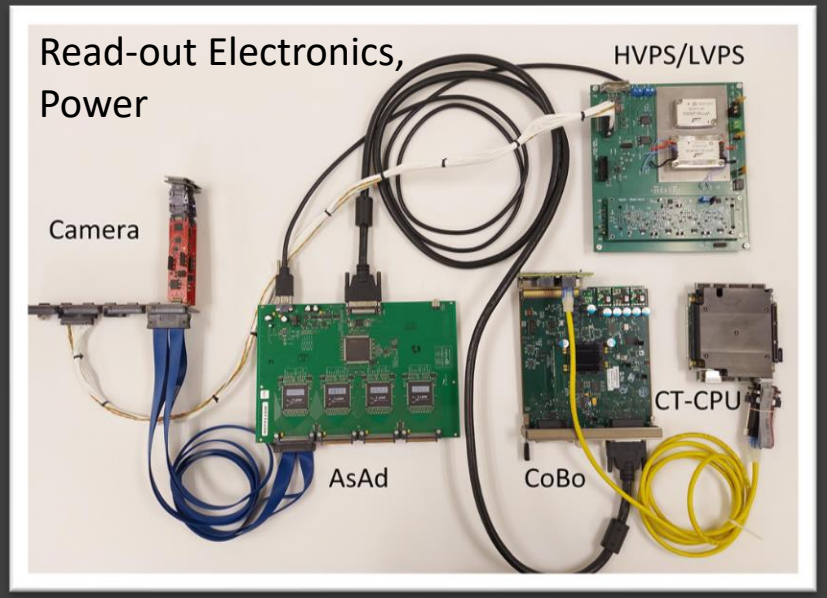
Test signal measured in a dark box, lab environment, based on current camera electronics.

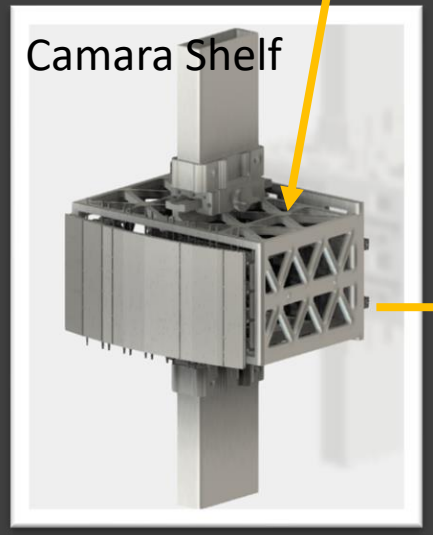


Bifocal optical design, lowers the threshold of accidental triggers.

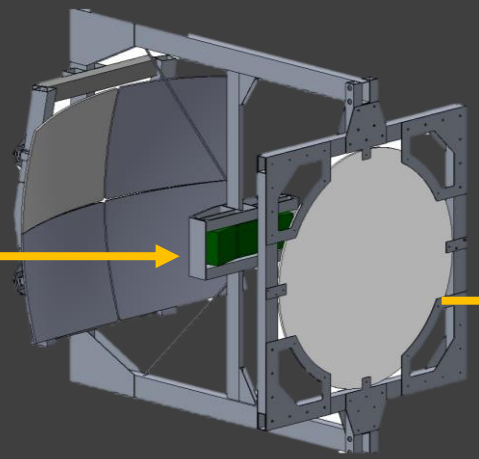
The Cherenkov Telescope

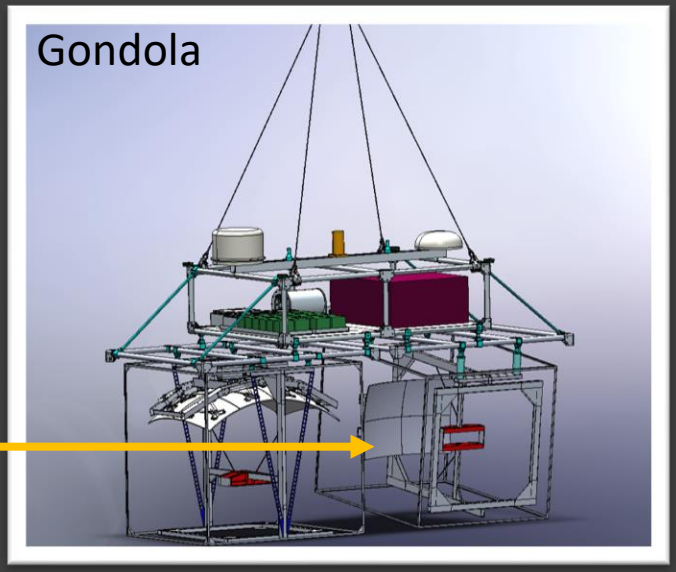






Cherenkov Telescope





Looking forward

- Incorporating and field testing the telescope in Colorado
- Data reconstruction based on simulations and methods for photon background and data analysis
- Preparations for the EUSO-SPB2 flight form Wanaka, New Zealand in 2023
- Providing background data and initial observations for future missions like Probe of Extreme Multi-Messenger Astrophysics (POEMMA)