

A Texas State University System Collaborative Initiative: A Proposed 1.5-Meter Telescope for Imaging and Spectroscopy in the Greater Big Bend International Dark Sky Reserve



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What



View from The TSUS Christmas Mountains property
Greater Big Bend International Dark Sky Reserve
(~22 magnitudes per square arc-second -- DARK)

Project Summary

Collaboration Research from Five Universities
in the Texas State University System (TSUS)

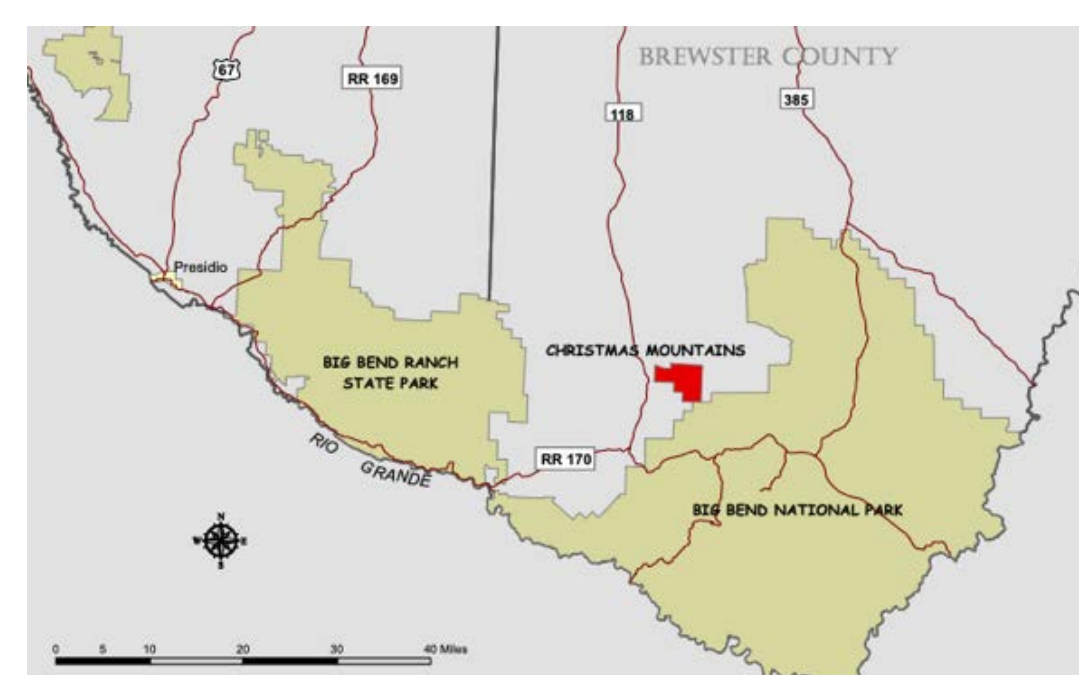
We propose to site and install

- a remotely operated 1.5-meter telescope
- imaging & spectrographic instrumentation

Supporting equipment includes

- a wind-resilient enclosure
- solar/battery power
- satellite communications (Starlink)

(Near McDonald Observatory – 120 miles NNW)



Why



Supernova (yellow arrow) in the M101 galaxy. Imaged May 2023 by Jerry Lin, near to the future telescope site. Taken with a 3.5" refractor during a Team Visit to CM

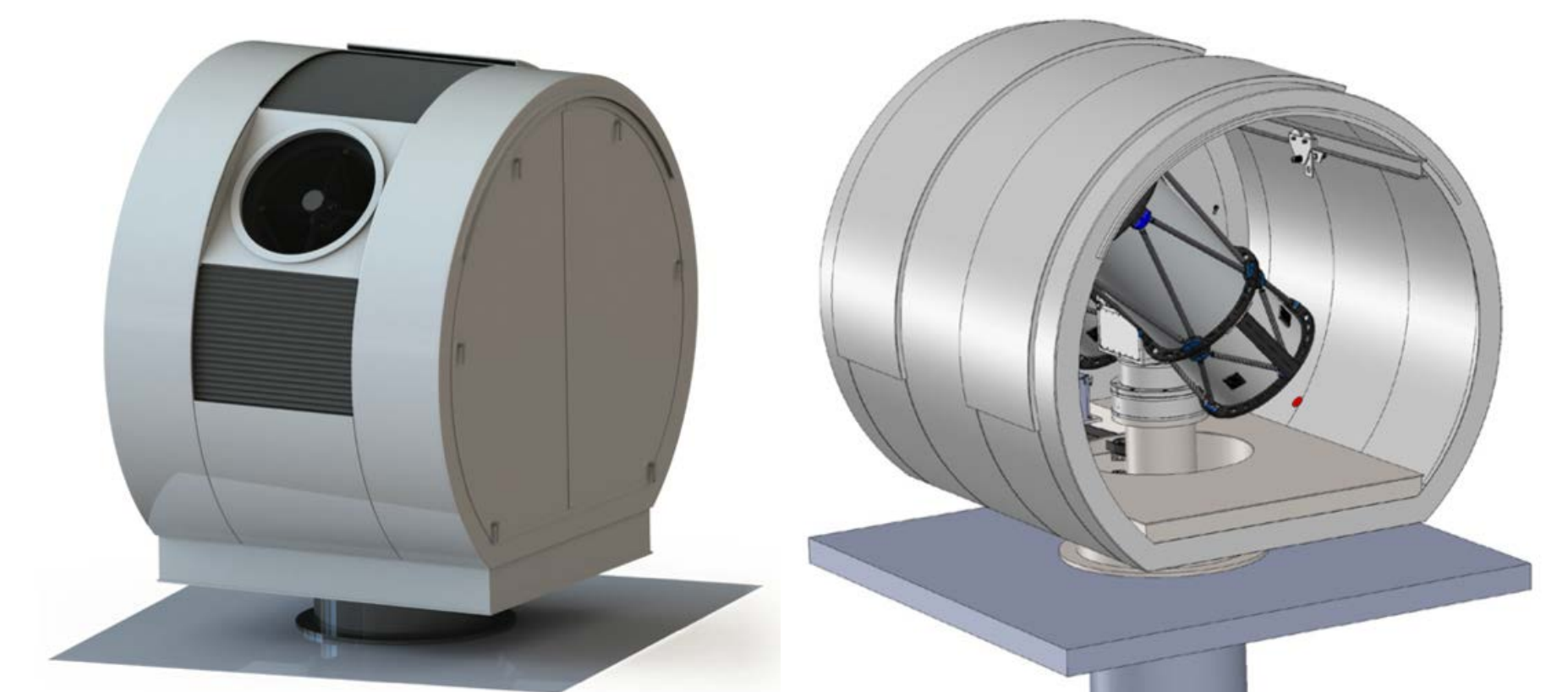
Medium-Sized Telescopes Opportunities:

- Network of medium-sized telescopes across the globe (currently only about 30 such telescopes across the Northern Hemisphere in this medium-sized class)
- Deep Field Studies
- Kilonovae in the optical range
- Measure central black hole masses and other galactic properties through Reverberation Mapping
- Study jets and outflows from young pre-main-sequence stars and their protoplanetary disks over long timescales of days to months to years.
- Other applications (Rice University)

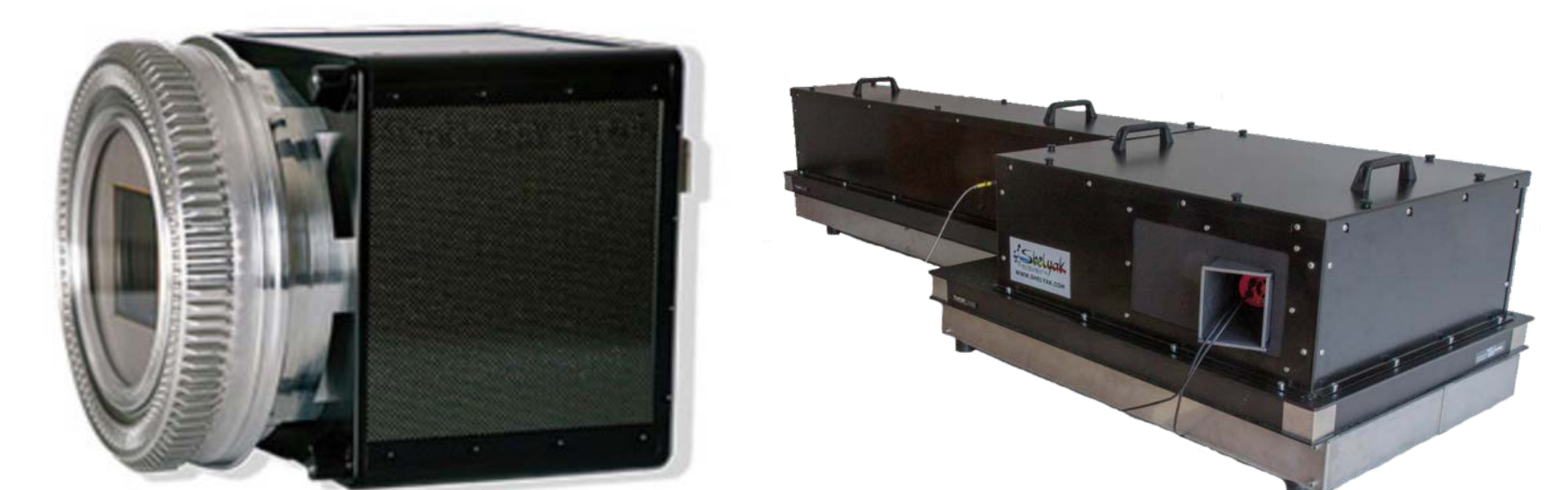
How



0.7m, 1.0m, 1.5m from Plane Wave Instruments



Low-Impact Weather Resilient Enclosure



Spectrograph: Whoppshel model from Shelyak: High-resolution fiber-optic ladder spectrograph with a resolving power of $R > 25,000$