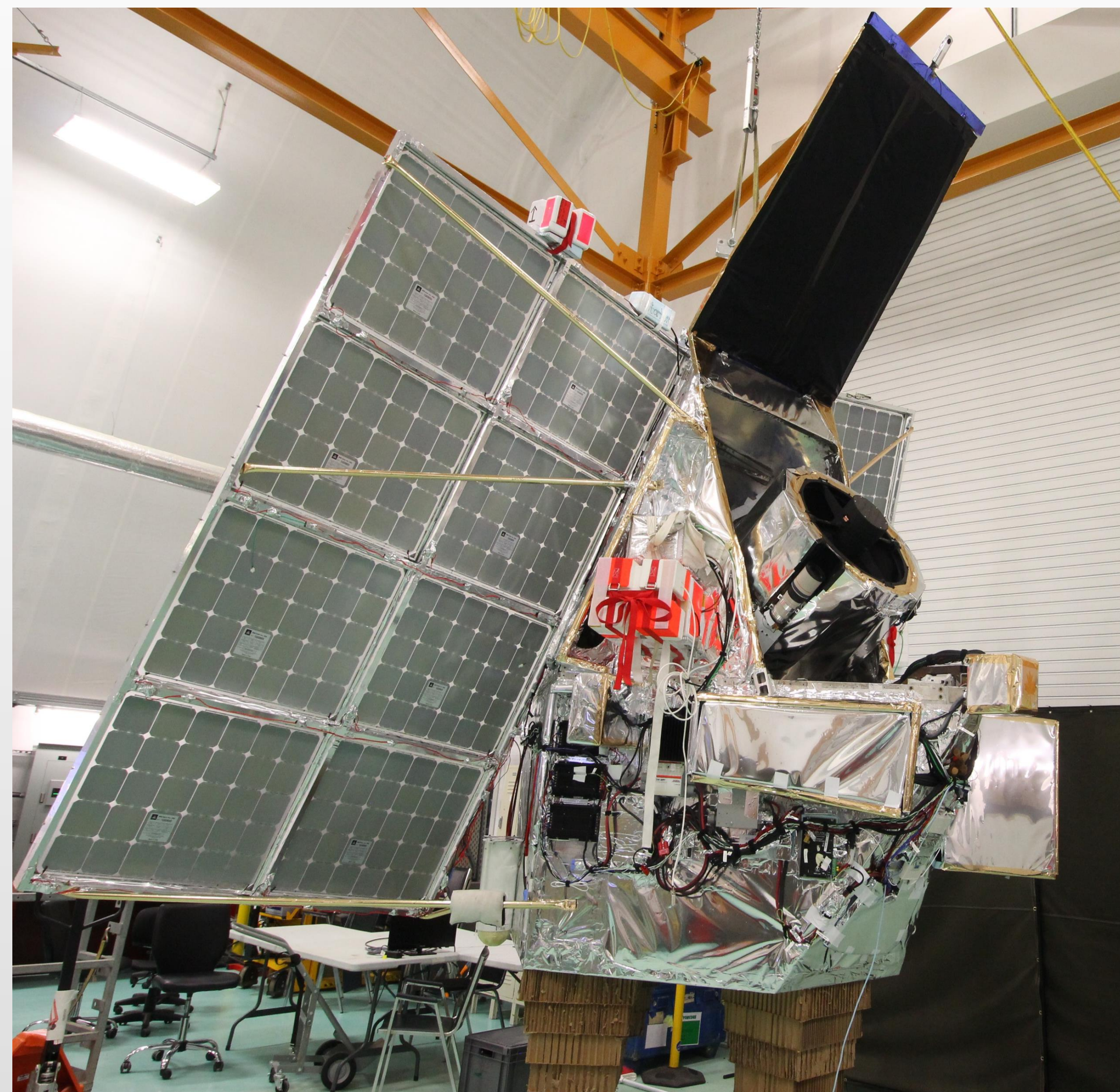


# Construction and Integration of the Super-Pressure Balloon-Borne Imaging Telescope (SuperBIT)

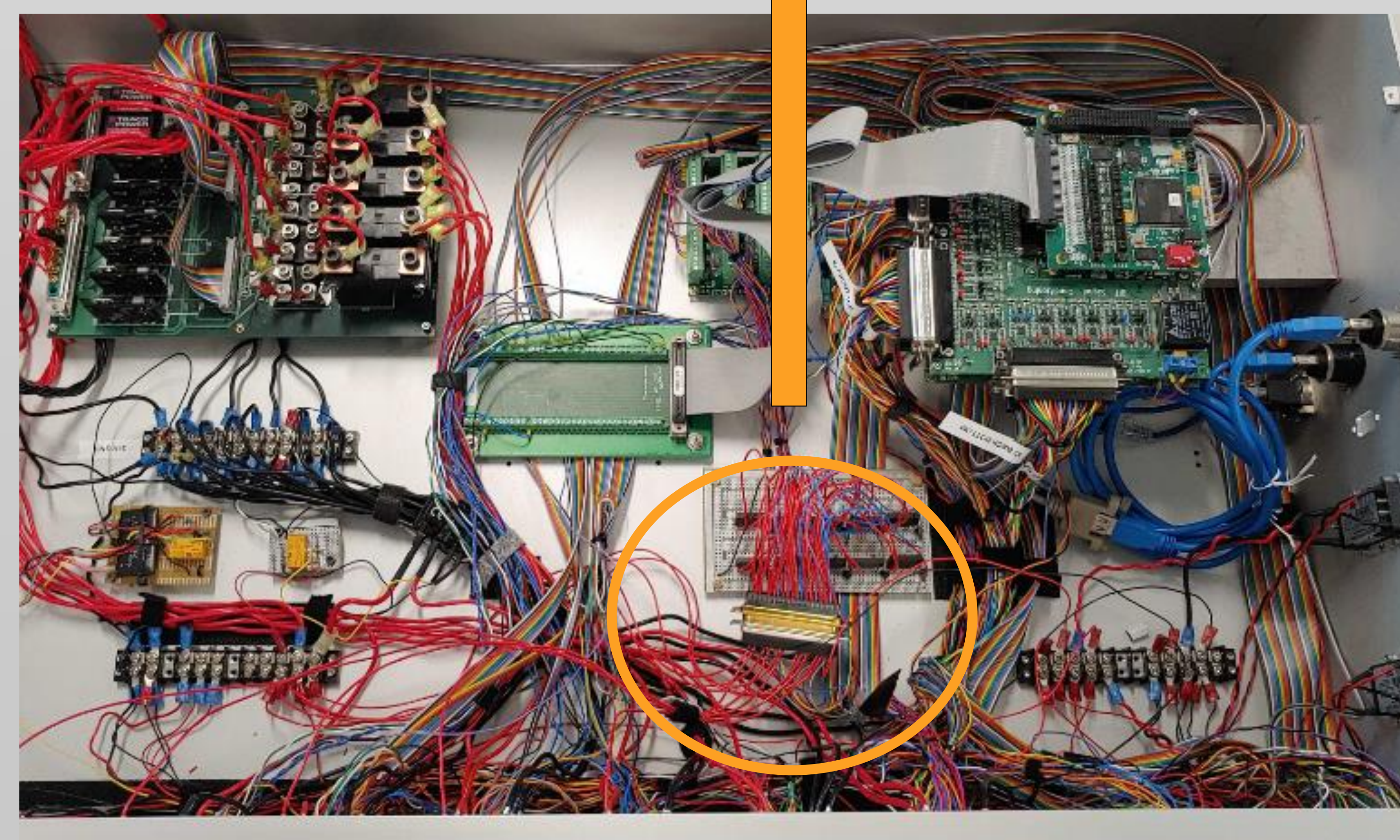
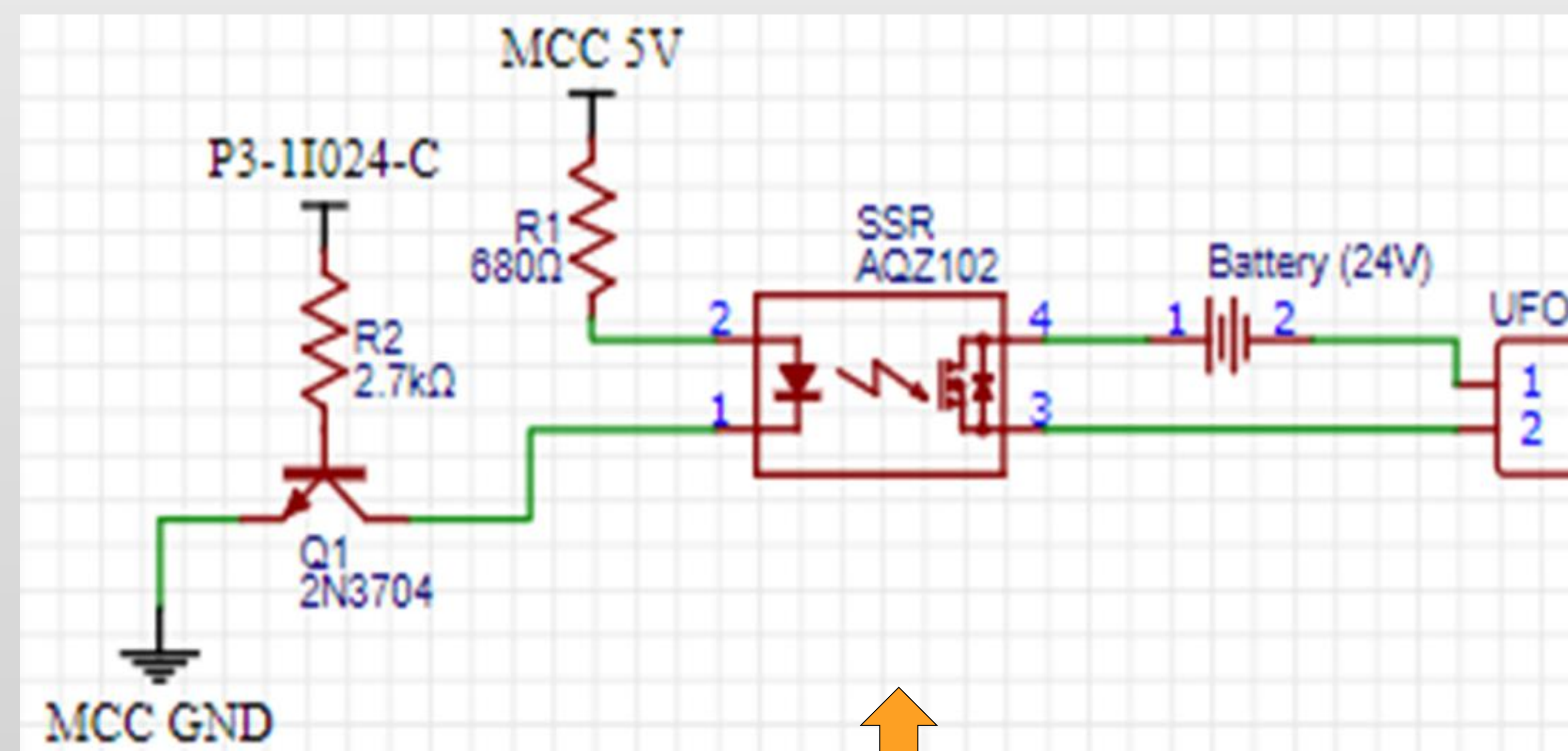
## Instrument Background and Science Goals



- A diffraction-limited, near-infrared to near-ultraviolet, wide field telescope
- Observations are conducted above 99% of Earth's atmosphere
- Primary research objective: understanding the behaviour and mapping the distribution of dark matter around galaxy clusters
- Upcoming integration in late 2021 at NASA Columbia Scientific Ballooning Facility (Palestine Texas)
- Final flight in Wanaka, New Zealand in 2022
  - 100 nights
  - Deep observations of galaxy clusters in near-infrared to near-ultraviolet

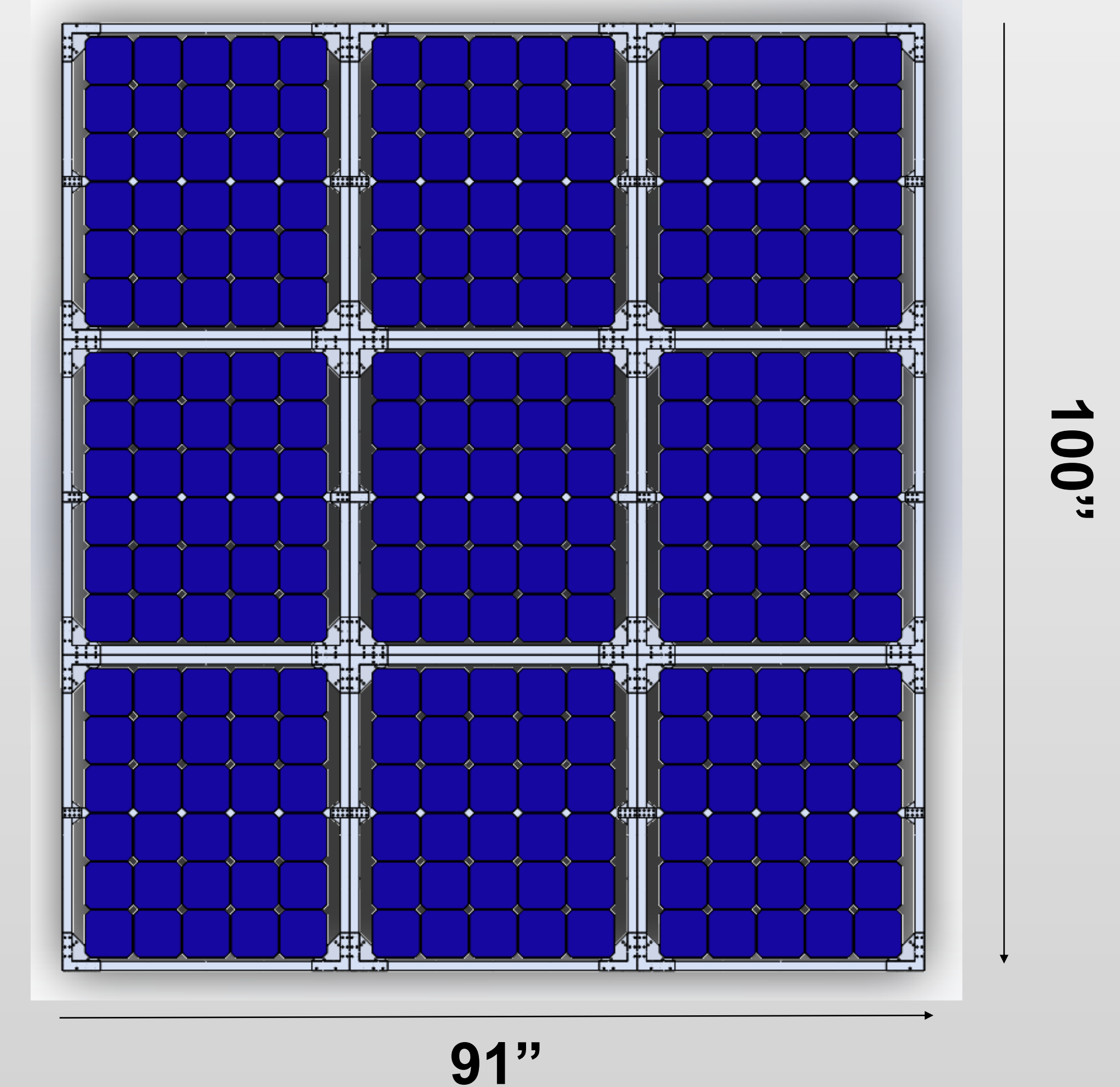
## Data Retrieval System (DRS/UFO) Power Circuit

- SuperBIT will carry more data than it can downlink
- Resultingly, the 5TB hard drives aboard SuperBIT will be dropped via parachute over areas more suitable for data recovery
- The DRS power circuit is employed through the regulation of power into the hard drives to control the timing of these releases
- Submodule consists of 10 relay-based circuits in total, each powering a separate load or hard drive
- Each circuit switches 4A of current



## Solar Array

- The solar array aboard SuperBIT charges the onboard batteries during the day
- My new design uses a modular approach for greater ease of transport and shorter assembly time
- Standalone frames can be assembled and disassembled rapidly at a campaign site
- Allows for efficient storage, packaging, and transport



## GoPro-Raspberry Pi (GoPi) Submodule

