

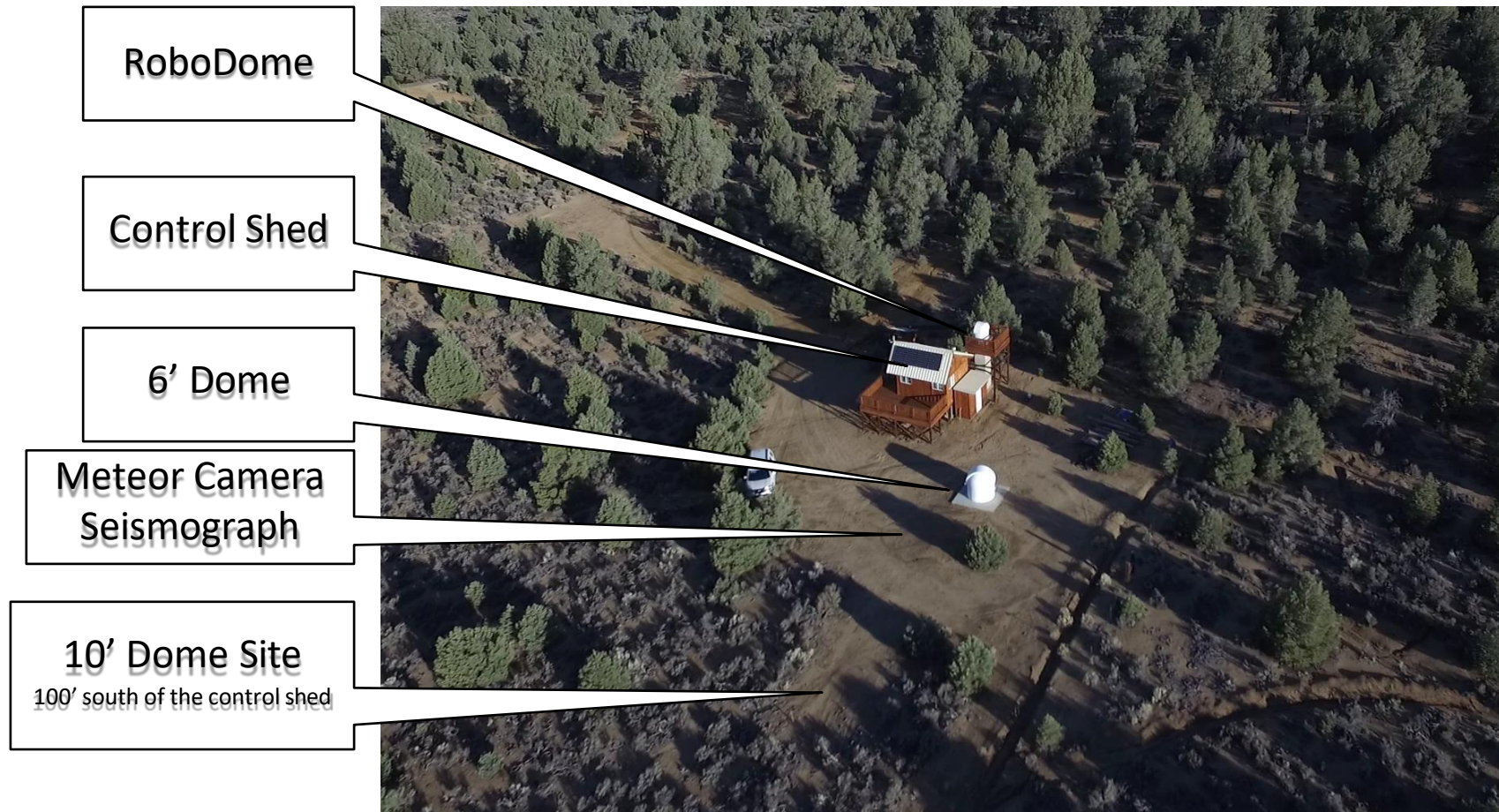
10' Dome Observatory Building

for a 17" CDK Telescope

Construction Project Exterior

June 15, 2021 to August, 2022

Observatory Layout



Polar Alignment 10' Dome Building

Building Polar Alignment:

1. A theodolite is setup and ready for darkness. I use this setup to align the concrete and cinder block structure to "True North".
2. One corner stake is placed, the theodolite is leveled and the stake is centered on the downward looking theodolite crosshairs.
3. After dark the theodolite is set to Polaris in altitude and azimuth,
4. An offset calculation for the alt az position of "True North" relative to polaris is made, based on local Sidereal Time.
5. The Theodolite Alt and Az are adjusted to true north.
6. Once theodolite polar alignment is achieved the next morning "only altitude" is adjusted such that the other markers are in line.
7. These two corners form a polar alignment reference for the concrete work.
8. Other edges of the concrete forms will be aligned parallel and orthogonal to this polar alignment reference.
9. A distant reference marker is painted on the control shed building.
10. Forms will again be checked prior to the concrete pour.
11. All of this is to simplify the initial polar alignment of instruments.
 1. Taurus 400 mount
 2. Seeing monitor
 3. Allsky camera

Polaris
(seen at night)

Reference
Distant
Marker

Second
Corner
Marker

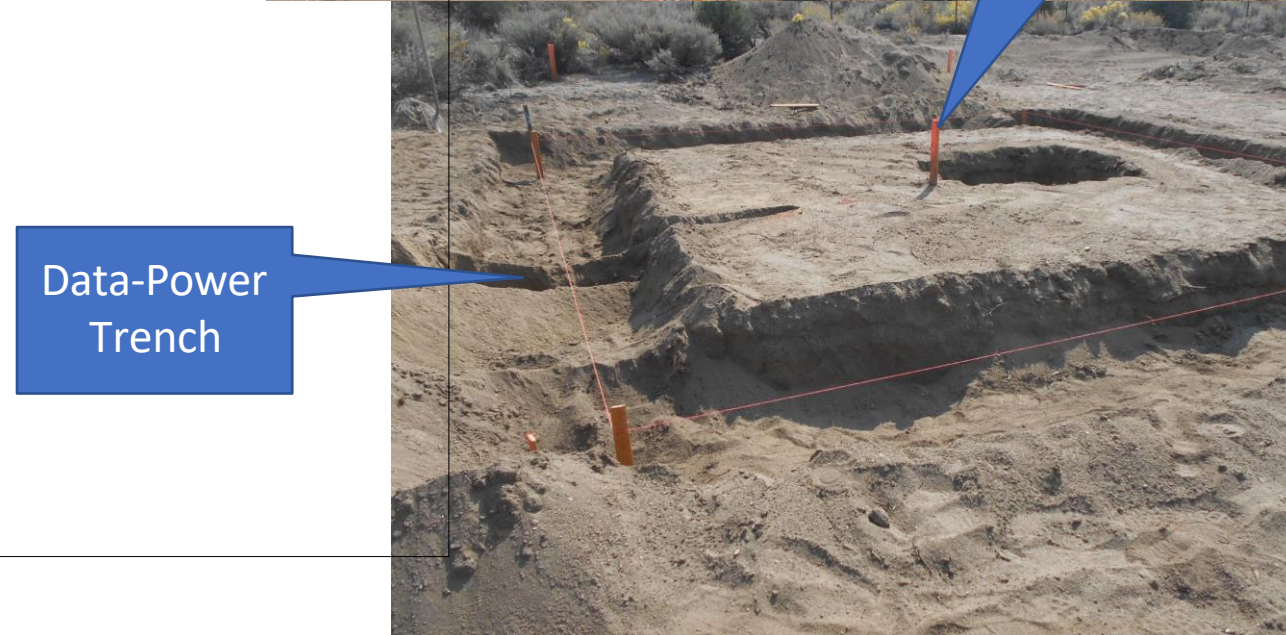
Theodolite

Reference
Corner
Marker



Layout for the Concrete Forms and Data-Power Trenching

- Trenching for the Data and Power conduit is set.
- Polar Aligned perimeter for concrete forms is laid out.
- Dome center marker is in place.



Data Line Trenching

20210920

Nearly 100ft from the control shed trenching is completed and ready for (2) 3" electrical conduits. One for data and another for power.

4' Robodome

Control Shed

6' Dome

24" deep Trench for data line and power line

Meteor Camera



Concrete Forms

20210922



18" Deep Footing

9" thick Floor

Data-Power Trench



Seismic Slab for Telescope Tower



Footings, Seismic Hole Data Trenching

Conduits
for Data
and Power



Rebar is installed for the floor and separate seismic slab

Electrical conduits in place



Concrete Perimeter Forms

Conduits
for Data
and Power

Seismic
Slab for
Telescope
Tower



Telescope is “On The Mount”

10-09-2021

- Ryan, Paul and Dave get the telescope on the mount for the first time, 10-09-2021
- Less than an inch from scraping the ceiling at closest approach.
- Yes those are Pam’s preschool toys in the background.



Paramount Taurus 400 Fork Mount Outside for star testing 10-10-2021

Hardware Specifications

- No meridian flips or dangling counterweights
- Tracks objects up to six (6) hours beyond meridian
- Extremely stable equatorial fork design
- 150 pound (68 kg) total instrument capacity
- Compatible with Schmidt-Cassegrain telescopes and truss OTAs up to 17-inches
- 20 arcseconds or less standard pointing accuracy
- 10 arcseconds or less with optional on-axis encoders (OAE)
- Optional on-axis encoders deliver sub-0.1 arcsecond resolution for optimal performance
- Belt-driven gears with spring loaded worm to gear interface results in virtually zero backlash
- Integrated azimuth and elevation polar-alignment adjustments
- Slews at 3.5 degrees per second in both axes
- Exceptionally comfortable access to eyepieces
- All standard electronics and through-the-mount-wiring are enclosed inside the mount
- Ample space for additional through-the-mount and fork-routed cabling
- Power supply and PC to mount cabling included



PlaneWave Instruments CDK17

- The PlaneWave Instruments CDK17 is a 17-inch (0.43 m) f/6.8 Corrected Dall-Kirkham Astrograph telescope. The CDK17 has a dual carbon-fiber truss design, with 3 cooling fans ejecting air from the back of the telescope, and 4 fans blowing across the boundary layer of the mirror's surface. The CDK17 covers a 70 mm field of view without any field curvature, off-axis coma, or astigmatism. The instrument weight is 94 lbs (43 kg) and comes standard with a back plate retaining ring ready to accept the focuser of your choice.

| | |
|-----------------------------------|---|
| Optical Design | Corrected Dall-Kirkham |
| Aperture | 17 inch (432 mm) |
| Focal Length | 2939 mm (115.71 inch) |
| Focal ratio | F/6.8 |
| Central Obstruction | 23.7% by surface area; 48.6% of the Primary Mirror Diameter |
| Back Focus from Mounting Surface | 10.24 inch (260 mm) |
| Back Focus from Racked in Focuser | 7.24 inch (184 mm) |
| Weight | 106 lbs (48 kg) |
| OTA Length | 42 inch (1067 mm) |
| Optical Performance | 6.5 micron rms at 21mm and 9.6 micron at 26mm off-axis |
| Upper Cage | Carbon Fiber Truss |
| Lower Cage | Carbon Fiber Truss with Carbon Fiber Light Shroud |
| Optimal Field of View | 70mm Image Circle |



The Big Pour

10' Dome Project

28.5 Wet Tons of Concrete

| | Truck1 | | Truck2 | | 8.34 |
|-------------|--------|--------|--------|--|-------------------|
| H2O allowed | 342 | gal | 209 | | |
| H2O Batched | 305 | gal | 188 | | 4111.62 |
| Cement | 5120 | pounds | 3090 | | |
| 3/8 AG | 3040 | pounds | 1880 | | |
| 1" AG | 10800 | pounds | 6640 | | |
| W Sand | 13840 | pounds | 8600 | | |
| Recover | 102 | Fl/ Oz | 63 | | |
| | 32800 | | 20210 | | 57121.62 28.56081 |



Monday October 11, 2021



A Cold Night but All Right October 12, 2021



A Dusting of Snow
Clear and 16°F from
Midnight to Dawn
10-12-2021



Tarp covering removed
in the morning

Review of Next Phase and Critical Dimension Confirmation

Brian and Martin
Inspect the Slab



30" between the
South Pier and the
Inside Wall



Forms Removed 10-15-2021

Seismic Slab

18" Footing



Data-Power
Conduit



Telescope Pier Almost Complete 11-03-2021

Telescope
Pier



First Cinder blocks Laid for the Walls

Telescope Pier



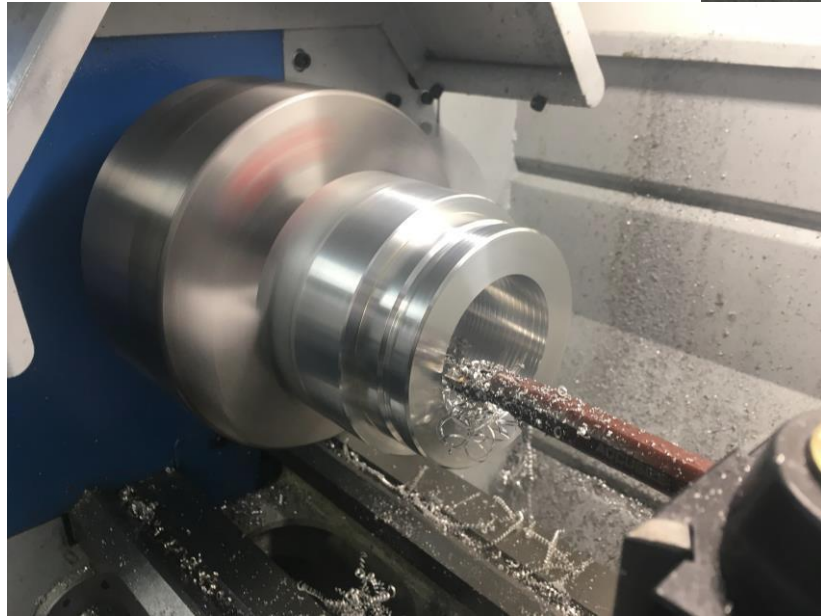
Martin Sets the First



Monochrome F/6.8 Camera, Filter Wheel, and Off Axis Guider

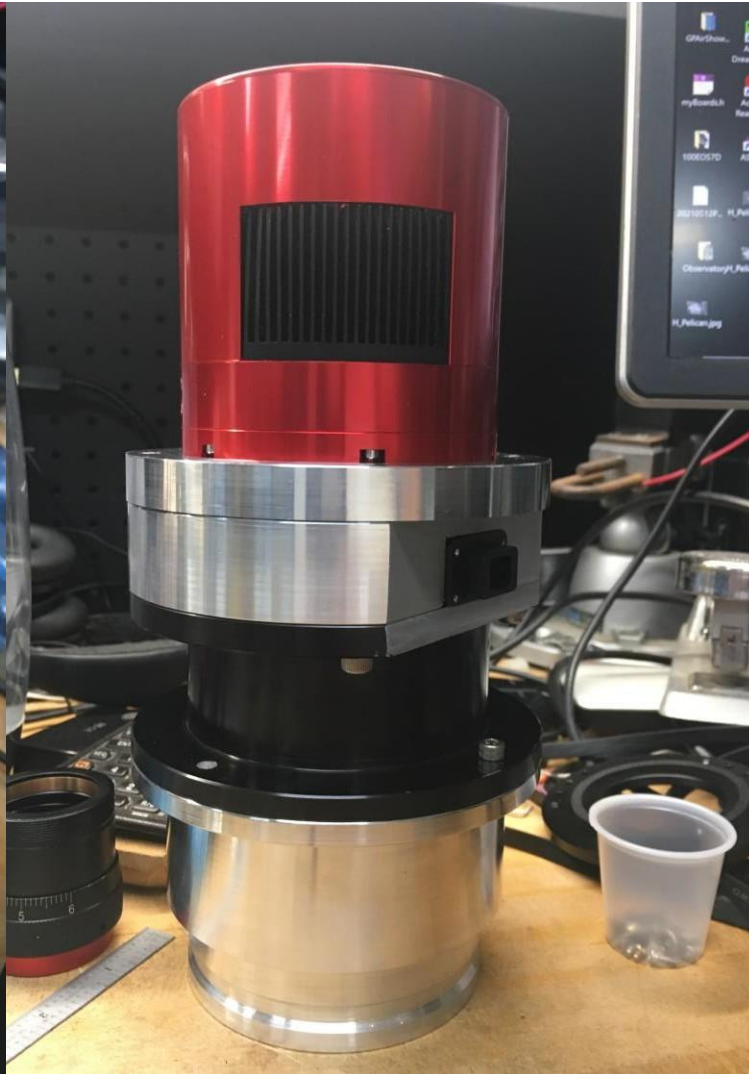
November 2021

Machined housing for the "Native F/6.8 Monochrome camera



ASI6200 One Shot Color Camera With Off Axis Guider

November 2021





Visual Back Machined in House



Pier Complete and
Walls Started
11-19-2021



Walls
Progressing
Nicely
11-29-2021



7-Rows
of Wall
12-04-2021



7-Rows of Wall

12-04-2021



Cold weather puts an end to construction for the next few months



Shutter for CDK17

November 2021



Shutter covering the central baffle

Primary cover in place

Stepper Motor with 100:1 gearbox direct drive

Shutter fully open

Baffle shutter used for dark frames and to protect field lens elements During non-use times



Dome Arrives on the Property

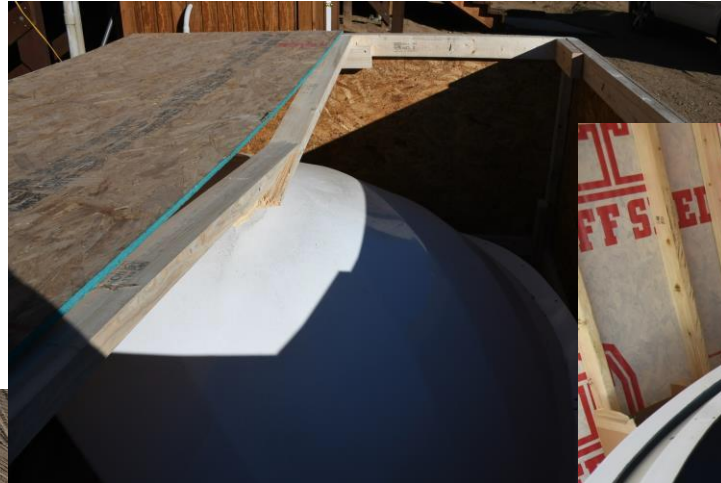
12-03-2021

The shipping company deemed delivery on site “Too Dangerous”
So I rented a U-Haul truck and drove it up myself

Will, Scott, and Martin unload it “On-Site”.



Dome Uncrated and In the Tuff-Shed 12-04-2021



The dome is uncrated and stored in the "Tuff Shed" for the winter.

Construction Starts May 2022



Floor Joists

After a few months things warm up enough to start construction again

The cinderblock walls are completed and the Floor joist framing work begins

Cinderblock wall

Meteor Camera
(Future home)

6' Dome
Housing the
Melior apo

Floor Joists in place May 2022

Good to have things progressing again
Floor joist framing is complete



Wall Framing Complete May 28 2022



Wall Framing is complete.
The dome base ring framing is partially complete

Dome Base Ring Framing Started



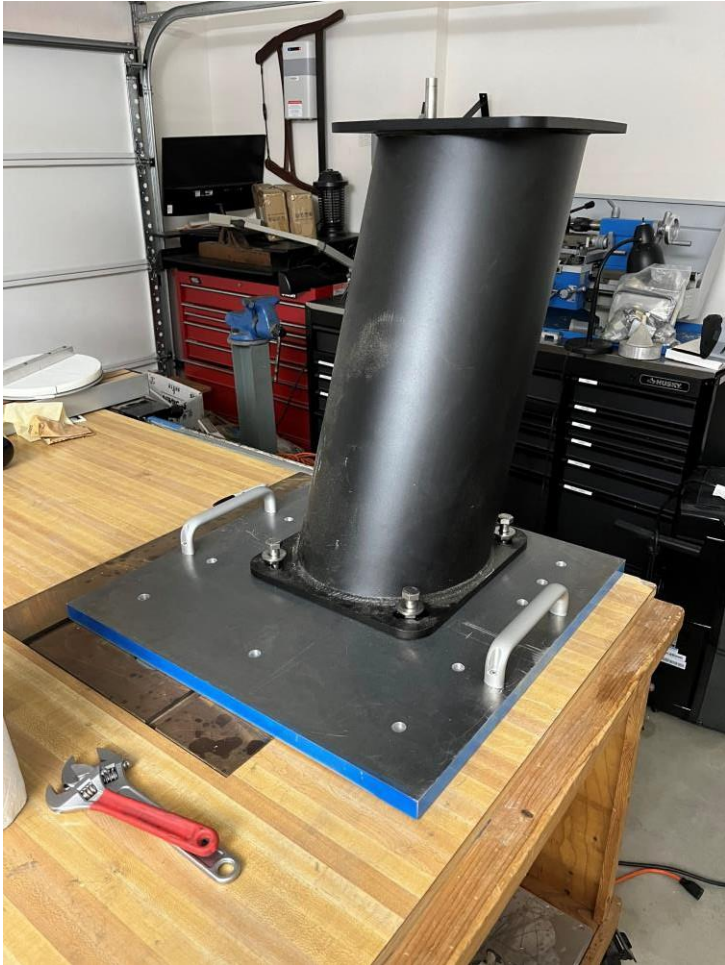
Wall Framing Complete

Martin and Jack

Cinderblock wall

June 2022

Taurus 400 steel pier, atop the aluminum pier plate



Grandson helps drill holes in
"Pier Top"
1" thick aluminum plate



Aluminum pier plate mounted on
The cinderblock pier with a lot of
epoxy and 1/2" stainless "j-bolts"
in the concrete cap..

Good and level



June 15 2022

Marci and Martin finish the vapor wrapping of the wooden framing

Marci, Martin and I start assembly of the dome skirt and fiberglass dome ring.



Dome
Fiberglass
Ring

Dome Skirt

Vapor Wrap



June 15 2022

Martin drills holes for door framing fasteners



Skirt placement set and clamped in place



Martin, Marci and I install T-111 siding on the upper framing

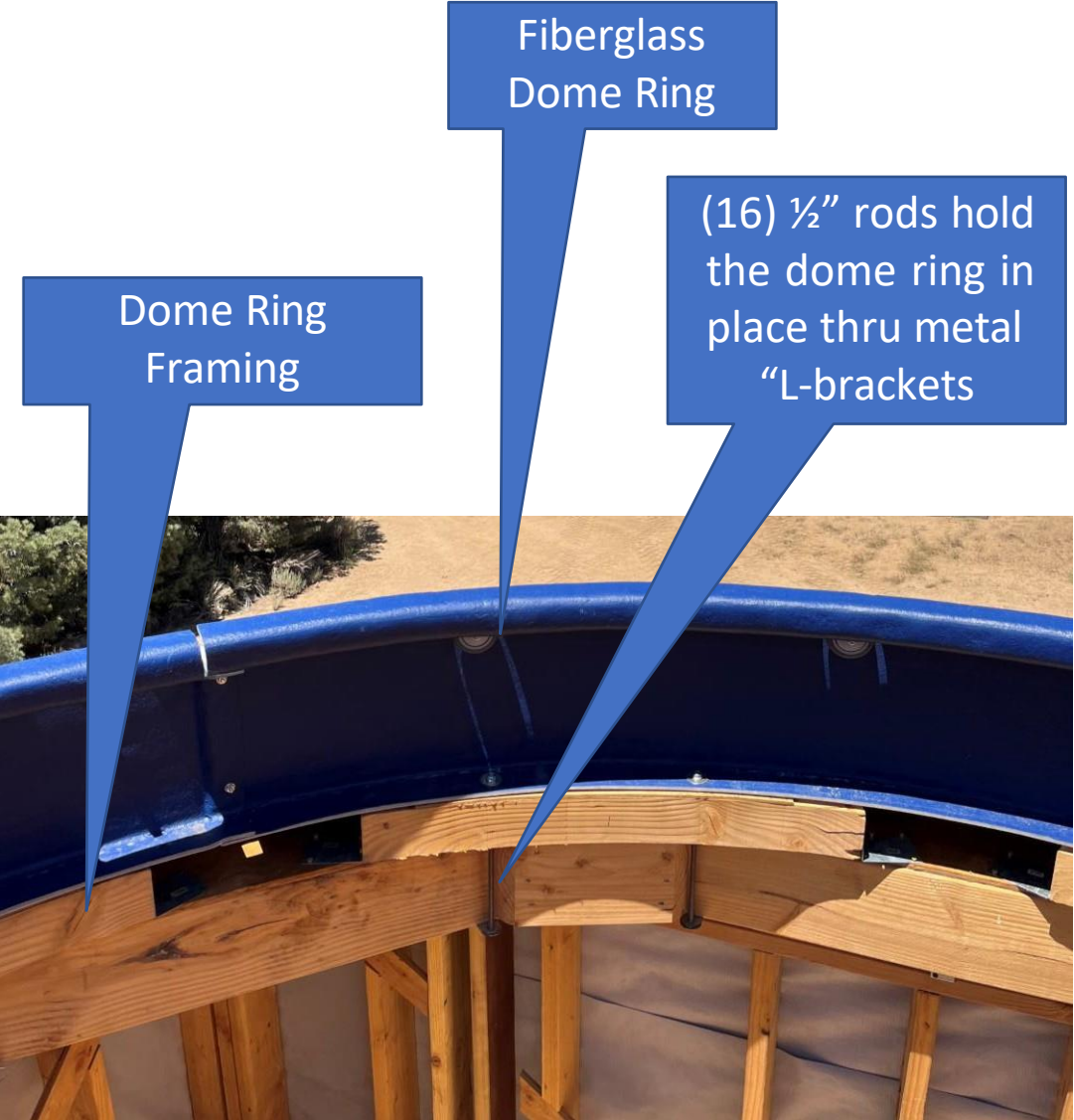


June 16 2022

T-111 Siding install complete



Fiberglass Skirt and Dome Ring Installed



June 24, 2022 Dome Assembly

The Dome in preassembled on the deck



Finally the Crane Arrives July 8, 2022

The Crane is delivered to “Grumpy Bear’s Restaurant



Martin and the Crane “On-Site”



Dome Prep and Test Lift July 8 2022

The Dome is fitted with eyebolts and ready for the morning lift



July 9, 2022

The Dome is lifted on to the building



(2) Sections of the dome ring are removed and the remaining (2) sections are partially loosened for the dome placement.

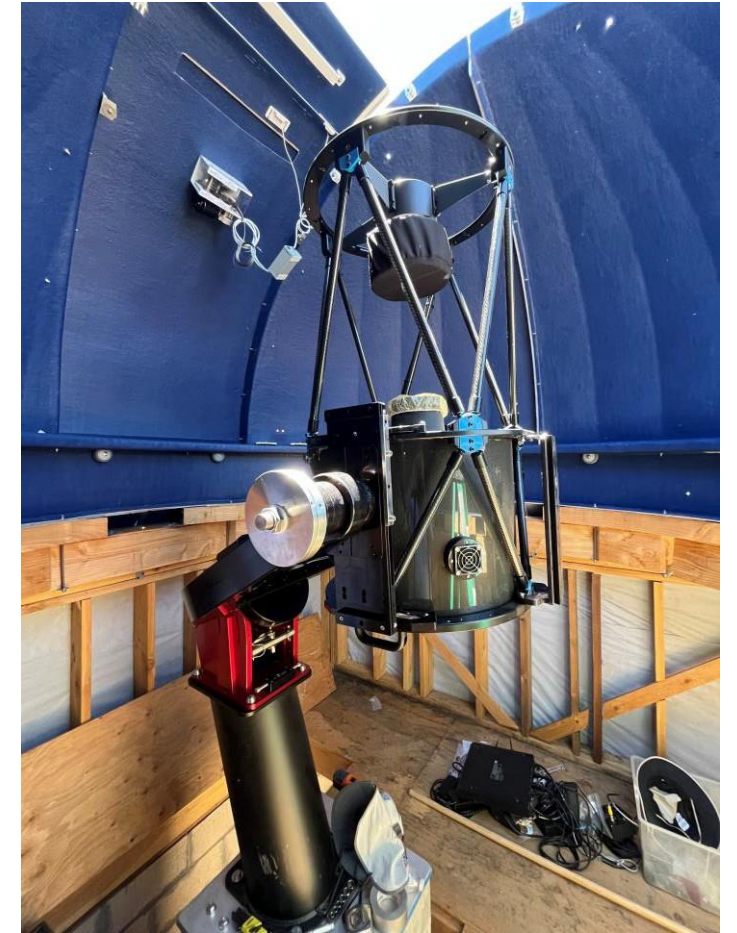
With the dome in place the dome ring sections are reassembled.

The dome easily rotates with a push to any azimuth position.

July 9 2022

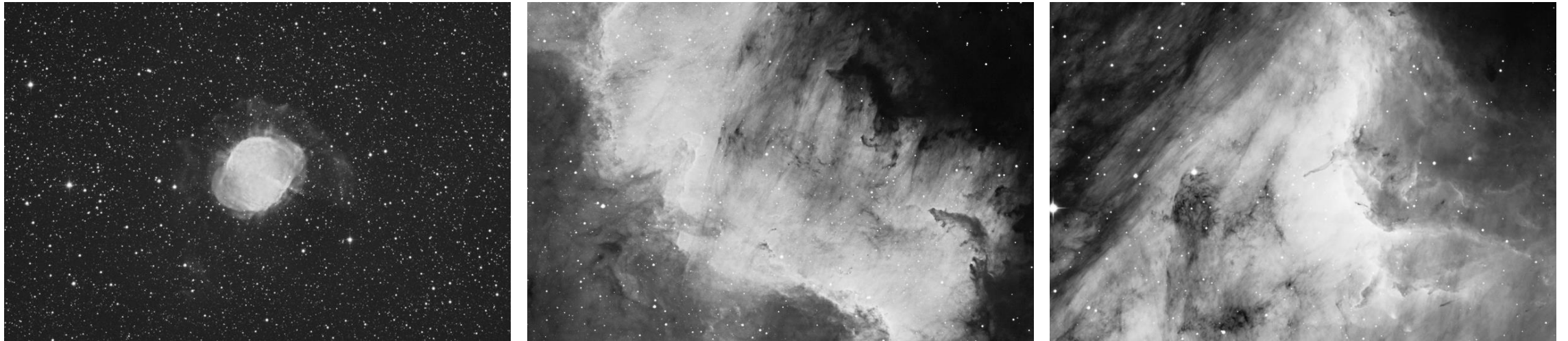
CDK17 Install

With the dome in place the CDK17 is lifted from the deck and lowered into the dome.



First Mono Images from the CDK17

July 23-24, 2022

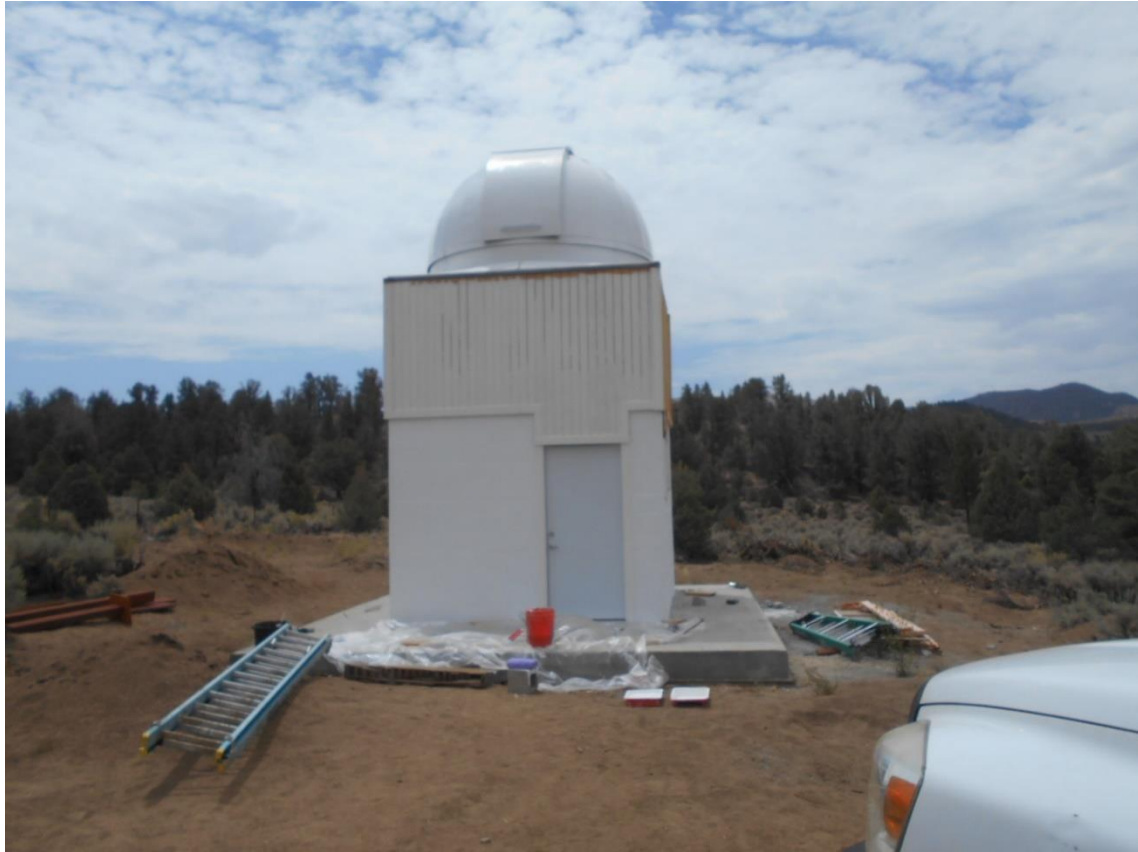


OIII focus is different than other filters due to thickness.

Proper focus on the guide camera requires adjustment, thus guider focus will be added

Exterior Painting “White”

Painting Started July 27, 2022



July 29, 2022... A few more coats should do it...

August 1, 2022



Exterior Painting “White”

Painting Completed Aug 10, 2022 (4-coats on everything)



View from the road

Construction of 10' Dome Complete



- Internal finish work will start with wiring and control systems.
- Additional solar panels will be added