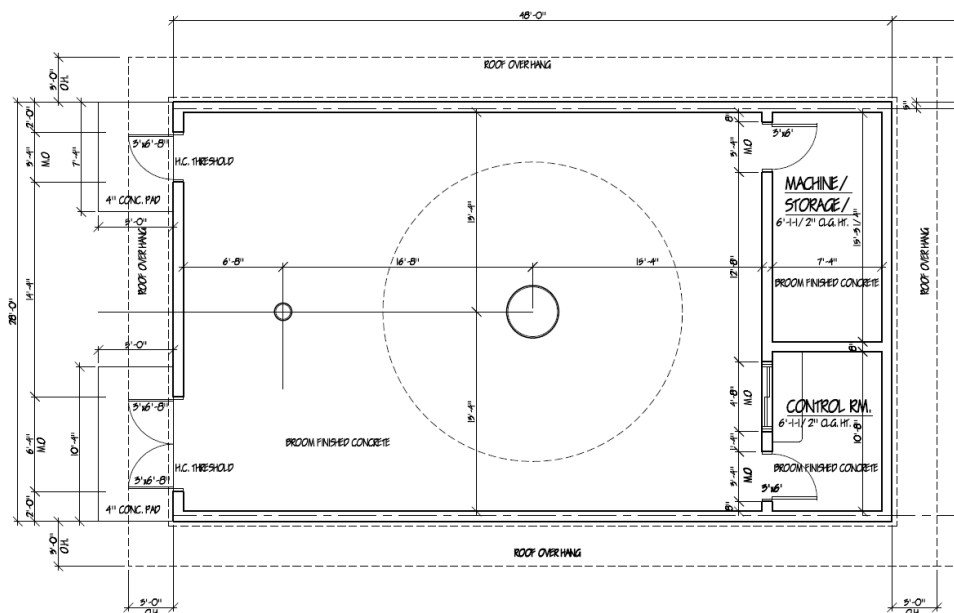


The Mayland Community College Blue Ridge Observatory and Star Park 2016 Annual Report

The Mayland Community College Blue Ridge Observatory and Star Park has had a sparse year for activities at the park, because the facility is not yet open at night. We have, however, been very active throughout the year to correct the situation. The land has been cleared, the road has been improved, construction of the Bare Observatory will soon begin, and we plan to take delivery of the 34 inch telescope in December.



Mayland's President, Dr. John C. Boyd, has worked tirelessly with the college's foundation on numerous mini-events throughout the year which have raised over \$10,000.00 for the project. A successful grant application to The Charles Cannon Foundation, Inc. resulted in an additional \$100,000.00 to be used to assist with the construction. This year has been one of many planning committee meetings during which several rounds of revisions for the observatory building drawings were made. Ultimately the observatory was lengthened eight feet [to 48' X 20'] to accommodate a second pier that will house a planetary scope. Through careful engineering the walls of the roll-off roof observatory have been lowered to allow better viewing angles, and the doors have been widened to allow greater flexibility during scope installation and for future routine maintenance.



The committee discussed and approved the following upgrades for the telescope:

- 1) A new design named The Horizon GEN2 that uses more up-to-date mirror supporting techniques.
- 2) A redesigned lower edge mount support and precision spherical bearings for all the crossbars and triangles. The mirror cell frame will be manufactured from steel instead of aluminum.
- 3) A completely new designed secondary optic holder that addresses the problem of pressure induced astigmatism caused by expansion and contraction created by temperature changes.
- 4) A lower profile rocker box that equates to better stability throughout the structure. Better stability means the telescope will be able to handle higher magnification at the eyepiece.
- 5) A mirror box with fiberglass reinforced plastic insulation that aids in keeping the mirror closer to the ambient air temperature. This is very important for high-power planetary and deep sky viewing.
- 6) A boundary layer fan option with fans slightly above the mirror surface blowing a column of air over the surface rather than on to the edge as in the old design. This will reduce the amount of turbulent air on the surface of the mirror during cool down.
- 7) A power ground board that allows power to be brought to the telescope from the ground into the structure without binding any wires when the scope rotates in azimuth.
- 8) A truss spreader option that is actually part of the transport system. The truss spreader is an octagon ring that mounts inside the truss poles that hold upper tube assembly. This ring applies preloaded pressure to the trusses which stops reoccurring vibration in the system.
- 9) A powder coating finish baked on to all interior and exterior metal surfaces for durability.
- 10) A remote wireless collimation system that will allow a single user to wirelessly align the optics while in the eyepiece of the telescope.

Lastly, the highly rated ISTAR Phoenix WXT 204mm F/6 Wide Field Refractor was purchased for installation on the side of the main scope to serve as the finder scope.



Lighting Guidelines & Sky Quality Measurements

There have not been any additions, deletions, or changes to the outdoor lighting since our initial application in 2013. All planned lighting for the new observatory is well within our approved Lighting Action Management Plan's guidelines. From the very beginning the sky quality measurements have been coordinated by Bob Hampton the president of the Blue Ridge Astronomy Group. Below is his most recent report:

2016 Annual SQM Readings

Readings taken on the night of Sept. 6/7, 2016

Sky conditions: 100% clear sky, no clouds visible, 5 day old crescent Moon set at 10:56 PM.

Readings by Bob Hampton, John Maddox, and Don Silver, of the Blue Ridge Astronomy Group

Transfer Station

9/06/2016 11:27 PM, temp 62 F. (16 C.)

Meter Angle 90 degrees

21.20

21.19

21.16

21.24

21.15

21.14

21.16

21.14

21.14

21.15

Average = 21.17

Meter angle 45 degrees, to East

20.91

20.93

20.91

20.90

20.97

20.88

20.87

21.06

21.05

21.03

Average = 20.95

Bare Dark Sky Observatory Site

(Our first readings here, trees recently removed for construction)

11:40 PM, Temp 67 F. (19 C.)

Meter angle 90 Degrees

21.17

21.17

21.16

21.17

21.16

21.17

21.17

21.18

21.16

21.15

Average = 21.22

Shooting Range

11:55 PM, Temp 68 F. (20 C.)

Meter angle 90 Degrees

21.16

21.16

21.18

21.18

21.18

21.19

21.22

21.18

21.17

21.19

Average = 21.18

Meter angle 45 Degrees to South

21.03

20.94

20.96

20.90

20.94

20.88

20.93

20.96

20.99

20.93

Average = 20.95

Light Meter (former "Green Machine" location)

9/07/2016, 12:00 AM, 66 F. (19 C.)

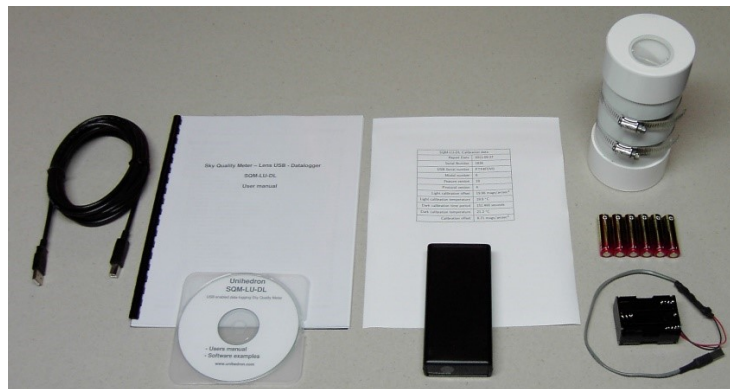
Meter angle 90 Degrees

21.16
21.15
21.13
21.14
21.17
21.16
21.16
21.16
21.13
21.12
Average = 21.15

Energy Xchange (parking lot)

12:10 AM, 67 Degrees F. (19 C.)
Meter Angle 90 Degrees
21.24
21.19
21.23
21.22
21.21
21.21
21.19
21.21
21.19
21.20
Average = 21.22
END OF REPORT

The overall readings have lowered slightly from an average of 21.23 last year to 21.18 this year. These are still well within the Silver range. There could be many factors involved and we will continue to monitor it. Since the very top of the mountain has been cleared for the construction the first actual readings from the observatory site were made where an average of 21.22 shows that to be the darkest spot in the park this year.



Once the observatory is operational our Unihedron SQM-LU-DL Datalogging Sky Quality Meter with narrow Field-of-View will be installed on site to continuously monitor the sky conditions over the site.

Commitment to Education & Outreach Programs Held

The following programs related to at the Star Park were held this year:

- ❖ March 15, 2016 Jon Wilmesherr spoke to the Spruce Pine Kiwanis Club about the significance and importance of dark skies.
- ❖ In April Bob Hampton led a three night continuing education course at the park offered by Mayland Community College entitled Understanding & Using a Telescope.
- ❖ On August 11 2016 Bob Hampton and his Blue Ridge Astronomy group met with a group from Chicago at the Dark Sky Park to observe the Perseids Meteor Shower.
- ❖ In late August and early September Bob Hampton led a three night continuing education course at the park offered by Mayland Community College entitled Observational Astronomy.
- ❖ The Blue Ridge Astronomy Group has been having great success hosting the New Horizons groups of visually impaired people and their escorts. The latest outing was on September 6, 2016. After a short lecture and tour of the night's sky some members actually looked through telescopes that night. Later on, that after moon set the club took the meter readings contained in this report.

While our star park remains open all night every night for pedestrian traffic, years of work and planning behind the scenes are coming together to take Mayland Community College's Blue Ridge Star Park to the next level. The new Bare Observatory will feature a 34" f/3.6 Newtonian telescope custom made by Michael Zammit of [StarStructure Telescopes](#) using a specially ground mirror made by Michael E. Lockwood of [Lockwood Custom Optics](#). The new facility will allow us to have regular public events in the park and greatly increase our dark sky programming to the public. The site has been cleared and the road leading up to it is being improved by widening, installing appropriate drainage, and the addition of eight inches of gravel to the road surface. Hopefully we will have the opening of the new observatory in late December and what better night to aim for than the longest night of the year?



Submitted September 29, 2016 by Jon Wilmesherr