VIEW OF A LIFETIME: 60” HALE ON MT. WILSON

I stumbled onto this adventure by complete serendipity: I visited the Griffith Observatory in Los Angeles one Saturday afternoon when they were having a star party sponsored by the Los Angeles Astronomical Society (LAAS). About 50 scopes were setup on the front lawn awaiting nightfall. I toured the exhibits, attended a planetarium show and had a bite to eat.

The Observatory had closed for several years for a complete restoration and expansion. It is amazing what they did since my last visit years ago: In addition to restoring the classic interior, they added a new subterranean level with a new theater, additional exhibits, a gift shop and café. On the front sidewalk, they engraved the scaled orbits of the planets to give a feel for the size of the solar system. Their website is here: http://www.griffithobs.org/

After touring the building, I went to the star party. Here is a photo of the star party on the front lawn of the observatory where the LAAS Members are setting up their scopes. The dome on the left is the home of the 12” APO. Note the line of people waiting to get in:

Just about all scopes were pointed either at Saturn or the moon. Nice views with a range of 6” Apo’s through 12” Cass to 20” Dobs. Then I saw a scope pointing north: “What are you sighting”, I asked. “24 Comae Berenises” he replied. What a beautiful double. One yellow, one blue. A virtual clone of Albireo!

24 Com	K2III Mag 5.1 yellow Primary with a B (Blue) Mag 6.3 Secondary, Sep 20.1”
Albireo	K3II Mag. 3.4 yellow Primary with a BOV (Blue) Mag 4.7 Secondary, Sep 34.7”

I had not heard of 24 Com before. Being a Bino Double Star chaser, it will become a regular on my double tours. Then I stumbled onto the LAAS booth and picked-up some literature. I checked out their website when I got home. I was, frankly, amazed at the extent of their organization and scope (ha!) of their programs. They even have some land 90 miles north of L.A. where they sponsor monthly Pot Luck/Star Party/Over-Night Sleep Overs! There are about a dozen concrete pads with power for your rig.

Also on their website was information about viewing through the 60" Hale sponsored by the Mt. Wilson Observatory (MWO). MWO has retired the 60" from scientific use and has dedicated the scope to public viewing. It is now the largest scope in the world dedicated to that purpose. MWO rents scope use for $900 for a 4 hour viewing session ('til 1:00 A.M.) and $1700 for a full night. LAAS has booked 4 half-nights and 1 full night for the summer. They limit space to 25 spots for members and guests for $45 each/half-night. Well, I had to join and book the last spot for June 7th. This is an entirely different viewing experience than waiting in line for an hour at the Griffith for a single view through the 12" APO.

MWO has its own website which offers a rich view of the historical evolution of the Observatory. Their website is here:

http://www.mtwilson.edu/

So here is some info about the 60" Hale telescope: First, it is named NOT after George Ellery Hale (GEH) who founded the MWO, but his father who donated the 60" blank for his son to further his son's career. GEH was a visionary and a hustler: He had already ordered the glass for the 100" Hooker and accepted delivery of the 100" mirror for the Hooker scope on the very day the cranes were lifting the 60" mirror into its mount atop Mt. Wilson. No one knew if the 60" would even work, let alone a 100" version based on the same design principles. The 60" Hale had first light in 1908. The 100" Hooker had first light in 1917. I guess it worked.

Astronomers who used MWO: George Ellery Hale (June 29, 1868-February 21, 1938), Edwin Hubble (November 20, 1889-September 28, 1953), Halton C. Arp (March 21, 1927), Allan Sandage (June 18, 1926-November 13, 2010), E.E. Barnard (December 16, 1857-February 6, 1923), Ejnar Hertzsprung (HR Main Sequence October 8, 1873-October 21, 1967), Fritz Zwicky (February 14, 1898-February 8, 1974) and others.

Location: 5700' above Los Angeles basin. Mt. Wilson was chosen for the site as the inversion-layer over Los Angeles actually improves the view. The inversion-layer has a warmer layer of air over the air below. It not only "caps" the smog, but dramatically improves the dark skies above. For example, Megrez is a Mag 3.3 star in the corner of the Big Dipper connecting the dipper to the handle. From my home, Megrez is barely visible. So the **N**aked **E**ye **L**imiting **M**agnitude (NELM) is about 3.5 from my house. On Mt. Wilson, the sky was sooo dark, I had difficulty seeing the Lyra Asterism as 1000's of fainter stars were now visible. The NELM had to be around 6 or better! Here is a picture of the inversion-layer I took on the way up the mountain:

But the Observatory still is a beehive of scientific activity with the 100" Hooker, 150' Solar Tower and the Chara Optical Spectroscopic Array. The Chara array has (6) 1m scopes, (2) each on a 120° spread with the longest leg of 300m. It has the highest resolution in the world of 1 mil arc second (.001").

60" Scope:

- 60" Mirror 7-1/2" thick and weighs 1900 lbs.
- FL 960" (24,384mm ! ! !)
- f/16
- Area of mirror: 2827 square inches (My 25x100 Binoculars have an objective area of 12.5 square inches). The 60" has a mirror 226 times larger than the objectives of my binos!
- 4" eye pieces: 100mm, 240x, FOV 11 arc-minutes
  50mm, 480x, FOV 6 arc-minutes (2" adapter available)
  32mm, 750x
- Declination range: -26° ~ +75°
- Weight:
  - -Base: 3.5 tons
  - -Polar Axis: 15' long, 4.5 tons
  - -Cast Iron forks: 5 tons
  - -Total weight: 22 tons including scope (Hardly a Grab n Go setup)
  - -Support: 10' diameter steel float filled with 650 pounds of mercury
- Most materials carried to the top of Mt. Wilson with 1 driver and a 4-mule team.
- Dome: 58 feet in diameter, covered 1st with a canvas cover with a 2' air-space to control heat-gain; and later replaced with metal in 1912.

Drive to the Observatory: A 18 mile winding mountain road with great views of the Los Angeles basin. Within a mile of the Observatory, you get a glimpse of the 60" dome just peaking over the ridge between the 100" dome on the left and the 150' Solar tower on the right. T.V. towers are on the right:

Participants for the viewing session assembled at the front gate where Darrell Dooley, LAAS 60” Director, had setup his Coronado Solar scope:


National Forest
PARKED VEHICLES
MUST DISPLAY PASS


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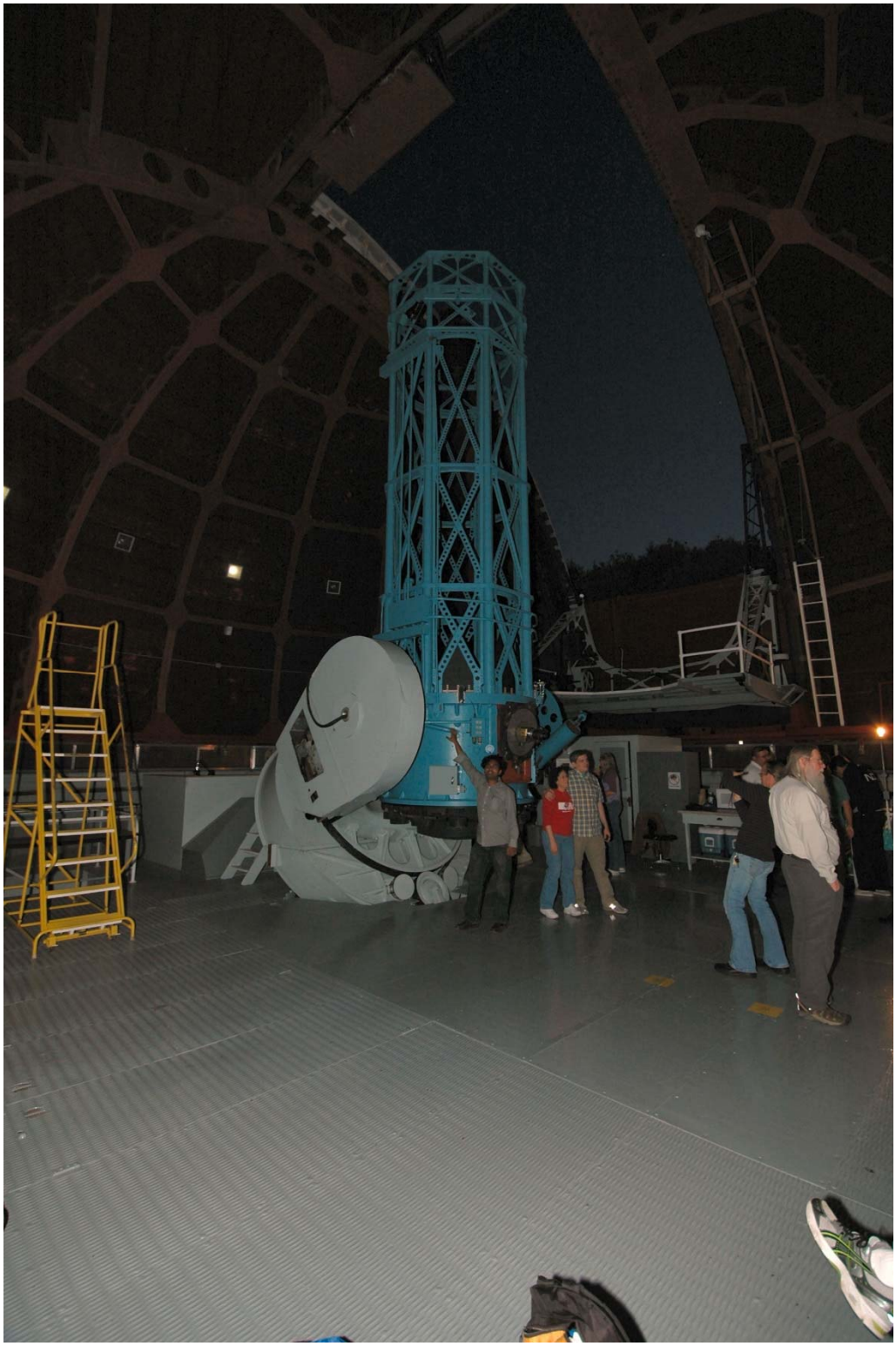
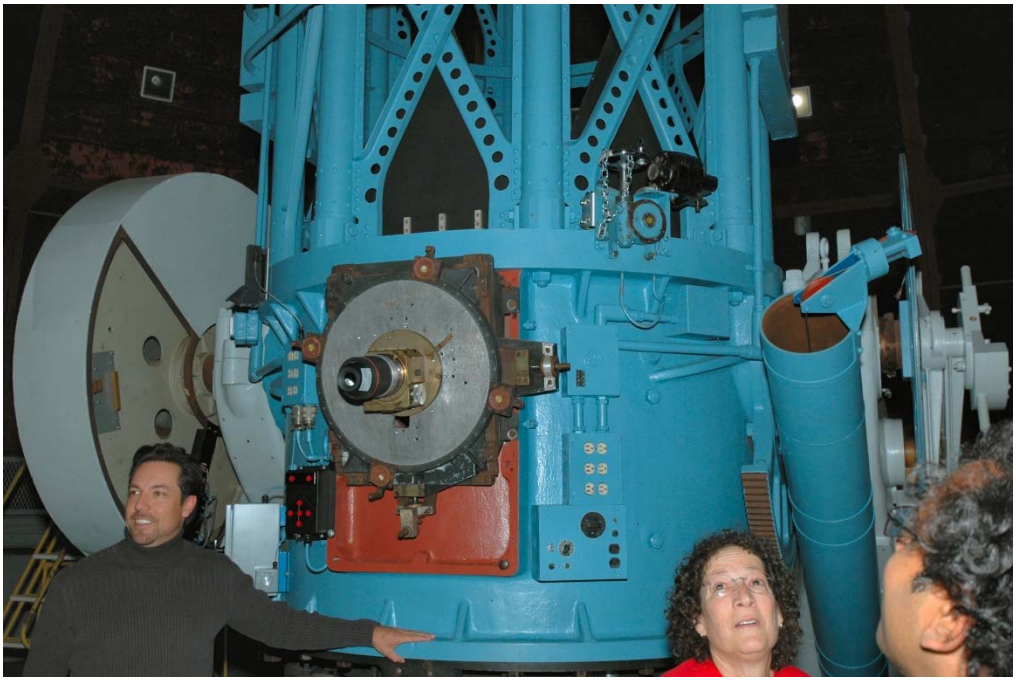
Upon entering the Dome, the MWO Session Director Tim Thompson shared some amazing history about the Observatory and the details of the planned viewing session. Tim has been a docent at the Observatory for 30 years. He is much more than a decent docent:

Norm Vargas was the scope operator. He has been running the scope for 13 years. Both men are LAAS members (Photo courtesy of Richard Fuentes):

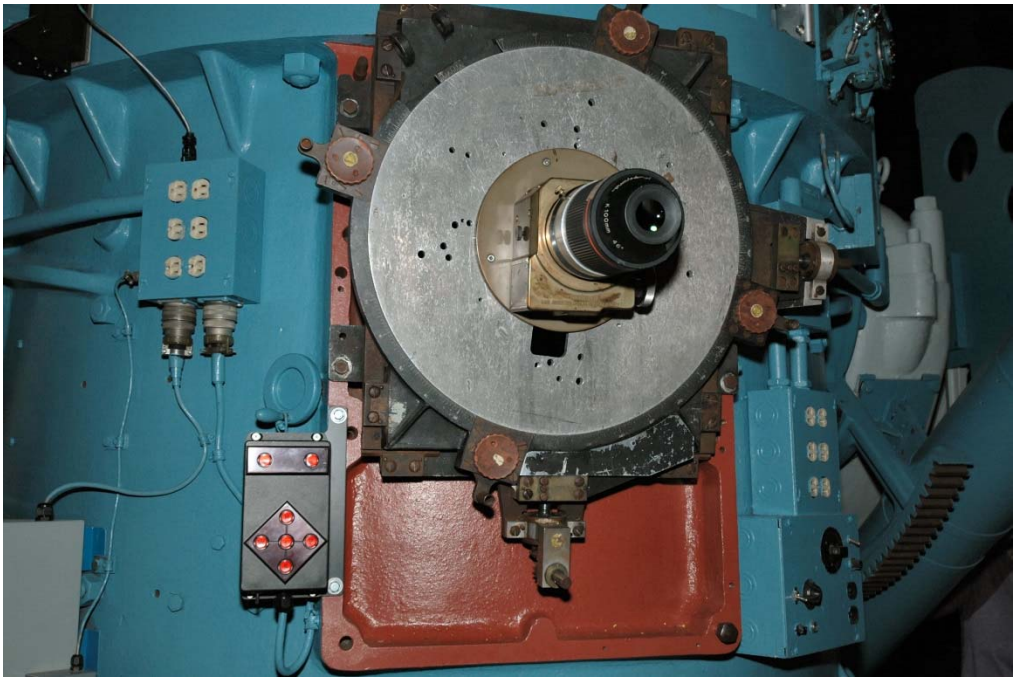
The scope is huge! Note the enormous mount for scope movement:



This is a view of the 4” eyepiece located about 6’ above the deck. On the lower left is a black box for fine-tuning the scope movement:



This is a close up of the 100mm eyepiece in-place:



Here is the control panel for the shutters. Note the 3 light bulbs above: there are the original Edison (Red) Carbon Filament bulbs installed in 1908 . . . 105 years ago and still working:

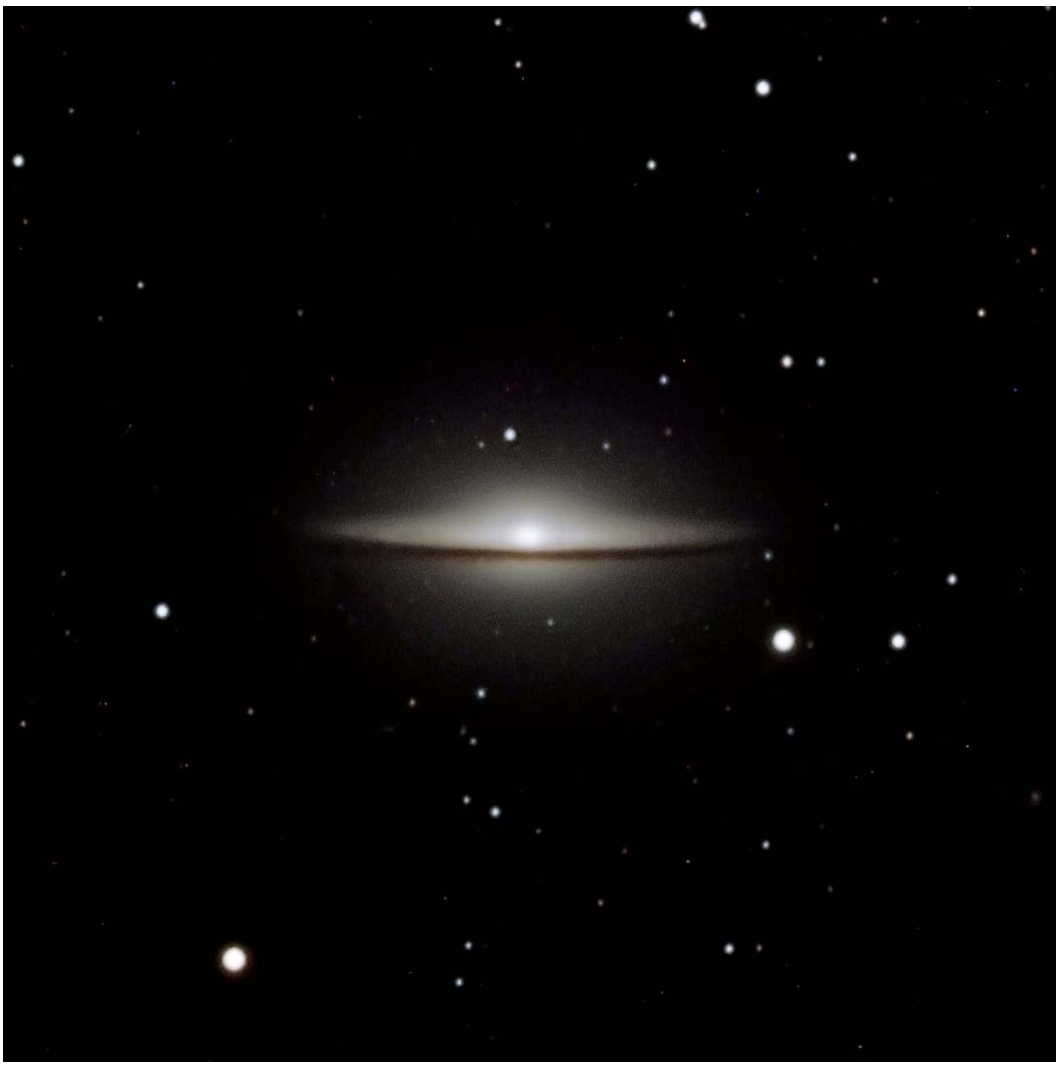
The viewing session was from about 9:00 P.M. to 1:00 A.M. A rolling ladder was used to enable viewing from the eyepiece:

Object Selection and Viewing: The following objects were chosen for the night's viewing. NOTE: An f/16 focal ratio is not ideal for viewing DSO's. They appear faint. But then again a 60" mirror speaks for itself:

•Gamma Leonis, double star Algieba, Mag 2.4, 3.6, separation 4.6". Really Nice

•M66, part of the Leo Triplet, Faint at Mag 9.0, but nice

•M104, the Sombrero Galaxy in Virgo. Faint but nice. Dust lanes were clearly visible. But the march in technology is truly amazing. Here is an image of M104 taken by a friend of mine, Pascal Menut, who used a Celestron Edge 11 with a CCD. In 105 years, phenomenal progress has been made with optics so that an amateur scope in 2013 produces incredible results:

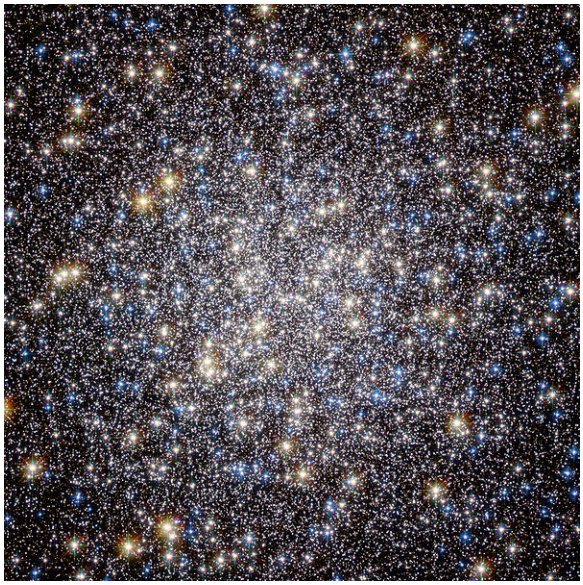


•Saturn, Huge in the eyepiece, Clean division of the rings. I looked for craters but didn't see any.

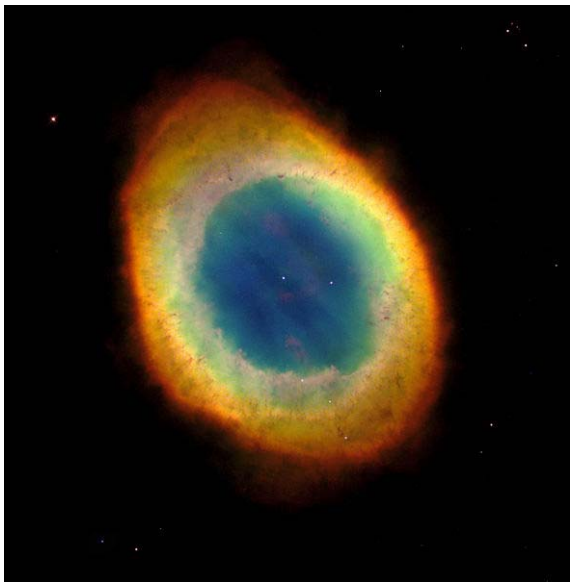
•M51, The Whirpool Galaxy. This is also an Arp Peculiar Galaxy #85, a Galaxy with a companion on an arm, Faint but nice. Here is a Wikipedia picture of M51:

•Cat's Eye Nebula (Caldwell 6) in Draco was Spectacular. Here is a composite image from the HST and Chandra X-ray Observatory (Wikipedia):

•M13, Globular Cluster in Hercules: Wonderful. Here is a shot from Wikipedia:



•Ring Nebula, M57 in Lyra, Really beautiful. Here is an image from Wikipedia:



•Epsilon Lyrae, the Double-Double. When I view this in my 25x100 binos with a 2.5° FOV, I can put Vega and the DD inside the FOV and the DD shows as split. The primaries are separated 210" and the secondaries are 2.1" and 2.4" respectively. I cannot come close to separating the secondaries. But with the 60" it was like looking at Vega and the DD with Vega being split: Beautiful.

Summary: Looking through the 60" Scope gives a view of a lifetime. And coupled to the history of the MWO, the construction of the scopes, the vision of George Ellery Hale who made it

happen, the Astronomers who used the equipment, and finally, being able to have a viewing session was an experience I will never forget. By the way, on the way to the bathroom on the level below the dome, I saw a typical gym locker: a 3-wide by 4-high array of 18”x18” boxes with astronomers names on the. One was Hubble, another was Zwicky, the feisty Austrian. My heart skipped a beat. I have booked another session in July!

Bill Pickard
“The difference between Stupidity and Genius, Genius has its limits.” Albert Einstein