



STAR FIELDS

Newsletter of the
Amateur Telescope Makers of Boston
Including the Bond Astronomical Club
Established in 1934
In the Interest of Telescope Making & Using

Vol. 34, No. 1 January 2022

This Month's Meeting . . .

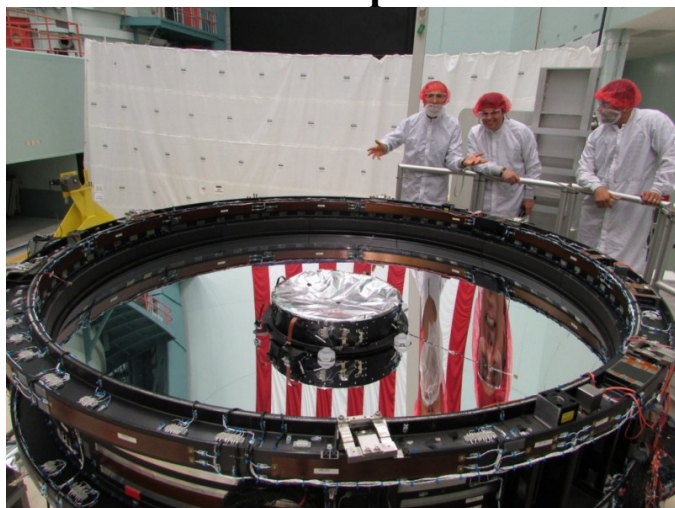
Thursday, January 13th, 2022 at 8:00 PM

[Zoom On-line Meeting](#)

All ATMoB meetings scheduled for the Harvard-Smithsonian Center for Astrophysics in Cambridge, MA have been **canceled indefinitely** due to concerns over the [coronavirus](#) outbreak.

We are holding virtual on-line meetings using the Zoom application. Please refer to the [ATMoB website](#) for future meetings. Members should check their email on the ATMOB-ANNOUNCE list for additional information. Please [select this Zoom link to attend the 948th Meeting of the Amateur Telescope Makers of Boston.](#)

Exquisite Stability for Large Space Telescopes



Nancy Grace Roman Space Telescope mirror. Credit NASA.

Many of us have waited long years in anticipation of the James Webb Space Telescope. Our wait was over on Christmas morning as the telescope was launched into space aboard a European Space Agency's (ESA) Ariane 5 rocket from French Guiana. The

telescope is currently unfolding itself as it coasts to Lagrange point 2 (L2), a gravitationally, quasi-stable point nearly a million miles from Earth and precisely opposite the Sun. Since these engineering marvels take years, if not decades to design, build, and test, there are new telescopes already in the pipeline.

This month's speaker is Dr. Matthew East who creates innovations on telescope systems as the lead Astrophysics Mission Architect at L3Harris Technologies. Dr. East's presentation is titled "Exquisite Stability for Large Space Telescopes". He writes: "Direct imaging of exo-Earths with high-contrast internal coronagraphs depends on ultra-stable opto-mechanical systems. Ultra-stable mirror assemblies enable decadal survey missions like the [Large UV/Optical/IR Surveyor](#) (LUVOR) and the [Habitable Exoplanet Observatory](#) (HabEx). To precisely define the necessary level of stability, the essential first step is to budget the maximum allowable disturbances for each optic in the system. Ideally, allocations are budgeted with respect to spatial- and time-domain frequencies. If allocations do not span these domains, the optic assembly designer cannot take advantage of frequency bands where requirements are looser because of assumptions about telescope control systems and internal coronagraph filtering." This talk explores how mirror assembly technologies and designs are predicted to impact stability, especially within the frequency bands that drive coronagraph contrast performance.

In his youth, Dr. East regularly attended amateur telescope making conventions, learning about optical systems analysis, fabrication, and metrology. His career began at MIT/Lincoln Labs, developing the Lunar Laser Communication Demo telescope, which broke records for fastest communication between the Earth and Moon. From 2014-2017, he developed large optics and structures for spaceborne applications, and patented inventions for 3D-printing titania-silica glass in Danbury, CT.

In 2017, Dr. East joined L3Harris Technologies and designed large spaceborne optics including the largest new mirror built for the [Nancy Grace Roman Space Telescope](#). He led risk reduction efforts to demonstrate low-temperature optical performance on Roman and led studies preparing for the next generation of NASA flagship mission concepts. Matthew specializes in precision optics, structures, and telescope systems, with an emphasis on scalable technologies and picometer-class stability to enable $\sim 10^{-10}$ contrast coronagraphic imaging of exo-Earths.

Matthew holds a BSME from Rensselaer Polytechnic Institute (2014) located in Troy, New York and a MSEM from Clarkson University (2017) located in Potsdam, New York. Danbury Mission Technologies is located in Danbury, CT and was home to the Chandra x-ray optics and the Hubble Space Telescope. L3Harris Technologies (formerly the Eastman Kodak Company) is located in Rochester, NY. L3Harris capabilities have enabled Hubble, Chandra, Kepler, JWST, Nancy Grace Roman Telescope, Keck, Hobby-Eberly, SALT, Subaru and the Vera C. Rubin Observatory, among others.

~ Rich Nugent – President ~

President's Message . . .

Here are some things I'd like to mention...

I was just outside (January 4) observing Venus during midday. Currently passing through Inferior Conjunction on January 8, Venus was sporting a 1 arcminute diameter apparent disk which was only 0.95% illuminated. Still surprisingly bright at magnitude -4.1, the planet was easily scooped up with my finder scope while only 9 degrees away from the Sun. On the 8th, that distance will be slightly less than 5 degrees, only 10 solar diameters. Why am I mentioning this? Well, as an observing challenge, I think you should try to observe Venus in broad daylight. Remember, you'll be using an unfiltered finder and telescope, so you must be VERY careful! I find the planet's altitude and azimuth from my Sky Safari 7 Pro app. Then I use my phone's compass and tiltmeter to point the telescope. The tiltmeter tends to be more accurate than the compass so once I set the altitude I slowly and carefully sweep the scope a tiny bit east and west. A long sunshield on the finder will somewhat help to ease your nerves. Once found, enjoy the view. Glare from sunlight entering the tube indirectly will add to the challenge. Again, a long dew shield or a well-placed aperture mask will help. A red or orange filter will boost the contrast. If the planet is too close to the Sun for your comfort level, wait a week past inferior conjunction and try then. Best of luck and I hope you are successful!

Remember the Moon, your very first (astronomical) love? You may recall that, given enough time, we can observe 59% of the lunar surface due to its monthly librations. Why not take advantage of this subtle, rocking motion? When we see a waxing Moon, the Moon's eastern limb is illuminated. Sometimes we can glimpse Mare Marginis and its enigmatic, light-colored, magnetically influenced swirls. Look for these on the evening of February 4th. When the Moon is waning in our skies, the giant impact basin, Mare Orientale is bathed in sunlight. When the libration is favorable, we can see the basin, its mountain rings and lava lakes along the Moon's south-western limb. This month, this observation will be favorable on the morning of the 23rd. I know many folks like to look for the Lunar X. A clair-obscur, the X is only visible for a few hours when the Moon is near its first quarter phase. The lunar V is also visible at about the same time. Unfortunately, the only opportunity we'll have to see these occurs on January 9 centered on 9:00 p.m. EST. Try to be patient with the Moon and don't hate it. After all, it's good for the Earth and, since we can't make it go away, we might as well enjoy it, right?

While I have you thinking about observing, as members of the club, you have access to some wonderful equipment. For the visual observers, the 25-inch Dob is now outfitted with a tracking platform, a suite of Tele Vue Ethos eyepieces, and a Tele Vue Paracorr. The tracking is spot on and allows observers to use high magnifications without the object drifting out of the view. This is wonderful feature for when a group is using the scope. You'll be hard-pressed to find a similar setup at any other astronomy club! To use the scope, we offer a short tutorial on opening, using, and closing the telescope. Visit on a work party Saturday and ask to learn about the scope. You won't be sorry...The views are amazing!

For imagers, the William Toomey Observatory is going through an upgrade and is being brought back on-line through the work of Tom McDonagh and Bruce Berger. Again, members can learn to use the equipment and then use the observatory for imaging. Adjacent to the Toomey Observatory is the fully robotic, Mittelman-ATMoB Observatory (MAO). I am hoping this facility will be fully operational in early 2022. To test the system some members have already been using the scope to measure variable stars. Look for their reports, listed as "MAO", on the AAVSO website.

Looking ahead, we are not far away from our annual election of officers in June. I've already started to enlist the six candidates to run for the Nominating Committee and I'll present the slate at our April meeting. Their task will be to find candidates by the May meeting for the election the following month. Any active member of the club can run for office, and I encourage you to do so. Descriptions of the responsibilities of each position can be found on the club's website. Being involved in the club at that level is a lot of fun and you can influence the future path of the organization. Please consider running for office! If you have any questions, please contact me or any of the other Board members.

I am hopeful that, despite the setbacks caused by new, highly transmissible, COVID Omicron variant, we will see a return to normal in the coming year. I continue to communicate with the folks at the Center for Astrophysics (CfA) but their calendar is closed at the moment and no outside groups are meeting there. Although I look forward to when we can meet there again in person, I can't predict when that will happen. Although the Board decided to skip the New Year's Eve party for the second year in a row, we are still holding occasional observing sessions at the Clubhouse. The interior of the Clubhouse is still restricted to bathroom use, and we ask that unvaccinated members refrain from visiting the site. The Omicron variant appears to be highly transmissible. The positivity rate in Massachusetts is currently near 20%, so I ask that you please make wise choices and follow the CDC guidelines. Please know that these restrictions and requirements are motivated by our shared responsibility to keep our members safe and healthy.

I hope your Holidays were wonderful and I wish you nothing but the best in the coming year. Be well, my friends!

~ *Rich Nugent – President* ~

Clubhouse Work Party Canceled . . .

Due to the COVID-19 Omicron variant our next work session that was scheduled for Saturday, January 15th has been **canceled**. Please watch for the ATMoB Announce email for information on future work parties.

~ *Rich Nugent – President* ~

December Meeting Minutes . . .



Arne Henden on Zoom *

ATMoB 947th Meeting Minutes December 9, 2021

Rich Nugent presented the President's welcome, including a thank you for all the support members have given to his family during their time of need. The CfA remains closed.

- Alva Couch presented the Secretary's report, including a summary of the inspiring talk by Michael Umbricht on the history of the Brown University Ladd observatory, and how it evolved from being an accurate time source for scheduling trains into a living history museum about how accurate time was kept over 100 years ago.
- Eileen Myers presented the Treasurer's report and reported a planned net deficit in November due to a furnace repair at the Clubhouse and the purchase of the Equatorial platform for the 25-inch Dobsonian.
- Chris Elledge presented the Membership report and welcomed new members Robert Blumstein; Adam, Elisabeth, and Henry Carpenter; Pete Geanancopulos; Diana Hannakainen; Arne Henden; Johnathan Henkin; Patrick Kelley; Rebecca Moore; Jesus, Amilio, Andrea, Ollano Prado and Melissa Gleckel; and Gary Walker.
- Glenn Chaple and Rich Nugent presented the Observer's report. The peak of the Geminid meteor shower is on December 14th and the Quadrantid meteor shower peaks on January 5th. On Tuesday, Dec. 14th, Uranus will be 1.5 degrees north of the Moon, while on Wed., Jan. 5th, Jupiter will be 5.8 degrees north of the Moon. Comet Leonard will be viewable for several days in the evening sky around the last week in December. The December Observer's Challenge is the galaxy NGC 16 in Pegasus.
- Steve Clougherty presented the Clubhouse report. The work party on Nov. 20th had 26 members attending. Joseph Rothchild and Joe Henry put up the snow fence. Slav Mich, Paul Cicchetti, and John Stodieck repaired the door to the

machine shop. Mike Hill organized and cleaned the library. Chris Elledge winterized the riding mower. Al Takeda, Alan Sliski, Bruce Berger, and James Chamberlain installed a weather monitor, LED lights, and a 10-gigabit hub in the MAO.

- On Saturday, Dec. 4, a crew of 11-12 people installed the Tom Osypowski equatorial platform for the 25-inch Dobsonian. They installed a new plywood base for the new EQ platform, and got it close to being polar aligned. Rich Nugent showed images of and explained the use of the new EQ platform. They were able to track Jupiter, Neptune's moon Triton, and a couple of double stars at up to 600 power using the platform.
- Rich Nugent and Kelly Beatty presented the Outreach report. Upcoming events include the Boy Scouts' Klondike Derby at Dunstable, MA on Sat., February 5th. The Westford Pack 95 Star party is postponed due to weather.
- Bruce Berger and Al Takeda gave the Mittelman-ATMoB observatory report, including a video of the telescope showing it being deployed and also stored. Peter Bealo and Pierre Fleurant have submitted 8 variable star observations to the AAVSO. Peter Graham processed an image of the "blue snowball" galaxy; James Chamberlain helped set up a weather monitoring screen. Chris Elledge imaged NGC 16 and has also made progress in getting the automation software to work properly.
- The team reports that the control room is still under construction. The weather station and cloud detector are installed, a UPS is installed in the observatory enclosure, and a stairway and deck are designed and await construction. Another uninterruptable power supply (UPS) is needed for the control room; donations would be appreciated. Please contact the MAO group if you have one to donate.
- Old business: <https://smile.amazon.com> is a great way to donate to ATMoB while shopping on Amazon.
- New Business: There will not be a New Year's Eve party due to the ongoing situation with the Omicron variant of Covid-19.

Arne Henden of the AAVSO spoke on the kinds of science we can explore using the new Mittelman-ATMoB Observatory (MAO). This 17-inch unguided, fully automated telescope supports unguided five minute exposures. This telescope lends itself to the study of many kinds of scientific phenomena. These include multi-color light curves for variable stars, which allow one to calculate star temperature. The scope also has the capability to discover the existence and nature of exoplanets. The rotation and size of comets and asteroids can be computed via time series photometry, and in combination with other instruments, physical shape can be inferred from occultation studies. Thus this instrument provides us with a way to contribute in a significant way to several kinds of scientific study of astronomical phenomena.

The next ATMoB Board meeting will occur on Thursday, December 16, starting at 8:00 pm.

The next monthly meeting of members will be held on Thursday, January 13, starting at 8:00 pm.

~ *Alva Couch – Secretary* ~

Quarterly Board Meeting . . .

Thursday, December 16, 2021

Bruce Berger, Al Takeda, Chris Elledge, and Alan Sliski gave updates on the status of the Mittelman-ATMoB Observatory. The design of the stairway and deck for the MAO, and soliciting donations for an uninterruptible power supply (UPS) for the Clubhouse Electronic/Control Room was discussed. A request of no more than \$500 was made for the purchase of an all-sky camera for monitoring cloud conditions. This request was approved unanimously.

The Equatorial Platform has been installed for the 25-inch Dobsonian but a few problems remain, including play in the drive system that arises from loosening of a gear during reset movements. The Clubhouse Committee is exploring various solutions to this problem.

Rich Nugent is already thinking about the 2022 Election, and will be approaching some of you about running for a position on the Nominating Committee. We also need volunteers to be understudies for our two most crucial club roles: Treasurer and Newsletter Editor.

Rich Nugent also brought up the proposal to create a “memorial garden” on the Westford grounds, with a bench and a small garden where we can remember past members and hold memorial ceremonies. There was consensus that a good location would be down the hill from the observatories.

We also discussed the recent increase in light pollution from the Fort Devens construction site for the new fusion research facility, five miles from the Westford Clubhouse. During current construction there is significant light pollution, and it is unclear who to approach about reducing light pollution when construction is completed. We plan to contact Tim Brothers, Observatory Manager of the MIT Wallace Observatory on the other side of the Haystack hill, about these issues.

Website Committee Chair Maria Batista gave a report on the progress of the website committee, and is seeking five volunteers to do usability testing on the proposed website design.

Outreach Committee Chair Kelly Beatty reported a conversation with an official at the Boston Public Library (BPL) who would like to obtain loaner telescopes for each of the 26 branches.

~ *Alva Couch – Secretary* ~

Membership Report . . .

I am pleased to welcome our newest members: Adam, Elisabeth, & Henry Carpenter; Jonathan Henkin; Mario Mendes; Rebecca Moore; Jesus, Amalio, Andrea, Oliana Prado, & Melissa Gleckel; & Richard Wagner.

As of December 30th, 2021 we have 330 memberships covering 413 members. This is broken down as follows:

- 140 Regular Members
- 132 Senior Members
- 8 Student Members
- 48 Family Memberships covering 131 Members
- 2 Honorary Members

Please contact me if you need any help with renewing or logging into the website.

~ *Chris Elledge – Membership Secretary* ~

Meeting Recordings . . .

The recording of ATMoB meeting #947 is available on YouTube: https://youtu.be/H_UAF1h2vtE

I would like to thank Dr. Arne Henden for giving his talk.

This link is to the publicly available cut of the meeting recording. To view the original version of the meetings, please see the Announce Forum on the ATMoB Website <https://www.atmob.org/forums>

~ *Chris Elledge - Membership Secretary* ~

Clubhouse Report . . .



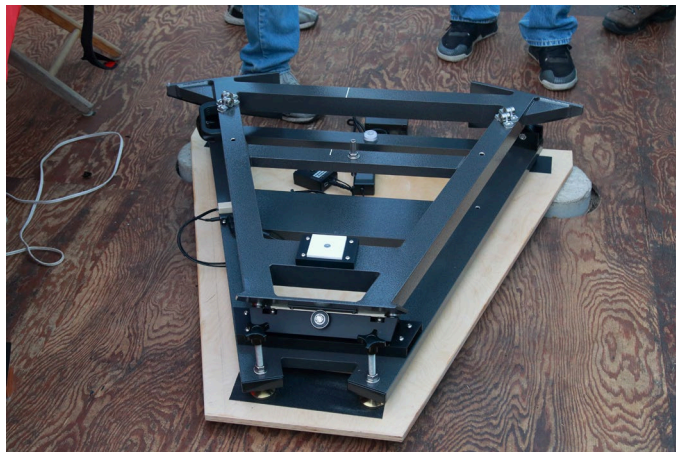
Installing the new EQ mount for the 25-inch Dobsonian *

December 2021 Clubhouse Report

Our monthly work session at the ATMoB Clubhouse was held on Saturday, December 18 with a total of 12 member-volunteers

present. We had to cut the session short due to inclement weather, so most activities ceased by mid-afternoon.

In the morning a few members helped with the friction drive on our new equatorial platform. Thanks to Joe Dechene for tweaking the set screw on the motor shaft which eliminated most of the play in the system. We would like to upgrade the motor-bearing assembly in the future so that members using the tracking platform will not have to struggle to reset the 80 minute "clock." Members with machining and mechanical ability might want to lend a hand for this project. We are happy to report that the tracking platform is performing very well with little or no drift evident using high magnification (360X - 600X).



The Tom Osypowski EQ platform installed in the Ed Knight Observatory. *

MAO team members worked on a meteor camera and weather sensor for this automated observatory. Condensation in the observatory has been an issue at times of certain rapid temperature gradients which produce high dew levels. Potential fixes for this issue are being looked at.

Bruce Berger retrieved a large supply of optical glass blanks which was being discarded by a local firm and brought it to the Clubhouse during the work party. Phil Rounseville will inspect the quality of the blanks, ranging in size from 6 to 13 inches in diameter. Some are very thin and might be used as tools for mirror grinding projects.

Thanks go out to Alva Couch who donated 4 computer monitors and several chairs that his office was no longer using.

Thanks to Eileen Myers who once again made a wonderful lunch of beef stew!

MIT's Haystack facilities manager informed us that major tree clearing will take place along both sides of the street from Route 40 to the Haystack facilities during late December and early January. We can expect all trees within 35 feet of the road cleared. We have asked that shrubs and smaller trees be spared along the East side of the observing field.

We would like to thank the following volunteers for their help during the December work session: Bruce Berger, Steve Clougherty, Joe Dechene, Bill Duane, Chris Elledge, Pierre

Fleurant, Eileen Myers, John Reed, Phil Rounseville, John Stodieck, Al Takeda and Bob Walcott.

NOTICE: Due to the COVID-19 Omicron variant our next work session that was scheduled for Saturday, January 15th has been **canceled**. Please watch for the ATMoB Announce email for information on future work parties.

~ *Clubhouse Committee Chairs* ~

~ *Steve Clougherty, John Reed and Dave Prowten* ~

Educational DVD Videos on Monday Evenings . . .

Maria Batista is hosting Monday evening streaming lectures. These weekly Zoom meetings start at 7 PM. Members can sign up on the Event Calendar at www.atmob.org.

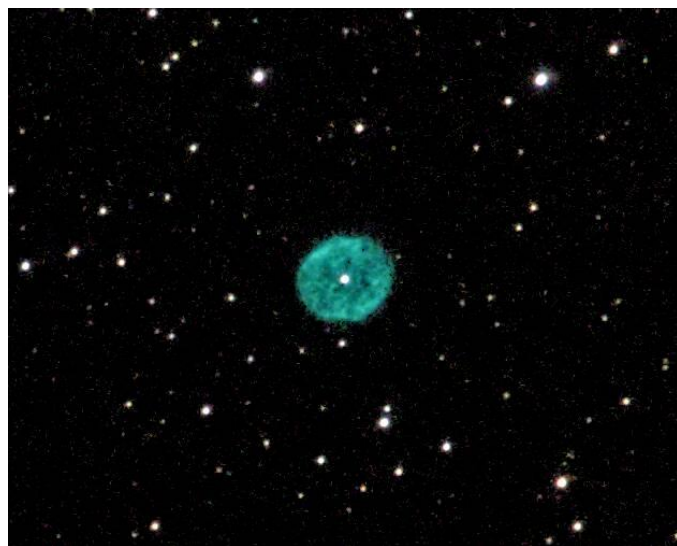
Observer's Challenge** . . .

January, 2022

NGC 1501 – Planetary Nebula in Camelopardalis

Magnitude 11.5

Size 52"

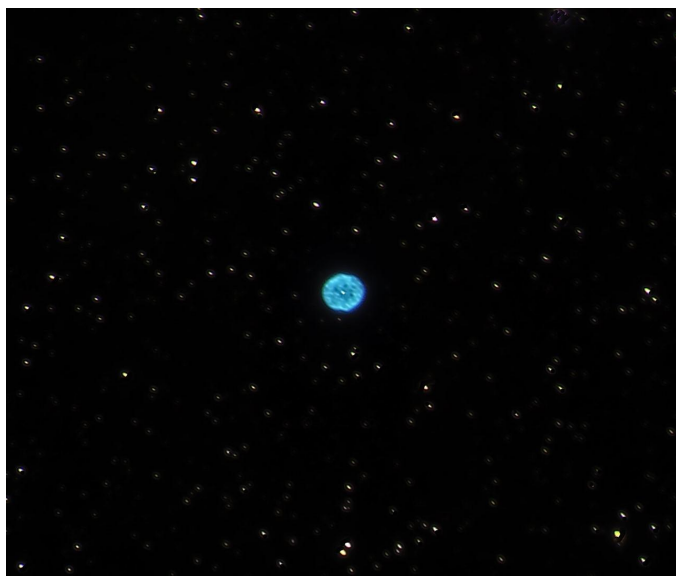


NGC 1501. Canon 80D, 1200mm f/8 lens, ISO 800, 17subs x 2 minutes.
North is up. Image by Doug Paul.

There are two major reasons why this month's Observer's Challenge, the planetary nebula NGC 1501, is largely unobserved. First of all, it's located in the extremely faint circumpolar constellation Camelopardalis (The Giraffe). Star-hoppers will have a rough time navigating around a constellation that lacks stars brighter than 4th magnitude. A second reason has

to do with its published magnitude, 13.0 in a number of web sources and observing handbooks. That's faint enough to scare away anyone observing with a small-aperture scope! But 13.0 is its photographic magnitude. Its visual magnitude is a more accommodating 11.5.

Although NGC 1501 can be viewed with small-aperture scopes under dark-sky conditions, its mottled appearance requires larger instruments. The 14.5-magnitude central star will challenge an 8-inch telescope. Embedded in the surrounding nebulosity like a pearl in a shell, it gives NGC 1501 its nick-name, the Oyster Nebula.



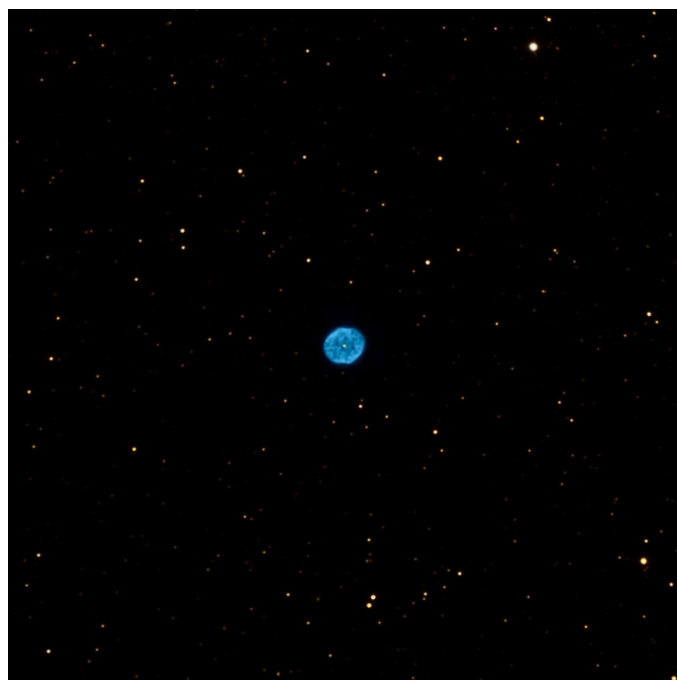
NGC 1501. 1 hour each of H-a, OIII, and SII, with 32-inch Relay Telescope, and ASI 6200 camera. Image by Mario Motta.

If you own a GoTo scope, you can get to the Oyster by punching in its 2000.0 celestial coordinates: RA 04^h 06^m 59.4^s, DEC +60° 55' 14.4". Star-hoppers can begin at nearby Kemble's Cascade- a remarkable asterism consisting of a 2½ degree-long near-straight chain of some 20 magnitude 7 to 10 stars punctuated near the middle by a 5th magnitude star. To find the Cascade, make a low-power (25-30X) search of the area marked by a line drawn from beta (β) to epsilon (ε) Cassiopeiae and extended an equal distance beyond (refer to finder Chart A). Once you've found it, keep the low power eyepiece in place and take a moment to admire this stunning stellar arrangement. At its southernmost end, you'll spot a tiny sprinkling of stars. This is the open cluster NGC 1502. A switch to a higher magnification (60-75X) will reveal several dozen stars of 9th magnitude and fainter surrounding a pretty double star (Struve 485, magnitudes 6.9 and 6.9, separation 18 arc-seconds). If you had gone directly to NGC 1502 via GoTo technology, you would have missed an amazing asterism, a neat little star cluster, and an attractive double star. Your final leg of the star-hop takes you 1.4 degrees south of NGC 1502 (refer to Chart B). Once the Oyster comes into view, you'll want to switch to the highest magnification your telescope and the seeing conditions will allow.

My first encounter with NGC 1501 was via a 3-inch f/10 reflector (Edmund Scientific's Space Conqueror) on the evening of February 2, 1986. According to the notes I wrote in my

logbook it was "very faint, but definitely seen. Visible at 60X." A sketch made with 120X shows the roundish form I saw. I was surprised to see this planetary at all, as my source gave a magnitude of 13.3, and I estimated it to be more like 11.0.

NGC 1501 was discovered by William Herschel on August 27, 1787. Its estimated distance is around 5000 light years, which translates to an apparent dimension (diameter) of 1.3 light years.



SHO Narrowband image. 12 subframes x 300 seconds SII, H-a, and OIII. Total= 3 hours. Planewave CDK17, QHY600 CMOS camera. Mittelman-ATMoB Observatory. Image processed by Chris Elledge.

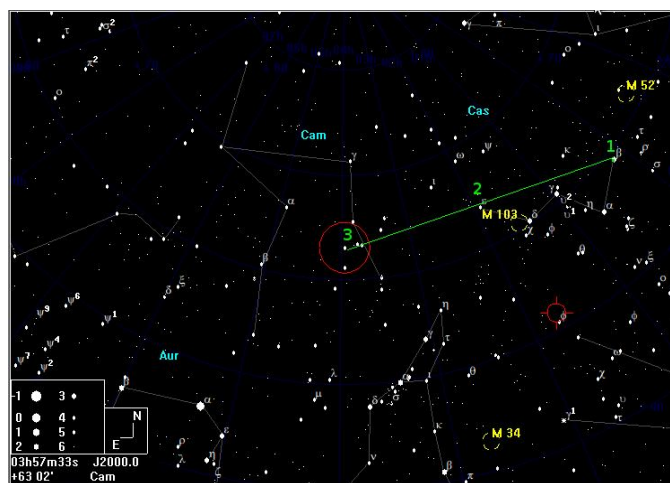


Chart A. Star-hopper's path to Kemble's Cascade (binocularsky.com)

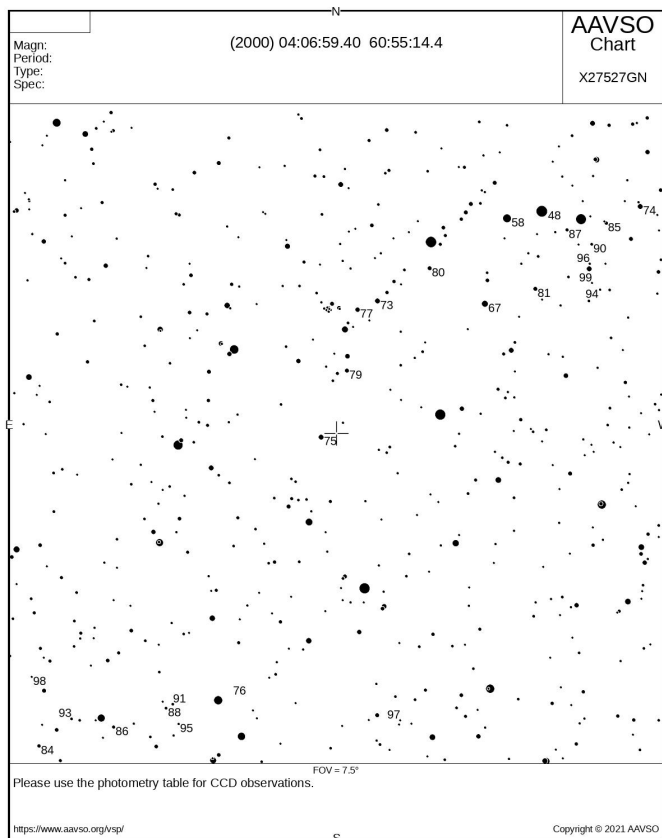


Chart B. Created using the AAVSO's Variable Star Plotter (VSP). Stars plotted to magnitude 10.0. Numbers are stellar magnitudes, decimals omitted. Field is 3 degrees square, with north at the top. Kemble's Cascade is the chain of stars running diagonally from middle top to middle left. NGC 1502 appears just left of the magnitude 7.7 star in the Cascade. NGC 1501 is labeled with a + at bottom left.

**The purpose of the Observer's Challenge is to encourage the pursuit of visual observing. It is open to everyone who is interested. If you'd like to contribute notes, drawings, or photographs, we'll be happy to include them in our monthly summary. Submit your observing notes, sketches, and/or images to Roger Ivester (rogerivester@me.com). To find out more about the Observer's Challenge or access past reports, log on to <https://rogerivester.com/category/observers-challenge-reports-complete/>.

~ Submitted by Glenn Chaple ~

Skyward . . .

By David H. Levi
 January 2022

Imagination and the Astronomical League

"A Dragon Lives forever, but not so girls and boys."

Three quarters of a century ago, during the Second World War, the famous Harvard astronomer Harlow Shapley, along with Charles Federer, founding editor of Sky and Telescope Magazine, launched an association of astronomy clubs across the United States. It is called the Astronomical League, and it thrives to this day with more than 100 astronomy clubs. Unlike the national Royal Astronomical Society of Canada, the League is designed to be a more loosely structured organization. According to Carroll

Iorg, its current president, one of its most critical and central goals is to inspire the next generation to enjoy the night sky. If that goal should fail the possibility exists that there may be no Astronomy for future generations.

As part of this vital goal, the Junior Astronomical League, a new subset of the Astronomical League, is now meeting every second Sunday over Zoom. But there is something more. My next book will be devoted to those young stargazers. It actually began as a typewritten saga I wrote in 1958 when I was ten years old and of all the 40 plus books I have written, this is Wendee's favorite. I am now completing a second edition of this book, in which a small group of children go on a stargazing adventure with Clipper, a magic beagle, and with Eureka, an enchanted reflector telescope. They go past the Moon and planets, the stars, the distant superclusters of galaxies, and even the great voids in distant empty space.

In its final chapter, this book explores the theme articulated in the last verse of Peter, Paul, and Mary's eminent song "Puff." "A dragon lives forever, but not so girls and boys." The children, now grown, go to university. When they complete their college education, the young woman, adept at math and physics, becomes an astronomer, but the young man goes on to become a lawyer. He marries, has children who are now grown, and unhappily gets a divorce. To recover he decides to take a vacation trip to Arizona. Driving his rented car one evening, he pulls off the road, gets out of his car, and looks at the stars. As childhood memories flood back, a second car pulls off. The young woman astronomer gets out of her car. The two cannot believe they are reuniting, and they catch up for hours. Then there is a break in their conversation. As the couple looks up silently at the stars, the magic beagle, and the telescope, appear and take shape. In that one ultimate celestial adventure, the magic of the night has returned.

~ Submitted by Mario Motta at the request of David Levy ~

Editor: * Photos by Al Takeda unless otherwise noted.

February Star Fields DEADLINE
Sunday, January 23rd

Email articles to Al Takeda at
newsletter@atmob.org

Articles from members are always welcome.

Amateur Telescope Makers of Boston, Inc.
c/o Chris Elledge, Membership Secretary
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How to Find Us...

Web Page www.atmob.org

MEETINGS: Zoom On-Line Meetings until further notice. Meetings held the second Thursday of each month (September to July) at 8:00 PM. For meeting details go to www.atmob.org and check your email on the ATMOB-ANNOUNCE list.

CLUBHOUSE: Latitude 42° 36.5' N Longitude 71° 29.8' W

The Tom Britton Clubhouse is currently closed. It is the white farmhouse on the grounds of MIT's Haystack Observatory in Westford, MA. Take Rt. 3 North from Rt. 128 or Rt. 495 to Exit 33 and proceed West on Rt. 40 for five miles. Turn right at the MIT Lincoln Lab, Haystack Observatory at the Groton town line. Proceed to the farmhouse on left side of the road. Clubhouse attendance varies with the weather.

Heads Up For the Month . . .

To calculate Eastern Standard Time (EST) from Universal Time (UT) subtract 5 from UT.

Jan 2 New Moon

Jan 5 Quadrantids meteors peak

Jan 7 Mercury at greatest eastern (evening) elongation (19 degrees)

Jan 9 First Quarter Moon (Moonset at midnight)

Jan 17 Full Moon

Jan 23 Mercury in inferior conjunction

Jan 25 Last Quarter Moon (Moonrise at midnight)

Jan 29 Mars 2 degrees North of Moon

Feb 1 New Moon

Feb 8 First Quarter Moon (Moonset at midnight)