



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. 6 June 2022

This Month's Meeting . . .

Thursday, June 9th, 2022 at 8:00 PM

[Zoom On-line Meeting](#)

All ATMoB meetings scheduled for the Center for Astrophysics (Harvard & Smithsonian) 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 953rd Meeting of the Amateur Telescope Makers of Boston.](#)

Sir Fred Hoyle – Some Perspectives



Sir Fred Hoyle. Wikipedia - Fair use.

Our speaker this month is our own Phil Levine. Phil's presentation is titled: **Sir Fred Hoyle – Some Perspectives**. Fred Hoyle (1915-2001) was a staunch advocate of his own "Quasi Steady State" (QSS) theory of the existence and evolution of our universe. He rejected the "Big Bang" theory

and is credited with coining that term during an interview on BBC radio. Hoyle was also a proponent of the idea that life originated on Earth through panspermia, a naturally occurring process thought to be responsible for spreading life throughout the cosmos. Hoyle was also the major contributor of the landmark work *Synthesis of the Elements in Stars* published in the October 1957 volume of *Reviews of Modern Physics*. While co-author of the paper, William Fowler received the Nobel Prize for this work, Hoyle did not share in the award. More can be read about this at:

<https://www.theguardian.com/science/2010/oct/03/fred-hoyle-nobel-prize>. Phil writes, "I have become enamored with Hoyle's independent, thoughtful, and creative mindset and although he made important contributions in astrophysics, he perhaps persisted too long in his support of the QSS theory." Phil's presentation will also summarize the evolution of the "Big Bang" theory as it seems proponents of both theories "borrowed" some elements from each other.

Phil earned a BS in History from Northeastern University and a Certificate of Electronics Technology from the Lowell Institute School (M.I.T.) Now retired, he worked some 43 years at Peter Bent Brigham/Brigham and Women's Hospitals in various capacities but, most notably, as a Cardiac Cath Lab technician. Phil also spent many years as a technician in the hospitals' Clinical Engineering Department. He is also a Certified Biomedical Engineering Technician, emeritus. Phil has done volunteer work with the CfA's Glass Photographic Plate Digital Conversion Project. He is a current member of ATMoB and served as the ATMoB Secretary from 2015-2018.

I am looking forward to Phil's presentation on this controversial astrophysicist and hope you are, too! I'll open the Zoom meeting at 7:45 pm and hope you'll join me!

~ Rich Nugent – President ~

President's Message . . .

As this is my last President's Message, I'd be remiss if I didn't thank the membership for their vote of confidence in electing me to serve as the club's President two years ago! I hope you have not been disappointed. It's been an honor to hold this office and I am genuinely saddened as I prepare to leave it. These have been challenging times with the COVID pandemic greatly changing the lay of the land. Our last meeting at the Center for Astrophysics (CfA) was in March 2020 and we are still waiting for Harvard to allow outside groups to hold in-person meetings again. During this time our meetings have been held via Zoom and seem to have gone well! The beauty of virtual meetings is that speakers can present from anywhere with a reasonable time difference and a WiFi connection! Early in the pandemic, MIT greatly restricted access to their facilities and, for a time, the Clubhouse and observing field were closed. We have reopened the site for observing and limited access to the Clubhouse and Saturday work parties have resumed. During the summer of 2020, we petitioned MIT for and, last year, was granted a five-year extension on our lease of the Clubhouse and observing field. It took a year to get the approval through the

bureaucracy. Let's not forget that as we approach the next renewal in April 2027.

During our last meeting at the CfA, it was announced that the club had received an impressive donation that has become the Mittelman-ATMoB Observatory (MAO)! We purchased a new camera and filters and, as everyone should know by now, the observatory has been installed at the Westford observing site and is currently being used to collect scientific data and to image the deep sky! On the visual side of the observing field, we purchased a Tom Osypowski equatorial platform for the 25-inch scope. This gives us about 80 minutes of tracking capability before requiring a reset. The polar alignment is spot-on, and tracking is impressive, even at 690x! A suite of TeleVue Ethos eyepieces and a ParaCorr were donated to the club by Jim Mahoney and are now being used exclusively with that scope. Next up will be the design and installation of a filter slide to accommodate UHC and OIII filters. If you haven't observed with the scope yet, please visit soon. You won't be disappointed!

Of course, it takes a village. In order for the club to run smoothly it requires a group of dedicated members in key positions. I think the most critical office is that of Treasurer and Eileen Myers has done a wonderful job of keeping the books in order. From monthly reports of monies in and out to taking care of banking, insurance, and tax documentation, Eileen has worked tirelessly for all of us and, happily, she has agreed to remain Treasurer for the next two years! Alva Couch has done a great job of keeping notes and reporting on all our meetings while Chris Elledge manages the membership records for the club. Chris also helps with website activities including membership renewals, online elections and helps keep the MAO operating. Going forward, Alva and Chris will remain in their current roles. Glenn Chaple and I will continue to represent the Observing Committee and I'll continue to work with Kelly Beatty to coordinate outreach activities. The success of the MAO has taken a team of highly skilled imagers and computer experts! We owe a debt of gratitude to Peter Bealo, Bruce Berger, Chis Elledge, Arne Henden, Tom McDonagh, Alan Sliski and Al Takeda for their continuing work on the observatory. Tom McDonagh is also upgrading the imaging equipment in the Toomey Observatory. Stay tuned! Maria Batista is heading committees to update our website. Al Takeda dedicates long hours to edit, assemble, and publish our monthly newsletters. The Clubhouse and observing site run smoothly due to the efforts of Steve Clougherty and John Reed. They maintain a good relationship with the folks "up the hill," coordinate the maintenance and upkeep of the facilities, and organize work parties and all observing on the site. We all owe ALL these folks a standing ovation and a heartfelt thank you because without them the club would not be the vibrant organization it is today! Thank you! Thank you! Going forward I'll remain on the Board as the most recent past President, joining Past Presidents Glenn Chaple and Tom McDonagh, and hope to guide the club over the next many years. Here are a few of the goals I'd like to see us strive for:

Centennial Committee – Since the passing of Anna Hillier in 2020 the club has been left without a historian. Our newsletters are a great resource for the activities of the club and its members, but I think we should have a small group of dedicated members to maintain the club history. Perhaps an annual review could be assembled from articles culled from the newsletters. Veteran members, current and past, might be willing to share their memories through recorded interviews. The group could also ask the membership, current and past, for old pictures. We know that Sal LaRiccia has digitized many of the mirror making activity photos from the past and I'll bet there are many more photos out there stashed in boxes in closets or basements. Let's try to find those photos, digitize and make them available to the membership! I think we need to take more photos of our current members, not only at the Clubhouse but at outreach activities and local gatherings such as NEAF, The Astronomer's Conjunction, and of course, Stellafane. Monthly work parties could be better documented if we had photos. I always make an annotated copy of the digital images noting the names of everyone in the photo. As memories fade, that info will remain in place. Our June meeting will mark the club's 953rd gathering. That means in less than 5 years, we'll hold our 1000th meeting! That should be celebrated. I want there to be cake! And, with a dedicated group, preparations could begin, long in advance, for the club's 100th anniversary in March 2034! I want there to be even more cake and ice cream, too! Wouldn't it be nice if beginning in March 2033 there were to be monthly presentations highlighting club milestones each leading up to a Grand Celebration at the centennial?

Mirror Fabrication – As many of us know, the Amateur Telescope Makers of Boston was formed in response to the newly accessible knowledge of the methods required to grind, polish and figure glass. In the early 1920's, Russell Porter and his colleagues began to fabricate telescope mirrors in Springfield, Vermont. Albert Ingalls wrote two articles on mirror making that were published in *Scientific American* magazine. He assembled the three volumes of the classic, *Amateur Telescope Making*. Back then, the only way most folks could afford a quality telescope was to make it themselves. And so, the art of telescope making was learned and passed along to each new generation. Today, with the availability of quality, affordable telescopes, the art of mirror fabrication has waned. In our club there are only a handful of members who can take a disk of glass all the way to the finished product. We certainly have the supplies and the equipment, but I think we should strive to rebuild a cadre of members who have enough experience to teach future generations. I know that's easier said than done. Try finding a group of young-ish, dedicated members interested in working for many years to learn the process, not by making just one telescope mirror, but many. The collective knowledge base would then be a valuable resource to anyone interested in making their own mirror. This way our club's legacy will continue well into the future.

Public Relations Contact – I cringe when I see the TV and radio weather forecasters incorrectly report information about something as predictable as a total lunar eclipse. Where do they get their information? Well, certainly not from any of us!

Wouldn't it be nice if we had a small group of club members interested in writing and submitting press releases describing upcoming astronomical events? Almost everyone I've ever spoken with has some level of interest in astronomy and many will venture out into the night if they know something is about to happen. But too often they go back inside, disappointed. If a newbie is going to have to put up with freezing cold in the winter and buggy nights in the summer, they might as well do so with realistic expectations. When the correct info is offered, the truth about meteor shower rates, for example, the public has a better understanding of what they should expect to see. I'd like to see the club become Boston's go-to source for astronomical information! As a bonus, having a conduit directly to the public will do a lot for expanding our membership and by increasing the number of members we will ensure the club will continue to thrive!

Member Events – What can we do for our members – new or veteran, alike? I think we should offer more member events at the observing site in Westford. Once we're through with COVID we'll resume the annual picnic, but I'm talking about member observing events. Let's dedicate evenings to observing the monthly Messier objects. How about the finest NGC objects of the season or an evening of observing double stars or beautifully colorful stars? Why not dust off your old 60mm refractor. I've always wanted to run small-telescope star parties at the Clubhouse. Heavens-Above.com lists bright satellites for each evening. Let's spend a couple of hours checking them off as they pass. Many of you already know how much I enjoy using the 25-inch to observe geostationary satellites...I'll be happy to show you some! How about early-evening observing for our members' children? To go a bit beyond casual observing, the Astronomical League (AL) offers many award programs to its members. While the club isn't part of the AL (very expensive!), you can become a member-at-large. The annual fee for such a membership is \$40, only \$20 if you're under the age of 19. Observations can be submitted for the awards program but since the AL publishes the lists of the objects on their website, you don't have to be a member to enjoy the views! All these types of events will encourage more of our members to get out under the stars to enjoy the beauty of the universe. I could go on but...

In closing, let me again thank each of you for your support during the past two years. The Amateur Telescope Makers of Boston is a wonderful club with a bright future, and I am proud to be part of it. Please welcome our new and returning Board members as they begin their tenure as custodians of the club. I look forward to seeing you all at meetings and out on the observing field for many years to come. And so, my friends, with that, I wish you nothing but the best of health and many clear, star-filled nights ahead!

~ Rich Nugent – President ~

Annual Meeting Notice . . .

Thursday, June 9th is the Annual Meeting for the members of the Amateur Telescope Makers of Boston.

ARTICLE VI, Section 2 of the Bylaws; "Annual Meeting - The first regular meeting of the members in June of each year shall be the annual meeting for the election of officers and the hearing of the annual reports."

The 2022 Nominating Committee, Maria Batista - Committee Chair, Steve Clougherty and Glenn Chaple has proposed a slate of nominations for the 2022-2023 Executive Board. "**Editor: Due to COVID-19 concerns, the ATMob Board has decided that the vote shall be held online. You may vote online by logging into our website at <https://www.atmob.org> and visiting the voting page: <https://www.atmob.org/vote>**". The nominees are:

President: Corey Mooney
Vice President: Christine Zacharer
Secretary: Alva Couch
Membership Secretary: Chris Elledge
Treasurer: Eileen Myers
Member at Large: Kai Cai
Member at Large: Alan Sliski

Per Articles IX of the ATMob Bylaws: Members shall have the right to offer additional nominations from the floor of the annual meeting, provided only that a suitable written notice, containing the name or names of the person or persons to be nominated from the floor at the annual meeting, and the signatures of at least seven members, is filed with the Secretary not less than ten (10) days prior to the date of the annual meeting.

Meeting Recordings . . .

The recording of ATMob meeting #952 is available on YouTube: <https://youtu.be/EHJHiVFC4FM>

I would like to thank Dr. Mario Motta 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 ~

Membership Report . . .

I am pleased to welcome our newest members: Daniel Abraham, Jane Barrett, Stephen Deal, Niko Grapsas, & Jiaming Huang.

As of May 30th, 2022 we have 354 memberships covering 445 members. This is broken down as follows:

- 149 Regular Members
- 140 Senior Members
- 11 Student Members
- 52 Family Memberships covering 143 Members
- 2 Honorary Members

Renewals for all members began on June 1st except for members who joined after January 1st this year. Please visit the website at <https://www.atmob.org/renew> to begin your renewal. You may need to login and revisit the link to proceed. If you want a printed newsletter mailed to you each month, then you need to select one of the membership levels that include "with Mailed Newsletter" in the type.

You can also download the membership application from the website at <https://www.atmob.org/signup> by clicking on the "Download an application" link.

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

~ *Chris Elledge – Membership Secretary* ~

May Meeting Minutes . . .



Mario Motta on Zoom. *

ATMoB 952nd Meeting Minutes May 12, 2022

Rich Nugent presented the President's welcome, including a summary about the slate of candidates for the June Executive Board election at this year's Annual Meeting. Information about the election is documented elsewhere in this newsletter. The Center for Astrophysics (Harvard & Smithsonian) remains closed to outside groups.

- Alva Couch presented the Secretary's report, including a summary of the wonderful lecture/demonstration of astronomical sketching at the April meeting by Mary McIntyre.
- Eileen Myers presented the Treasurer's report, and reported inflows from memberships, member donations, and purchases of library telescopes for the Boston Public Library system. Outflows were reported for insurance, an all-sky camera for the MAO, and a yearly donation to the Clear Sky Chart website.
- Chris Elledge presented the Membership report and welcomed new members Niko Grapas, Jay Jones, William Kazman and Ann Westerheim, Hank Keating, and Richard Martino.
- Glenn Chaple and Rich Nugent presented the Observer's report, including solar activity in both white light and h-Alpha, the May 15-16 total lunar eclipse, and close encounters between the Moon and Saturn, Jupiter, Mars, and Venus. Images of Supernova SN 2022hrs were contributed by Doug Paul, Chris Elledge, Mark Helton, and Mario Motta. The May observer's challenger is Messier 106. Images of M106 were contributed by Doug Paul, Mario Motta, Mark Helton, and Chris Elledge. The June Observer's Challenge is the NGC 5474 Galaxy in Ursa Major, with a picture contributed by Doug Paul. Send us your pictures of NGC 5474 before the June meeting!
- Rich Nugent presented the Clubhouse report for Steve Clougherty based upon the newsletter summary. The April Work Party included cleaning the first floor, organizing donated materials on the second floor, cleaning and organizing the glass room, and making an inventory of mirror making supplies. A staircase and porch were constructed for the MAO. The setscrew on the 25-inch equatorial platform was modified to improve its contact with the motor shaft.
- Rich Nugent presented the Mittelman-ATMoB Observatory (MAO) report. A porch was installed on the MAO. Chris Elledge contributed a MAO photo of the planetary nebula, Ellis Grayson Bond (EGB) 6, located in the constellation of Leo.
- Rich Nugent presented the Outreach report. Upcoming events include an astronomy outreach at the Billerica Elks Club for the Boy Scouts of Billerica on Sunday, June 12, and two evenings of astronomy at the Tower Hill Botanical Gardens on Thursday, July 7 and Thursday, August 4.
- Rich Nugent presented the Eclipse 2024 Committee report. Although the eclipse path is within driving distance, the cloud forecast for New England is poor, and many members are still planning to view the eclipse in Texas where the cloud forecast is more favorable.
- Old business: <https://smile.amazon.com> is a great way to donate to ATMoB while shopping on Amazon.

- New business: Friday and Saturday Clubhouse hours will resume, weather permitting, if at least one “A-list” Clubhouse Committee member is available to open and close the building. Work parties were resumed in April.

Our speaker for May was by ATMoB member Mario Motta (MD), whose talk title was: “The AMA position on outdoor LED lighting and UN recommendations”.

Mario presented a wide-ranging summary of the effects of light pollution beyond its effects upon astronomy, as reported by the American Medical Association (AMA). Light pollution can affect circadian rhythms in humans and other organisms, leading to loss of biodiversity in affected species. For example, decorative lights on a bridge were found to inhibit salmon migration and reproduction; salmon wouldn’t migrate past the lights. In humans, improper outdoor lighting can increase risk of certain cancers due to suppression of the natural cycle of melatonin production. These effects can be mitigated by avoiding blue light (e.g., by using LED light with color temperature less than 3000K, instead of the more common “white LED light” with a color temperature of 5000K), avoiding lighting the sky in favor of lighting the ground, turning on lights only when needed, and only using white light when absolutely needed for sporting events. Some of these principles (and particularly, the role of light color temperature in circadian cycle disruption) remain relatively unknown and controversial to public officials in charge of installing outdoor lighting, even though a mountain of scientific evidence and academic publications support these findings.

~ *Alva Couch – Secretary* ~

Clubhouse Report . . .



Chris Elledge mowing the Observing Field *

Our monthly work session for the month of May was held on Saturday the 14th under sunny skies. The new riding mower was put to good use and Chris Elledge mowed the entire property first thing in the morning. Other member volunteers used the two self-propelled push mowers and others trimmed branches and hedges and kept the growth around the observing field in check.

Cleaning and organizing continued in the Clubhouse with several members lending a hand. Most of the donated equipment which had accumulated over the past two years was removed from the second floor library and sorted. ATM parts are now housed in the upper barn loft while surplus telescopes and gear are stored in the Clubhouse attic. Loaner telescopes are available in the second floor scope room and have been organized. Our first floor scope room has a formidable collection of eyepieces and two 8-inch Dobsonian telescopes for observing field use.

John Maher purchased a new eyepiece case for the Meade 16-inch scope and we now have a dedicated eyepiece box for each of our observatory telescopes. Members picked through our ATM hardware collection and donated a total of \$50 for surplus parts during the work party.

We also accepted a donation of a Meade ETX 90 telescope, equatorial mount and eyepieces.

Thanks to Eileen Myers for providing a wonderful home cooked lunch for the crew!

Our June work session will be held on Saturday the 11th. We will continue with finishing clearing the second floor office room of various items and will remove antique computer/video equipment. Mowing and observing field lawn care will also be a priority.

Thanks to the following members for helping out at the work session: Larry Ciummo, Steve Clougherty, Alva Couch, Chris Elledge, Dick Koolish, Jon Lyna, John Maher, Eileen Myers, John Reed, Dave Siegrist, John Stodieck, Al Takeda, Joe Tansey and Christine Zacharer.

~ *Clubhouse Committee Chairs* ~

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

Observer's Challenge** . . .

June, 2022

NGC 5474 Galaxy in Ursa Major

Magnitude 10.8

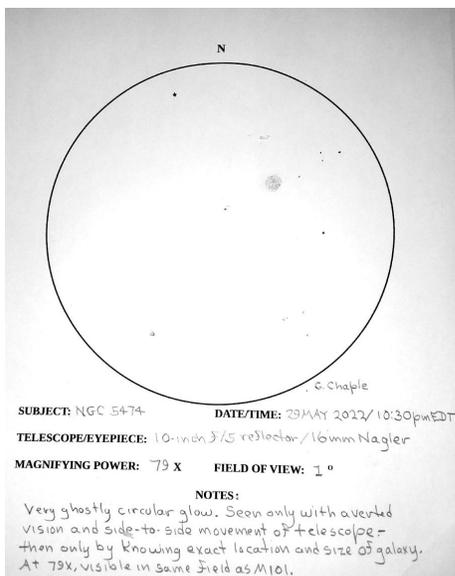
Size 4.7'



32-inch f/6, ZWO ASI 6200 camera, 90 minutes of imaging Luminance filter only. North is up. Image by Mario Motta

This month's Observer's Challenge is the peculiar dwarf galaxy NGC 5474 in Ursa Major. William Herschel, who discovered it on May 1, 1788, entered it in his deep sky catalog with the designation H 1-214, which translates to Herschel, Class I [Bright Nebulae], 214th entry). Anyone who has tried to observe this galaxy visually might argue that it belongs in Herschel's Class II (Faint Nebulae).

NGC 5474 can be located by using its coordinates (RA 14h 05m 01.6s, Dec +53o 39' 44"), but I highly encourage visual observers to star-hop there instead. That's because the starting point is the beautiful double Mizar, the middle star in the handle of the Big Dipper. From Mizar, a series of stellar stepping stones that includes its naked eye partner Alcor (80 Uma), then 81, 83, 84, and 86 Uma will take you to M101, the Pinwheel Galaxy (refer to Finder Chart A). If you're unable to see this 8th magnitude face-on spiral don't bother with NGC 5474, which is also a face-on spiral but 3 magnitudes fainter.



10-inch f/5 reflector at 75X. North is up in this 1 degree field. Sketch by Glenn Chaple. [Click this link for an enlarged view.](#)

If you can see M101, spend a few minutes trying to tease out as much detail as you can. The exercise will ready your eye for NGC 5474, which lies less than a degree south-southeast (Finder Chart B). My first attempt to capture NGC 5474 with my 10-inch f/5 reflector was "iffy." The limiting naked eye magnitude was around 5, typical for my suburban skies. But there was a slight hint of humidity in the air, and all I could make out were fleeting glimpses of a small, ghostly circular glow. A few nights later, a mass of clear, dry air settled over the area, and I tried again. This time NGC 5474 was definitely visible, still a small and faint roundish blob, but steadily seen with averted vision. There was no sign of its oddly-placed nucleus. A big help in capturing NGC 5474 was knowing the galaxy's exact location and approximate size. My best view was with a 79X wide-field eyepiece that captured M101 in the same field of view.

The nearness of NGC 5474 to M101 isn't coincidental. The little galaxy is a companion of the Pinwheel, both being about 21 million light years away. The odd skewing of its nucleus towards M101 was once thought to be a result of a gravitational tug from the much-larger galaxy but is now thought to be internally produced.



M101 and NGC 5474, TPO R-C 8" f/8.0 (.75x Reducer), Electronically-Assisted Astronomy (EAA), Hutech IDAS HEUIB-II: 35x300" (2h 55'), Image by Dave Rust.

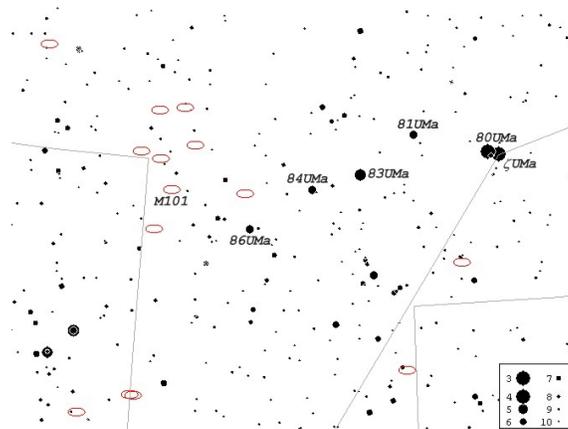


Chart A - astrosurf.com

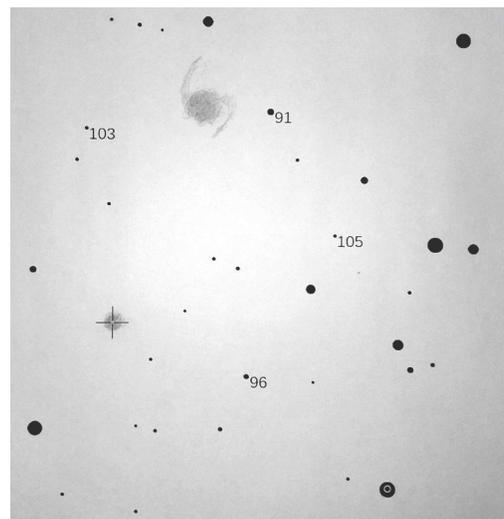


Chart B - M101 (near top) and NGC 5474 (lower left, marked with cross) Chart prepared using AAVSO's Variable Star Plotter (VSP). Numbers indicate stellar magnitudes (decimals omitted). North is up in this 1½ by 1½ degree field. Chart limiting magnitude is 11.0. Galaxies drawn to scale.

**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 ~

Arlington Astronomy Nights . . .

Three Arlington Astronomy Nights have been scheduled for this summer. The location is Robbins Farm Park in Arlington, MA. Please attend if you can and bring a telescope.

- Saturday, June 11
- Saturday, July 23
- Saturday, September 3

Thanks.

~ Submitted by Dick Koolish ~

Skyward . . .

By David H. Levi
June 2022

Nothing in the night sky quite beats a total eclipse of the Moon. Other than a shooting star, eclipses prove to all who watch them that the sky is a changing place. During the several hours of a lunar eclipse, we can actually watch as the Moon slowly orbits the Earth, and as it passes through the shadow of the Earth we can enjoy its changing illumination.

Last Sunday evening, May 15, 2022, there was a total eclipse of the Moon. It was perfectly timed for observers throughout most of North America. On the east coast, the eclipse began in mid-evening. For those of us who live in Arizona, in the great American southwest, the eclipse began just as the Moon was rising, and it ended late in the hours of the evening.

As the Moon marched its way eastward, the penumbral shadow manifested itself as shading, slowly dimming the Moon's light as it spread across. Gradually the eastward facing limb, or edge, of the Moon grew darker and darker. About 90 minutes into the event, the full and profound darkness of the umbra, the central shadow of the Earth, struck the Moon's leading edge. Over the next hour or so the Moon lost much of its light.

Seeing an eclipse of the Moon is not the same as experiencing it. To do that, you need also to notice the sky. At Moonrise the sky was very bright, with moonlight swamping everything except the brighter stars. But as the eclipse progressed that night, the sky began to darken gradually, then more obviously

as fainter stars appeared, and finally, from a dark site, the Milky Way could be seen. On a personal note, one of the variable stars I observe, TV Corvi (Clyde Tombaugh's star), cannot be viewed through a telescope when the Moon is near its full phase. But on this night the darkened Moon let the sky get so dark that I easily got a reading of the field of that star. It was yet another aspect of the magic.

The other part of experiencing the eclipse, a completely unexpected part of it, is to learn just how dark the Moon gets during the total phase. There is a scale, the Danjon scale, which ranges from L=4, where the eclipsed Moon is so bright that you barely notice that there is an eclipse going on at all, all the way down to L=0, during which the Moon is barely visible. If the Earth has suffered a serious volcanic eruption in the months preceding an eclipse, the volcanic dust still remaining high in the Earth's atmosphere can seriously darken the shadow. I saw one such eclipse on the morning of December 30, 1963. Thanks to the eruption in February 1963 of Indonesia's Mount Agung volcano, at mid-totality the Moon simply disappeared. Observing from a rural site, my friend Constantine Papacosmas said that the eclipsed Moon was no brighter than a 5th magnitude star.

A few months ago, Mt Hunga Tonga-Hunga Ha'apai, a gigantic undersea volcano about 60 miles north of Tongatapu, Tonga's main island, erupted and spewed lots of dust into the upper stratosphere. For this reason, I estimated this eclipsed Moon's luminosity as L = 1.5. It was the darkest eclipse I have seen since 1963, and Wendee and I thoroughly enjoyed sitting in our observatory watching the wonderful spectacle.

We get to do this all over again in November when a second total eclipse of the Moon will be visible from the Americas. Because the Moon must pass directly through the Earth's shadow to be eclipsed, these events can happen only at full Moon. May the sky be clear with the Moon as inviting as it always is. Then you will have another chance to watch the sky in motion, and to watch the world move along not with the trivia and rush of the daily news, but with the slow and solemn, long term march of cosmic time.

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

Editor: * Photos by Al Takeda unless otherwise noted.

July Star Fields DEADLINE
Sunday, June 26th

Email articles to Al Takeda at
newsletter@atmob.org

Articles from members are always welcome.

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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 phone #: (978) 692-8708.

Heads Up For the Month . . .

To calculate Eastern Daylight Time EDT subtract 4 from UT.

Jun 7 First Quarter Moon (Moonset at midnight)

Jun 14 Full Moon, Moon at perigee

Jun 16 Mercury at greatest western (morning) elongation, 23 degrees

Jun 19 Asteroid Vesta 0.7 degrees North of Moon

Jun 20 Last Quarter Moon (Moonrise at midnight)

Jun 21 Summer solstice

Jun 22 Mars 1 degree North of Moon

Jun 28 New Moon, Moon at apogee

July 6 First Quarter Moon (Moonset at midnight)

July 13 Full Moon