



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. 32, No. 8 October 2020

This Month's Meeting . . .

Thursday, October 8th, 2020 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 934th Meeting of the Amateur Telescope Makers of Boston.](#)

The Naval Precision Optical Interferometer



Naval Precision Optical Interferometer. Copyright Lowell Observatory

Our speaker this month is W. Lowell Putnam. Mr. Putnam will be presenting on the operation of, and research done by, the Naval Precision Optical Interferometer (NPOI). This facility, built and managed by Lowell Observatory, is the longest baseline

optical interferometer in the world and is used by its 3 partners (Lowell Observatory, the U.S. Naval Observatory and the Naval Research Laboratory) for a variety of research purposes.

From the NPOI website: "NPOI is a specialized astronomical telescope called an interferometer. Instead of a single telescope, an array of six mirrors spaced tens of meters apart precisely direct beams of light from a star to a point. Extraordinary image detail can be derived from the resulting data.

NPOI can record images of stars and optically separate distant pairs of stars so close together that they appear as a single star in even the largest conventional telescopes. NPOI has the ability to measure the precise relative positions of stars across the sky which the Naval Observatory uses as a reference system for the determination of positions on earth and in space and for monitoring time keeping. Currently operating at about one-fourth of its designed capability, when finished the interferometer will span the distance of over four football field lengths, 430 meters."

The Lowell Observatory was financed and used by Putnam's Great-Granduncle, Percival Lowell. The elder Lowell used the observatory's 24-inch refractor to conduct a detailed survey of the surface features on Mars. When completed the NPOI facility will be capable of studying exoplanets around relatively nearby stars! I'm looking forward to Lowell's presentation. I hope you are too! For more information, here's the link for the NPOI website: <https://lowell.edu/research/research-facilities/npoi/>

Mr. Putnam is serving as the 5th Sole Trustee of Lowell Observatory, having succeeded his father, Bill in 2013. Putnam also serves as one of seven members of the Board of Trustees of the [Lowell Observatory Foundation](#).

Prior to becoming the Trust Administrator for the observatory in 2010 he founded Video Communications, Inc., a software company specializing in business systems for TV networks, cable channels, and local TV stations. Clients included The Weather Channel, Comcast, Univision, and many local TV stations across the country.

Mr. Putnam holds a B.S. in Psychology from American International College in Massachusetts and is a Life Member of the American Alpine Club and The Nature Conservancy. He was awarded an honorary doctorate degree from Northern Arizona University in 2018.

President's Message . . .

For visual observers and imagers alike it's time to turn our attention to the Red Planet, Mars. This October, Mars reaches a perihelic opposition on the 13th of October with Earth's closest approach happening the week before, on the 6th. A telescope of almost any size will show the dusky surface features as well as the small white southern polar cap. When I look at Mars my thoughts turn to how impressive the evolution of astronomy is and how far we've come in such a short time.

During the summer of 1877 Mars was particularly close to Earth and one astronomer, Giovanni Schiaparelli, using an

exceptionally fine 8-inch refractor, made sketches of the subtle surface features. The mistranslation of the word he used to describe linear features he observed - canali - led to a surge of interest in the planet. His so-called channels became canals and the popular belief held that these canals were waterways constructed by intelligent life to transport water from the melting polar caps to the Martian cities!

So compelling was this belief that the wealthy Massachusetts-born astronomer Percival Lowell constructed a world-class observatory in Flagstaff, Arizona to study these canals. Using a 24-inch (!) refractor, Lowell sketched canals crisscrossing the Martian surface. It was not until 1965 that the Mariner 9 spacecraft reached Mars and beamed photographs of its surface back to Earth that the ideas of Martian inhabitants were put to rest. Mariner 9 showed a world that looked more moon-like than Earth-like.

In 1976, the two Viking landers showed a desolate landscape strewn with rocks as far as the landers could see. There was no apparent sign of water, let alone life. The landers did carry experiments to look for biosignatures and, although there was great excitement over the results at first, NASA scientists announced that the signals appeared to represent Martian geochemistry rather than the awakening of dormant microbes. Still, we continued to look.

From orbit, spacecraft have revealed considerable evidence that Mars once had flowing water. Rovers sent to the planet have uncovered the types of rocks which can only form in the presence of water. Of those, my favorite is hematite concretions known as "blueberries." Hematite is a form iron oxide that needs water to form. On Earth we call it rust and this is what gives Mars its orange color. You can find hematite concretions on Earth. These are the so-called Moqui Marbles. Found in southern Utah, these brown and black spheres formed when iron precipitated from flowing water during Jurassic times. Slicing one open reveals a sandstone core encased in Hematite. It's the geological version of a Tootsie-Pop!

The Phoenix lander arrived at Mars in 2008 and touched down in the Martian arctic. Just beneath the regolith, Phoenix found bright white deposits of water ice. Its cameras revealed that directly beneath the lander the descent engine exhaust had cleared the dust away to reveal even more of the ice. Next February, the Perseverance rover will touch down on Mars to continue the search. Last month, the European Space Agency announced that further evidence obtained by the Mars Express orbiter lends support to the discovery that large bodies of salty water may lie beneath the surface! Considerable evidence suggests there is water at Mars; it's just not flowing on the surface. Why do we care? Because humans will harvest it in the future.

I'm hopeful that, by the time of the next perihelic oppositions of Mars in 2033 and 2035, humans will be leaving footprints on its surface. The journey will be long and extremely dangerous but immensely rewarding. Having accessible water already there means we won't have to bring it with us! The water near the surface will be collected and purified for consumption and, using

electrolysis, astronauts will decompose the water into its elements to provide a source of hydrogen for fuel and oxygen for breathing. If 2033 seems too aggressive then maybe my grandchildren or their children will be witness to it!

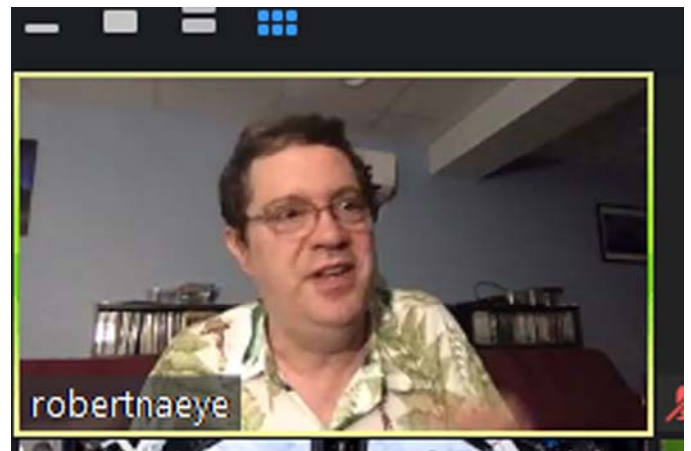
In the meantime, you and I will have to explore Mars from our backyard. Astro-imagers will use a process called "lucky" imaging. With this technique, many short exposures are taken and examined by computer software. The sharpest images, captured during brief moments of near-perfect seeing, are then stacked and processed to produce stunning images.

Visually, Mars can be a challenge. It reaches opposition every 26 months, but we wait for perihelic oppositions to observe the planet at its largest apparent diameter. This month Mars will be as large as 22.6" in diameter! I use a variety of telescopes to observe Mars. In my 3-inch refractor, Mars is tack sharp and some of the large, prominent surface features are visible. During steady seeing so is the southern polar cap. The limitation of this scope is its magnification. Pushing the telescope to 50x per inch or more results in vanishingly small exit pupils that cause every speck of dust, and every floater in my eye to be frustratingly visible! In my 20-inch, brightness is a concern. To use the telescope's full aperture, I employ a moon filter to cut the planet's brightness. An off-axis mask will do the same thing but using one will rob the scope of its ability to work at full resolution. A happy, in-between scope is my 10-inch Dob. This scope offers a comfortable, high power view from a seated position. When I use high powers I find it best to have the scope on its equatorial platform so it can track the planet. Colored filters can be used to enhance surface and atmospheric features.

Well, no matter which type of observer you are or what you have for equipment, this IS the month to observe Mars! The next time its apparent diameter will reach 20" will be in June 2033 but the planet will be low in our skies. A better opposition will happen in 2035 but that's a bit of a wait! So, in closing let me offer the hope for clear, steady skies this month! Astronomy waits for no one so don't let this opportunity pass you by. Be well.

~ Rich Nugent - President ~

September Meeting Minutes . . .



Robert Naeye on Zoom

ATMoB 933rd Meeting Minutes

September 10, 2020

Meeting convened at 8:04 am.

Rich Nugent first gave us a primer on using Zoom during the meeting, including how to unmute and mute yourself. The newest version of Zoom does not allow the host to unmute anyone.

Rich gave several updates. The Harvard-Smithsonian Center for Astrophysics reports that it remains closed to meetings in its meeting hall, and suggests that we contact them at the beginning of 2021.

The Clubhouse and grounds remain closed. We will be discussing safety protocols for reopening at the board meeting in two weeks.

- Eileen Myers gave the Treasurer's report and reported on spending for the Mittelman ATMoB Observatory.
- Chris Elledge gave the Membership report, and reported that he had cleared the rolls of inactive members and welcomed seven new members, including:

Mihai Albu
Christian BJORBAEK
Raymond Gerbi
Nteri Nelson
Peter Nelson
Brandon Parsons
Pranitartharan Ramachandran

- Glenn Chaple presented the Observer's Report, including opportunities to observe Neptune at opposition, and Jupiter and Saturn paired with the moon. "International Observe the Moon Night" is September 26, and Mars is closest to Earth on Tuesday, October 6. Observers should also watch for the Draconid meteor shower on Wednesday, Oct 7. The September 2020 Observer's Challenge is the Veil Nebula in Cygnus.

Glenn Chaple has created an Observer's Log Sheet with the ATMoB logo that can be used for logging visual observing with sketches. He will provide this to Al Takeda for possible inclusion in the newsletter.

- Steve Clougherty gave the Clubhouse report and described three possible locations for the Mittelman ATMoB Observatory:

1. Beside the Greg Chase hutch containing the 17.5-inch Dobsonian
2. Near the rear of the Clubhouse
3. Beside the ATMoB Research and Imaging Observatory (ARIO)

There was some discussion of the proposed Mittelman ATMoB Observatory locations.

Mario Motto was concerned that the position behind the Clubhouse will cause radiative heat problems when viewing over the building.

Bruce Berger reported that there is also underground conduit to ARIO including fiber, which makes that location desirable.

Alan Sliski gave the Mittelman ATMoB Observatory progress report. The observatory is currently in Alan's front yard in the same orientation as it was positioned on the Mittelman roof. Everything is working. A camera borrowed from ARIO is on the telescope at the moment. Bruce Berger is going to clean the camera. In considering a new camera for the observatory, one candidate is the QHY600. Al Takeda has populated a spreadsheet with specifications of all of the cameras under consideration.

The Mittelman ATMoB Observatory team has purchased the ACP automation software to run the overall observatory. The guide scope and guide camera are operational. In a test run, two of five pictures were usable and Al Takeda presented a processed image during the meeting. Bruce reported that James Chamberlain is working on integrating real time weather and observing conditions for a future Clubhouse display monitor. He showed a mockup of this during the meeting.

Steve also reported that mice have been in the 17.5-inch Greg Chase hutch, but not inside the telescope. The building is in good shape with no rain leaks. Steve also commented that gasoline is on hand for next lawn mowing some time this month.

- Rich Nugent and Kelly Beatty gave the Outreach report. Corey Mooney gave another "virtual star party" on Friday, Aug 21, with Discord discussion. Last November, eight telescopes were "ruggedized" for library loan, and one was distributed to Tewksbury, and one to Belmont.

One outreach possibility of note is to partner with Popscope, which attempts to bring stargazing to under-represented groups. There is a natural synergy between the social media skills of the younger generation and the older ATMoB members with their knowledge and telescopes.

Rich Nugent noted that member Terry Manning passed away (1927-2020).

Old business:

<http://smile.amazon.com> remains a great way to support the club, by donating a small percentage of each purchase on Amazon to the club.

New business:

Rich Nugent offered to host a “Zoom Virtual Clubhouse Night” starting at 7 pm on Saturday nights and shutting down at about 11 pm. He’ll be outside observing, but will keep the room open for chatting and breaks from observing.

Kelly Beatty mentioned the opportunity to collaborate with <http://www.globeatnight.org>, which monitors viewing and light pollution via user reports, and reports these on an electronic map.

Speaker Robert Naeye dedicated his talk to the late Tal Mentall, former President of ATMob. The talk is based upon the cover story, *How we'll find life in the universe*, in the September 2020 issue of *Astronomy Magazine*. The talk gave a sweeping overview of all current efforts to detect extraterrestrial life, including planetary missions planned in our solar system, study of exoplanet atmospheres, and the search for technological signatures (SETI). He asked some rather deep questions, including whether we will discover “life as we know it”, “life as we don’t know it” (e.g., silicon-based life), or “life as we really don’t know it” (e.g., “the black cloud” of Fred Hoyle). From missions to Titan and Europa, to large telescopes being proposed to study exoplanet atmospheres, Robert gave an optimistic view that we will, someday, discover life elsewhere.

Meeting was adjourned at 10:26 pm.

~ *Alva Couch - Secretary* ~

ATMoB Executive Board Meeting Highlights . . .

September 24, 2020

Refer to the full meeting report on the ATMob web site.

Meeting Attendees:

Executive Board: Maria Batista, Glenn Chaple, Alva Couch, Chris Elledge, Tom McDonough, Eileen Myers, Rich Nugent, Alan Sliski, Bill Toomey

Members: Kelly Beatty, Steve Clougherty, Philip Levine, Dick Koolish, John Reed, Phil Rounseville, Al Takeda,

Meeting convened at 8:04 PM

Agenda Items:

- COVID restrictions update for meeting at the Harvard Smithsonian Center for Astrophysics in Cambridge, MA. The CfA has asked us to contact them in the beginning of 2021.
- Discussions on the strategy and safety protocols for reopening the Clubhouse in Westford, MA.

- Application for lease extension update.
- Filling the club's Vice President vacancy.
- Revision of By-Laws discussion.
Electronic voting.
Language concerning exceptional conditions and an emergency clause.
- Mittelman ATMob Observatory update.
- Joint virtual meetings with other clubs and organizations.
- Action items:
Rich will work with Alva to write up rules for Clubhouse reopening.
Eileen will obtain and forward the Certificate of Insurance to Rich.
Rich will consider appointing a committee to review the bylaws.

Next meeting:

Tentatively Jan 7, 2021, 8-10 pm.

Meeting adjourned at 9:32 PM.

Membership Report . . .

I am pleased to welcome our newest members: Christine Zacharer; Carlos, Lisa, & Nathan del Llano.

As of September 29th, 2020 we have 264 memberships covering 338 members. This is broken down as follows:

- 107 Regular Members
- 106 Senior Members
- 2 Student Members
- 44 Family Memberships covering 118 Members
- 3 Guest Members
- 2 Honorary Members

Membership renewals for the 2020-2021 fiscal year are past due. Members that joined after January 2020 are not due for renewal until next year.

You can check if you need to renew and start your renewal process on the website at <https://www.atmob.org/renew>

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

Donations are encouraged during membership renewal to help keep our club running smoothly, our Clubhouse maintained, and telescopes in good condition. Donations are tax deductible to the

extent allowed by law. If you choose to pay by credit card please consider making at least a small donation since credit card companies take a few percent of your payment to the club.

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 #933 is available on YouTube: <https://youtu.be/h4SJzY88vRO>

I would like to thank Robert Naeye for giving his presentation and allowing us to record it.

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>

~ Chris Elledge - Membership Secretary ~

Clubhouse Report . . .



The Clubhouse. Image by John Stodieck

October 2020 Clubhouse Report

John Blomquist, Maria Batista and I arrived at the Clubhouse on Monday, September 28 to mow the lawn and inspect the facilities. John spent two hours with his tractor mower cutting the tall weeds and grass around the Clubhouse while Maria and I used two power mowers to cover the areas inaccessible to the tractor. We completed approximately 90% of the grass cutting and left a small area behind the roll off observatory when John experienced a problem with the tractor. We will need help raking and completing a final mowing in about three weeks.

The Clubhouse itself is in very good condition with no sign of leaking or damage. The basement is dry and the oil tank is full, though the furnace is currently shut down. We will visit the facility as soon as we know if MIT gives us permission to use the observing field during the Fall and possibly the Winter.

Currently there are no firm plans to open the Clubhouse itself and restart mirror making and workshop activities or Clubhouse-based astronomy video classes.

Clubhouse Saturday Schedule	
Indefinite Period	CLOSED DUE TO THE CORONAVIRUS PANDEMIC

~ Clubhouse Committee Chairs ~

~ Steve Clougherty, John Reed and Dave Prowten ~

Wednesday Evening Educational DVD Videos . . .

Member-at-Large Maria Batista is hosting Wednesday evening DVD lectures. These weekly Zoom meetings start at 7 PM. Members can sign up at www.atmob.org.

Observer's Challenge . . .

October, 2020

NGC 7332/7339 - Galaxies in Pegasus

NGC 7332, Mag: 11.1, Size: 4.1' X 1.1'

NGC 7339, Mag: 12.1, Size: 3.2' X 1.0'



NGC 7332/7339, taken with an ASI6200 camera through the 32-inch scope. 1 hour Luminance, and 45 min. each RGB. Image by Mario Motta

The deep sky aficionado who has spent time exploring galaxies in the constellation Pegasus is familiar with NGC 7331 and the nearby galaxy group Stephan's Quintet. For more Pegasus galaxies, look eleven degrees due south for the interesting edge-on galactic pair NGC 7332 and NGC 7339. Both were discovered by William Herschel on September 19, 1784 and entered in his Catalogue of Nebulae and Clusters of Stars as Class II (Faint Nebulae) objects.

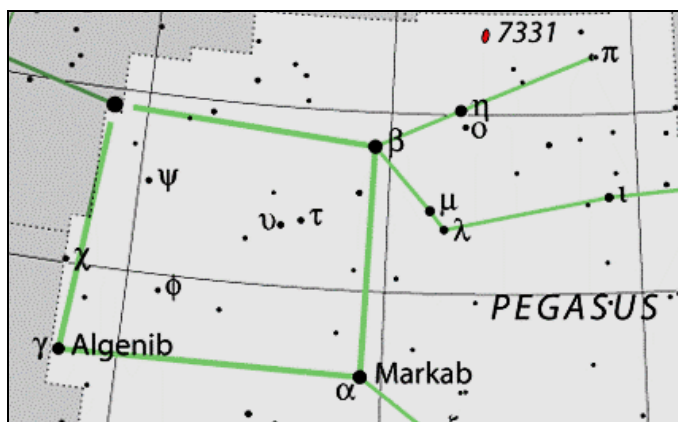
Far be it for me to question Sir William's judgment, but I would humbly opine that NGC 7332 should have been catalogued as a Class I (Bright Nebulae) object. I had no trouble capturing the elongated form of this 11th magnitude edge-on lenticular galaxy with a 4.5-inch reflecting telescope and magnification of 100X. NGC 7339 wasn't as accommodating. A magnitude fainter than NGC 7332 (and certainly deserving its Class II status), this edge-on spiral required a bigger scope (a 10-inch reflector), ample time to dark-adapt my eyes, and averted vision.



NGC 7332/7339, Stock Canon 80D, 1200mm f/8 lens, ISO 800, 60 x 2-minute subs for a 2 hour total exposure, 2/3rds scale, North is up. Image by Doug Paul

To find these galaxies with GoTo technology, use the coordinates for NGC 7332 (RA 22h 37.4m, dec. +23° 47.9'). If you're a star-hopper, train your finderscope on the wide pair mu (μ) and lambda (λ) Pegasi (magnitudes 3.5 and 3.9, respectively). After centering lambda in a low-power eyepiece field, nudge your scope 2 degrees westward until a pair of 7th magnitude stars less than a degree apart and oriented N-S enters the field. Center the northernmost of the two in the eyepiece field and switch to a higher magnification. NGC 7332 should immediately be visible. NGC 7339, located 5 arc-minutes east of NGC 7332 will appear as a faint E-W-oriented streak.

NGC 7332 and NGC 7339 appear to form a gravitationally bound system. They lie some 67 million light years from earth.



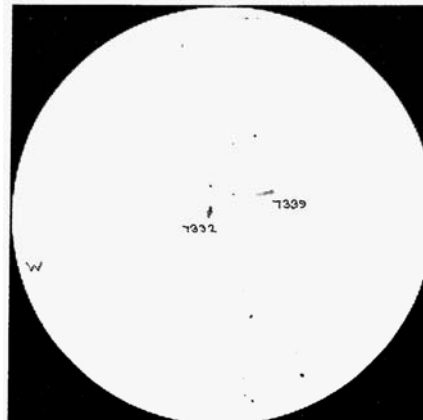
Finder Chart for NGC 7332/7339, www.constellation-guide.com



OBSERVING LOG

NAME: Glenn Chaple
 DATE (M/D/Y) 9/11/2020 TIME: 10:20 pm EDT
 OBSERVING SITE: Townsend MA
 SKY CONDITIONS: Seeing (Antoniadi Scale) _____ Limiting Magnitude 5.2
 OBJECT: NGC 7332 NGC 7339 TYPE: Lenticular Gal Spiral Gal CONSTELLATION: Peg

SKETCH (note direction of west)



NOTES:

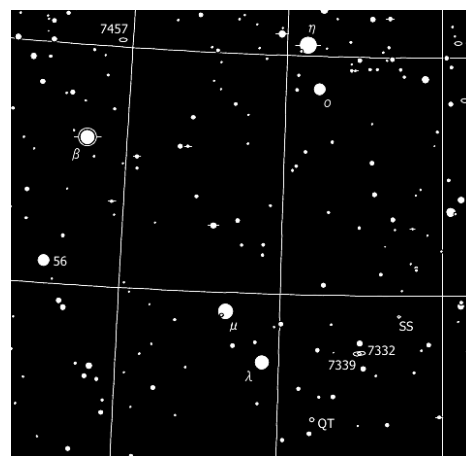
NGC 7332 - easily seen with lowpower. Stellar nucleus at 139 X. Elongate roughly N-S.
 NGC 7339 - very faint at 139 X. Elongated E-W

OBSERVING EQUIPMENT

Binoculars X
 Telescope: 10-inch f/5 reflector Eyepiece: 5mm Nagler
 Mag: 139 X Field Diam: 0.6 ° Filter (if any): _____

NGC 7332/7339, as seen with 10-inch f/5 reflector at 139X.
 Sketch by Glenn Chaple

Editor's note: A blank copy of Glenn's Observing Log sheet for astro-sketchers can be downloaded from the [Documents section in the Observing folder on the ATMOB website](#).



Taki's 8.5 Magnitude Star Atlas (takitoshimi.starfree.jp)

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 Levi

October 2020

The Long Summer of 2020

When Earth crossed the summer solstice on June 21, 2020, we were all mired in the midst of the most serious pandemic in more than a century. Summer is the most important season for me for one reason: it was many years ago, during the summer of 1960, that I fell in love with the night sky. This summer just concluded had a start filled with disappointment.

On June 21, 1960, I was riding my bicycle to school when its front wheel struck a curb and broke my arm. My cousin, Roy Kaufman, gave me a book about the planets as a get-well present. I read and reread that book all summer, and by September I was enjoying my first look through a telescope, at the planet Jupiter. The view of the planet with its bands of color, combined with its four big moons, was one I have never forgotten. To this day Jupiter remains my favorite planet. As I never tire of looking at this world, I was able to view Jupiter this summer also.

The summer of 2020 began with a huge handicap, but something appeared in the sky that quickly altered my perception. That something was Comet Neowise. Not since Comet McNaught in 2007 has such a bright comet graced our sky. I first saw Neowise on the morning of July 5. The full Moon was setting in the west, and the sky was brightening rapidly in the east. With a pair of good binoculars I found Capella, then carefully moved them toward the eastern horizon. Suddenly, the beautiful comet made its appearance with a bright glowing head and a brilliant tail. As the comet faded slightly over the next few days its tail grew longer.

Comet Neowise might have been a highlight of this Summer season, but there were other highpoints. Over the course of the summer I enjoyed sixteen "AN" or all night observing sessions, nights under the sky that went on from dusk to dawn. Most of these were interrupted by lengthy periods of rest during which I would watch some television, but the final one was not. Session 21755AN2 began when my friend David Rossetter and I observed for several hours at the dark site run by the Tucson Amateur Astronomers Association. Once back home, I enjoyed more hours searching for comets until dawn spelled an end.

Searching for comets is something I have enjoyed for many years. It is an activity of which I never tire, even though I have not found a new comet since October 2006. After all, the search is what is so important to me. It is refreshing, it is fun, and it recharges my soul and my spirit.

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

Dark and Quiet Skies for Science and Society . . .

The United Nations Office for Outer Space Affairs and Spain, jointly with the International Astronomical Union (IAU) are organizing an online Workshop on the topic of "Dark and Quiet Skies for Science and Society". This online event is replacing the Conference initially foreseen in October. The face to face Conference is postponed to 19-23 April 2021 and will be hosted by the Instituto de Astrofísica de Canarias (IAC) at Santa Cruz de La Palma, Canary Islands, Spain. In lieu of the on site meeting, the first week of October 5-9, 2020 there is a virtual meeting that is available for all (free registration).

I have been asked to be a participant, and will deliver a talk on human effects of light pollution on Tuesday, Oct 6. I am an author of the part of the report of this meeting that deals with light pollution effects on human health, with the full report to deal with aspects of astronomy from light pollution to satellite proliferation issues.

This is a worldwide event, and the final publication will be sent to the United Nations General Assembly for ratification. I am hopeful that this document, if ratified, will have a worldwide impact on light pollution issues, similar to my 2016 American Medical Association (AMA) report on the same issue. See link below for full details, and register (free) if interested in viewing or participating in the virtual discussion. After every section, there will be moderated Q&A sessions for participants. When the final document is published, I will be able to share it.

See the link below for the program and registration:

Editor's note: According to the website, registration is now closed.

<http://research.iac.es/congreso/quietdarksky2020/pages/home.php>

~ Submitted by Dr. Mario Motta ~

*Editor: * Photos by Al Takeda unless otherwise noted.*

**November Star Fields DEADLINE
Sunday, October 25th**

**Email articles to Al Takeda at
newsletter@atmob.org**

Articles from members are always welcome.

POSTMASTER NOTE: Not mailed due to the coronavirus pandemic

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FIRST CLASS

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NEWSLETTER Al Takeda newsletter@atmob.org

PUBLIC OUTREACH

COMMITTEE CHAIR: Rich Nugent starparty@atmob.org

STAR PARTIES: Bernie Kosicki

Laura Sailor

John Harrington

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 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. It is wise to call in advance: (978) 692-8708.

Heads Up For the Month . . .

To calculate Eastern Daylight Time (EDT) from Universal Time (UT) subtract 4 from UT.

Oct 6 Mars at closest approach

Oct 8 Draconid meteors peak

Oct 9 Last Quarter Moon (Moonrise at midnight)

Oct 13 Mars at opposition

Oct 16 New Moon

Oct 21 Orionid meteors peak

Oct 23 First Quarter Moon (Moonset at midnight)

Oct 31 Full Moon, Uranus at opposition

Nov 1 Daylight Saving Time ends

Nov 8 Last Quarter Moon (Moonrise at midnight)