



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. 33, No. 10 November 2021

This Month's Meeting . . .

Thursday, November 11th, 2021 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 946th Meeting of the Amateur Telescope Makers of Boston.](#)

Time



Time is an interesting...*thing*. Under the conditions of our everyday world it flows in one direction, from the past to the future, at the rate of one second per second. Einstein showed that the passage of time is relative to our frame of reference and, when travelling at relativistic speeds, the rate of the passage of time slows down. To measure its passage humans devised clocks. Sundials have been used for thousands of years to mark its passage and by noting the cyclical apparent motion of the Sun across the sky led to a system of calendars. Clocks evolved to accommodate the need for more accurate timekeeping. The stick-in-the-ground method was improved by the invention of water clocks, burning candle clocks and, eventually, by the advent of the pendulum clocks. The ability to accurately determine the longitude of a ship at sea required another leap of technology.

John Harrison, an English carpenter, and clockmaker invented the spring-wound marine chronometer in 1730. This device proved to keep remarkably accurate time onboard a ship being tossed about by the waves. Quartz clocks made their appearance in the 20th century and today, extremely accurate timekeeping is made possible with atomic clocks. But what time is it, really?

Using a sun-clock, the exact time varies with one's location on the Earth. For two locations just one degree of longitude apart, the difference is 4 minutes. Time zones have been set up to standardize our clock system but folks living on the western edge of a time zone can see sunrise an hour later than folks living on the eastern edge of the same zone. Daylight Savings Time doesn't help. It was the expansion of our passenger rail network during the 1840's that necessitated a standardized clock system. Major observatories being built at the same time were ideal for accurately measuring time.

This month's speaker is Michael Ulbricht, Curator of Brown University's historic Ladd Observatory. The Observatory opened in 1891 and is part of the Department of Physics at Brown University. Today it is operated as a working museum where visitors can experience astronomy as it was practiced a century ago. Mike spends most of his time presenting science outreach and public education programs, demonstrations, and exhibits. He is also responsible for the historic scientific instrument collection. Mike's primary research interest is late 19th and early 20th century astronomy with a focus on precision timekeeping using mechanical clocks and transit telescopes. Other research includes the early history of wireless radio transmission and the industrialization of Providence, Rhode Island. He has been with Brown since 2004. Before that Mike was the coordinator for the Providence Planetarium in the Museum of Natural History at the Roger Williams Park.

If you have time (hehe), please join us for the November meeting. I'm sure it will be time well spent!

~ Rich Nugent – President ~

President's Message . . .

As most of you already know, my family has experienced the tragic loss of our oldest son, Brian. While running the virtual Baystate Marathon on October 11th, he was stricken with acute and severe rhabdomyolysis which caused him to go into cardiac arrest. The Acton Police, Fire, and EMTs worked on him until a Life Flight helicopter transported him to Tufts Medical Center in Boston. Despite the valiant efforts by everyone involved, Brian could not be saved. He was only 35 years old. He was a wonderful son, and we were proud of the young man he grew up to be. Brian was a shining example of how to be a loving, caring husband and dad. He was completely dedicated to his wife and their three young children, and he will be missed by his family, friends, coworkers and neighbors every day. The outpouring of love and support for Brian and his family has been amazing!

I want to take this opportunity to again thank all of you for keeping Brian and his family in your thoughts and prayers during

this ordeal. Please continue to do so. I also wanted to thank everyone who was able to contribute to the GoFundMe site set up for his family by one of their neighbors. Your generous donations will help Liz greatly.

I also want to thank Vice President, Corey Mooney and past President Tom McDonagh for taking over the preparation and the running of the October monthly meeting. I've asked them to do the same for the November meeting. I hope to be back with you in December, but only time will tell.

Are there lessons to be learned from this or things to be considered? Yes. First, take good care of yourself. Make good choices. Try to find ways to be more healthful. Exercise a little more. Eat better. Work to break habits that are unhealthy. See your doctor on a regular basis. Don't keep symptoms buried inside you. Challenge yourself to learn new things. Don't wait until it's time to make New Year's resolutions...Start now, today, for there is no promise of a tomorrow.

As we enter the holiday season find ways to become a better person. Tonight, hug your loved ones and tell them you love them. If you can't do that in person, call them and tell them you love them. Tell them how proud they make you feel. Mend fences if they need mending. Be patient with others because they are probably going through something you'll never know about. Be tolerant of others and don't hate them for thinking differently than you. Each day perform acts of kindness towards others. Be a good person. You get the idea.

I haven't done any observing since Brian's passing but I did look at one star, Delta Trianguli. I had never paid attention to it until now. It's an unassuming, 5th magnitude star that is remarkably like our Sun. It is 35 light years distant. The light I see now left the star when my son was an infant. I will look at the star as often as I can and let its photons remind me of the bright light that was my son, Brian. Be well, my friends. Stay safe and take care.

~ Rich Nugent – President ~

October Meeting Minutes . . .



Dr. Mahboubeh Asgari-Targhi on Zoom *

ATMoB 945th Meeting Minutes October 14, 2021

Vice President Corey Mooney presented the President's welcome and presided over the meeting.

- Alva Couch presented the Secretary's report. October's speaker was "the other Richard Nugent of Houston TX" who spoke on how to become involved in occultation timing research. Thanks, Richard, for an inspiring presentation!
- Eileen Myers presented the Treasurer's report and reported donations and membership renewals which offset by some maintenance expenses lead to a small net inflow.
- Chris Elledge presented the Membership report and welcomed new members Bret Bersack, Nimit Chovatia, Robert Lebel, Marie Mabardi, Tommy McPherson, Rajeev Meharwal, and Lauren Nichols.
- Corey Mooney presented the Observer's report. The Orionid meteor shower peaks on October 20th. The Taurid meteors can be seen from late October to early November. This month we will have many near passes between the Moon and the planets Venus, Saturn, and Jupiter. The October Observer's Challenge is NGC 6857.
- Steve Clougherty presented the Clubhouse report. We had a Sept. 18th Work Party with 23 volunteers. We did house cleaning. We want to give a big thank you to MIT's buildings and grounds department for allowing us to use their dumpster. John Maher held training sessions for the on-site telescopes. The next work party is scheduled for October 23rd. We'd like attendees to let us know if you are planning to attend the work party, so we can plan for the proper amount of lunch.
- Alan Sliski gave the Mittelman-ATMoB Observatory report. Chris Elledge has been testing the startup and shutdown scripts against edge cases to ensure that we can shut down and stow the telescope whenever things go wrong. New B and V filters have been installed and Al Takeda has done some test images.
- Corey Mooney presented the Website Committee report. We've been rewriting some sections and will be doing some usability testing.
- Corey Mooney presented the Outreach report.
Upcoming star parties:

October 15/16: Observe the Moon Day at New England Sci-Tech in Natick, MA.

Nov 11/12: with the Westford Pack 95 Cub Scouts.
- Old business: <https://smile.amazon.com> can be set up to give us a donation for each Amazon purchase.

- New business:

The Newsletter contains a summary of the Board Meeting. Approval was given to purchase an equatorial platform for the 25-inch Dobsonian.

Our guest speaker for October was Dr. Mahboubeh Asgari-Targhi whose talk title was “Here Comes the Sun”.

Dr. Asgari-Targhi, of the Harvard-Smithsonian Center for Astrophysics, discussed the Sun’s “coronal heat paradox”, the fact that temperature in the corona increases as one travels outward from the Sun’s surface and photosphere. The variation in temperature goes from 6000 Kelvin at the surface to above 3 million Kelvin in the corona. This seems paradoxical because temperature is increasing as plasma density decreases. After a discussion of basic solar dynamics, Dr. Asgari-Targhi discussed the theories that attempt to explain this strange and counterintuitive temperature pattern. Influences that might explain this paradox include “Alfvén waves”; low frequency oscillations of plasma and magnetic fields. Theoretically, Alfvén waves can heat the corona by propagating energy upward inside coronal loops, “braided-looking” loops of energy that expand outward from the surface. This possibility has been studied via mathematical modeling and correlated with coronal temperature observations. At present, energy transfer via Alfvén waves inside coronal loops is a plausible explanation for part of the “coronal heat paradox”, supplemented by other kinds of energy transfer.

~ *Alva Couch – Secretary* ~

Membership Report . . .

I am pleased to welcome our newest members: Mahboubeh Asgari-Targhi, Nimit Chovatia, and Lauren Nichols.

As of October 30th, 2021 we have 300 memberships covering 375 members. This is broken down as follows:

- 125 Regular Members
- 124 Senior Members
- 5 Student Members
- 44 Family Memberships covering 119 Members
- 2 Honorary Members

Renewals for FY2021-2022 are past due for all members 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* ~

Meeting Recordings . . .

The recording of ATMoB meeting #945 is available on YouTube: https://youtu.be/vu1v4WL-1_A

I would like to thank Dr. Mahboubeh Asgari-Targhi for giving her 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 . . .



“Changing of the Guard” for a new season *

October 2021 Clubhouse Report

Our monthly work session at the Clubhouse was held on Saturday, October 23rd with a total of 22 member volunteers helping out with a variety of projects.

During the morning hours Chris Elledge provided instruction for operating our riding lawn mower while other volunteers used the two self-propelled push mowers to complete mowing the grounds. With a little luck this mowing will be the final one for the year!

A broken window pane on the second floor of the Clubhouse was replaced.

Several members helped to dispose of a number of old Sonotubes found in the barn loft. We reorganized this space and kept for telescope making several of the cardboard tubes, the fiberglass tubes and the aluminum tubes.

Our composting toilet was emptied and a new mix will be completed next month. This task is done yearly, usually in the fall.

Thanks to Pierre Fleurant for tackling the cleaning of shelving and drawers in the Ed Knight roll-off observatory. Tom McDonagh and Bruce Berger are working to refurbish the

William Toomey Observatory. They have removed the C-14 Schmidt-Cassegrain telescope and will be replacing it with Tal Mental's donated Meade 5-inch apochromatic refractor. Please speak with Tom and Bruce if you would like to take part in this project.

We would like to thank member Jim Mahoney for his generous donation of equipment to the ATMob. Jim has donated a set of Ethos eyepieces along with a 10-inch Dobsonian telescope for our use.



Jim Mahoney's Ethos Eyepiece donation. *

The next work party will be held on Saturday, Nov. 20th. We will need assistance rehabbing the front barn door leading from the machine shop which has rotted through.

Thanks to Eileen Myers for making a wonderful homemade lunch for all volunteers!

Thanks to the following members for a very productive work session for the month of October:

Maria Batista, Bruce Berger, Paul Cicchetti, Steve Clougherty, Tom Consi, Chris Elledge, Pierre Fleurant, Joe Henry, Eric Johannsen, John Maher, Avery and Seth Mangum, Tom McDonagh, Vladislav Mlch, Corey Mooney, Eileen Myers, Robert Nick, Joseph Rothchild, Phil Rounseville, Dave Siegrist, Al Takeda and Dave Wilbur.

~ *Clubhouse Committee Chairs* ~

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

Mittelman-ATMoB Observatory Update . . .

The Mittelman-ATMoB Observatory (MAO) group is proud to announce that we have submitted our first science data to the American Association of Variable Star Observers (AAVSO).

On September 22, 2021 and October 7, 2021 we took photometric images of NGC 7790 using filters B, V, Sloan-R and Sloan-I. From these raw images Peter Bealo (Observer code:

BPEC) and Pierre Fleurant (Observer code: FPIA) selected the variable star ER Cas (Cassiopeia) to measure.

The images were first calibrated and stacked to remove unwanted artifacts in the image. The files were uploaded to AAVSO's on-line "VPhot" tool to get a photometric analysis. After the analysis the data was uploaded to the AAVSO database. Peter's and Pierre's ER Cas light curve plots are shown in Chart 1 below.

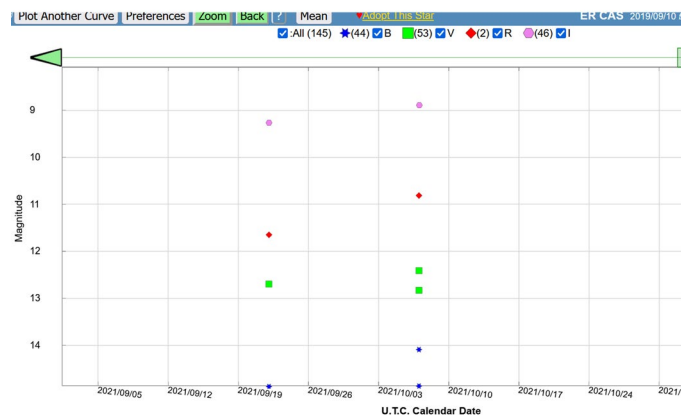


Chart 1: MAO ER Cas data submitted by Peter Bealo and Pierre Fleurant. Plot by AAVSO's WebObs Light Curve Generator

The AAVSO light curve plots for ER Cas for the year 2021 are shown in Chart 2.

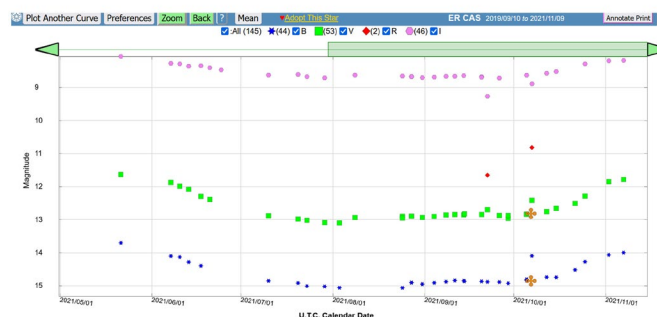


Chart 2: FY 2021. Plot by AAVSO's WebObs Light Curve Generator

As of the beginning of November 2021, all of the data gathered thus far have been performed manually. Going forward, Chris Elledge has been working on the programming scripts that interface with the ACP Observatory Control Software to perform these operations automatically.

We would like to thank the following people that have contributed to data gathering, automation setup and maintenance of the observatory: Peter Bealo, Bruce Berger, James Chamberlain, Chris Elledge, Pierre Fleurant, Arne Henden, Jim Gettys, Tom McDonagh, Aaron Sliski, Alan Sliski, Al Takeda and Gary Walker.

~ *Al Takeda - MAO Operations and Imaging* ~

Observer's Challenge** ...

November, 2021

NGC 7662 – Planetary Nebula in Andromeda

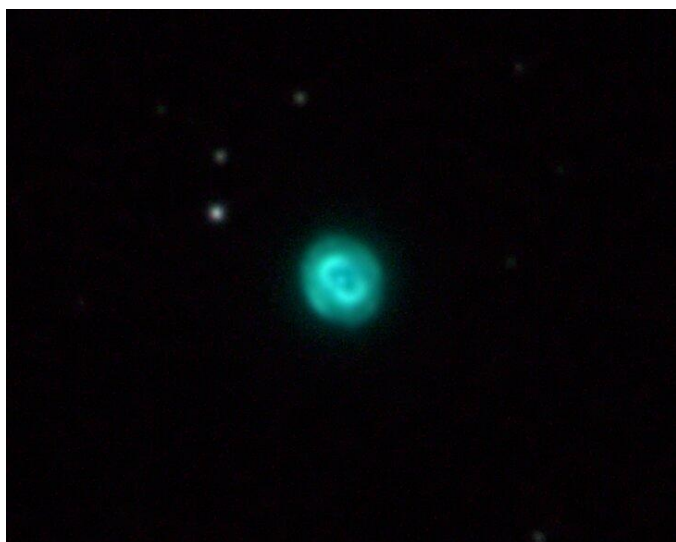
Magnitude 8.3

Size 37"



32-inch scope using SBIG STL 1001E camera, 1 hour each of H-alpha, SII, and OIII filters, cropped and enlarged 2x. Image by Mario Motta

Last month's Observer's Challenge focused on NGC 6857, an emission nebula that astronomers once mistook for a planetary nebula. Our November Observer's Challenge, NGC 7662 in Andromeda, is a bona fide planetary nebula. It was discovered by William Herschel on October 6, 1784, one month after he found NGC 6857. At a magnitude of 8.3, NGC 7662 is a full 3 magnitudes brighter than NGC 6857. It's one of the brightest of all deep sky objects in its class, easily seen in a small scope. So what is its challenge?

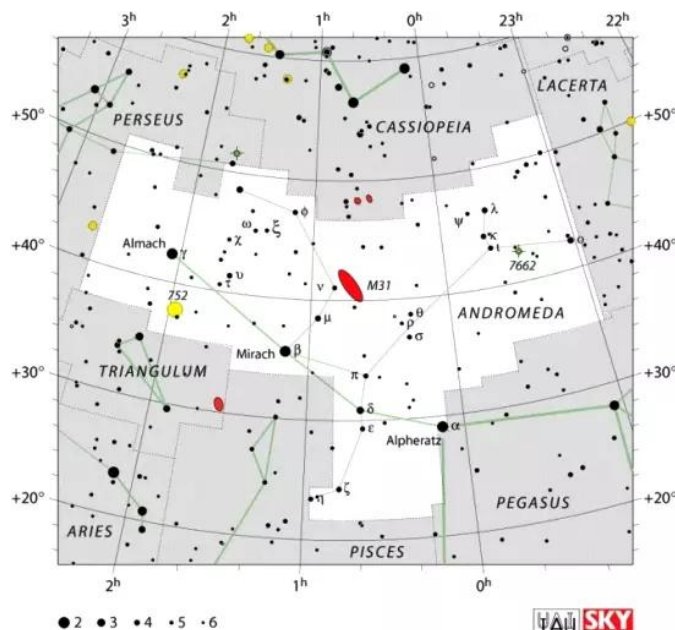


Canon 80D, 1200mm f/8.0 lens (150mm aperture), ISO 400, 46 x 30 sec. subs = 23 min. total exposure, 200% scale, North up. Image by Doug Paul

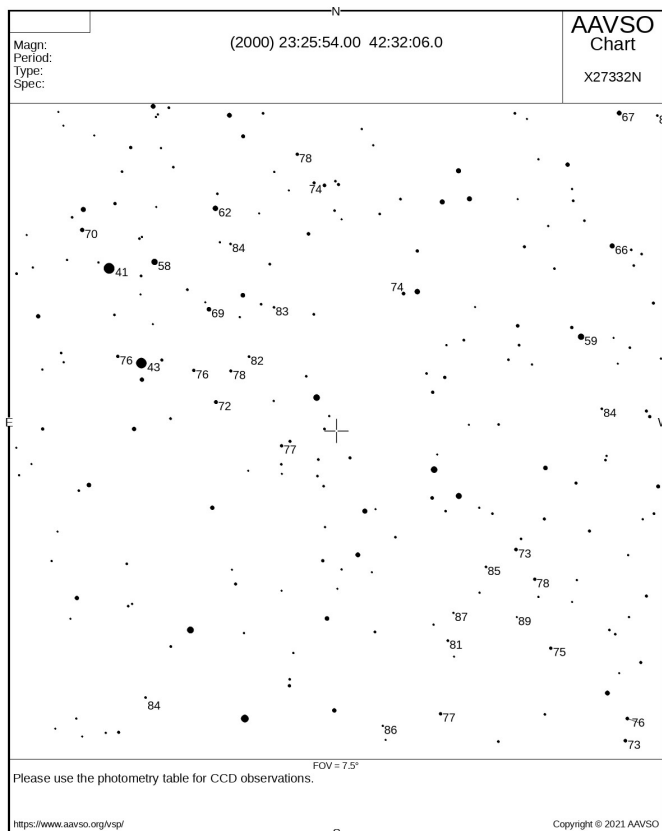
If you're a novice backyard astronomer, even the brightest and easiest planetary nebula can test your developing observing skills. These objects are small and will appear stellar at low magnifications. Begin your NGC 7662 quest at "Frederick's Glory," a Y-shaped asterism in the northwest part of Andromeda (refer to Finder Chart A). Using a low-power eyepiece and Finder Chart B, start at iota (i) Andromeda, the 4.3-magnitude star on the chart. From there, move 2 degrees westward until the 6th magnitude star 13 Andromedae (the unlabeled star one-half degree northeast of NGC 7662) enters the field. Switch to a medium-power eyepiece (60X works fine) and sweep the area around 13 Andromeda until NGC 7662 comes into view as a small out-of-focus star. Center it in the field of view and switch to the highest magnification your telescope aperture and seeing conditions allow. Owners of GoTo scopes can "cheat" by punching in the celestial coordinates, Right ascension 23h 25m 54s, Declination 42° 32' 6" and slewing straight to the target.

Here's a fact about NGC 7662 that I haven't mentioned. It's noted for its blue color, hence the popular nickname, the "Blue Snowball." I was unable to detect any color at all when viewing NGC 7662 with a 60mm (2.4-inch) refractor, but the color was vivid when I viewed it with an 18-inch Dob. What is the smallest aperture that will bring the "Blue Snowball" to light? For that matter, what is the smallest aperture that reveals its 13th magnitude central star?

Challenge yourself by looking for NGC 7662 with binoculars. Using Finder Chart B as a guide, you should come across an 8th magnitude "star" in the position indicated on the chart. Reasonably dark skies will be a must if you're working with standard 7x30's or (better yet) 7x50's.



NGC 7662 Finder Chart A



NGC 7662 Finder Chart B. Chart made using the AAVSO's Variable Star Plotter. Numbers refer to a star's magnitude, decimals omitted. Magnitude 4.1 and 4.3 stars are kappa (κ) and iota (ι) Andromedae, respectively. North is up in this 4 by 5 degree field. Stars shown to 10th magnitude.

As is the case with many planetary nebulae, the distance to NGC 7662 is uncertain at best. Calculations fall between 1800 and 5600 light years. I'll settle on a figure of 2500 light years, given by NASA and the Universe Guide website (universeguide.com). The latter source includes an interesting table that shows the time needed to arrive at NGC 7662 by various means of travel. Light speed gets you there in 2500 years. The New Horizons Probe, which took 15 years to reach Pluto, will require 51 million years. A Mach 2 jet airliner would reach its destination in a little over 1 billion years, while a speeding (120 mph) car would require nearly 14 billion years, not counting a lot of stops for gas! Want to take a stroll to the Blue Snowball? If you "leg it out" at a 15 minute per mile pace, plan on around 420 billion years! I don't know about you, but I'm sticking to my backyard and a telescope.

**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

October 2021

Fond memories of Carolyn Shoemaker



(L-R) Wendee Levi, David Levi and Carolyn Shoemaker. Image by David Levi

One clear evening during the summer of 2019, I was using Pegasus, one of my childhood friend Carl's telescopes, at our annual Adirondack Astronomy Retreat. When my cellphone began to ring, I picked it up with some surprise. At the other end of the line was Carolyn Shoemaker. I was thrilled to hear from her, as it had been some time since our last contact. Carolyn was doing well, except for a mild loss of hearing. She had called to say that since her daughter and son-in-law had moved to New Mexico, she would be living at the Peaks, a comfortable assisted living facility in Flagstaff. My colleague Brent Archinal gave me her cell phone number. I was able to speak with her again a few months later. I wanted to find a way to increase the frequency of our conversations. "You speak with your brother Richard every Monday," Wendee commented, and suggested, "Why not call Carolyn every Monday as well?"

For the next 18 months that's what I did. Carolyn would pick up the phone and announce, "It is David. It must be Monday!" Wendee would often join the discussion as well. But when I called on Monday, August 9, no one answered. After repeated tries, her daughter Linda called to say that Carolyn had had a minor fall and was in the hospital. On Thursday evening, August 12, she went into respiratory arrest. Carolyn died the next morning at 10:40 A.M. Arizona time.

With her husband Gene and the five-year comet and asteroid program we shared, Carolyn was responsible for a very rich period in my life. In fact, virtually every article one reads about the Shoemakers will agree that the discovery and impacts of Comet Shoemaker-Levy 9 were the most significant part of our professional lives.

Carolyn began her observing project a few years after her husband Gene was disqualified as a potential astronaut because of Addison's disease. He decided to go at the problem of impacts, not from studying craters as he walked about on the Moon, but from the opposite direction of the comets and asteroids that collide with the Moon, and with the Earth. Carolyn quickly learned to become proficient at using the stereomicroscope. She would place two films into the microscope; they were identical except that the second plate would be about 45 minutes later than the first. The films were almost always identical, except that when an asteroid was moving slowly, it would appear to float above the starry background. Carolyn discovered 377 asteroids this way, each one charted until its orbit round the Sun could be determined accurately. When one included the asteroids for which orbits have not yet been determined, that number rose significantly, according to Carolyn, to about 800.

In 1983 Carolyn discovered the first of her 32 comets. When their colleague Henry Holt joined the following year, the number of new comets rose rapidly. It was only a year or two after that when she surpassed the number of comets another famous astronomer, Caroline Herschel, discovered, and *Sky & Telescope* published a news note about "Carolyn passing Caroline." I joined the team in 1989. In a sense, passing Herschel's record might have been Carolyn's golden moment, but it wasn't. That came later on a cloudy and dull day on March 25, 1993. Two nights earlier I had taken two exposures that she was scanning. Suddenly looking up, she announced "I don't know what I have, but it looks like a squashed comet." That was the discovery moment of Comet Shoemaker-Levy 9. Sixteen months later, when the 21 pieces of this fragmented collided with Jupiter, we got to meet President Clinton and chat amiably with Vice President Gore and share the world's excitement over the first collision of a comet and a planet ever witnessed by humans. It was a satisfying peak to all our careers.

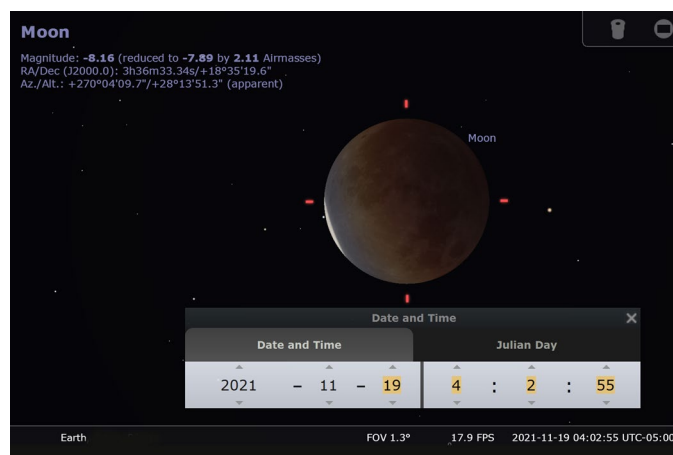
After Gene died in a car accident in Australia, Carolyn continued observing with Wendee and me for several years. One evening she confided that sometimes she wished she had died with Gene. But she did not and the world was able to enjoy her company for more than 24 more years. The weekly telephone calls began much later. I shall miss the deep friendship I enjoyed with Carolyn Shoemaker, the woman whose energy, intelligence, and terrific sense of humor brightened our lives and made the night sky a happier place.

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



Tis the season for turkeys to go into hiding at the Clubhouse. *

Partial Lunar Eclipse . . .



Greatest Eclipse. Visualization from Stellarium.

Set your alarms and get up early (or stay awake) and watch the partial lunar eclipse on Friday morning November 19, 2021. The Umbral phase will last for approximately 3 hours and 28 minutes.

Eclipse Contacts: (Data from *RASC 2021 Observer's Handbook*)

- P1= 06:02:09 UT (01:02:09 EST)
- U1=07:18:43 UT (02: 18:43 EST)
- Greatest= 09:02:55.5 UT (04: 02:55.5 EST)
- U4= 10:47:07 UT (05: 47:07 EST)
- P4= 12:03:44 UT (07:03:44 EST)



Wide view of the partial eclipse. Visualization from Stellarium.

~ Al Takeda -Newsletter Editor ~

Editor: * Photos by Al Takeda unless otherwise noted.

December Star Fields DEADLINE

Sunday, November 21st

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 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.

Nov 11 First Quarter Moon (Moonset at midnight)

Nov 11 Lunar X visible. 22:50 UT (17:50 EST)

Nov 12 North Taurid meteors peak

Nov 17 Leonid meteors peak

Nov 19 Full Moon

Nov 19 Partial Lunar Eclipse. Greatest eclipse: 09:02 UT (04:02 EST)

Nov 27 Last Quarter Moon (Moonrise at midnight)

Dec 3 Venus at Greatest Illuminated Extent

Dec 4 New Moon

Dec 7 Venus 1.9 degrees North of Moon

Dec 11 First Quarter Moon (Moonset at midnight)