



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. 2 February 2020

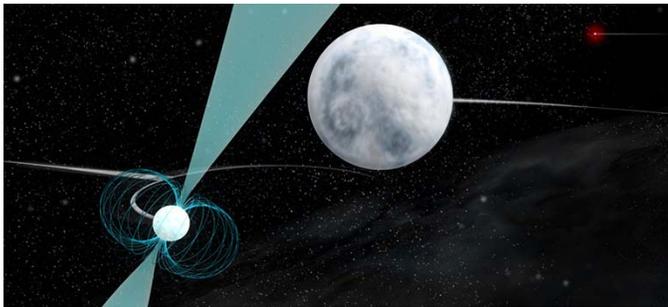
This Month's Meeting . . .

Thursday, February 13th, 2020 at 8:00 PM
Phillips Auditorium

Harvard-Smithsonian Center for Astrophysics

Parking at the CfA is allowed for the duration of the meeting

New Models for the Progenitors of Type Ia Supernova and Gravitational Mergers



Millisecond pulsar, left foreground, is orbited by a hot white dwarf star, center, both of which are orbited by another, more-distant and cooler white dwarf, top right. Illustration: Bill Saxton, NRAO/AUI/NSF

Many of the processes that eject energy and the enriched materials necessary for life on Earth can occur only in binaries. When the components of a binary are in orbits close enough to permit mass transfer, the end result can be a Type Ia supernovae, or merging neutron stars and/or black holes. Pure binary models may not, however, be able to produce the observed rates of events. Fortunately, most high-mass stars have multiple companions. Our speaker this month is Dr. Roseanne Di Stefano, who will discuss the implications of mass transfer from a third star in a hierarchical triple. This situation, not much considered until recently, provides new models for the progenitors of important events, including gravitational mergers and Type Ia supernovae.

Dr. Rosanne Di Stefano is an astronomer at the Harvard Smithsonian Center for Astrophysics. She works on the theory of binary and triple systems, including those producing Type Ia supernovae and gravitational mergers. She also conducts research on gravitational microlensing, especially by and within binaries and planetary systems. Active areas of work also include X-ray astronomy, SETI, and studies of the history of science.

Dr. Di Stefano received her M.A. in physics from Columbia University, and received her PhD in Astrophysics from State University of New York (SUNY) Stony Brook. She currently is an astrophysicist at the Smithsonian Astrophysical Observatory and a lecturer of Astronomy at Harvard University. Her early research was in field theory, specifically topics related to supersymmetry. She left the New York Institute of Technology to pursue research centered on the study of the formation of close binary systems. At MIT and at Harvard she studied millisecond pulsars in globular clusters and luminous supersoft x-ray sources. She was twice selected as a Bunting Science Scholar at Radcliffe College's Mary Ingraham Bunting Institute, a center of advanced studies for women. She also served as an evaluator for the Introductory University Physics Project, the large-scale, national experiment to modernize the introductory physics course.

Please join us for a pre-meeting dinner discussion at [House of Chang, 282 Concord Ave., Cambridge, MA.](#) at 6:00 pm before the meeting.

President's Message . . .

On February 4th, 1906, the discoverer of Pluto was born. Clyde Tombaugh began his career as an amateur telescope maker and astronomer after a freak weather event sidelined his plans to attend university. During the mid-1920's, Tombaugh built several telescopes on his family's Kansas farm, even going to the length of digging a mirror test trench 24-foot long x 8-foot tall x 7-foot wide. This test tunnel doubled as a tornado shelter. With these telescopes, Tombaugh sketched Mars and Jupiter, which garnered the attention of Percival Lowell, the founder of the Lowell Observatory in Flagstaff, Arizona. Tombaugh was offered a staff position at the observatory in 1929 without any formal training.

Tombaugh's task was to search for a predicted 9th planet based on Newtonian mechanics calculations modeling the planet Uranus's confusing orbit perturbations. Clyde set himself to the task of systematically imaging regions of the sky thought to harbor the mysterious "Planet X". He utilized a 13-inch Astrograph to record 1-hour images on 14" x 17" glass photographic plates on successive evenings. Each image was painstakingly hand guided to ensure high quality images through the cold of the night. After development of the photographic plates, Tombaugh utilized a Zeiss blink comparator to search for moving objects set against a fixed starfield by toggling between one region of the sky taken on successive evenings. On February 18th, 1930 Tombaugh recognized the telltale shift of a moving object across one evening's image when compared with the next night. After confirming the observations over the next week, the word of discovery was communicated to the Harvard College Observatory on March 13th, 1930.

The announcement of the discovery was celebrated around the world. Over one thousand name suggestions were received, with Pluto, the god of the underworld, being selected. So captivated was the public, Disney renamed a cartoon dog Pluto the Pup, loyal companion of Mickey Mouse. Neptunium, Uranium and Plutonium followed upon their discovery in the early 1940's.

The newly discovered planet was scrutinized over the years, with the projection for overall mass falling to nearly 1/460th of Earth. While diminutive in size, the tiny planet continued to capture the imagination of the public and professional astronomers.

In August of 2006, The International Astronomical Union defined a planet as an object that orbits a star, possesses enough gravity to be round, and has cleared its orbit. At that time Pluto was re-classified as a dwarf planet, causing some alarm and disdain from the public and professional communities alike. But for clearing its orbit, Pluto should be a planet.

So, on February 18th I will celebrate the 90th anniversary of the discovery of the dwarf planet Pluto, and wish upon a star that it was still a full-fledged planet.

Keep looking up with your feet firmly on the ground!

Tom

~ Tom McDonagh - President ~

January Meeting Minutes . . .



Sal LaRiccia *

Minutes of the 927th ATMob meeting held January 9, 2020, at the Harvard-Smithsonian Center for Astrophysics in the Phillips Auditorium. Club Vice President Rich Nugent presided and called the meeting to order at 8:00 pm.

- Secretary John Harrington read the minutes of the Club's December meeting.
- Bob Toop gave the Treasurer's report in Eileen Myers' absence and spoke about the continuing substantial cost to the

Club of distributing copies of the newsletter in hardcopy format.

- Membership Secretary Chris Elledge presented the Membership Report, showing 313 total memberships covering 406 Club members.
- Glenn Chapple gave the Observer's Report, and noted that the Observer's Challenge object for the month is NGC 1999, a 9th magnitude reflection nebula in Orion that is illuminated by light from the variable star V380 Orionis.
- Steve Clougherty gave the Clubhouse Report, noting that 29 Club members participated in the December 14th work party, which focused on cleaning up the barn portion of the Clubhouse. At that work party, Corey Mooney gave a presentation on 3-D printing and Phil Roundsville gave a presentation on mirror-making. Barry Jansen and George Roberts have almost completed work on the Club's new Bath interferometer. The next work party will be January 11th.
- Bill Toomey spoke on the ATMob Research and Imaging Observatory (ARIO), which is performing well. The 104mm refractor has now been fitted with a new camera and a filter wheel. Club members are currently using ARIO to monitor variable stars.
- Rich Nugent gave the Outreach Report and noted that the Club participated in 12 star parties during 2019 and that Bernie Kosicki had been very helpful in obtaining expanded liability insurance to cover Club members attending Club-sponsored star parties.

- Old Business:

ATMoB pins are still available.

Purchases made through the smile.amazon.com website will result in a small donation to the Club.

- New Business:

Corey Mooney announced that he is selling his 127mm Maksutov telescope for \$225.

On January 25th at 1 pm, there will be a reception at the Old Schwamb Mill, a historic 19th century mill in Arlington that formerly hosted the Club's mirror making shop prior to the move to the current Clubhouse at MIT's Haystack Observatory. The "Mill" is marking its 50th anniversary as a museum.

Vice President Nugent then introduced longtime Club member Sal LaRiccia, who spoke about a photographic history of the ATMob that he has been compiling. Sal opened by recounting the story of his involvement in astronomy, beginning with making a 6-inch reflector for his high school science fair. He attended his first Club meeting in 1967, making a number of lifelong friends.

Sal specializes in photographing people, not the stars. He has been working hard to produce a shared archival photographic record of club activities and encourages all Club members to view the record and contribute to it. In order to access the archive at the home page of the Club website, members should click on "Photo Albums," then "Filter," and then select "Club History" from the dropdown menu. Photos date from 1968 onwards! If you wish to contribute photos or modify a caption, please contact Chris Elledge.

Sal reminisced about Club history, including the period when the Club's optical shop was located in Bernie Forrests' cellar. Later the Club met at the Old Schwamb Mill. He showed photos of long-time Club members, including Jeff Blazey, David Garroway (original anchor of *The Today Show*), Walter Scott Houston (longtime columnist for *Sky & Telescope* magazine), George East, Dennis di Cicco (also of *Sky & Telescope*), Sam Bergin, Jim Gagan, Ed Knight, George Wood, Steve Clougherty, Mario Motta, and Ken Launie. He also noted some famous presenters to the Club, including Harvard's Owen Gingerich and Cornell's Carl Sagan.

Glenn Chaple then gave a brief summary of his efforts to monitor variable stars, particularly Algol, and of the AAVSO pin available for this type of work. He will update the Club on his activities in more detail at a later meeting.

Vice President Rich Nugent apologized for the lack of refreshments by our scheduled volunteer. He gratefully thanked Julie Kaufmann who happened to bring homemade cookies to share with the members. Rich adjourned the meeting at 9:36 pm.

~ John Harrington, Club Secretary ~

Meeting Refreshment Assignment . . . 2020

Feb. - Eileen Myers

Mar. - Glenn Chaple

Apr. - Chris Elledge

May - Al Takeda

Jun. - TBD - A volunteer from the membership is requested

Jul. - Tom McDonagh

Meeting Recordings . . .

The recording of ATMob meeting #927 is available on YouTube: <https://youtu.be/0HcsduhdALE>

I would like to thank Sal LaRiccia 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 ~

Membership Report . . .

I am pleased to welcome our newest members: Pankajkumar Shah and Christina Wan.

As of January 31st, 2020 we have 318 memberships covering 411 members. This is broken down as follows:

- 138 Regular Members
- 114 Senior Members
- 8 Student Members
- 53 Family Memberships covering 146 Members
- 3 Guest Members
- 2 Honorary Members

Please contact me if you need any help with [renewing](#) or logging into the [website](#).

~ Chris Elledge – Membership Secretary ~

Outreach Report . . .

Upcoming Star Party

Wednesday, February 26
Cheney Middle School
95 Washington Street, Belmont, MA
7:30 - 9:00 p.m.
Set up time 6:30 - 7:30 p.m.

As always, in order for these events to be successful, we need your help. Please consider volunteering for this event. Register on the ATMob Event Calendar so we'll have a head count. If you have any questions contact me or any of our star party coordinators via starparty@atmob.org.

~ Rich Nugent - Vice President and Outreach Chair ~

Astronomy Day . . .

New England Sci-Tech will host a public Astronomy Day event on Saturday, May 2, at 16 Tech Circle, Natick. We would love to have ATMob join us with solar and night telescopes, mirror grinding demos, and anything else you would like to offer. Plans include indoor astronomy activities and planetarium shows as well as outside telescopes. See our Astro Day web page <https://www.nescitech.org/astronomy-day/> for details and to sign up. For questions, contact Bob Phinney or Rusty Moore at info@nescitech.org.

~ Submitted by Bob Phinney ~

Clubhouse Report . . .



(L-R) Slav Mlch and Joe Dechene working on the driveway*

January 2020 Clubhouse Report

The new year saw two work sessions at our Clubhouse on January 4th and January 11th. The first session commenced when John Stodieck opened the door at 10:55 am under cloudy skies, drizzle, and a 37-degree temperature. He was joined shortly by 10 members that removed, packed and stored the decorations from the New Year's party. A big thanks goes out to Alva Couch, Keith Davies, Pierre Fleurant, Marion Hochuli, Julie Kaufmann, Sandra Lobo, Eileen Myers, Steve Scampini, John Stodieck and Al Takeda. A lox, bagels and cream cheese lunch was provided by Eileen M. and served by Julie K., to the satisfaction of all present. Then the clean up continued and further work on the modification of the optical test tunnel, Foucault tester and Bath interferometer continued. Removable insulation was attached to the bare outside door to keep the new polishing room warm. The weather did not improve and the Clubhouse was closed early in the evening.

There was a subsequent snow removal effort by Paul Cicchetti, Art Swedlow and John Reed. A second ice storm required an effort by Tom McDonagh and Bruce Berger to clear ARIO. Paul Cicchetti used the snow blower to clear paths to observatories and observing pads.

The second work session began on January 11th when John Blomquist opened the Clubhouse at 10:25 am under an unusually sunny, 56-degree clear sky day. He was joined by 23 members to complete the needed day's work. Another big thanks goes out to John Blomquist, Paul Cicchetti, Steve Clougherty, Alva Couch, Joe Dechene, Chris Elledge, Pierre Fleurant, Jim Gettys, Marion Hochuli, Barry Jensen, Eric Johansson, Jon Lyna, Vladislav Mlch, Corey and Kiera Mooney, Rich Nugent, Dave Prowten, John Reed, George Roberts, Phil Rounseville, Steve Scampini, John Stodieck, Al Takeda, Bill Toomey and Bruce Berger.

Several MAJOR areas of effort developed. Several removable securing clamps were added to the polishing room door insulation structure. Dave P. also added silicone to plug the leaks in the roof of the metal shed. The repair will be checked at the next work party.

You will see new signage created by Kiera M. around the Clubhouse to guide activities in every room. It looks much better now.

Gravel was hauled from the rear gravel pile to the front drive to fill muddy low spots by Alva C. , Joe D., Chris E, Slav M. and Al T. Hopefully we will track less mud inside.

Work continued upstairs in the far barn with relocating assets and making visible stock available for member use.

Corey M. again demonstrated the 3-D printer in action making usable duplicates for new or broken parts on our scopes.

Bill T. assembled some optical components and camera parts to build a system capable of tackling several variable star and occultation projects in the ARIO. This kept Bill T., Jim G., and Bruce B. busy.

Barry J. and George R. worked on the positioning of both the Foucault Tester & Bath Interferometer at the working end of the test tunnel in the glass room. Eric J. was testing grinding results for a set of different combinations of mirror/tool contact positions.

We missed Eileen Myers today due to her bad cold. Thanks to John Reed and crew for picking up lunch from Market Basket. We also had lots of sweets from the New Year's Eve party. We survived nicely and went back to work with no ill effects. In fact the skies cooperated, so several scopes were set up as darkness enveloped us. It was another good work party.

The next Work Party is on Feb 8th starting at 10 am. Come on up and see what's happening. There are always plenty of projects that need to be done.

Clubhouse Saturday Schedule		
Feb 15	Jim Gettys	John Panaswich
Feb 22	Bruce Berger and Glenn Meurer Messier Marathon # 1	
Feb 29	Eileen Myers	Rich Nugent
Mar 7	WORK PARTY # 3 Chris Elledge and Slav Mlch	
Mar 14	Nina Craven	Brian Maerz
Mar 21	George Paquin and Tom Wolf Messier Marathon # 2	
Mar 28	Mike Hill	Eric Johansson
Apr 4	Glenn Chaple and Dave Prowten NEAF Convention	
Apr 11	WORK PARTY # 4 Pierre Fleurant and Art Swedlow	

** Closing time for the Clubhouse is determined by the work crew

Clubhouse Evening Schedule	
Friday Night Educational Videos	ATMoB-Announce
Saturday Night Observing	7:00 pm - ##
# Closing time is determined by the organizers	
## Closing time is determined by the "A" members on duty.	

~ Clubhouse Committee Chairs ~
 ~ Steve Clougherty, John Reed and Dave Prowten ~

Bath Interferometer Mirror Tester is Operational. . .



George Roberts working on the Bath Interferometer *

The Clubhouse Bath Interferometer mirror tester is up and running. The most expensive part is \$22 (not counting Barry's DSLR camera) so don't be afraid to try it out. Barry and I created an [instructional training video for using the Bath](#). To find it search [YouTube](#) for "atmob bath" and it's the first result. I tested it against a known reference mirror and even just a quick test agreed with the reference mirror within 1/50 wave. If you have any questions contact George Roberts (gr@gr5.org) or Barry Jensen.

~ Submitted by George Roberts ~

Mountains of Stars Outreach Program . . .

The Mountains of Stars outreach program that I manage (and about which I spoke to the Club at a meeting two years ago) has a new website - <https://www.mountainsofstars.org>, where we make available all of the materials and information we offer to the public. There is also a password-protected area which has additional resources for program delivery. Please take advantage of what is on the site for public outreach events and activities. Mountains of Stars is also running a fundraiser in partnership with the Appalachian Mountain Club, to match a challenge grant from the Toomey Foundation to support the undergraduate physics and astronomy students who work in our summer outreach program. Contributions can be made at <https://www.gofundme.com/f/douglas039s-campaign-for-appalachian-mountain-club>. Please do what you can to help us keep this important program running.

~ Submitted by Douglas Arion ~

Observer's Challenge . . .

February 2020

NGC 1931 – Emission-reflection Nebula and Cluster in Auriga
 Mag: 10.1; Size: 6'



NGC 1931. Taken with 32-inch f/6 scope and SBIG STL 1001E camera, 1 hour of H-alpha, 1 hour of Sulfur II, and 20 minutes of OIII filters. Processed in PixInsight. North is up. Image by Mario Motta, MD

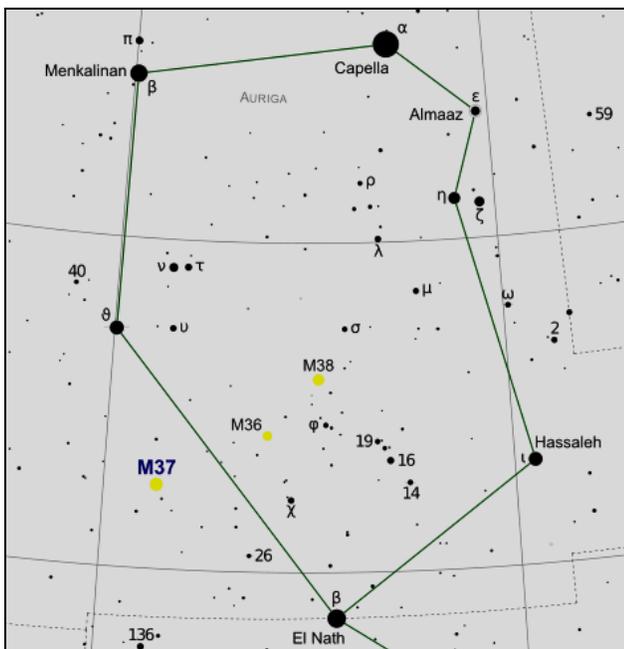
Last month, we looked at a nebula in Orion – not the Orion Nebula (M42), but one (NGC 1999) located a little over a degree further south. This month we explore another “Orion Nebula” - this one in Auriga. Confused? Here’s the explanation.

Our February Observer’s challenge, NGC 1931 in Auriga has been likened to a miniature version of M42. Like M42, it’s an emission-reflection nebula containing an embedded multiple star whose four brightest members form a trapezium. NGC 1931 was discovered on Feb 4, 1793 by William Herschel, who catalogued it as H I-261 – his 261st Class I (Bright Nebulae) object. His descriptive notes, “Very bright, irregularly round, very gradually brighter in the middle, 5’ in diameter” make no mention of a central star or stars. In 1827 his son John found a double star (catalogued as HJ 367) located in the center of the nebula. The hot early B-type component stars of magnitudes 11.1 and 12.1 were 7.0 arc-seconds apart at the time and have since widened slightly. They form a neat equilateral triangle with a third star of magnitude 12.8. A 14th magnitude star discovered by the eagle-eyed double star observer S. W. Burnham in the late 1890s completes the trapezium.

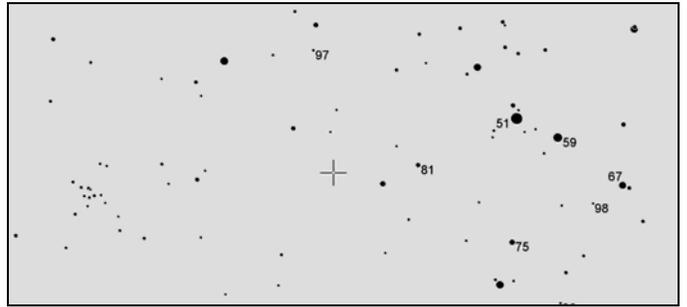


NGC 1931. Stock Canon 80D, 400mm f/2.8 lens, ISO800, 55 subs X 30 sec = 27.5 min. North is up. Image by Doug Paul

On an evening with a magnitude limit of 5 and so-so seeing conditions, I viewed NGC 1931 by star-hopping from 5th magnitude phi (ϕ) Aurigae (see finder chart below). With a 4.5-inch f/8 reflector and a magnifying power of 150X, I could make out what appeared to be a 10th magnitude nebulous star and was surprised that Herschel didn't catalog it as a Class IV (Planetary Nebulae) object. A switch to a 10-inch f/5 scope and 208X brightened the nebula and split the star, but atmospheric turbulence prevented me from seeing the third member of the triangle and the 14th magnitude star that completes the trapezium. In her book, *Deep Sky Wonders*, Sue French reports seeing the four with a 10-inch at "high power." Sources like Luginbuhl and Skiff's *Observing Handbook* and *Catalogue of Deep-Sky Objects* and Kepple and Sanner's *Night Sky Observer's Guide* suggest that the triangle itself can be picked up with a 6 or 8-inch scope. In any case, this multiple star mandates steady seeing and a magnification of 200X or more.



www.constellation-guide (from IAU and *Sky and Telescope*)

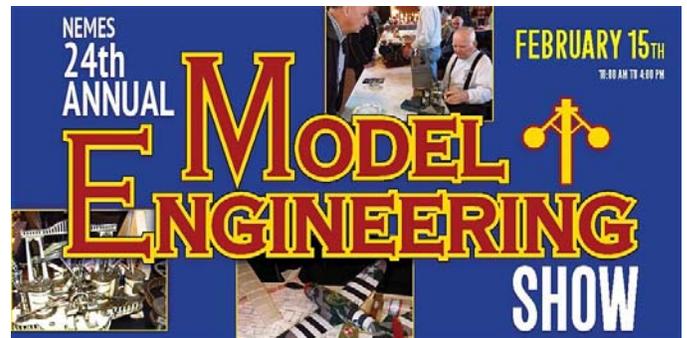


NGC 1931 finder chart, adapted by Glenn Chaple from AAVSO Variable Star Plotter (VSP). Numbers indicate magnitudes (decimals omitted). The magnitude 5.1 star is phi (ϕ) Aurigae. Area covered is 1.3 X 3.0 degrees. North is up.

The purpose of the Observer's Challenge is to encourage the pursuit of visual observing and is open to everyone who is interested. Contributed notes, drawings, or photographs will be published in a monthly summary. Submit them to Roger Ivester (rogerivester@me.com). To access past reports, log on to <https://rogerivester.com/category/observers-challenge-reports-complete/>

~ Submitted by Glenn Chaple ~

Model Engineering Show . . .



The [New England Model Engineering Society](http://www.newenglandmodelsociety.com) will have their annual makers - science fair at the Charles River Museum in Waltham, MA on Saturday, February 15th. Non-members may exhibit.

In the past ATMoB demonstrated mirror making. It would be wonderful if ATMoB would set up a table to meet people and recruit new members. ATMoB members who make interesting things are welcome to exhibit them. We could also use a demonstration of mirror making.

Please contact Dick Koolish at koolish@dickkoolish.com for details.

On display at the show will be operating scale steam, gasoline, traction and aircraft engines, also model locomotives and model boats. Meet the craftsmen who built them! This event is a popular, great event for all ages.

~ Submitted by Dick Koolish ~

Skyward . . .

By David Levi, February 2020



(L-R) Eureka and Wendee Levi with Echo. Images by David Levi.

Something old, something new...Eureka instead of Echo.

This is the story of my first telescope, of the comet it did not discover and which later collided with Jupiter, and the telescope that replaced it.

Although this story has been building for almost sixty years, it came to a head last fall. First, in late October, I got myself a brand-new reflector telescope. It is a 12-inch diameter reflector, with a fast f/5 focal ratio, which means that at low power I can get well over a degree field of sky when I gaze through it. That means more than two Moon-diameters. I had some difficulty setting up the new telescope, and needed some help, but when it finally was ready, the views were a wonder to behold and a true joy.

I named the new telescope Eureka, after an asteroid I discovered at Palomar with Henry Holt in June of 1990. The asteroid turned out to be orbiting at the L5 point (LaGrangian 5) in Mars' orbit, as it has for much of the life of the solar system. The asteroid is the first known Martian trojan, and our proposed name, Eureka, was accepted as an expression of joy in making a discovery. It was named for Archimedes' expression of delight after discovering how objects displace water, and how he leapt out of his bathtub and ran down the street yelling Eureka! (There is nothing in the story that suggested that Archimedes bothered to dry off and dress before he darted outside.) For my new telescope Eureka's first light, (see last month's column) I chose Jupiter, which is my choice for first light objects ever since September 1, 1960.

That brings me to the second telescope, named Echo after a large passive communications satellite launched on August 12, 1960. Echo was my very first telescope, and it was the telescope through which I looked at Jupiter for the first time on that far-off night. On that distant night, Mom and Dad were with me and they were excited as well. An entirely new world was opening up for me, a world that has remained open and inviting ever since. For a few years it was my only telescope, replaced only when I upgraded to a 5-inch telescope while I was a patient at the Jewish National Home for Asthmatic Children in Denver, and an 8-inch

a year later. Over the years Echo has provided a wealth of happy nights under the stars.

On Thursday evening, November 7, 2019, I formally donated Echo to the Linda Hall Library of Science, Engineering, and Technology in Kansas City, along with more of my observing records. Echo began its new life that very evening. Under a clear sky, some people got the chance to look at the Moon through Echo, which still functions well after 59 years. May Echo get a lot of use at this wonderful library, one of the largest science libraries in the world.

All this brings me to the point of this article. After all these years I wanted a powerful telescope to replace my first telescope. With my new telescope, Eureka, I now have that telescope. Every time I look through it, my mind is filled with the magic and delight of that long-gone evening when I first set up a telescope and looked at Jupiter. On that night I saw Jupiter, its belts, and its four big moons. One thing I did not see, and neither did anybody else, was a small comet moving close to the planet. That comet would remain undetected until March 23, 1993, when Gene and Carolyn Shoemaker and I set up a night's observing at Palomar that would include the field that revealed this comet. It was reported on the 25th. Sixteen months later, this comet, now known as Shoemaker-Levy 9, collided with Jupiter in the most dramatic explosions ever witnessed by humanity. May Eureka, instead of Echo, also reach for the stars.

~ Submitted by Mario Motta ~

Comet C/2017 T2 Passing the Double Cluster . . .



Comet C/2017 T2. Image by Al Takeda *

Editor: * Photos by Al Takeda unless otherwise noted.

March Star Fields DEADLINE
Sunday, February 23rd

Email articles to Al Takeda at
newsletter@atmob.org

Articles from members are always welcome.

POSTMASTER NOTE: First Class Postage Mailed February 11, 2020

Amateur Telescope Makers of Boston, Inc.
c/o Chris Elledge, Membership Secretary
99 College Ave
Arlington, MA 02474
FIRST CLASS

EXECUTIVE BOARD 2019-2020

PRESIDENT: Tom McDonagh (617) 966-5221

VICE PRES: Rich Nugent (508) 935-8158

SECRETARY: John Harrington

MEMBERSHIP: Chris Elledge (781) 325-3772

TREASURER: Eileen Myers (978) 456-3937

MEMBERS AT LARGE: Maria Batista (617) 347-3730

Alan Sliski
Al Takeda (508) 494-7877

PAST PRESIDENTS:

2015 - 18 Glenn Chaple (978) 597-8465

2012 - 14 Mike Hill (508) 485-0230

COMMITTEES

CLUBHOUSE: John Reed (781) 861-8031

Steve Clougherty (781) 784-3024

David Prowten (978) 369-1596

OBSERVING: Bruce Berger (978) 387-4189

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: Held the second Thursday of each month (September to July) at 8:00PM in the Phillips Auditorium, Harvard-Smithsonian Center for Astrophysics, 60 Garden St., Cambridge MA. For INCLEMENT WEATHER CANCELLATION see 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 open every Saturday from 7 p.m. to late evening. 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 Standard Time (EST) from Universal Time (UT) subtract 5 from UT.

Feb 9 Full Moon

Feb 10 Mercury at greatest Eastern (evening) elongation (18 degrees)

Feb 13 Juno 0.6 degrees S. of Moon. Occultation 05:00 EST (10:00 UT)

Feb 15 Last Quarter Moon (Moonrise at midnight)

Feb 23 New Moon

Mar 2 First Quarter Moon (Moonset at midnight)

Mar 8 Daylight Saving Time begins

Mar 9 Full Moon

Mar 16 Last Quarter Moon (Moonrise at midnight)