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. 1 January 2021

This Month's Meeting . . .

Thursday, January 14th, 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 937th Meeting of the Amateur Telescope Makers of Boston.

Galaxies

M51 Whirlpool Galaxy. 6-inch, f/4 Newtonian. Sony A7III, ISO 800
30 x 90 second subframes. Image by Mark Helton

This month's speaker is Dave Eicher, chief editor of *Astronomy* magazine. Eicher will be speaking on galaxies. He writes: "A revolution has taken place in the last 10 to 15 years in understanding galaxies, their origin, evolution, and nature, and amazing aspects of them, such as the Milky Way's barred spiral structure, the ubiquitous nature of black holes, galaxy mergers, and more.

Dave Eicher is one of the most widely recognized astronomy enthusiasts in the world. He has been with *Astronomy* magazine for 36 years, beginning as an assistant editor and working through associate, senior, and managing positions. He has been the magazine's chief editor since 2002.

He has appeared on CNN, CNN Headline News, MSNBC, Fox News Channel, National Public Radio, and other media outlets to promote the science and hobby of astronomy. He has spoken to many science and business groups around the world, including locations with his collaborator Brian May, and at Harvard University, the Starmus Festival, and the American Museum of Natural History in New York.

Dave has written 15 books on astronomy, including *GALAXIES: Inside the Universe's Star Cities* (Penguin Random House). He has also written 9 books on American history. Dave is also enthusiastically interested in minerals and meteorites and has a collection of more than 1,500 specimens! An accomplished rock and blues drummer, Dave enjoys jamming with his colleagues at Kalmbach Publishing Co. He lives in Waukesha Township, Wisconsin, near Big Bend, with his wife, Lynda, a schoolteacher. Dave is also a big fan of the Green Bay Packers, and during the football season, you will often find him in Lambeau Field.

In 1990, the International Astronomical Union named a minor planet, 3617 Eicher, for Dave in recognition of his service to astronomy.

~ Rich Nugent – President ~

President's Message . . .

Last month I waxed nostalgic about my own early days of astronomy. This month, I'll look forward, just a bit. I'm hopeful that the new year will bring new beginnings. Soon, we'll have received our COVID-19 vaccines and things should settle down and life will return to normal…well, some *new* normal, at least. The progress of the pandemic will certainly dictate the timeline but I'm hopeful we'll be able to return to the Clubhouse and resume meetings at the Center for Astrophysics at some point this year.

If you like to attend the area conventions, here are some dates for your calendars: NEAF will be held on April 10-11, The Astronomer's Conjunction dates are July 9-10, Stellafane is scheduled for August 6-8. The date for AstroAssembly has not been decided yet but I'm penciling it in for late September/early October. The 2021 Astronomy Days are set for May 15 and October 9. Of course, these dates assume the COVID-19 pandemic is under control.

Astronomically speaking, there are a few events I'm looking forward to… Just before sunrise on the morning of May 26th, the Moon will pass through Earth's shadow, producing a total lunar eclipse. Unfortunately, here in New England, we'll see only the penumbral phase of the eclipse. The umbral phase begins at 5:45

AM EDT but, in the Boston area, the Moon will set at about a half hour before then. The Moon will be crossing Scorpius so this event will be low in the SW. If you had a clear view of last month's Jupiter/Saturn Great Conjunction, you may want to return to the same spot for this minor eclipse. I'm planning on sleeping in! However, if you happen to be visiting locations to our west, be sure to set you alarm clock for this one! Observers in California will see the entire umbral portion of the eclipse. Hmmm…

Two weeks later, on June 10, the Sun will rise already in eclipse! This is an annular eclipse with the path of annularity passing through NE Labrador, NW Greenland, and a portion of northern Siberia. I'm not planning an expedition but will find a nearby location with a clear view to the north-east to view this one. Sunrise is just after 5:00 EDT and the eclipse will end just after 6:30 EDT with the Sun standing 13° above the horizon. Hope you kept your eclipse glasses from 2017!

Speaking of the Sun, recent activity has suggested Cycle 25 is underway! We're still 4-5 years away from the next solar max but observers with white-light filters can monitor sunspots and those with H-alpha scopes can observe prominences, the filamentary structure of the photosphere, and solar flares.

For lunar observers, a favorite target is the so-called Lunar X. This chiaroscuro (the play of light and shadow) is only visible for a few hours each month as the Sun rises at the craters Purbach, La Caille, and Blanchinus. The best opportunities for east coast observers this year are: March 20 (5:30 PM), May 18 (7:30 PM), July 16 (6:47 PM), September 13 (5:56 PM), and November 11 (5:50 PM).

Jupiter's Mutual Events… Now that the Great Conjunction has passed, Jupiter and Saturn will soon be lost to the glare of the Sun. During the late winter, Jupiter emerges in the morning sky and reaches opposition again on August 20. I'll continue to send out the dates and times to observe the Great Red Spot and shadow transits but this year I'll include information about mutual events. Every six years, or so Earth passes through the plane of the orbits of Jupiter's Galilean satellites. When this happens, we can observe transits and eclipses involving these moons. They're fun to watch and image!

As for Saturn, this year the rings are tilted at about 21°. Opposition is on August 2.

While there are no bright comets predicted for 2021, we all know that comets often surprise us! Perhaps another NEOWISE will come our way! The best meteor shower of the year will be the Perseids. The Moon will be a waxing crescent as the shower peaks on the 12th.

The Mars 2020 rover *Perseverance* will reach the Red Planet on February 18 and, if all goes according to plan, will be sitting on the surface at Jezero crater at the edge of the Isidis Basin, near Syrtis Major. I will give you more information about this mission next month.

We've been waiting and waiting for the launch of the James Webb Space Telescope (a replacement for the aging Hubble Space Telescope). As of this writing the Webb telescope is scheduled to launch on October 31. Destined for the Earth-Sun Lagrange 2 point - almost a million miles from Earth - the telescope will unfurl itself along the way and will ultimately provide unprecedented infra-red views of the universe. No spacecraft can remain at L2 for very long so the telescope will be placed in a large, quasi-periodic, Lissajous orbit, centered on the L2 point. This halo orbit will ensure that the spacecraft stays put while keeping it out of Earth's shadow thus enabling its solar panels to provide continuous, full power. This mission has been plagued by setbacks so let's keep our fingers crossed that it launches this year.

There's so much ahead of us in the coming year and I don't want any of us to miss even a moment of it. After the Holiday and New Year's celebrations have passed, I'm certain we will see much more suffering and loss due to COVID-19 so please be careful by staying strong! Follow the guidelines and continue to practice safe social distancing. I look forward to when we can meet and observe together, again. Until then, masks up! Have a healthy and happy New Year, my friends.

~ Rich Nugent – President ~

December Meeting Minutes . . .

Dr. Diana Hannikainen on Zoom *

ATMoB 936th Meeting Minutes
December 10, 2020

President Rich Nugent gave the president's welcome. Rich reported that the Harvard-Smithsonian Center for Astrophysics in Cambridge, MA remains closed. Due to the state's "stay at home" mandate which includes a curfew from 10 pm to 5 am, the Clubhouse and grounds are closed. Observing field pads have been marked with orange markers so we'll know where to shovel. Mary Young, Interim Assistant Director for Administration at MIT Haystack Observatory has contacted the MIT Legal Counsel and they have indicated that they are too busy but plan to renew our lease.

Rich Nugent also reported that the Board, in a special meeting on Nov 23, 2020, voted unanimously to rename the "ATMoB

Research and Imaging Observatory" (ARIO) as the "William Toomey Observatory." A rededication celebration will have to wait until the Clubhouse reopens.

- Alva Couch presented the Secretary's report, including a summary of the 935th meeting.

- Treasurer Eileen Myers presented the Treasurer's report. She reported spending on a camera and filters for the Mittelman - ATMoB Observatory, and inflows from membership and sales of a telescope to the Everett Public Library.

- Membership Secretary, Chris Elledge, presented the membership report. We have 307 memberships, including 393 members and welcomed one new member, Edward Quinlan.

- Glenn Chaple presented the Observing Committee report. This included something for everyone. This month we have multiple conjunctions, including the spectacular conjunction of Jupiter and Saturn in the evening sky, meteor showers and the December 2020 Observer's Challenge of M76 (the "little dumbbell nebula"). Glenn also gave an update on observing the cataclysmic variable star SS Cygni.

- Clubhouse Chair Steve Clougherty presented the Clubhouse report. The Clubhouse remains closed due to Massachusetts regulations, and activity has been limited to a small contingent of members doing onsite preparations for the installation of the Mittelman - ATMoB Observatory. The heat in the Clubhouse remains off, all perishables have been removed, and the water system has been winterized.

- Rich Nugent presented the Mittelman - ATMoB Observatory progress report. The enclosure is still in Lincoln Massachusetts, but at the Clubhouse site, everything is ready for mounting the observatory.

- Kelly Beatty presented the Outreach Committee Report. He reported that beginner telescopes are in incredibly short supply. Consumer purchases of telescopes during this pandemic are up to four times the normal demand. Places that seem to have a decent stock include Hunt Camera in Melrose, MA and NYC Camera dealers. Another good activity for the winter is to track light pollution and viewing conditions via https://globeatnight.org.

- Old Business:

  RASC Handbooks and 2021 Calendars are at Eileen Myers' house and ready for pickup.

  https://smile.amazon.com remains a great way to donate to ATMoB.

- New business:

  There are several live streams available for the eclipse on Monday, accessible via the link:
  http://time.unitarium.com/events/eclipse/122020/live.html

Our guest speaker for the evening, Dr. Diana Hannikainen, Observing Editor at *Sky and Telescope* took us on a grand tour of the history of radio astronomy. She started with Karl Jansky's 1933 conclusion that radio waves can come from space, to planetary-scale networks of synthetic aperture radio "telescopes" now spanning the globe. Jansky's rotating "Merry Go Round" antenna picked up radio interference that was synchronized with the rotation of the Earth, and thus, with the positions of stars in the sky. Jansky concluded that these signals were coming from space! Although this was not recognized immediately as important, the discovery spurred a small number of others to explore radio signals from space, including Grobe Rieber, who constructed a dish, as an amateur, in his back yard! After a brief interruption in radio astronomy due to World War II, in which radar was aggressively developed, radar technician James Stanley Hey discovered in 1942 that some interference with radar was due to sunspot activity.

After WWII interest grew rapidly in radio astronomy and increasingly larger single dish radio telescopes were constructed, up to the practical world record limit of the Green Bank 300-foot dish in West Virginia, which unfortunately collapsed in 1988. A new 100-meter (328-foot) movable dish was built to replace the 300-foot dish. Facing an absolute limit on telescope size, further telescopes were developed as arrays of smaller dishes, using a similar kind of signal correlator to that used in optical interferometry. This led most recently to the ability to use global arrays of telescopes as one "telescope" via aperture synthesis, to take a radio picture of emissions from around the black hole located in M87. Arrays of 27 dishes are available around the world, with arrays of thousands of dishes planned for the future. In this era of planetary-scale infrastructure, there is also a place for amateurs, documented via the Society of Amateur Radio Astronomers (SARA).

After the talk, the discussion turned to what will happen to Arecibo, which recently collapsed. The problem with Arecibo, which caused many years of idleness, is that while it has high sensitivity, it has very little ability to aim and fairly low resolution. The consensus in the discussion was that money needed to rebuild Arecibo could perhaps be better spent on a higher-resolution synthetic aperture array, which would outperform Arecibo at a fraction of the cost.

~ Alva Couch - Secretary ~

ATMoB Executive Board Meeting Highlights . . .

January 7, 2021, 8 pm
For details, refer to the full meeting report on the ATMoB web site.

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

Members: Bruce Berger, Steve Clougherty, Mark Helton, Mario Motta, Kay Paulson, Al Takeda, Bruce Tinkler, Gary Willinski

Meeting convened at 8:04 PM

Agenda Items:

Discussions were made about opening the Clubhouse grounds for observing. Due to the COVID-19 surge and the Massachusetts 10 pm curfew, the Board agreed to keep the Westford facility closed.

A vaccination policy for accessing the Clubhouse and grounds was discussed. The issue was tabled until the March Board meeting.

Bruce Berger gave a Mittelman - ATMoB Observatory update. The new CMOS camera, filter wheel and narrowband filters have arrived and have been installed. Testing is proceeding. The Clubhouse site preparation is continuing. The telescope enclosure installation is planned for the 1st quarter of this year.

President Rich Nugent is starting to solicit volunteers for this year's Nominating Committee.

Next Board meeting:
Tentatively March 25, 2021, 8-10 PM.

~ Alva Couch - Secretary ~

AmazonSmile Supports ATMoB . . .

You can now shop at smile.amazon.com and Amazon will donate to the Amateur Telescope Makers of Boston.

There is no extra cost, extra steps, or delays for you to place your Amazon orders this way, and with each purchase a small donation is made to the Amateur Telescope Makers of Boston.

You can use the same account on Amazon.com and on AmazonSmile.

When you sign up for AmazonSmile you will be asked to select one from over a million charities to support.

Or, ATMoB's unique charity link is
https://smile.amazon.com/ch/04-6360709

When you click on ATMoB's unique link, it will skip this charity selection process.

Instead, you will be taken to smile.amazon.com and will be asked if you want to support The Amateur Telescope Makers of Boston Inc.

~ Eileen Myers - Treasurer ~

Membership Report . . .

I am pleased to welcome our newest members: Terry Appleton, William Bakos, Paul Bleicher,. Raymond Mascola, Edward Quinlan, Marsha Wilcox, Gary Willinski, Gianni and Kasey Feola.

As of January 5th, 2021 we have 319 memberships covering 409 members. This is broken down as follows:

- 132 Regular Members
- 126 Senior Members
- 4 Student Members
- 52 Family Memberships covering 142 Members
- 3 Guest Members
- 2 Honorary Members

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.

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 #936 is available on YouTube: https://youtu.be/6V5tJMwz3oc

I would like to thank Dr. Diana Hannikainen for giving her 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 Observing Suspension

With Governor Baker's mandate for a 10:00 p.m. curfew beginning on 6 November, we are suspending our observing sessions at the Clubhouse, for the time being.

~ Rich Nugent – President ~

Clubhouse Report . . .

The William Toomey Observatory *

January 2021 Clubhouse Report

During the month of December there were no events held at the ATMoB Clubhouse in accordance with the Massachusetts COVID-19 mandate.

I did an inspection of the facilities during the final week of the month after a neighbor reported a broken 2nd floor window. Fortunately the damage was minimal, and NOT due to vandalism. In fact, the 2nd floor window was just cracked, and a temporary patch fabricated. The rest of the Clubhouse was weather tight without any sign of water or wind damage.

Upon inspecting each or the observatories I found a dead electrical circuit in the Ed Knight roll off observatory. I rerouted the heating element cords running from the 25-inch Dobsonian and the Meade 16-inch. I will ask for help from members with electrical experience to replace the center circuit breaker located on the East wall of the observatory. The rest of the observatories were in great shape.

Thanks to Bruce Berger for replacing our smoke alarm batteries in the Clubhouse.

~ 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 . . .

January, 2021

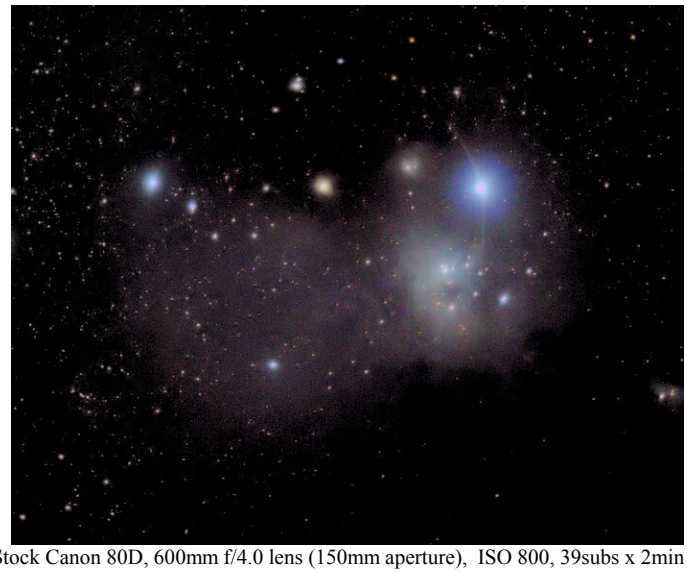
IC 348– Cluster and Reflection Nebula in Perseus
Mag: 7.3
Size: 8'

32-inch relay scope, ZWO ASI6200 CMOS camera. ~90 minutes total imaging, 30 minutes each red/green/blue. North is up. Image by Mario Motta

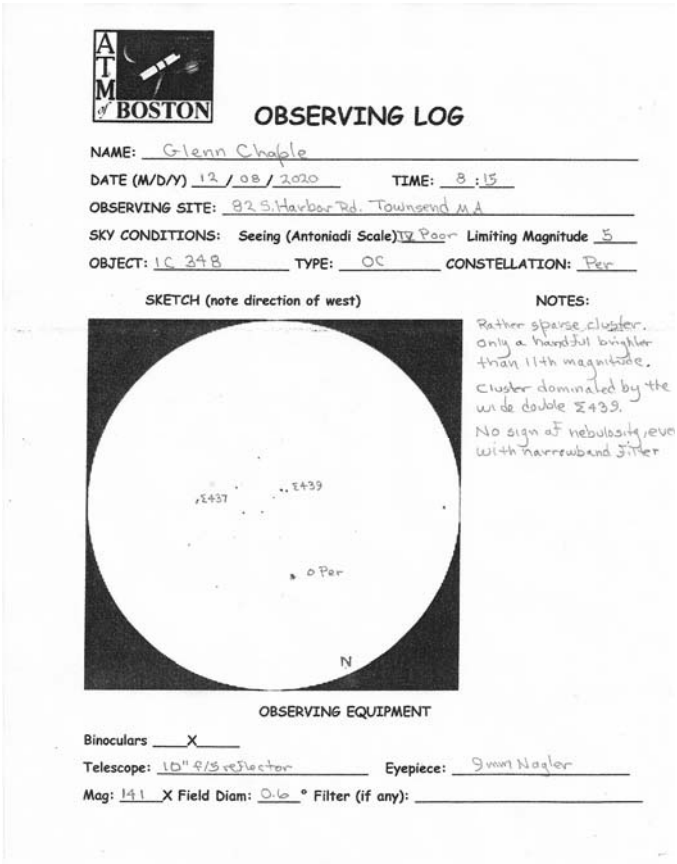
IC 348 is a star-forming region in Perseus, located just 7 arc-minutes south and slightly east of the magnitude 3.8 star omicron (o) Persei. It contains several hundred stars, most of which are too faint to be seen with typical backyard scopes. The cluster illuminates the surrounding reflection nebula VdB 19. Visually, a small-aperture scope will capture a dozen or so of the brighter cluster members, while the nebulosity mandates medium to large apertures and a dark-sky location.

In her book *Deep-Sky Wonders*, Sue French mentions a triple star, Σ439, and a double star, Σ437, that are associated with IC 348. In most scopes, Σ439 appears as a magnitude 8.8 and 10,3 double separated by 23.4". The brighter star is actually a tight binary system (BD+31°643) whose magnitude 9.3 and 9.5 components, both hot B5-type main sequence stars, are just 0.6" apart. Σ437 is a near twin system comprised of magnitude 9.8 and 10.0 stars separated by 11.4".

IC 348 is a young open cluster, perhaps no more than 2 million years old. Cluster and nebula are 900 to 1000 light years away.



Stock Canon 80D, 600mm f/4.0 lens (150mm aperture), ISO 800, 39subs x 2min = 1hr 18min total exposure. North is up. Image by Doug Paul



ATM of BOSTON

OBSERVING LOG

NAME: Glenn Chaple

DATE (M/D/Y) 12/08/2020 TIME: 8:15

OBSERVING SITE: 82 S. Harbor Rd. Townsend MA

SKY CONDITIONS: Seeing (Antoniadi Scale) IV Poor Limiting Magnitude 5

OBJECT: IC 348 TYPE: OC CONSTELLATION: Per

SKETCH (note direction of west)

NOTES:

Rather sparse cluster. Only a handful brighter than 11th magnitude. Cluster dominated by the wide double Σ439. No sign of nebulosity, even with narrowband filter

OBSERVING EQUIPMENT

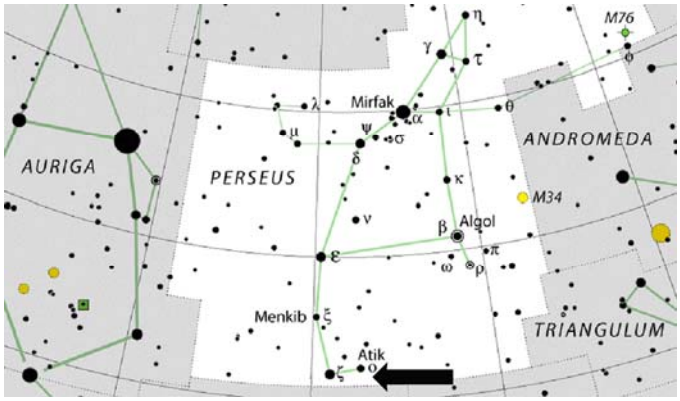
Binoculars ___X___

Telescope: 10" f/5 reflector Eyepiece: 9mm Nagler

Mag: 141 X Field Diam: 0.6 ° Filter (if any): _____

IC 348, as seen with 10-inch f/5 reflector at 141X. Field is 0.6 degrees across. For an enlarged image, click here. Sketch by Glenn Chaple

Editor's note: *To see an enlarged image of Glenn's drawing click on the following link: IC 348. A blank copy of Glenn's Observing Log sheet for astro-sketchers can be downloaded from the Documents Library in the Observing folder on the ATMoB website.*



IAU and *Sky & Telescope*

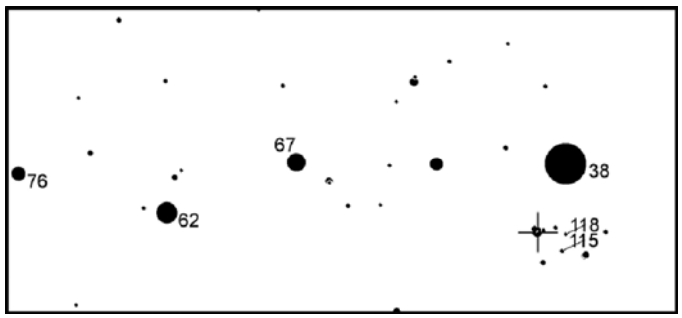


Chart made using AAVSO's Variable Star Plotter. Numbers are magnitudes, decimals omitted. Field of view is 1.0 by 0.5 degrees. North is up. Bright star is omicron Persei.

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

~ Submitted by Glenn Chaple ~

Skyward . . .

By David H. Levi
January 2021

A Great Conjunction and the Christmas Star

For more than two thousand years, people have tried to attach some astronomical meaning to the Christmas star. From books and planetarium shows, I have gathered several; possible interpretations:

(1) The star was Halley's Comet. Unlikely, because Halley's Comet returned in October of the year 11 BC.

(2) An exploding star; a nova or a supernova. Although we have no evidence of such an event in those years, there could have been one.

(3) A planetary conjunction. The Moon did pass close to Venus in the eastern sky (the location in the east appears twice in the biblical account). My personal favorite is a conjunction between Jupiter and Venus, on June 17, 2 BC. However, this conjunction happened after the death of King Herod in 4 BC, and it would have led the Magi in the wrong direction.

However, there was a Great Conjunction in 6 BC. (Great conjunctions involve only Jupiter and Saturn and take place roughly every twenty years.) A subset of this series involved the Moon passing close to Jupiter on April 17, 6 BC. True to the biblical account, Jupiter was in the east over Israel at this time, and King Herod was still living.

One thing I like about the planetary conjunction theory is that astrologers in those ancient days, more than the general population, paid attention to these events. One possible translation of "wise men" is "astrologers", people versed in how the stars and planets influence humanity. They would have paid

attention to planetary conjunctions more than the general population.

(4) It could have been a miracle. In my own life, I consider every night out under the stars as a miracle, so why not? Whatever the Christmas star was, we got to see it again as a "Great Conjunction" on Monday, December 21st. It is the closest that Jupiter and Saturn have been to each other since 1623. That long-ago year that also saw the first publication of the First Folio of Shakespeare's plays. On that day in 1623, the conjunction took placed in daylight, so no one would have paid attention to it. But the one in 2020 was visible in the early evening! Therefore, millions of people were definitely paying attention to it, and it reminds us of the Star of Bethlehem. Whatever it was, we shall never know. But for those of us who were able to gaze in wonder at this fabulous event, it acted to increase the nightly miracle of the magnificent sky.

Even in our postmodern age, the chance close alignment of the solar system's two biggest planets is not a big scientific event. However, it is a big astrological happening. While no true scientist follows astrology these days, two thousand years ago the night sky was all about astrology. And were it not for ancient astrology, we would not enjoy today's comprehension of the night sky. Even in 1623, the last time Jupiter and Saturn were this close, most people were more interested in astrology. I quote from Shakespeare, who did not follow "judicial astrology". The two opening lines of Sonnet 14 state clearly that "*Not from the stars do I my judgment pluck, And yet methinks I have astronomy…"*

I believe that Shakespeare used astrology a lot in his plays because he knew his audience followed it. And now at the close of 2020, we have that rare opportunity to reflect on an astrological event, the joining together of two planets, a simple event that helps us to go outside, look towards the southwest, and revel in the beauty of the night sky.

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

John Boudreau's Great Conjunction Image . . .

AP140EDF refractor, ADC, and ASI462MC camera. Used a global non-linear stretch on a 2500 frame stack. Image by John Boudreau

Lunar X and V for 2021 . . .

"The Lunar X (also known as the Werner X or the Purbach Cross) is an effect of light and shadow that creates the appearance of the letter 'X' about 6 hours before the first quarter and 6 hours after the last quarter moon. It is formed by the rims of Blanchinus, La Caille, and Purbach craters. It lasts for only a few hours, but the X will appear to float just beyond the terminator for about an hour."

"At the same time, another letter appears nearer the center of the lunar disc. That is the Lunar V, which is located near the terminator at the same time as the Lunar X. It is formed by two ridges between Mare Vaporum and Sinus Medii."

Editor: *The above text is reprinted from Julie Kaufmann's Newsletter articles from October 2013 and March 2017.*

March 20	21:30 UT (17:30 EDT)
May 18	23:30 UT (19:30 EDT)
July 16	22:47 UT (18:47 EDT)
September 13	21:56 UT (17:56 EDT)
November 11	22:50 UT (17:50 EST)

www.eyesonthesky.com. Copyright David Fuller

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

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February *Star Fields* DEADLINE
Sunday, January 24th

Email articles to Al Takeda at
newsletter@atmob.org

Articles from members are always welcome.
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POSTMASTER NOTE: Not mailed due to the coronavirus pandemic

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

EXECUTIVE BOARD 2020-2021

PRESIDENT:	Rich Nugent	(508) 935-8158
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	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: 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 Standard Time (EST) from Universal Time (UT) subtract 5 from UT.

Jan 6 Last Quarter Moon (Moonrise at midnight)
Jan 11 Mercury and Venus pass 1.5 degrees of Jupiter
Jan 13 New Moon
Jan 20 First Quarter Moon (Moonset at midnight)
Jan 23 Mercury at greatest eastern (evening) elongation (19 degrees)
Jan 25 Moon is 0.3 degrees North of M35
Jan 28 Full Moon
Feb 4 Last Quarter Moon (Moonrise at midnight)
Feb 11 New Moon