



## 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. 10    December 2020

### This Month's Meeting . . .

Thursday, December 10<sup>th</sup>, 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 936th Meeting of the Amateur Telescope Makers of Boston.](#)

### The Radio Sky: Exploring the Universe at the Longest Wavelengths



The Milky Way Galaxy seen over the Karl G. Jansky Very Large Array.  
Credit: NRAO/AUI/NSF, Jeff HELLERMAN

Our speaker this month is Dr. Diana Hannikainen. Dr. Hannikainen's talk is "The Radio Sky: Exploring the Universe at the Longest Wavelengths".

Following the pioneering work of Karl Jansky and Grote Reber in the 1930s, radio astronomy really took off with the advances of radar technology during World War II. Engineers have devised ingenious contraptions to capture the longest wavelengths of the electromagnetic spectrum arriving at Earth from the farthest reaches of the cosmos. In tonight's talk Dr. Hannikainen will walk us through the historical steps that led to today's gargantuan arrays. Along the way she will highlight groundbreaking discoveries and show how they influenced our understanding of the universe. Hannikainen will conclude with some examples of her own research in microquasars and discuss how radio data complete the picture when interpreting data at other wavelengths.

Dr. Hannikainen attended the University of Edinburgh for her undergraduate studies, and later obtained her PhD in high-energy astrophysics from the University of Helsinki. Following that, she held a postdoctoral position at the University of Southampton, and then returned to Helsinki where she received a Fellowship from the Academy of Finland. She was lucky to have forged a close collaboration already during her PhD studies with the University of Sydney, which provided her with much-needed escapes to the Southern Hemisphere during the cold Nordic winter months. Her research focused on radio and X-ray observations and analyses of X-ray binaries, specifically those dubbed "microquasars," i.e., X-ray binaries that exhibit jets akin to their extragalactic counterparts, quasars. Dr. Hannikainen currently works at *Sky & Telescope* magazine in the capacity of Observing Editor.

~ Rich Nugent – President ~

### 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 ~

### President's Message . . .

As I grow older, I find that I've become more nostalgic about the beginnings of my interest in astronomy. My earliest recollection involves my dad leading my siblings and me into the night to observe a pass of the radio reflecting satellite, Echo. It was the summer of 1961 and the local newspaper was the likely source of my dad's information. Unfortunately, despite the clear skies, distant lightning flashes could be seen and this "heat lightning" spooked a younger sibling. That led to much crying and begging to be brought inside. None of us, including my dad, saw Echo that night and he was not happy! But my dad continued to sprinkle astronomy on us, if not mostly me. He and I successfully observed the partial eclipse of the sun on July 20, 1963, and the lunar eclipse on December 18, 1964. Of course, with few reliable resources, there were also failed attempts. We tried to observe the great comet of 1965 (the sky was too bright) and the Leonid meteor shower the next year (we looked just after sunset instead of just before sunrise). Just like many of us, my interest was being stoked nightly by the news reports about our progress towards sending Americans to the moon! Happily,

somewhere along the way I caught the bug...this was for me! My passion for the hobby was cemented with a binocular view of the Pleiades during the fall of 1966. And so it began.

Somehow, my folks managed to scrape up enough money to buy me a telescope. It was most likely under the tree on Christmas morning, 1966. Looking back at the only picture I have of the scope, it was probably bought out of the Sears catalog, likely a 50mm or 60mm refractor on an alt-azimuth mount. The telescope was equipped with a sliding eyepiece to vary the magnification but had no finder scope. Obviously, this was designed for terrestrial observing but I was determined to view the heavens. The moon was nearly full that week and although Jupiter and Saturn were in the sky, I probably did not know it. During these times, I was on my own. I didn't know of anyone else interested in astronomy and my only resources were the dusty books at the public library. I still remember the moment, while in the eighth grade, when a friend gave me two copies of magazines her dad was discarding - *Sky & Telescope*. I was elated! These opened the world of astronomy for me. I soon had my own subscription, a copy of *Norton's Star Atlas*, and a card listing the Messier Objects on one side with a map of their locations on the other. One telescope led to another and by the time I was fifteen, I was lucky enough to own an eight-inch reflector on a clock driven, equatorial mount. Now, after more than fifty years, I am grateful to my parents for supporting my fledgling interests in the heavens.

What about you? How, when, and why did you become interested in astronomy? Who influenced you during the early days? What was your first telescope? How has your interest in the hobby evolved? Are you a visual observer? Imager? Both? I would like to hear from you!

We all have experiences that are truly valuable when we share them with others...especially newcomers to the hobby. What do you say when asked about a first telescope? I'm sure you've all been asked to make recommendations. We've all seen what hobby-killer telescopes can do to newcomers. There is a bewildering array of telescopes, so...what do you say to someone? If you want examples of which to NOT recommend, search Facebook Marketplace, Craig's List, or even ShopGoodwill.com. While it's true that you can sometimes find surprisingly good deals on these sites, they are rare. More likely, you'll find every sort of hobby-killer telescope imaginable! They are mostly small aperture, all plastic refractors that promised their owners high power views not unlike images from the Hubble Space Telescope! Many of these scopes come with plastic optics and inferior eyepieces which conspire to produce fuzzy, color-fringed images. The barely functional finder scopes make it difficult to aim and the wobbly mounts make tracking almost impossible. These scopes wind up collecting dust, not starlight.

Usually, cost is one of the first considerations, but buying quality should be another. Ease of use is important. Even for seasoned observers, a telescope that is not easy to set up, use, and put away might not see starlight very often. And for the I-want-to-see-everything crowd, aperture is important. I suggest folks set a budget and do their homework. The websites of *Sky & Telescope* and *Astronomy* magazines offer more than a few

articles on choosing and observing with a new telescope. But when push comes to shove, I usually recommend a reflecting telescope like those we modify for the Library Telescope Program. These telescopes are Orion's 4.5-inch StarBlast scopes and I suggest that folks first check with their local library to see if they can borrow one. Before spending their hard-earned cash on a telescope, this program offers the opportunity for folks to try-before-they-buy. Maybe astronomy isn't the hobby they thought it would be and nothing will have been lost. But maybe, the experience of that first look at the moon, Jupiter, or Saturn will open the door to a lifetime of enjoyment. It certainly did for you and me.

Let me close by offering everyone best wishes for safe and happy Holidays. Be well, my friends.

~ Rich Nugent - President ~

## November Meeting Minutes . . .



Dr. Ana Bonaca on Zoom \*

### ATMoB 935th Meeting Minutes

November 12, 2020

The meeting was called to order at 8:02 pm

President Rich Nugent presented the President's Welcome. The Harvard Center for Astrophysics (CfA), where we usually hold in-person meetings, remains closed. Rich Nugent is in contact with MIT every week to get a status report or to inform them of work being done on the Clubhouse property. There was some observing at the Westford Clubhouse grounds in October. This was recently curtailed by Gov. Baker's order to businesses and organizations for people to stay at home between the hours of 10 pm to 5 am. Thus, at this point, the Westford observing field and Clubhouse remain closed until further notice.

- Alva Couch presented the Secretary's report. Alva and President Rich Nugent reported on the Special Board Meeting held on October 22, 2020 to consider additional funding for the Mittelman-ATMoB Observatory project. The Board approved funds to complete the project, including buying a QHY600 camera, scientific-grade filters, and a filter wheel.
- Treasurer Eileen Myers presented the Treasurer's report. There was a small outflow this month due to purchasing a new computer for the Mittelman-ATMoB Observatory and paying

membership dues to the International Dark Sky Association. Many thanks to Bernard Volz, who donated the renewal of our domain name "atmob.org". Although we plan substantive expenses in the coming months to install the Mittelman-ATMoB Observatory, Clubhouse Chair Steve Clougherty reported that we don't foresee any other major expenses for the next 2-3 years.

- Chris Elledge presented the membership report. We have 13 new members, including:

Philip Babcock  
Sagar Bhatt  
Andrew Howard  
Daniel Lee  
Robert McCarthy  
Stephen Moshier  
Kegin Murphy  
Corinna Smith  
Michael, Trina, Rachel, and Samuel Toups,  
Robert Walcott

- Glenn Chapple presented the Observer's Report. Stay tuned for Jupiter, Saturn, and the Moon together on the horizon on November 18-19. Other night wonders include a penumbral lunar eclipse on Monday, November 30. During this month, Comet Atlas (C/2020 M3) is in Orion.
- Bruce Berger presented a progress report on installing the Mittelman-ATMoB Observatory enclosure. The supporting columns were installed at a work party two weekends ago. Last weekend 6"x6"x8" crossbeams that will support the observatory were secured in place on the columns. Members dug a trench and laid a 2" diameter conduit between ARIO and the Mittelman-ATMoB Observatory enclosure site to provide AC power and communications and control cables. An 8-foot ground rod was also installed. Bruce Berger and the Mittelman-ATMoB Observatory working group thanked the ATMoB Board of directors for OK'ing the funding to finish this exciting project.
- Kelly Beatty presented the Outreach report. ATMoB is building a relationship with PopScope, a group of enthusiasts advocating urban public astronomy. In the past month, Kelly Beatty did a telescope basics tutorial for PopScope members and is planning for a future joint event.
- Old Business: None
- New business:  
[Skyscrapers, Inc.](#) (Amateur Astronomical Society of Rhode Island) with Francine Jackson of Brown University will lead a "[Quest for the Northern Lights: Iceland 2021](#)" tour on Oct 2-8, 2021.

November's speaker was Dr. Ana Bonaca of the Harvard-Smithsonian Center for Astrophysics, who spoke on "Uncovering the Nature of Dark Matter with Stellar Streams in the Milky Way".

It is estimated that roughly 90% of the matter in the Milky Way is invisible. The search for dark matter is a billion-dollar project if one includes the LUX experiment in South Dakota, the Fermi Satellite (gamma ray sensor) and use of the Large Hadron Collider at CERN. But there is another way to study dark matter via its effects upon stars in the Milky Way. Star clusters in motion leave behind tidal streams that preserve a record of gravitational interactions. Using computer simulations to predict the dynamics of tidal streams gives us an estimate of the amount of dark matter in those regions of the Milky Way. A detailed study of the Gossamer stream, called GD1 after [Carl Grillmair](#) (an astronomer at the California Institute of Technology (Caltech) and his collaborator [Odysseas Dionatos](#) (University of Vienna - Dept. of Astrophysics), gives estimates of how much dark matter is distributed around its path. Study of similar streams has promise in predicting the amount and distribution of dark matter in our galaxy.

Meeting adjourned at 10:06 pm.

~ *Alva Couch - Secretary* ~

## ATMoB Executive Board Special Meeting Highlights . . .

November 23, 2020, 7:30 pm

For details, refer to the full meeting report on the ATMoB web site.

Meeting Attendees:

Executive Board: Rich Nugent, Chris Elledge, Maria Batista, Eileen Myers, Tom McDonagh, Alan Sliski

Members: Peter Bealo, Bruce Berger

A proposal to rename the ATMoB Research and Imaging Observatory (ARIO) facility to honor the work of Bill Toomey was made to the Board. A Special Board meeting was held on November 23 where the proposal was briefly discussed. Since his retirement from teaching, Bill has played a key role in the operation and maintenance of the facility, has advocated for the facility to be used for the collection of scientific data and has worked with local students to support their astronomy projects.

The motion to rename the facility was made and the vote was unanimous for renaming the ATMoB Research and Imaging Observatory (ARIO) to the William Toomey Observatory.

I'm proud of the work Bill has done and will continue to do with this facility. We will schedule a rededication ceremony once we can safely meet at the observatory, again.

Next Board meeting:

Tentatively Jan 7, 2021, 8-10 PM.

~ *Rich Nugent - President* ~

## Membership Report . . .

I am pleased to welcome our newest members: Philip Babcock, Kevin Murphy, and Corinna Smith.

As of November 29th, 2020 we have 300 memberships covering 383 members. This is broken down as follows:

- 124 Regular Members
- 120 Senior Members
- 3 Student Members
- 48 Family Memberships covering 131 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 #935 is available on YouTube: <https://youtu.be/vrOyTE76IjI>

I would like to thank Dr. Ana Bonaca 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 Report . . .



The Observing Field with the Clamshell and the Chase Hutch \*

## December 2020 Clubhouse Report

During the month of November the Clubhouse was not available for members, with the exception of allowing a small crew to be on-site for the completion of the foundation work for the Mittelman-ATMoB Observatory enclosure. The decision was made to defer installing the observatory until such time that it can be made fully operational and used on a regular basis. Hopefully, this will occur by early spring.

Rich Nugent added reflective stakes to the NW corner of each observing pad to aid in snow removal. Thanks to Rich for this helpful work!

The refrigerator was emptied and set on low for the winter months. All bottled water is now in the warm pump room.

Healey Oil Company assured us that having a full tank of oil over the winter is safe, however, we took the extra step of having them add several quarts of anti-freeze to the tank in order to prevent freezing of the fuel line. Tom McDonagh will be alerted by way of his smart phone app when the temperature dips below freezing. We plan on bi-weekly inspections of the facilities going forward.

~ Clubhouse Committee Chairs ~

~ Steve Clougherty, John Reed and Dave Prowten ~

## 2021 RASC Observer's Handbooks and 2021 Astronomy Calendars . . .



2021 RASC (Royal Astronomical Society of Canada) *Observer's Handbooks* U.S. Edition and 2021 *Astronomy Deep Space Mysteries Calendars* were ordered for those who replied to the atmob-announce emails. Both calendars and handbooks finally arrived safely at my house and are now available for distribution to those members who placed orders with me.

Each calendar is \$8. Each Handbook is \$24. Please mail the payment check to me using the directions in the atmob-announce emails. All checks must be received before pickup.

I will be contacting each member who ordered materials to finalize their most convenient pickup location.

~ Eileen Myers - Treasurer ~

## 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](http://www.atmob.org).

## Observer's Challenge . . .

December, 2020

Messier 76 - Planetary Nebula in Perseus

Mag: 10.1

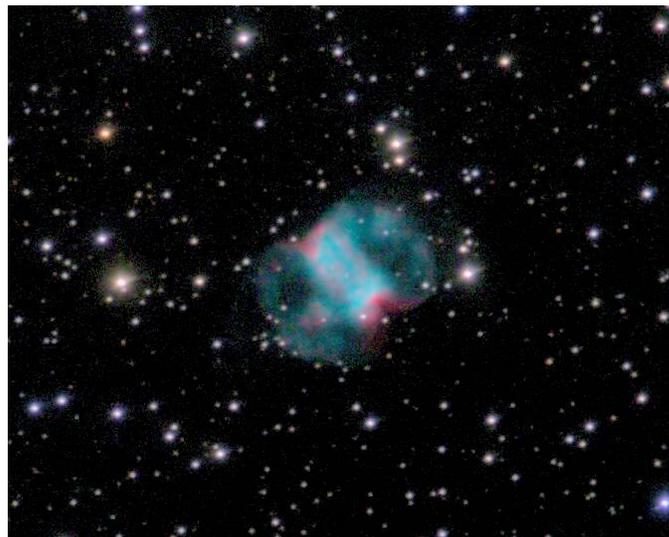
Size: 2.7' X 1.8'



M76, taken with 32-inch scope using SBIG 1001E camera and narrow band filters. About 2 hours total imaging. North is up. Image by Mario Motta

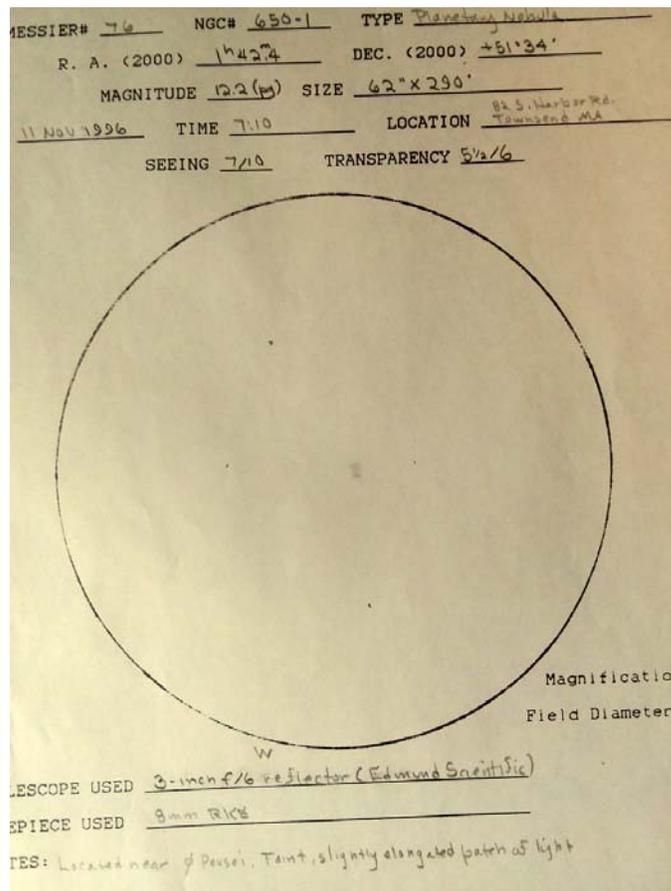
Messier 76 is one of four planetary nebulae listed in the Messier Catalog, the others being the Dumbbell Nebula (M27), the Ring Nebula (M57), and the Owl Nebula (M97). Similar in shape to M27 but 2½ magnitudes fainter and 3 times smaller, M76 is nick-named the “Little Dumbbell Nebula.”

The Little Dumbbell is located at RA 01h 42.4m and Dec +51° 34.5'. For star-hoppers, that's about a degree north and slightly west of the 4th magnitude star phi (φ) Persei. At 10th magnitude and covering an area 2.7 by 1.8 arc-minutes, it's considered to be one of the more difficult to observe members of the Messier Catalog. However, it can be viewed with small-aperture instruments under reasonably dark sky conditions and with dark-adapted eyes.



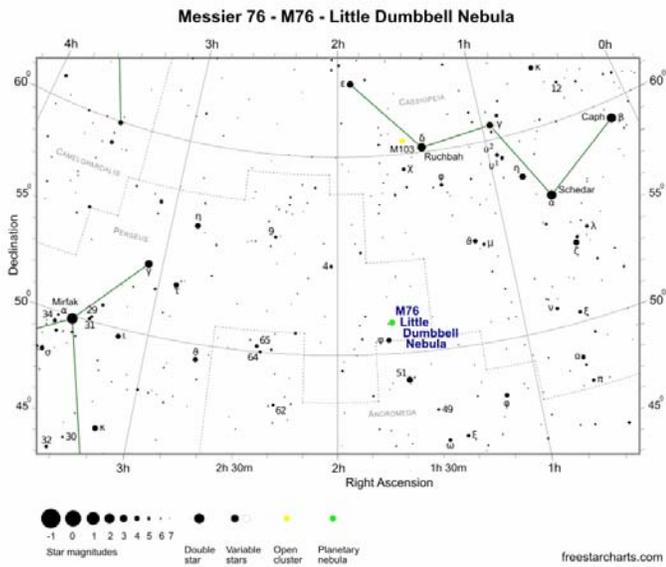
M76, taken with Canon Ra, 1200mm f/8.0 (150mm aperture) lens, ISO 1600, 86subs x 2min = 2hr 52min total exposure. North is up. Image by Doug Paul

M76 was discovered by French comet hunter Pierre Méchain on September 5, 1780. He reported his find to Messier, who added it to his catalog on October 21. Once believed to be two separate emission nebulae, the Little Dumbbell bears the New General Catalogue designation NGC 650/651. It lies about 2500 light years away and has a true diameter of 1.2 light years.



M76, as seen with 3-inch f/6 reflector at 57X. Field is one-half degree on a side and rotated so that North is up. [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: [M76](#). 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](#).



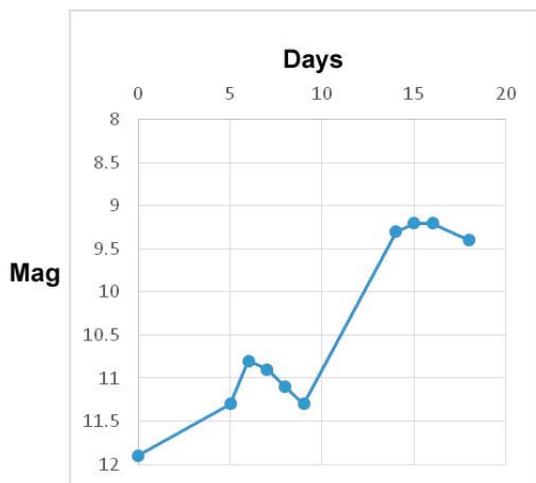
The purpose of the Observer's Challenge is to encourage the pursuit of visual observing. It is open to everyone who is interested. If you'd like to contribute notes, drawings, or photographs, we'll be happy to include them in our monthly summary. Submit your observing notes, sketches, and/or images to Roger Ivester ([rogerivester@me.com](mailto: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 ~

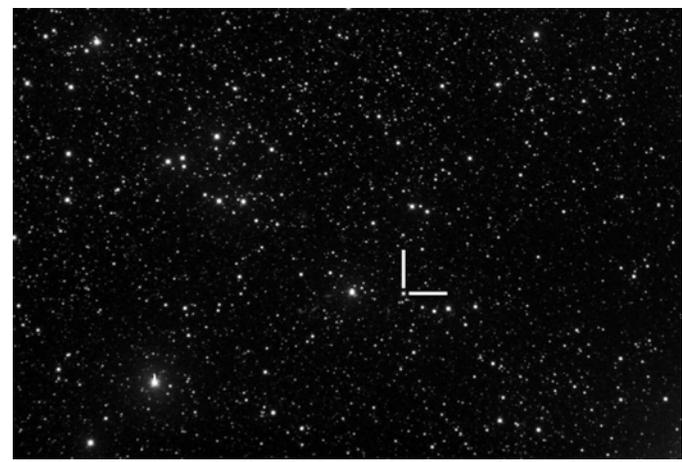
## Joseph Rothchild Catches SS Cygni in Outburst ...

To generate interest in variable stars, Glenn Chaple gave a challenge to astroimagers and visual observers at the October 10th ATMoB meeting. Glenn chose the cataclysmic variable star SS Cygni (SS Cyg). It is a binary system with a sun-like star closely orbiting a white dwarf. The white dwarf "sucks" material off of the major star for a few weeks until the gasses ignite a runaway hydrogen fusion reaction causing an outburst. The challenge for astroimagers is to be the first to catch SS Cygni in its quiescent state and at its outburst stage. Glenn also wanted to see who can be the first visual observer to see SS Cygni going into outburst.

Joseph Rothchild became the first ATMoB astroimager to capture SS Cygni in outburst on October, 30th. He used a remote 20-inch Planewave telescope at iTelescope.net in New Mexico. He measured the quiescent state at magnitude 11.3 and the outburst at magnitude 9.2.



SS Cygni Light Curve from Oct. 21 - Nov. 2. Joseph Rothchild



SS Cygni base image. V filter. 20 October 2020. Image by Joseph Rothchild



SS Cygni in outburst. V filter. 30 Oct 2020, 03:00 UT. Image by Joseph Rothchild

~ Al Takeda - Newsletter Editor ~

# Skyward . . .

By David H. Levi

December 2020

December 17



(L-R) Andy Bauman and David Levi with his 8-inch Cave Newtonian reflector.  
Photo by Joe Howard

The night of December 17, 1965 changed my life. That was the night I began a search for comets that goes on to this day. It represents the second most important decision I have ever made, to begin a visual search for comets and exploding stars that are called novae. The first most important decision, of course, was to marry Wendee. Both decisions made my life what it is today.

Usually in Montreal, November, December, and April are the cloudiest months. Therefore I wasn't counting on a clear sky that evening. After a Friday evening dinner with my family, I walked over to my friend Tom Meyer's home and we visited for a while. Afterwards, around 11 pm I took Clipper, our little beagle, for a walk towards the summit of the hill on which we lived.

It was during this little stroll with Clipper that things began to change. Towards the west there appeared to be some lightening of cloud cover, and soon after, clearing. Within about 15 minutes large swaths of sky were showing some stars. I couldn't believe it. I turned toward home, and for a few seconds Clipper and I enjoyed a tug-of-war until he gave up and walked back home with me. Just before midnight on the 17th, I began my first comet hunting and I scanned the sky between Pollux and Castor, in the constellation of Gemini. The clouds returned after that.

As the famous ABC news reporter Jules Bergman said on the launch of Telstar, the world's first active telecommunications satellite in 1962, "And it all began today." For me, it surely did. In December 2020, fifty-five years will have passed, and I still

am searching almost every clear night. There are 22 comets roaming about the solar system with the Levy name on them, plus one named Jarnac. Jarnac Observatory is the name of our observing site here in Vail, Arizona and is named in turn after my grandfather's cottage, Jarnac, near Ripon, Quebec. An object was found and automatically reported by Tom Glinos, who once had an automated telescope here. Because he incorrectly identified the object as an asteroid, when it turned out that it sported a tail and was reclassified as a comet, it was named, following the rules, for the observatory, not for the discoverer. Thus, my total is now 23 comets. If my grandfather knew that his beloved cottage (and later observatory) now had a comet with its name on it, he would be dancing all over heaven. It is a happy story that still goes on today.

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

## Mario's Ultimate Horsehead Nebula (IC434) Image . . .



32-inch relay scope, ZWO ASI6200 MM CMOS, Total of 4 hours with RGB and H-alpha, Oxygen III and Sulfur II filters. Image by Mario Motta.

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

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**January Star Fields DEADLINE**

**Sunday, December 27<sup>th</sup>**

**Email articles to Al Takeda at**

**[newsletter@atmob.org](mailto: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](mailto:newsletter@atmob.org)

#### **PUBLIC OUTREACH**

COMMITTEE CHAIR: Rich Nugent [starparty@atmob.org](mailto:starparty@atmob.org)  
STAR PARTIES: Bernie Kosicki  
Laura Sailor  
John Harrington

## **How to Find Us...**

### **Web Page [www.atmob.org](http://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](http://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.

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## **Heads Up For the Month . . .**

**To calculate Eastern Standard Time (EST) from Universal Time (UT) subtract 5 from UT.**

Dec 7 Last Quarter Moon (Moonrise at midnight)  
Dec 12 Venus 0.8 deg. South of Moon 21:00 UT (16:00 EST)  
Dec 14 New Moon, Geminid Meteors peak 01:00 UT (20:00 EST, 12/13)  
Dec 21 Winter Solstice  
Dec 21 First Quarter Moon (Moonset at midnight)  
Dec 21 Jupiter 0.1 deg. South of Saturn 14:00 UT (09:00 EST)  
Dec 29 Full Moon  
Jan 3 Quadrantid Meteors peak, 14:30 UT (09:30 EST)  
Jan 6 Last Quarter Moon (Moonrise at midnight)  
Jan 11 Mercury passes 1.5 degrees S. of Jupiter 11:00 UT (06:00 EST)