



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. 31, No. 4 April 2019

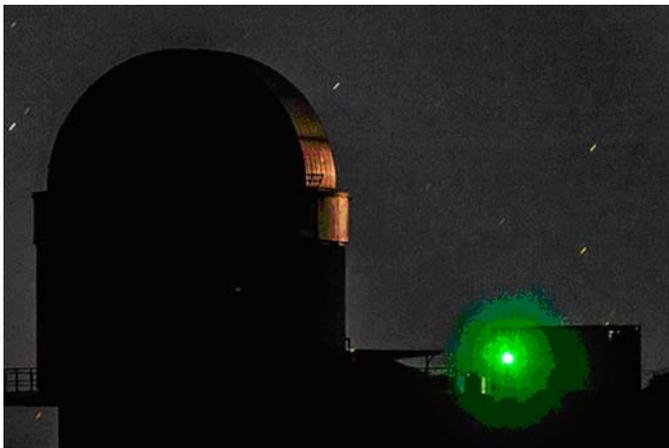
This Month's Meeting . . .

Thursday, April 11th, 2019 at 8:00 PM
Phillips Auditorium

Harvard-Smithsonian Center for Astrophysics

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

Testing Quantum Mechanics with Cosmic Photons on the Canary Islands



La Palma, Canary Islands, Courtesy: Massimo Cecconi

Our guest speaker for the April meeting will be Calvin Leung. Calvin will speak about the experiment that was performed, using Spain's Canary Island telescopes, to close the "freedom-of-choice" loophole in Bell tests of quantum entanglement.

Calvin Leung is a graduate student in physics at MIT. He was a physics and math major at Harvey Mudd College, where for his undergraduate thesis he developed a unique astronomical instrument which uses photons from quasars to generate random bits. He was a crucial member of a team, led by Anton Zeilinger at the University of Vienna and David Kaiser at MIT, that used some of the world's largest optical telescopes on the Canary

Islands to conduct rigorous tests of quantum entanglement. He is passionate about science communication, and enjoys teaching. In his spare time he likes to play the cello and watch silly YouTube videos.

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 . . .

Over the last ten years or so, members of the Clubhouse and Observing Committees, with the help of dedicated members, have put a tremendous amount of effort into the building out of our Clubhouse facilities.

These efforts include the building of our Clamshell Observatory with a 10-inch Schmidt-Cassegrain Telescope (SCT) on a Losmandy G11 German Equatorial mount. This system has worked well for visual observing and imaging. The Ed Knight Observatory has seen upgrades also. A fork mounted 16-inch SCT was donated to the club by Bentley University and has proven to be a visual favorite. In addition to the 16-inch, a 25-inch Dobsonian was purchased and is regularly used for all manner of "faint fuzzies". Our 17-inch Dobsonian has seen improvements to the structure that houses it. It is a fine, easy to use instrument and has recently been dedicated in Sai Vallabha's memory. Last but certainly not least, is the ATMoB Imaging and Research Observatory, housing a C14 (14-inch) SCT on a Paramount German Equatorial mount for deep sky imaging. All of these instruments are available to all members. If you have an interest, we have trained super users that can get you up to speed with their operation and care.

In addition to our observatories, we have invested in our workshop. Our metal and woodworking facilities offer the ability to fabricate telescopes and mount parts. We have a broad selection from basic hand tools to a metal machining Bridgeport end mill and lathe. There are a number of super users that could help you with your project. Please reach out to any Clubhouse Committee member with any questions.

Another area of intense focus of late is a rejuvenation of our mirror grinding and polishing facilities. Three distinct projects are ongoing. First off, the mirror testing tunnel is being cleaned and updated to allow for easier analysis of mirrors being produced in-house. In addition to our standard Foucault tester, plans are in the works for installing an interferometer which should ease the process of interpreting the figure of in-process mirrors. The second project, led by Eric Johansson and Barry Jensen, involves the recycling of an old mirror making machine and converting it to a mirror grinding instrument. The third project involves the making of an advanced Mirror-o-Matic (MoM) mirror grinding and polishing machine. Barry Jensen is spearheading this effort with assistance from other club members. Check out the basic design and operation at: <http://www.mirror-o-matic.com/>. This machine should allow us to process mirrors up to 18-inches.

In addition to these projects, the mirror making facilities are getting a makeover with cleaning, installation of a barrier to lower dust and dirt and the removal of excess surplus equipment and supplies that should make the area easier to work in. So many people are involved that I hesitate to write names in fear of leaving anyone out. Thanks to all of the club members that have helped with these projects.



Mirror-o-Matic grinding machine. Image by Tom McDonagh

With these new observatories and working areas comes more welcome traffic and risk. With that benefit comes some responsibility. My main concern is for the safety of all members. We recently experienced two safety incidents at the Clubhouse. One involved a slip and fall after our last major snow and ice weather event. Please take extra care when making your way around the Clubhouse. Snow and ice removal is a priority but it is very difficult to manage. The second involved the use of power tools in the workshop. The individual received a nasty cut and bruise but luckily no permanent injury. In both cases, the individuals were not alone at the site and were able to transport themselves for medical care. All of the power tools and the new mirror grinding and polishing instruments can present a life threatening hazard if used improperly or if one is inattentive. Safety glasses and appropriate protective clothing is a must. Please get checked out by the Clubhouse Workshop Manager on the safe operation of these tools **BEFORE** you use any of them.

Please note, the club has a **two-person** policy for just this reason. If you plan to work at the Clubhouse, please send along an email to atmob-announce@atmob.org. I am sure others would be happy to keep you company and work on their projects too.

Note: Please consider participating as a club officer or volunteering as candidate for the nominating committee. Contact me via email (president@atmob.org) or via phone (617-966-5221).

~ Tom McDonagh – President ~

Meeting Refreshment Assignment . . . 2019

Apr. – Chris Elledge
May – Al Takeda
Jun. – Bruce Berger
July – TBD

March Meeting Minutes . . .



Hugh Blair-Smith *

Minutes of the 918th ATMoB meeting held March 14, 2019 at the Harvard-Smithsonian Center for Astrophysics in the Phillips Auditorium. Club President Tom McDonagh called the meeting to order at 8:01 pm.

President McDonagh opened the meeting by wishing ATMoB a happy 85th anniversary this month. ATMoB was founded in 1934 and merged with the former Bond Astronomical Society in 1973, making it one of the oldest astronomy clubs in the U.S.

- Secretary John Harrington read the minutes of the February Club meeting.
- President McDonagh gave the Treasurer's report in Eileen Myers' absence.
- Membership Secretary Chris Elledge presented the Membership Report, showing 320 total memberships covering 414 Club members.
- Glenn Chapple presented the Observer's Report and noted the upcoming occultation of the asteroid 324 Bamberga on March 21, as well as the scheduled Messier Marathon on March 30 (with March 31 as a fallback). He also announced a conjunction of Venus, Mercury and the Moon on April 2, and that Mercury would be at greatest elongation on April 11. This month's Observers Challenge object is NGC 2300, a lenticular galaxy in Cepheus.
- Steve Clougherty gave the Clubhouse Report, noting that the February 16 work party had focused on the grinding and polishing rooms, and that the Mirror-o-Matic machines were approaching 75% completion. He particularly thanked Barry Jansen, Eric Johansson, and Tom McDonagh for all their work at the Clubhouse. The next work party is scheduled for March 23.
- Vice President Nugent presented the Outreach Report and noted that Bernie Kosicki has been working on insurance coverage for the Club that would cover Club members who participate in ATMoB star parties. He discussed the need to publicize key star party rules, such as being patient with attendees, avoiding laying power cords on the ground, prohibiting children from using laser pointers, and refraining

from lifting children to see through eyepieces. He announced that the Chenery Middle School star party had been a big success, with over 200 attendees.

Upcoming star parties include:

March 16 at Acton Congregational Church for the Girl Scouts

April 8 at the John Glenn Middle School is in Bedford, MA

- Old Business:

President McDonagh repeated notices from the February Club meeting regarding John Harrington's publication of the book *Shallow Sky* about planetary imaging, and Dr. Mario Motta's new website at mariomottamd.com, which includes his medical activities, light pollution advocacy, and a link to his wonderful deep sky images.

President McDonagh also read a response from the Club's previous speaker Camille Carlisle regarding a question as to whether dark matter could fall into a black hole (answer: "only if it loses momentum").

- New Business:

President McDonough urged Club members to consider joining the Nominating Committee, which under the bylaws needs six members.

Sky & Telescope's parent F+W Publications has filed for Chapter 11 bankruptcy, but *Sky & Telescope* is profitable and will likely survive.

Mario Motta played a short video bringing greetings from famed astronomer and science writer David Levy.

Bruce Berger announced that the MARS (Maine Astronomy Retreat) Star Party will held July 28-August 3 this year, and Dava Sobel will be the featured speaker.

President McDonagh then introduced Hugh Blair-Smith, who spoke on the subject of *Left Brains for the Right Stuff*, his book published in 2015. Blair-Smith worked at MIT's Instrumentation Lab (now Draper Laboratory) from 1959 to 1981 and designed numerous pieces of guidance and navigation hardware for the Apollo program, and then fault-tolerant software for the Space Shuttle program.

Blair-Smith began his presentation with an historical overview of the development of rocketry, beginning with Wan Hu in 1567 and moving on through Konstantin Tsiolkosky, Robert Goddard (who performed many of his experiments in Massachusetts), Hermann Oberth and Fred Singer. He then described how navigational instruments "got scientific," through such innovations as radio navigation, the Sperry gyro autopilot, and Draper Lab's inertial navigation system. Computers, too, advanced, with Alan Turing's wartime work at Bletchley Park in England, John von Neumann's development of his computer architecture, and Presper Eckert and John Mauchly's development of the ENIAC computer and subsequent founding of the Univac Corporation. Blair-Smith described the sudden shock delivered by the Soviet Union's successful orbiting of

Sputnik in 1957, just at the time when he was working with computer hardware and software and attempting to "bridge" the two.

Devoting the next portion of his presentation to the development of the U.S. space program and its long race with the Soviets, Blair-Smith described how Russian rocket designer Sergei Korolev pushed the Soviet program ahead, including the first orbital flight of Yuri Gagarin in 1961. Meanwhile, the U.S. answered with high altitude flights of the X-15 aircraft followed by the Mercury and Gemini space missions of the 1960s.

Blair-Smith worked to design key digital computer hardware for the Apollo program, especially the Apollo Guidance Computer (AGC), developed at Draper Laboratory. During Apollo missions, astronauts still made the decisions, but the AGC did the work of implementing them. He recounted how the AGC survived repeated attempts by the IBM Corporation to replace it with an IBM machine.

The US finally took a lasting lead in the space race with the Saturn V heavy lift rocket. Apollo 8 became the first crewed spacecraft to leave low Earth orbit, orbit the Moon, and then return safely. The Soviet Union rushed to counter with its super-heavy-lift N-1 rocket, but all four of its launches failed, the second in early July, 1969 resulting in a massive explosion that destroyed the launch facility. The US Apollo 11 mission successfully landed on the moon in mid-July of 1969, ending the space race. Apollo 15 went on to deliver a rover vehicle to the moon and Apollo 17 brought geologist Jack Schmidt, who took the famous "Blue Marble" image of Earth.

In the 1970s, former rivals the US and USSR began to cooperate in space. The Apollo-Soyuz mission of 1975 saw the docking of an Apollo spacecraft to a Soviet Soyuz capsule and a famous handshake in space. The next era of space exploration was dominated by space stations, first Russia's Mir and then today's International Space Station (ISS).

President McDonagh thanked Glenn Chaple and Maria Batista for providing the refreshments, and then adjourned the meeting at 10:04 pm.

~ John Harrington, Secretary ~

ATMoB Executive Board Meeting Minutes Summary . . .

March 7, 2019

ATMoB Clubhouse

- Attendees: Tom McDonagh, Rich Nugent, Eileen Myers, John Harrington, Glenn Chaple, Chris Elledge, Al Takeda. Also in attendance were Steve Clougherty, Bruce Berger and John Maher.
- Election Planning: President McDonagh announced the need for a 3-person Nominating Committee and stated that, per the bylaws, that Committee must nominate 6 candidates.

- Mirror-making at the Clubhouse: A report was given on the construction of the Mirror-o-Matic, grinding machine and interferometer.
- ATMoB Imaging and Research Observatory: Bruce Berger gave a report on the addition of the a 102mm APO refractor and 80mm Williams Optics guide scope to the 14-inch SCT.
- Clubhouse Committee: Steve Clougherty discussed the Clubhouse budget
- Treasury: Treasurer Eileen Myers briefly discussed the current financials, noting that income is slightly over budget due to a combination of fewer memberships but more than budgeted donations to the Club.
- Matt Ben-Daniel Donation: Al Takeda gave an overview of the items donated. They include a telescope, mounts and assorted astronomy gear, plus a vast amount of medium-format and 35mm film camera equipment. The Board decided to publicize the gift to the Club membership at the next meeting.
- Outreach Committee: Rich Nugent spoke on the subject of liability insurance for star party participants. Rich then discussed the need for an online pop-up list of star party rules for event registrants.
- Membership Committee: Chris Elledge reported on the current membership numbers. He also discussed the newsletter electronic to paper mailing ratio and costs.
- Website Committee: Chris Elledge and Maria Batista spoke briefly about the Club's website.
- No voting was taken.

A full report of the Executive Board meeting will be posted on the ATMoB website.

~ *John Harrington, Secretary* ~

Meeting Recordings . . .

The recording of ATMoB meeting #918 is available on YouTube: <https://youtu.be/E9Upayvjszg>

I would like to thank Hugh Blair-Smith 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 Nico Carver, Tom Cefalo Jr., Megan Ding, Gregory Getchell, Andrew Graytock, Varnit Kothari, Gary Shaw, Desiree Sutton-Griest, Kenneth and Andrew Griest, and Peter, Lana, and Nonna Tilke.

As of March 25th, 2019 we have 327 memberships covering 424 members. This is broken down as follows:

- 151 Regular Members
- 107 Senior Members
- 8 Student Members
- 56 Family Memberships covering 153 Members
- 3 Guest Members
- 2 Honorary Members

~ *Chris Elledge – Membership Secretary* ~

Clubhouse Report . . .



Dave Prowten installing the clear plastic dust barrier *

Our monthly work party was held on Saturday, March 23 under partly cloudy skies with a total of fourteen volunteers. Since there was very little snowfall in recent weeks we were able to concentrate our efforts on indoor projects.

Al Takeda sorted through donations and placed those items in the first floor telescope room. He also fabricated an adapter plate to install the club's parallelogram binocular holder onto a better tripod. Later that night, Al and George Paquin tested a 4.5-inch F/9 Dob along with a 4.5-inch tabletop Dob, both of which were determined to be in good working order.

Bruce Berger, with help from Tom McDonagh and Corey Mooney, did Spring cleaning in the ATMoB Research and Imaging Observatory. The walls, floors and counter were cleaned and hanging hooks were installed. Bruce removed the telescope's Starlight Focus Max 2 and focuser motor control from the C-14. The focuser system will be given to Starlight Instruments at the Northeast Astronomical Forum (NEAF) next month to be repaired. A donated camera was installed on the 80 mm refractor.

An Apogee Alta U8300 camera, donated by Tom McDonagh, was installed on the Vixen 102 mm refractor.

Several volunteers helped out in the new grinding room. Chris Elledge relocated two baseboard electric heaters and installed a new electrical control box. Dave Prowten constructed framing for the new plastic sheeting which was hung across the span of the room. We now have a complete "clean room" available for future mirror grinding and polishing. Eric Johansson, Tom McDonagh and Steve Clougherty painted the Mirror-O- Matic table along with the new spin grinding table. Eric recently reported that he finished painting all the components of this new grinding machine. Thanks to Keira Mooney for applying a fresh coat of paint to the test tunnel.

Work continued well into the evening during the work session. Two new families arrived later that day and Chris Elledge and John Maher gave them a tour of our facilities.

Thanks to John Reed for providing lunch to the crew.

Thanks to the following volunteers for their efforts at the March work party: Bruce Berger, Paul Cicchetti, Steve Clougherty, Chris Elledge, Eric Johansson, Dick Koolish, John Maher, Tom McDonagh, Corey and Keira Mooney, Dave Prowten, John Reed, Art Swedlow and Al Takeda.

The next work party will be held on April 20th.

Important Notice: Please check your email on the ATMoB-ANNOUNCE list for mirror making sessions.

Clubhouse Saturday Schedule		
April 13	Tom McDonagh	Volunteer Needed
April 20	WORK PARTY # 4 ** Art Swedlow	
April 27	John Maher	Dave Siegrist
May 4	Steve Clougherty	Jim Gettys
May 11	CLOSED Astronomy Day Outreach	
May 18	WORK PARTY # 4 ** Eric Johansson	
May 25	Art Swedlow	Al Takeda
June 1	Tom McDonagh	John Stodieck

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

Clubhouse Evening Schedule	
Friday Night Educational Videos	ATMoB-Announce
Saturday Afternoon Mirror Making	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 ~

Sky Object of the Month . . .

April 2019

Courtesy Observer's Challenge***

NGC 2964/2968 - Galaxies in Leo

NGC 2964 Mag: 11.3 Size: 3.0' X 1.7'

NGC 2968 Mag: 11.8 Size 2.2' X 1.5'

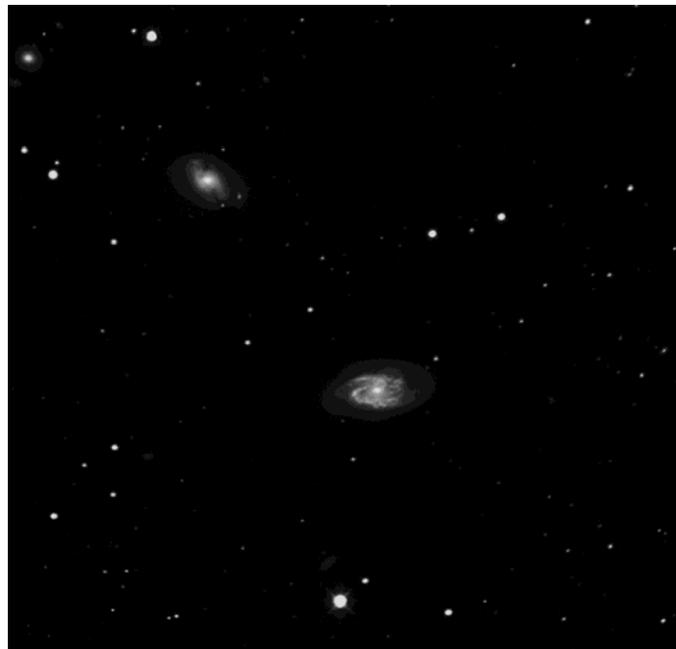
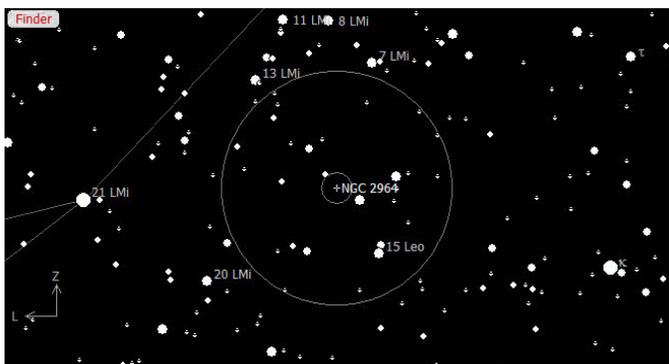
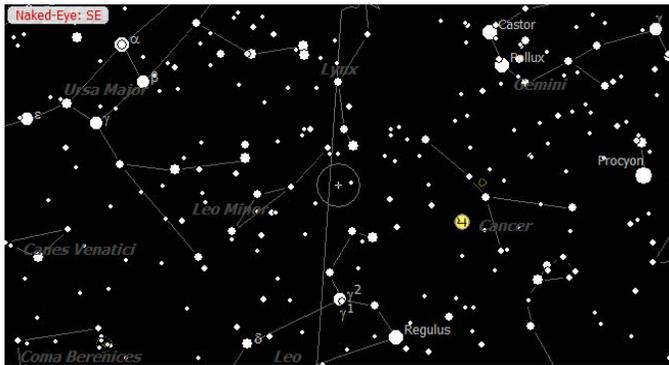


Image by Mario Motta M.D

As was the case last month, our Observer's Challenge consists of a pair of galaxies – in this case, NGC 2964 and NGC 2968, located in the northwest corner of Leo above the Lion's head. NGC 2964, an inclined spiral, is the brighter and slightly larger of the two. NGC 2968, classified as a lenticular galaxy, lies 5.8' northeast.

A third galaxy, NGC 2970, is 4.6' further northeast and appears in the upper left-hand corner of Mario Motta's image above. With NGC 2964 and 2968, it forms what is sometimes called the Leo Triplet 2 or forgotten Leo Triplet (Leo Triplet 1 being consisted of the galaxies Messier 65, Messier 66, and NGC 3628). At 13th magnitude and less than 1.0' in diameter, this elliptical galaxy appears almost star-like in large-aperture scopes.

NGC 2964 and NGC 2968 were discovered by William Herschel in 1785. The brighter NGC 2964 was designated as a H114¹, his 114th Class 1 (Bright Nebulae) object, while NGC 2968 was relegated to Class 2 (Faint Nebulae) and designated as H491². Herschel's son, John, discovered NGC 2700 in 1828. NGC 2964 is believed to be 60 million light years away, while NGC 2968 and NGC 2970 are about 75 million light years distant.



Finder charts from bristolweather.org.uk/galaxies

***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 either [Roger Ivester \(rogerivester@me.com\)](mailto:rogerivester@me.com) or [Fred Rayworth \(fred@fredrayworth.com\)](mailto:fred@fredrayworth.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-all-reports-from-2009/>

~ Glenn Chaple ~

Outreach Report . . .

On Tuesday, March 12th, ATMoB volunteers were on hand to support an evening of Astronomy at the Cheney Middle School in Belmont, MA. The skies were beautifully clear and the large group of students and their families were treated to some amazing views! Laura Sailor and Kai Cai spent the evening at an indoor display as did NASA Ambassador and Aldrich Astronomical President (and ATMoB member), Jim Zebrowski. Corey Mooney was inside and outside with his telescope/projection system. At the outdoor telescopes, I was joined by Christopher Elledge, Gregory Flaherty, Tony Flanders, Pierre Fleurant, John Harrington and Tom McDonagh. Everyone enjoyed views of the moon, Pleiades, the Orion Nebula, Sirius and Betelgeuse, Alcor and Mizar, as well as some lovely double stars.

On Saturday, March 16th Chris Elledge hosted a small group of Girl Scouts and their chaperones at the ATMoB Clubhouse. Despite the earlier forecast for clear skies, clouds spoiled much of the viewing. Instead, Chris gave the scouts a tour of our observatories and facilities. Later in the evening, clouds gave way a bit and the group, using Chris's telescope, managed to observe the moon and some star groupings in Ursa Major. On

hand to help out were Nina Craven, John Maher, and Phil Rounseville.

On the same night, not quite 9 miles to the south-east another group of volunteers was supporting a STEM evening for a group of Girl Scout Brownies and their parents at the Acton Congregational Church. We too had clouds early and the first group of girls to observe had little more than street lights to look at. The second group had better luck...they got to see the moon, the Pleiades, the Orion Nebula, Mars, and a few pretty double stars. As it turned out, the first group did get to see the same objects as they were leaving the event so everyone left happy! Bernie Kosicki did an indoor presentation early in the evening then joined, me, Pierre Fleurant, Corey Mooney, and Bob Toop in the parking lot.

Thanks so much to all of our Star party volunteers! Please let me know if I've left anyone out. If you've never attended one of these you should make plans to do so. No telescope is too small and whether you're a newbie to amateur astronomy or a seasoned veteran, you're always welcome! Here are some future events we've been asked to support:

- Monday, April 8: Bedford (MA) HighSchool
- Week of April 7: The Center School, Stow, MA
- Saturday, April 13: Farrington Nature Center, Lincoln, MA
- Friday, May 3: Stratton Elementary School, Arlington, MA
- Saturday, June 15: The Second Step, Hale Reservation, Westwood, MA

Also, Astronomy Day 2019 will be held on Saturday, May 11. I'll let you know of volunteer opportunities as we get closer to the date!

~ Rich Nugent - Vice President and Outreach Chair ~

Astronomy Day Event. . .

New England Sci-Tech plans to host a public Astronomy Day event on Saturday, May 11, at 16 Tech Circle, Natick, MA.

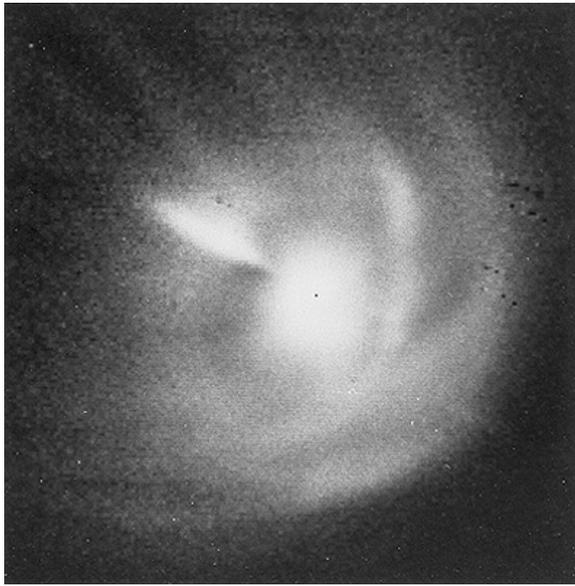
See our Astro Day web page <https://www.nescitech.org/astronomy-day/> for details. Plans include indoor astronomy activities and planetarium shows as well as outside telescopes.

Anyone wishing to participate in the planning stages should contact Bob Phinney (508-720-4179) or Rusty Moore at info@nescitech.org. See

~ Submitted by Bob Phinney ~

Skyward . . .

By David Levy, March 2019



Comet Halley. Image by Stephen Larson and David Levy

If you have read this column more than once, you probably are not too surprised to understand that I love comets. Comets are a part of me, a part of who I am.

But I had to wait a while before I saw my first comet. I was already 17 years old and had been interested in the sky for a number of years. When I learned that the two young Japanese amateur astronomers Kaoru Ikeya and Tsutomu Seki had discovered a comet that could become the comet of the century, I was spellbound. During the mild autumn of 1965, as I awaited this mighty comet, I decided to begin a comet search program of my own.

At the end of October I finally saw this comet as it rose, tail first, in the sky to the east beyond the St. Lawrence River. I observed it again a week later in early November. I have never forgotten it, even as, in later years, I finally was able to correspond with the comet's two discoverers. Their comet did become the brightest comet of the 20th century, and my own program, after many more years of searching, was successful.

To me, comets are as personal as almost anything in my life. I have discovered or co-discovered 23 of them, but my favorite is Comet Hyakutake. (pronounced Yah-koo-tah-key.) This comet provided everything a great comet should: it was big, it was bright, and its tail stretched majestically across the sky. I followed the tail one night from Polaris, the north star, all the way past Corvus in the far southern sky. When I reported my observation, a professional astronomer wrote to me that it was simply impossible for the tail to be so long. In order for that to happen, the tail would have had to stretch from Earth past Jupiter. A few years later, scientists studying the data from the Ulysses space probe identified its detection of the tail at the orbit of Jupiter, and the astronomer confirmed what I saw.

There is one other aspect that I can write about Comet Hyakutake. Between the time it passed so close to the Earth and the time it passed close to the Sun a couple of months later,

Wendee and I were growing closer. One evening, as we were driving home to Arizona from Las Cruces, New Mexico, I pulled over, turned off the car, and we enjoyed the comet together as it was near its perihelion, or its closest point to the Sun. It was the first time Wendee saw a comet. She saw another one, Hale-Bopp, the next year on our wedding night. And on October 3, 2006, she saw a third comet, one I had discovered the previous morning.

Oh, how I wish that more young people could capture s love of the night sky. Maybe soon another bright comet will pay us a visit, and a young teenage girl or boy will look up, watch it wander lazily across the sky, its tail pointing off in some direction, and maybe this comet might inspire that young person to learn about the night sky that is so much a part of us.

Editors Note: David Levy has discovered 23 comets and along with collaboration with Eugene and Carolyn Shoemaker he discovered Shoemaker-Levy 9. He also discovered or co-discovered 61 minor planets. He was a contributing editor to Sky and Telescope magazine, Sky News, Astronomy magazine, Science Editor for Parade magazine, and is the author or editor of 34 books. He won an Emmy in 1998 as part of the writing team for the Discovery Channel documentary, Three Minutes to Impact. He currently writes a monthly blog for his local newspaper and astronomy group.

~ Submitted by Mario Motta ~

Loaner Scope . . .

This 4.5-inch, f/4 tabletop Dobsonian is available for loan to any club member. Please contact a Clubhouse Committee member or visit the Clubhouse on Saturday evenings for details.



Orion 4.5-inch, 450mm, f/4 tabletop Dobsonian. *

**Correction: March 2019, Heads Up For The Month:
The line should be; "Eastern Daylight Time".**

Editor: * Photos by Al Takeda unless otherwise noted.

**May Star Fields DEADLINE
Sunday, April 21st**

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

Articles from members are always welcome.

POSTMASTER NOTE: First Class Postage Mailed April 10, 2019

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

EXECUTIVE BOARD 2018-2019

PRESIDENT: Tom McDonagh (617) 966-5221
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2012 - 14 Mike Hill (508) 485-0230

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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: 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 Daylight Time (EDT) from Universal Time (UT) subtract 4 from UT.

Apr 5 New Moon
Apr 11 Mercury at greatest western (morning) elongation (28 deg)
Apr 12 First Quarter Moon (Moonset at midnight)
Apr 19 Full Moon
Apr 23 Lyrid Meteors peak, Jupiter 1.6 degrees South of Moon
Apr 25 Saturn 0.4 degrees North of the Moon (14 UT - 10 EDT)
Apr 26 Last Quarter Moon (Moonrise at midnight)
May 4 New Moon
May 5 Eta Aquariid Meteors peak (13 UT - 9 EDT)