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. 7 July 2021

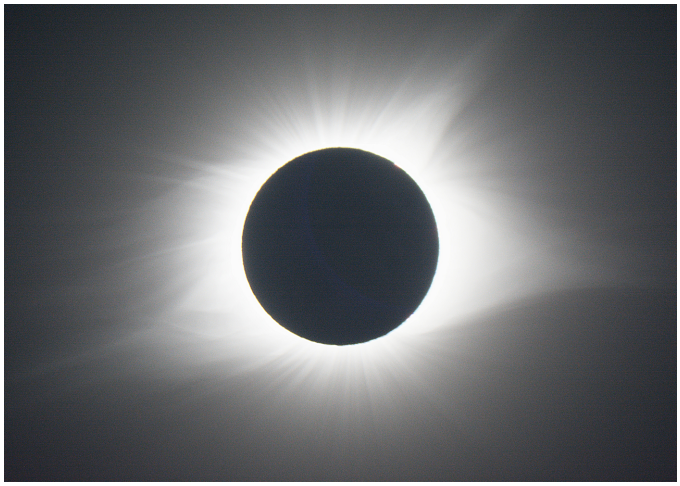
This Month's Meeting . . .

Thursday, July 8th, 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 943rd Meeting of the Amateur Telescope Makers of Boston.

Solar Eclipses



2017 Total Solar eclipse from Marion, Illinois. Photo by Mario Motta

This month, we'll dedicate the meeting to solar eclipses past and future! Our main speaker is *Sky and Telescope's* Senior Editor and ATMoB member, Kelly Beatty. Kelly will give us a summary of last month's expedition to view the annular eclipse. With COVID restrictions forcing the closure of the US/Canadian border, the only way to reach annularity was by jet. Kelly and fellow ATMoB member Bruce Berger were on the *Sky & Telescope* sponsored flight and enjoyed the view high above any clouds or COVID concerns! I wonder if the Wright Brothers ever imagined such a thing!

We'll continue the meeting with members Mario Motta and Bernie Volz. They will be offering suggestions and advice for planning the next ATMoB eclipse trip. Also, I would like to invite other members to share their experiences about past eclipses. It will be a rather informal meeting, but I think it'll be a lot of fun. I hope to see you there!

~ Rich Nugent – President ~

President's Message . . .

Imagine travelling to a faraway place to observe and study a total eclipse of the Sun only to realize – at the final moments before the onset of totality – that you were observing *outside* the predicted path! That's what happened to the ill-fated Harvard College eclipse expedition of 1780.

The American Revolutionary War was raging during that year, but an opportunity to study the solar corona was too valuable to miss. So, Harvard secured approval and financing for an expedition to be led by Professor of Mathematics and Natural History, Samuel Williams. In addition to five telescopes, the expedition carried with them a compass, a thermometer, an astronomer's quadrant, an octant, a micrometer, and, of course, a clock. Penobscot Bay, Maine was the destination and the group travelled aboard the galley ship, *Lincoln*.

Penobscot Bay was heavily fortified by British troops, but the British commander gave safe passage for the expedition. Williams was permitted to use only the islands in the bay and for only five days. Camp was set up on Islesboro Island and measurements to determine the precise latitude and longitude were made. The day of the eclipse dawned clear but hazy. As the moment of totality approached, Williams and the others watched as the sliver of the solar disk turn into what we now call Bailey's Beads. Imagine the sinking feeling that gripped them as the beads turned back into a growing crescent. Astronomy waits for no one. Totality had been missed!

Historians cite two possible causes for the missed opportunity. Williams' calculations may have been off when he determined the path of totality for the eclipse. Also, latitude calculations proved that the map he was using had an error in latitude of one-half degree. That translates into about 35 miles! Had the British commander given the expedition more time, this error may have been realized and a more suitable location might have been found. In the end, despite failing to accomplish its prime objective, the expedition was able to observe the Bailey's Beads, provide an accurate latitude and longitude for Islesboro Island, which improved the maps of the day, and record weather

observations during the eclipse. I'm sure the mood on the return trip home was sullen!

Fast forward to 1972, Cap Chat, Quebec. Using published maps, my brother, Kevin, and I knew we were camped right on the center line for the eclipse of July 10. However, we, too failed to accomplish our primary objective as clouds had covered the sky before the Moon's shadow passed us. What did I learn from that experience? Well, when thick clouds obscure totality, it gets *really* dark! But also and most importantly, mobility is the key. That morning, the sky had an odd haziness to it and the best weather forecast we could get was from a radio station in Montreal about Montreal. Had we been more pro-active and a little less naive, we would have driven as fast as possible south-eastward across the Gaspe Peninsula, ahead of the clouds! An opportunity lost.

My first successful eclipse trip did not come until the 2017 eclipse. The ATMoB group was based in Columbia, Missouri but, since weather prospects for both our primary and secondary observing sites were poor, we took to our buses and headed to the south-east. We settled on the grounds of a large church in Marion, Illinois. We had clear skies, enjoyed strong shadow bands and little over two minutes of totality. The experience was unforgettable!

What of future eclipses? There are still many total solar eclipses to be observed during the first half of the 21st century! In the United States, the annular eclipse of 2023 is followed by a total eclipse on April 8, 2024. This eclipse will provide over 4 minutes of totality along a path that stretches from Mexico, across Texas, sweeping towards the north-east (Marion, Illinois will once again enjoy totality!) to western New York, and northern Vermont, New Hampshire, and Maine. Overlay cloud cover data and you'll see that Texas offers the best chance to view the eclipse in the U.S. Several major cities skirt the path of totality! But remember, mobility is the key!

I'm hopeful that eclipse trips in the *22nd century* will be very different! When space-tourism becomes affordable, imagine booking a week-long vacation into totality! You know, there's a total eclipse of the Sun taking place *right now*! You just can't get there from here…yet! Parking a spacecraft just inside the apex of the Moon's shadow would allow you to observe totality for an unlimited amount of time! Don't think you'll be around in 2117 and 2125 for the next transits of Venus? No worries, there's a transit of Venus taking place *right now*! Same deal! Maybe my grandchildren's grandchildren will enjoy this type of vacation…I hope so! But, in the meantime, we're stuck here. Where will you be in 2024?

If the club is to have an organized trip, now is the time to start planning! Neither Mario Motta nor Bernie Volz, our past eclipse-trip organizers, are able to so for 2024. It should be an easy trip to plan for but the club needs a small group of volunteers to make a 2024 trip happen. Any takers…please?

As we emerge from the ongoing pandemic, please be careful as the Covid Delta Variant is becoming more of a concern. I hope everyone has been fully vaccinated by now. Still, please wear your mask when visiting indoor public spaces. As always, please be safe and remain healthy!

~ Rich Nugent – President ~

Executive Board Election Results . . .

We are pleased to announce the results of our on-line election for the 2022 Executive Board.

- Richard Nugent - President
- Corey Mooney - Vice President
- Alva Couch - Secretary
- Chris Elledge - Membership Secretary
- Eileen Myers - Treasurer
- Alan Sliski - Member-at-Large
- Kai Cai - Member-at-Large
- Mark Helton - Member-at-Large

June Meeting Minutes . . .

Geoff Chester on Zoom *

ATMoB 942nd Meeting Minutes
June 10, 2021

Rich Nugent presented the President's welcome. The Harvard-Smithsonian Center for Astrophysics (CfA) remains closed.

MIT has lifted restrictions on the Clubhouse. Thus we are opening up the grounds under the following rules:

Members who are fully vaccinated may participate on the grounds without masking, unless in the Clubhouse or with other members in the enclosed William Toomey or Mittelman-ATMoB observatories. Masking is required in the Clubhouse unless eating, and in the Toomey and Mittelman-ATMoB observatories when accompanied by other members. Members who are not fully vaccinated must wear masks at all times, and are only allowed access to the restroom in the Clubhouse.

Double-masking is required for the restroom and masks will be provided as necessary.

- Alva Couch presented the Secretary's report, including a summary of the inspiring presentation by lifetime comet-watcher, David Levy.

- Eileen Myers presented the Treasurer's report and reported a small net inflow due to substantive donations including those in memory of Bill Toomey balanced by expenditures in installing the Mittelman-ATMoB observatory (MAO). Eileen then presented the year-end Treasurer's report, which included substantive spending on the Mittelman-ATMoB observatory, balanced with substantive donations, leading to a small year-end surplus. Thanks to everyone for their generous donations!

- Chris Elledge presented the Membership report and welcomed new members Sheela Marston, Chris Slack, and Tim Solinski.

- Glenn Chaple presented the Observer's report. He reported on today's annular solar eclipse. On Friday, June 11 Venus shines above and to the left of a 40-hour-old crescent Moon. Other treats this month include eclipses of Io by Europa, Europa by Io, and a visit by Mars to the Beehive cluster (M44). The June observers challenge is NGC 5746 in Virgo.

- Steve Clougherty presented the Clubhouse report. We had a good observing session at the Clubhouse last weekend. The 25-inch Dobsonian was used for the first time in over a year. It was reported that globular clusters and planetary nebulae were observed.

- At the Clubhouse we had two work parties in May. On Saturday, May 22, we had 13 volunteers. The second floor was cleaned and vacuumed, the mirrors on the 25-inch Dob. and the 16-inch Schmidt-Cassegrain telescope (SCT) were cleaned and the lawn was mowed. The next work party is planned for Saturday, June 19, with a rain date of June 26.

- Alan Sliski presented the Mittelman-ATMoB Observatory report. The MAO control systems have been placed on the desk built by Al Takeda. Bruce Berger and Alan Sliski performed an initial polar alignment and modeling on the telescope. The next step is to install air conditioning in the Electronics/MAO Control room.

- Rich Nugent presented the Outreach report. We will restart the outreach program with observing nights at Tower Hill Botanical Gardens in Boylston MA on 6/17, 7/15, 8/12, and 8/19.

- Old business:
  Amazon Smile remains a great way to donate to ATMoB. Thanks to everyone who has used this simple donation mechanism!

- New business:
  - Rich reminded everyone to vote in the annual election.
  - Maria Batista is convening a website committee to make the website more welcoming.
  - Member's night is July 8, with member presentations welcome.
  - Annual reports of the committee chairs, except for the report from the Treasurer, were delayed until the July 8th meeting.

This evening, Geoff Chester was our featured speaker. His presentation title was "Sky and Ocean Joined: a Brief History of the U.S. Naval Observatory".

Public Affairs Officer and Historian for the United States Naval Observatory (USNO), Geoff Chester spoke on the unique role of the US Naval Observatory in both naval navigation and astronomy. Created on Dec 6, 1830, the original mission of the USNO was to predict the exact times of meridian crossings for bright stars so that ship chronometers could be set accurately, and to certify ship chronometers for accuracy before their placement in ships. This seemingly mundane task led to the acquisition of increasingly larger telescopes, including the "Great Equatorial" refractor with a 26-inch objective, the largest of its kind in the world at the time. These telescopes were used by affiliate astronomers to discover the Moons of Mars, a white spot on Saturn, and eventually the elusive Moon Charon of Pluto. In the present day, the USNO remains the keeper of time, now maintaining state-of-the-art atomic clocks. Its five sites around the US include the Navy Precision Optical Interferometer in Flagstaff, AZ, the subject of a previous ATMoB talk by Lowell Putnam on Oct 8, 2020. The motto of the USNO, selected in 1867 remains (translated from Latin): "Then too, the pilot's care: the stars are scaled, and sky with ocean joined."

~ Alva Couch – Secretary ~

Summary of the ATMoB Budget Meeting for FY2022 . . .

The ATMoB Executive Board met over Zoom on June 24, 2021 to review and approve the 2021-2022 budget.

The budget highlights for this year include:

- Completing work on the Mittelman-ATMoB observatory.
- Purchase of a riding lawn-mower for mowing the observing grounds.
- A new computer for the Toomey observatory, to replace one that is currently 10 years old.

Reduced costs were predicted and budgeted for:

- Mirror making supplies.
- Clubhouse upgrades

We left the administrative budget for in-person CfA meetings as-is, though we understand that the CfA will remain unavailable for in-person CfA meetings until at least November or December.

In summary, projected spending exceeds projected income by about 14%, partly due to capital expenditures on the Mittelman-ATMoB observatory and the purchase of a riding lawn mower. We have sufficient funds in our bank account for this fiscal year to pay for any predicted shortfall.

The budget was approved by a unanimous vote.

~ Alva Couch – Secretary ~

Membership Report . . .

I am pleased to welcome our newest members: Sheela Marston and Tim Solinksi

As of July 1st, 2021 we have 347 memberships covering 443 members. This is broken down as follows:

- 143 Regular Members
- 136 Senior Members
- 5 Student Members
- 58 Family Memberships covering 154 Members
- 3 Guest Members
- 2 Honorary Members

Renewals for FY2021-2022 are due by September 1st for all members except for members who joined after January 1st this year. Please visit the website at https://www.atmob.org/renew to begin your renewal. You may need to login and revisit the link to proceed. If you want a printed newsletter mailed to you each month, then you need to select one of the membership levels that include "with Mailed Newsletter" in the type.

You can also download the membership application from the website at https://www.atmob.org/signup by clicking on the "Download an application" link.

Please contact me if you need any help with renewing or logging into the website.

~ Chris Elledge – Membership Secretary ~

Meeting Recordings . . .

The recording of ATMoB meeting #942 is available on YouTube: https://youtu.be/WfqzAYdIC0g

I would like to thank Geoff Chester for giving his talk 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/forums

~ Chris Elledge - Membership Secretary ~

Clubhouse Report . . .

(L-R) Phil Rounseville and John Stodieck cleaning the Meade 10-inch SCT *

June 2021 Clubhouse Report

We held our June work party at the ATMoB Clubhouse in Westford on Saturday the 19th under partly cloudy skies. Volunteer turnout was very good with 16 members participating.

Once again lawn mowing was the priority and several volunteers began mowing early Saturday morning. Before noon the entire property was finished including trimming the perimeter.

Meanwhile a second crew of volunteers helped us with refurbishing the 10' by 10' telescope shed which was showing signs of age. We installed white vinyl trim board along the entire perimeter of the shed and completely caulked the joints and seams, thus insuring a weatherproof seal. Next month we will stain the entire shed and seal a few areas inside which had water damage.

Phil Rounseville cleaned the corrector plate on the Meade 10-inch SCT located in the clamshell observatory.

Al Takeda took the lead in the Electronics Room. Phil Levine donated an air conditioner and assisted Al in installing it.

Thanks to Eileen Myers for providing a wonderful lunch, including all prep work and clean up.

We are happy to announce that the Executive Board approved funds for the purchase of a rider mower. We ask for your input in selecting the most suitable model for our needs. Please feel free to drop one of us a line if you would like to help with this acquisition.

Thanks to the following members who helped out at this work session: Paul Cicchetti, Steve Clougherty, Tom Consi, Alva

Couch, Chris Elledge, John Harrington, Joe Henry, Phil Levine, Jon Lyna, Nkosi Muhangi, Eileen Myers, John Reed, Phil Rounseville, Steve Scampini, John Stodieck and Al Takeda.

Our next work session will take place on Saturday, July 17 starting at 10:00 am.

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

Newsletter Announcement . . .

ATMoB will resume mailing printed newsletters beginning with the June newsletter; however, we will only do so for memberships that renew this year while paying a required $14 additional fee for mailed newsletters. We will be using a service to handle the printing and mailing, and this fee will cover the expense to the club. When renewing online starting on June 1st, select the appropriate membership listing "with Mailed Newsletter" on the end to be charged the fee and receive the newsletter by mail.

Any member who paid the $5 donation for postage in 2020 may request a refund from ATMoB since we were unable to handle the printing and mailing for that period of time. If you want to request a refund, please contact our Treasurer, Eileen Myers.

As always, any member with a financial hardship may request a waiver of dues. Contact the Membership Secretary for further information.

~ Chris Elledge – Membership Secretary ~

Observer's Challenge** . . .

July, 2021

NGC 6572 - Planetary Nebula in Ophiuchus
Mag: 8.1
Size: 16” X 13”

1200mm f/8.0 lens, Canon 80D, ISO 200, 45 subs x 15 sec. (11 min. total exposure), 200% scale, north up, Image by Doug Paul

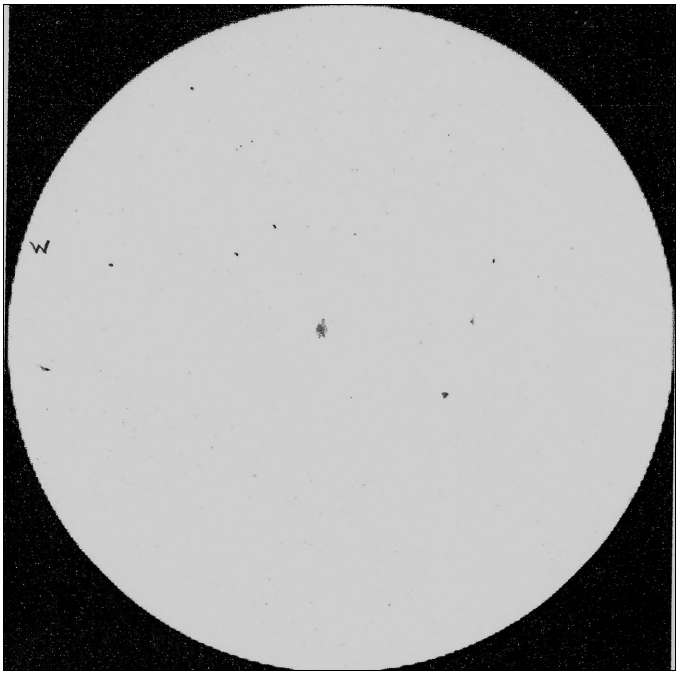
The visual observer is all too aware that, with the exception of double stars like gold and blue Albireo and ruby-red carbon stars like R Leporis, the deep sky is a pretty colorless place. Bright planetary nebulae like this month’s Observer’s Challenge, NGC 6572 in Ophiuchus, are a notable exception.

32-inch scope. H-alpha, OIII, and SII filters - 30 minutes each, Image by Mario Motta, MD

NGC 6572 was discovered by the Russian-German astronomer Friedrich Georg Wilhelm von Struve in 1825. Struve was in the midst of a survey to catalog double stars when he came upon “a star surrounded by bright green ellipse of fuzzy light.” At the time, astronomers were unaware of the true nature of such a curiosity. Today we know that NGC 6572 is a planetary nebula – an expanding luminous shell of gas ejected by an aging star. It’s relatively young as planetary nebulae go, perhaps no more than 2600 years.

The 2000.0 coordinates for NGC 5672 are: R.A. 18h 12m 06.6s , Dec. +6° 51’ 13”. I star-hopped there by starting at the 5th magnitude star 71 Ophiuchi, the unlabeled star just south of 72 Ophiuchi on Finder Chart A. Finder Chart B shows an 8th magnitude star, SAO 123133 just northwest of 71 Ophiuchi. A line from this star through 71 Ophiuchi and extended 1.3° brought me to a triangle of 8th magnitude stars, NGC 6572 was a little less than a degree SSE of the southernmost star in the triangle.

At 39X in my 10-inch f/5 reflector, NGC 6572 appeared stellar. At 208X, it was definitely non-stellar when compared to a pair of stars immediately to its east. It seemed slightly elongated in a north-south orientation and was decidedly pale blue. I was unable to detect the central star, which is said to be 13th magnitude.



NGC 6572, as seen with 10-inch f/5 reflector at 208X. Field is 0.3 degrees across. For the Log Sheet, click here. Sketch by Glenn Chaple

Editor's note: *To see Glenn's Observing Log Sheet click on the following link: NGC 6572. 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.*

NGC 6572 is approximately 5000 light years away. This translates to an actual diameter of ⅓ light year.

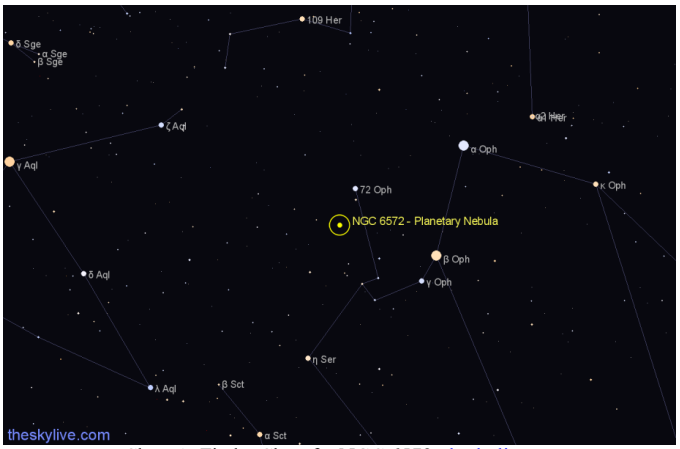


Chart A. Finder Chart for NGC 6572. theskylive.com

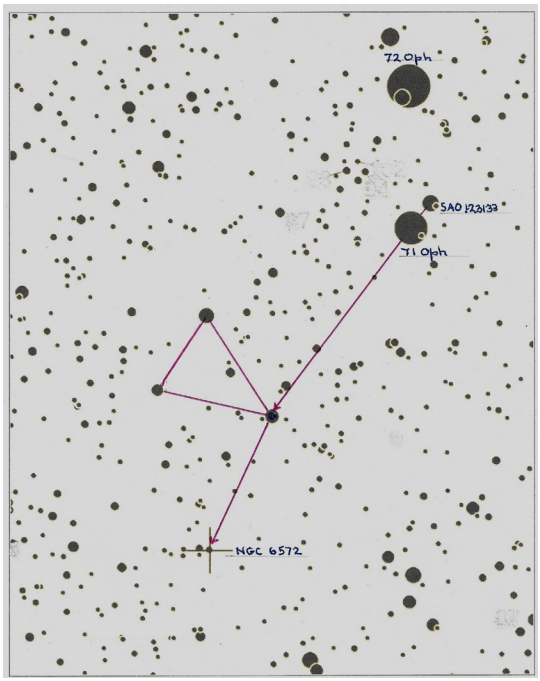
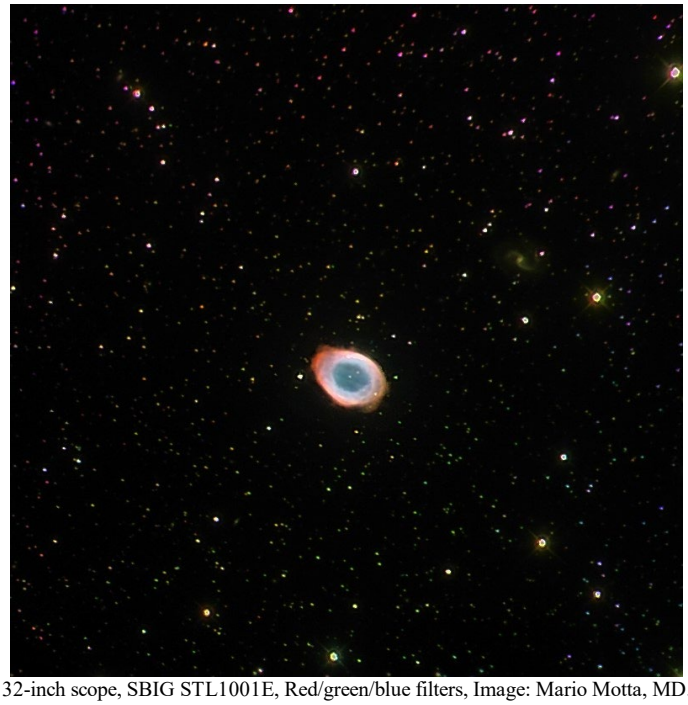


Chart B. From AAVSO's Variable Star Plotter (VSP). Field 3° by 4°. Stars plotted to 11th magnitude. Annotations by Glenn Chaple.

Observer's Challenge** . . .

August, 2021

M57, the "Ring Nebula" – Planetary Nebula in Lyra
Mag: 8.8
Size: 86" X 62"



32-inch scope, SBIG STL1001E, Red/green/blue filters, Image: Mario Motta, MD.

Our August Observer's Challenge is M57, the "Ring Nebula," in Lyra. On the surface, this large and bright planetary nebula may not seem like much of a challenge. It's easily found midway between beta (β) and gamma (γ) Lyrae and is readily visible even

in a common 60mm (2.4-inch) refractor. That said, there are two challenges offered by M57.

Canon Ra, 1200mm f/8.0 lens, ISO 1600, 45 subs x 2 min. (90 min. total), North up, Image by Doug Paul.

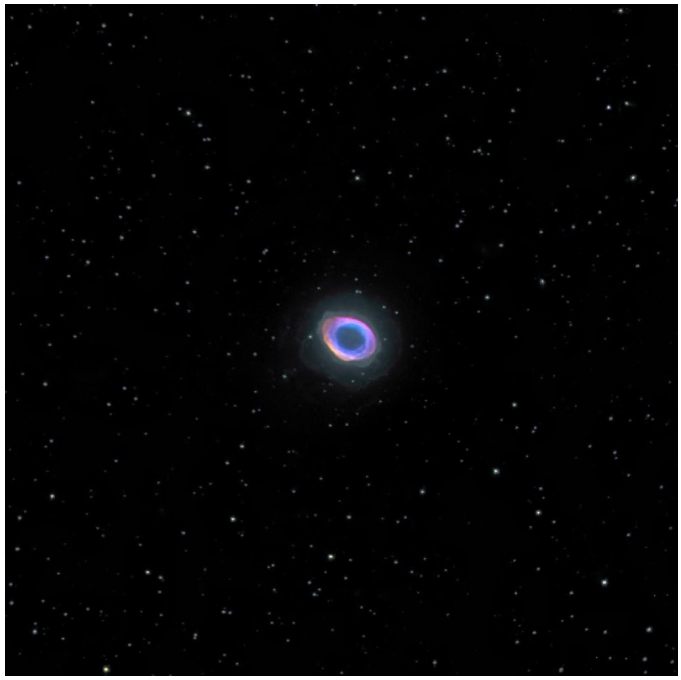
First is its annular aspect. In small-aperture scopes, M57 appears as an oval blob with no dark center. Larger instruments will reveal the dark inner region, hence the Ring itself. What is the smallest aperture that will show the "ring-ness" of M57?

The second challenge involves the visibility of M57's central star, which is said to shine at 15th magnitude but may be slightly variable. This is definitely a big scope target, although Sue French, in her book *Deep-Sky Wonders*, notes that it has been glimpsed in a 9-inch. Her recommendation is to wait for an evening of exceptional seeing and to use high magnification.

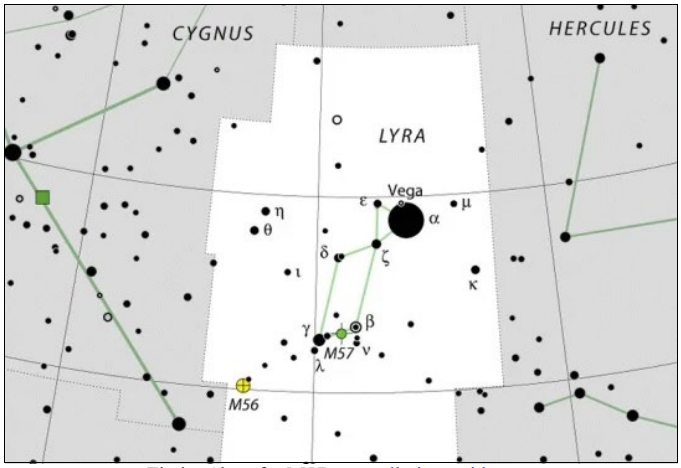
Because M57 is so easily located, I view it many times each summer – often at the onset of an observing session. I begin by centering my finderscope on a point midway between beta and gamma and then giving a slight nudge towards beta. A search with low-medium magnification (45-60X) will reveal an out-of-focus star. I then switch to high magnification (100-300X, depending on scope aperture and seeing conditions) for a closeup view.

There has been some confusion as to whether M57 was discovered by Charles Messier or his French contemporary Antoine Darquier de Pellepoix. A historical study in 2013 and published in 2017 indicated that M57 was found by Messier on January 31 1779, and observed by Darquier days later.

Distances to planetary nebulae are iffy at best. A recent measurement of the distance to the nebula's central star yielded a value of 2300 light years. The bright visual part of the Ring Nebula spans nearly a light year, while a faint surrounding halo, visible in a narrowband image taken by Mario Motta, more than doubles the nebula's size.



32-inch scope, SBIG STL1001E camera. "Narrowband (Ha/O3/S2) and it shows extended nebulosity you cannot get any other way, but blocks the central star", Image by Mario Motta, MD



Finder Chart for M57. constellation-guide.com

**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 ~

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

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September *Star Fields* DEADLINE
Sunday, August 22nd

Email articles to Al Takeda at
newsletter@atmob.org

Articles from members are always welcome.
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Amateur Telescope Makers of Boston, Inc.
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FIRST CLASS

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Web Page www.atmob.org

MEETINGS: Zoom On-Line Meetings until further notice. Meetings held the second Thursday of each month (September to July) at 8:00 PM. For meeting details go to www.atmob.org and check your email on the ATMOB-ANNOUNCE list.

CLUBHOUSE: Latitude 42° 36.5' N Longitude 71° 29.8' W

The Tom Britton Clubhouse is CLOSED. It is the white farmhouse on the grounds of MIT's Haystack Observatory in Westford, MA. Take Rt. 3 North from Rt. 128 or Rt. 495 to Exit 33 and proceed West on Rt. 40 for five miles. Turn right at the MIT Lincoln Lab, Haystack Observatory at the Groton town line. Proceed to the farmhouse on left side of the road. Clubhouse attendance varies with the weather.

Heads Up For the Month . . .

To calculate Eastern Daylight Time (EDT) from Universal Time (UT) subtract 4 from UT.

Jul 9 New Moon
Jul 17 First Quarter Moon (Moonset at midnight)
Jul 18 Pluto at opposition
Jul 23 Full Moon
Jul 31 Last Quarter Moon (Moonrise at midnight)
Aug 8 New Moon
Aug 12 Perseid meteors peak, 19:00 UT (15:00 EDT)
Aug 15 First Quarter Moon (Moonset at midnight)
Aug 22 Full Moon
Aug 30 Last Quarter Moon (Moonrise at midnight)