



EPHEMERIS

The official newsletter of the Prescott Astronomy Club (PAC)
e-phem-er-is: a time-based listing of future positions of solar system objects

SEPTEMBER 2021

UPCOMING EVENTS



Wednesday, September 1 - Regular PAC meeting @ 6:30 PM. The meeting will be conducted virtually on Zoom hosted by Jeff Stillman. Invitations will be sent to all members. Guests can register on our webpage. To participate in the meeting, one must register by e-mail.

Maitrayee Bose, Assistant Professor in the School of Earth and Space Exploration at Arizona State University, will present *'Asteroid Dust Collected by the Hayabusa 2 and OSIRIS-Rex Spacecrafts'*. Japan's Hayabusa 2 was launched in December 2014 to study asteroid Ryugu, and to collect samples to bring back to Earth for analysis. Hayabusa 2 arrived at the asteroid in June 2018. The spacecraft deployed rovers and landers onto Ryugu's surface and collected samples. Hayabusa 2 delivered the asteroid sample to Earth on Dec. 6, 2020.

Launched on Sept. 8, 2016, NASA's OSIRIS-REx arrived at near-Earth asteroid Bennu in 2018 and collected a large sample of dust and rocks. The spacecraft is on its journey to deliver the asteroid sample to Earth on Sept. 24, 2023.

Wednesday, September 8 - METASIG @ 5:00 PM at local restaurant. At this time, no Zoom events will be conducted for METASIG. Anyone wishing to organize a meeting should coordinate with Russell Chappell.

Wednesday, September 8 - Arizona Astrophotography Association @ 7:00 PM. The meeting will be conducted virtually on Zoom hosted by Jeff Stillman. David Viscio will present *'High-Res Planetary-Lunar-Solar Imaging'*.

Saturday, September 11 - Starry Nights @ 7:30 PM at Pronghorn Park in Prescott Valley. Please e-mail John Baesemann (jbaesemann@q.com) if you would like to participate in the event.

Thursday, September 30 through Saturday, October 2 - The 8th Annual Flagstaff Star Party will be held September 30, October 1 and 2 at Flagstaff's Buffalo Park. Details regarding the event are at the end of the newsletter.

STARRY NIGHTS PUBLIC STAR PARTIES RETURN

John Baesemann and David Viscio

On Saturday, August 7, 2021, a Starry Nights public star party was held at Pronghorn Park in Prescott Valley, which was a good night for viewing. Seven or eight club members setup their telescopes. There were two old-time members and the rest were new members. Everyone was glad to be out with fellow astronomers. Thirty-five to forty people came to view. Everyone that I talked to was very appreciative that we set this up for them.

Thank you everyone who helped to make the star party a huge success. I plan on setting up another start party around the new moon in September. I will send an email out to everyone when I firm up the date.

Thank you everyone: John Baesemann

I would like to acknowledge the effort and contribution from Katye Allen, the new events manager at Pronghorn Ranch. Katye included the star party in her weekly schedule of events she e-mails Pronghorn Ranch residents the week before. She followed up with a focused e-mail announcement 4 days before the star party. This increased local knowledge of the star party, leading to the wonderful turn-out we had for the event.

Thank you to Katye Allen: David Viscio

CATCH ANDROMEDA RISING

David Prosper

If you're thinking of a galaxy, the image in your head is probably the Andromeda Galaxy! Studies of this massive neighboring galaxy, also called M31, have played an incredibly important role in shaping modern astronomy. As a bonus for stargazers, the Andromeda Galaxy is also a beautiful sight.

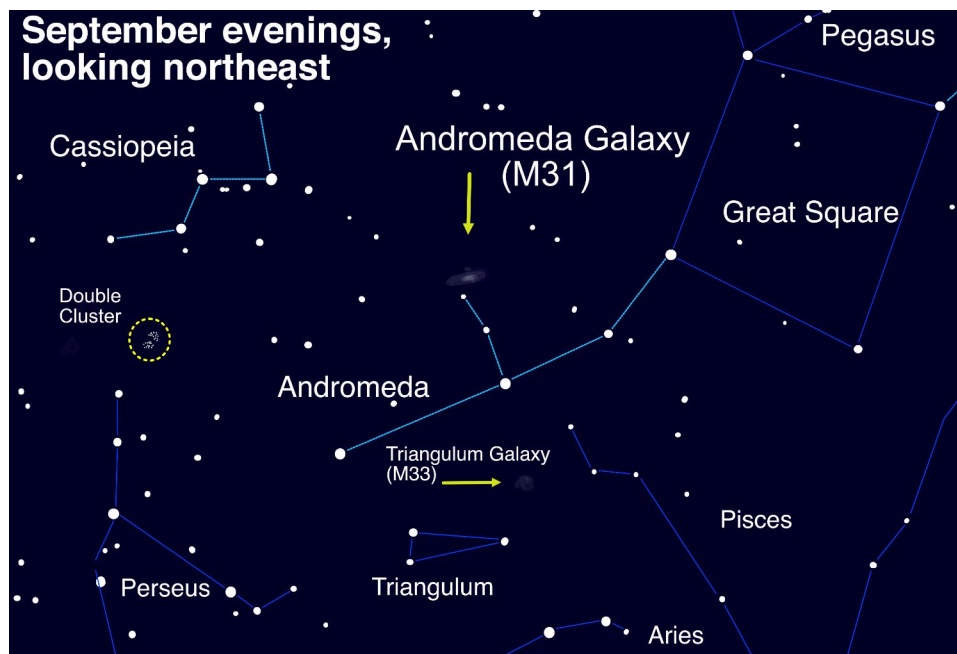


Have you heard that all the stars you see at night are part of our Milky Way galaxy? While that is mostly true, one star-like object located near the border between the constellations of Andromeda and Cassiopeia appears fuzzy to unaided eyes. That's because it's not a star, but the Andromeda Galaxy, its trillion stars appearing to our eyes as a 3.4 magnitude patch of haze. Why so dim? Distance! It's outside our galaxy, around 2.5 million light years distant - so far away that the light you see left M31's stars when our earliest ancestors figured out stone tools. Binoculars show more detail: M31's bright core stands out, along with a bit of its wispy, saucer-shaped disc. Telescopes bring out greater detail but often can't view the entire galaxy at once. Depending on

the quality of your skies and your magnification, you may be able to make out individual globular clusters, structure, and at least two of its orbiting dwarf galaxies: M110 and M32. Light pollution and thin clouds, smoke, or haze will severely hamper observing fainter detail, as they will for any “faint fuzzy.” Surprisingly, persistent stargazers can still spot M31’s core from areas of moderate light pollution as long as skies are otherwise clear.

Modern astronomy was greatly shaped by studies of the Andromeda Galaxy. A hundred years ago, the idea that there were other galaxies beside our own was not widely accepted, and so M31 was called the “Andromeda Nebula.” Increasingly detailed observations of M31 caused astronomers to question its place in our universe – was M31 its own “island universe,” and not part of our Milky Way? Harlow Shapley and Heber Curtis engaged in the “Great Debate” of 1920 over its nature. Curtis argued forcefully from his observations of dimmer than expected nova, dust lanes, and other oddities that the “nebula” was in fact an entirely different galaxy from our own. A few years later, Edwin Hubble, building on Henrietta Leavitt’s work on Cepheid variable stars as a “standard candle” for distance measurement, concluded that M31 was indeed another galaxy after he observed Cepheids in photos of Andromeda, and estimated M31’s distance as far outside our galaxy’s boundaries. And so, the Andromeda Nebula became known as the Andromeda Galaxy.

These discoveries inspire astronomers to this day, who continue to observe M31 and many other galaxies for hints about the nature of our universe. One of the Hubble Space Telescope’s longest-running observing campaigns was a study of M31: the Panchromatic Hubble Andromeda Treasury (PHAT): bit.ly/m31phat . Dig into NASA’s latest discoveries about the Andromeda Galaxy, and the cosmos at large, at nasa.gov



Spot the Andromeda Galaxy! M31's more common name comes from its parent constellation, which becomes prominent as autumn arrives in the Northern Hemisphere. Surprising amounts of detail can be observed with unaided eyes from dark sky sites. Hints of it can even be made out from light polluted areas. Image created with assistance from Stellarium



While M31's disc appears larger than you might expect (about 3 Moon widths wide), its "galactic halo" is much, much larger – as you can see here. In fact, it is suspected that its halo is so huge that it may already mingle with our Milky Way's own halo, which makes sense since our galaxies are expected to merge sometime in the next few billion years! The dots are quasars, objects located behind the halo, which are the very energetic cores of distant galaxies powered by black holes at their center. The Hubble team studied the composition of M31's halo by measuring how the quasars' light was absorbed by the halo's material. Credits: NASA, ESA, and E. Wheatley (STScI) Source: <https://bit.ly/m31halo>

WHAT'S HAPPENING IN SEPTEMBER 2021

This calendar from In-The-Sky.org shows the objects and events visible during September 2021.

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|--------------------------|---|-----------------------------|--|--|--|---|
| | | | 1 Aurigid meteor shower 2021 | 2 | 3 | 4 |
| 5 Mercury at aphelion | 6 New Moon | 7 | 8 Conjunction of the Moon and Mercury The Moon at perihelion | 9 September ϵ -Perseid meteor shower 2021 Conjunction of the Moon and Venus Close approach of the Moon and Venus | 10 4P/Faye at perihelion | 11 The Moon at perigee Asteroid 2 Pallas at opposition |
| 12 | 13 Moon at First Quarter Mercury at greatest elongation east | 14 Neptune at opposition | 15 | 16 Conjunction of the Moon and Saturn Close approach of the Moon and Saturn | 17 Mercury at dichotomy | 18 Conjunction of the Moon and Jupiter Close approach of the Moon and Jupiter The Moon at aphelion |
| 19 | 20 Mars at apogee Full Moon | 21 | 22 September equinox | 23 | 24 Close approach of the Moon and Uranus NGC 55 is well placed | 25 |
| 26 The Moon at apogee | 27 Daytime Sextantid meteor shower 2021 47-Tuc is well placed | 28 Moon at Last Quarter | 29 | 30 136472 Makemake at solar conjunction | | |

For additional information and details, see: <https://in-the-sky.org/newscal.php> and www.telescopius.com . Observing lists of monthly ‘Binocular’ and ‘Telescope’ Showpieces can be found on the club website.

NEED TO KNOW - ASK A MEMBER

A new 15-minute segment is being added to the regular general meetings where members can have their ‘burning’ questions answered by other knowledgeable members. If you have an astronomy related question you would like explained, submit the question to John Carter (jrcpvaz@icloud.com). You can also bring up the question at the meeting.

FOR SALE

Please visit the Classified Ads section of the club website to view the items posted there for sale:

<http://prescottastronomyclub.org/classified-ads/>

New items are added now and then, so don’t miss out on something that you would like to get for yourself...or a friend.



PAC MENTORS

If you need advice on the purchase of astronomy equipment, setting up equipment, astrophotography, etc., contact a PAC mentor.

Jeff Stillman - Astrophotography - (928) 379-7088

David Viscio - General - (928) 775-2918

Greg Lutes - Visual Observing - (928) 445-4430

Joel Cohen - Beginner’s Astronomy: Selecting & Using a Telescope - (856) 889-6496

John Carter - Video Observing - (928) 458-0570



OBSERVING LISTS

Observing lists are available in PDF format on the PAC website to provide guidance and goals for visual and astrophotography programs.



| | |
|---|-------------------------|
| Astroleague Lunar 100 | Binocular Showpieces |
| Bright Nebulae | Caldwell |
| Dunlop 100 | Face-On Spiral Galaxies |
| Globular Clusters | Herschel 400 |
| Herschel II | Hidden Treasures |
| Messier | Open Clusters |
| Planet Maps | Planetary Nebulae |
| Royal Astronomical Society of Canada Finest NGC | |
| Saguaro Astronomy Club Best NGC | S&T Lunar 100 |
| Telescope Showpieces | The Secret Deep |

PAC WEBSITE & YAHOO GROUPS

Website: <http://www.prescottastronomyclub.org>

E-mail: pacinfo@prescottastronomyclub.org

Arizona Astrophotography Association:

<https://www.facebook.com/groups/azastro>



BOARD OF DIRECTORS

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At Large: Dave Covey

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PAC COORDINATORS



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Highland Center Coordinator: David Viscio

Membership: Art Arnold-Roksandich

METASIG: Russell Chappell

Newsletter: David Viscio

Night Sky Network: John Carter

PAC Affiliate Partner w/ NAU Space Grant Program – Cory Shaw

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Public Relations: Adam England

Refreshments: Open

Schools & Camps Outreach: Don Beaman & Joel Cohen

Starry Nights Coordinator: Don Beaman & Joel Cohen

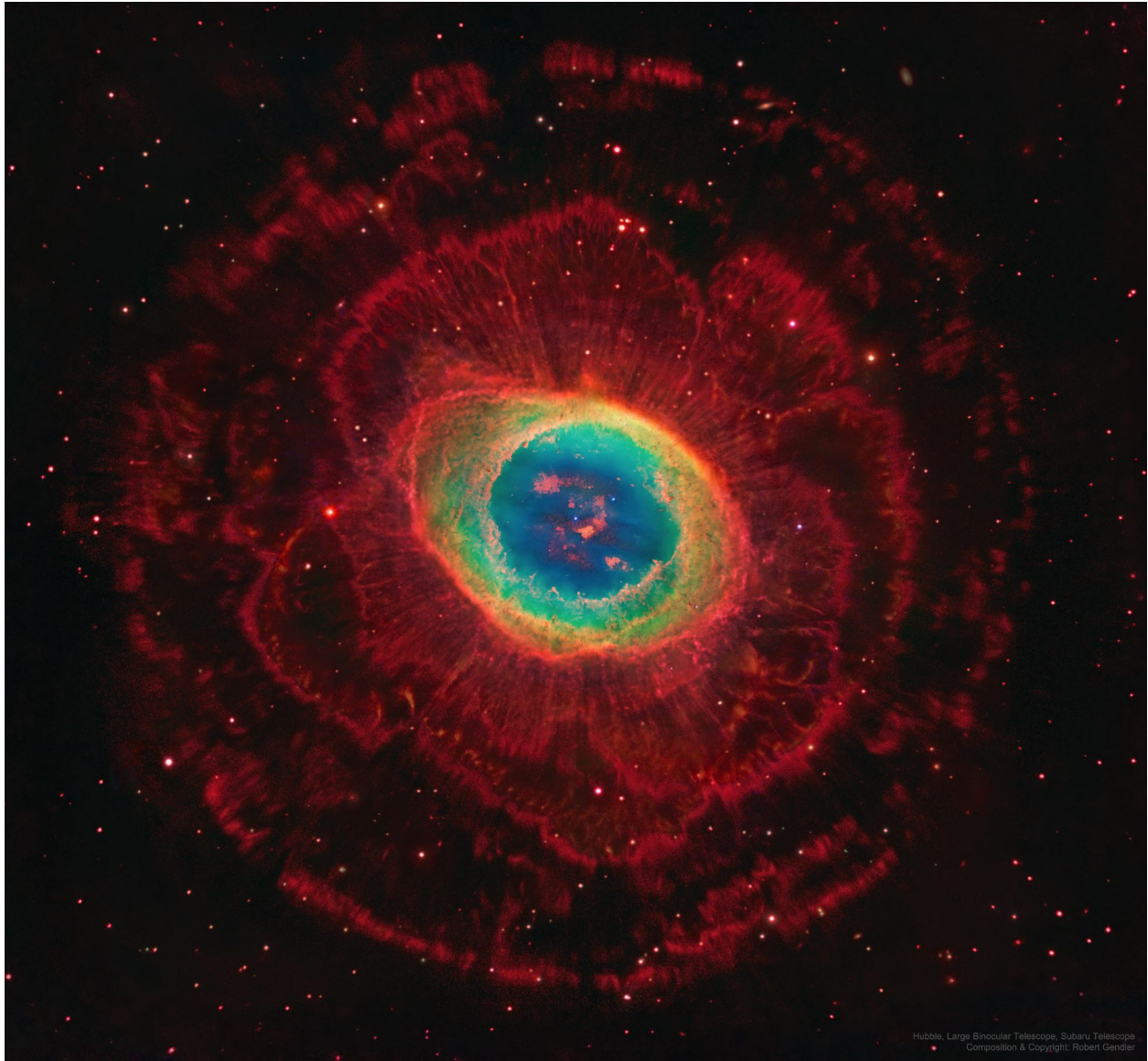
Third Thursday Coordinator: Dave Covey

Webmaster: Russell Chappell

AUGUST 18, 2021 APOD: RINGS AROUND THE RING NEBULA

Image Credit Hubble, Large Binocular Telescope, Subaru Telescope

Composition & Copyright: Robert Gendler



The Ring Nebula (M57) is more complicated than it appears through a small telescope. The easily visible central ring is about one light-year across, but this remarkably deep exposure - a collaborative effort combining data from three different large telescopes - explores the looping filaments of glowing gas extending much farther from the nebula's central star. This composite image includes red light emitted by hydrogen as well as visible and infrared light. The Ring Nebula is an elongated planetary nebula, a type of nebula created when a Sun-like star evolves to throw off its outer atmosphere to become a white dwarf star. The Ring Nebula is about 2,500 light-years away toward the musical constellation Lyra.

The 8th Annual Flagstaff Star Party September 30, October 1 & 2, 2021

The event is hosted by the Flagstaff Dark Skies Coalition, the Coconino Astronomical Society, the Northern Arizona University Department of Astronomy & Planetary Science, Lowell Observatory, and the U.S. Naval Observatory.

Astronomy Club members throughout Arizona are invited to bring their scopes and share the wonders of the universe with the public.

Telescope hosts are invited to an informal catered reception at Lowell Observatory

If you would like to volunteer to be a telescope host, please visit the Flagstaff Star Party Website (flagstaffstarparty.org) and look for the Telescope Hosting link to get more information.

Background Photo: Site for the Flagstaff Star Party, Flagstaff's Buffalo Park —stars like no-one would imagine in the middle of a town of 65,000 people.