



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

FEBRUARY 2018

UPCOMING EVENTS



Wednesday, February 7 - Regular PAC meeting @ 6:30 PM in the Davis Learning Center, Embry-Riddle Aeronautical University. Club member Gary Frey will present on 'Discovering a New Variable Star'.

All subsequent monthly meetings will be held at the David Learning Center; a map of its location is at the end of the newsletter.

Wednesday, February 14 - METASIG @ 5:00 PM at El Charro. Sign up at February 7 meeting or through an e-mail link on the PAC website.

Thursday, February 15 - Third Thursday Presentation @ 6:00 PM in the Founder's Suite, Prescott Public Library. Kellie Ault, Graduate Student, Embry-Riddle Aeronautical University and member of LIGO team, will present a LIGO-VIRGO update, describing detection of Gravitational Waves by LIGO-VIRGO, collaboration updates, the recent new discoveries, the Nobel prize and more!

Wednesday, February 21 - Board meeting @ 6:00 PM in the Elsea Conference Room at the Prescott Public Library.

COMPUTER & SOFTWARE PURCHASE

The board of directors' proposed purchase of a laptop computer and accounting software for a cost about \$600 to organize club membership finances was approved by club members at the January 3 meeting. The computer (Dell Inspiron 3000 laptop, i3 processor, 1TB hard-drive and 15" monitor) and software (Quicken Deluxe) has been purchased and is in use by the Treasurer.

SALE OF PAC EQUIPMENT - 8" MEADE LX200 SCT

The Meade telescope offered for sale to PAC membership by sealed bid from mid November to

mid December resulted in no bids. Thus, the Board of Directors will again offer the 8" Meade SCT telescope to the membership by sealed bid. A bid must be submitted to John Baesemann (7295 N. Viewscape Drive, Prescott Valley, 86315) on or before February 20. Do not submit bids by email or to anyone other than John. Bids will be opened on February 21. The highest bidder will be offered the scope at his/her bid price. Here are photos and a description of the scope and accessories.



Meade LX 200 8" aperture, f/10 Schmidt-Cassegrain telescope

Original padded box

Optical tube and fork mount weight = 37 lbs

Meade tripod with 2" diameter legs, weight = 20 lbs

Meade hand controller

Meade finder scope 8x50

Power required – minimum 12-volts to maximum 18-volts DC; comes with Sceptre AC to DC 18-volt, 2 Amp converter; appears to operate better with 18 volts

Meade diagonal -- 1 1/4"

Eyepieces: all 1 1/4"

3 Meade Super Plossl -- 26mm, 32mm, 40mm

Barlow -- 1.8x Televue

Filters -- Celestron polarizing filter and #23A red filter -- both 1 1/4"

Original Meade manual

The minimum bid price to members is \$450. Anyone who is interested in seeing the telescope can contact Patrick Birck (pbirck@cableone.net) to arrange a mutually convenient time.

SIXTY YEARS OF OBSERVING OUR EARTH

By Teagan Wall

Satellites are a part of our everyday life. We use global positioning system (GPS) satellites to help us find directions. Satellite television and telephones bring us entertainment, and they connect people all over the world. Weather satellites help us create forecasts, and if there's a disaster—such as a hurricane or a large fire—they can help track what's happening. Then, communication satellites can help us warn people in harm's way.



There are many different types of satellites. Some are smaller than a shoebox, while others are bigger than a school bus. In all, there are more than 1,000 satellites orbiting Earth. With that many always around, it can be easy to take them for granted. However, we haven't always had these helpful eyes in the sky.

The United States launched its first satellite on Jan. 31, 1958. It was called Explorer 1, and it weighed in at only about 30 pounds. This little satellite carried America's first scientific instruments into space: temperature sensors, a microphone, radiation detectors and more.

Explorer 1 sent back data for four months, but remained in orbit for more than 10 years. This small, relatively simple satellite kicked off the American space age. Now, just 60 years later, we depend on satellites every day. Through these satellites, scientists have learned all sorts of things about our planet.

For example, we can now use satellites to measure the height of the land and sea with instruments called altimeters. Altimeters bounce a microwave or laser pulse off Earth and measure how long it takes to come back. Since the speed of light is known very accurately, scientists can use that measurement to calculate the height of a mountain, for example, or the changing levels of Earth's seas.

Satellites also help us to study Earth's atmosphere. The atmosphere is made up of layers of gases

that surround Earth. Before satellites, we had very little information about these layers. However, with satellites' view from space, NASA scientists can study how the atmosphere's layers interact with light. This tells us which gases are in the air and how much of each gas can be found in the atmosphere. Satellites also help us learn about the clouds and small particles in the atmosphere, too.

When there's an earthquake, we can use radar in satellites to figure out how much Earth has moved during a quake. In fact, satellites allow NASA scientists to observe all kinds of changes in Earth over months, years or even decades.

Satellites have also allowed us—for the first time in civilization—to have pictures of our home planet from space. Earth is big, so to take a picture of the whole thing, you need to be far away. Apollo 17 astronauts took the first photo of the whole Earth in 1972. Today, we're able to capture new pictures of our planet many times every day.

Today, many satellites are buzzing around Earth, and each one plays an important part in how we understand our planet and live life here. These satellite explorers are possible because of what we learned from our first voyage into space with Explorer 1—and the decades of hard work and scientific advances since then.

To learn more about satellites, including where they go when they die, check out NASA Space Place: <https://spaceplace.nasa.gov/spacecraft-graveyard>



This photo shows the launch of Explorer 1 from Cape Canaveral, Fla., on Jan. 31, 1958. Explorer 1 is the small section on top of the large Jupiter-C rocket that blasted it into orbit. With the launch of Explorer 1, the United States officially entered the space age. Image credit: NASA

THE 2017 GEMINIDS

By Greg Lutes

I always thought the Perseid meteor shower was the most fun to watch. Fast but with many having ion trails following. After watching the meteors streaking out of the constellation Gemini Wednesday night (December 13) I might have to tip my hat to this shower. I watched them from my observing pad at home (Prescott, Az.) in 30-minute segments from 9:30 p.m. to 1:00 a.m. The night was very clear and calm. I will give you a total count recap at the end. I took a couple of short breaks so my total time watching was 3 hours. I was impressed with the medium speed and long lengthy streaks. The slower speed compared to the Perseids allowed me to actually focus on them vs. just catching the streak in my peripheral vision. Many (not several), many flared out near the end of each meteor. A high percentage of the brighter ones were seen in my western sky. Not sure why that was the case. As you can surmise from the recap the shower did build as the night continued. Although there was a drop off during the 11:18 - 11:48 segment with only 24 seen. The debris field at that time was apparently not as rich. I also, noticed this group was not as bright as compared to the other groups. Throughout the night most were whitish in color. In the 10:40 group, two fell within a second of each other in the lower Northeast sky and flared out with a greenish ting. The last one of these two was brighter and lit up the distant hill. Neat! I noticed during the shower when one meteor lit up the sky a lot of times it was accompanied by one or two others in the following minute, and then a period of no meteors. Overall I think about 98% were from the shower with a few sporadic meteors. Unfortunately none fell in my yard but it was fun to watch.

9:25 - 9:55 p.m. = 14 meteors

10:00 - 10:30 p.m. = 26 meteors

10:40 - 11:10 p.m. = 28 meteors

11:18- 11:48 p.m. = 24 meteors

12:00 - 12:30 a.m. = 43 meteors

12:30 - 1:00 a.m. = 41 meteors

Grand Total = 176 meteors observed!

LET'S PARTY FOR FEBRUARY

Astronomical objects for public (and private) star parties.
by Fulton Wright, Jr.



Flashy, deep-sky objects, visible in the middle of the month, at the end of astronomical twilight, 7:10 PM this month, (when it really gets dark). This list, customized for Prescott, Arizona, should work well anywhere in the state and the lower 48 states.

Double Stars (2 or 3 stars, close together)

Sigma Orionis (SAO 132406, triple star, another double nearby)

Mag: 3.8, 6.3, 6.6, Sep: 13 arc-sec, 42 arc-sec

R.A.: 5hrs 39min, Dec.: -2deg 36'

Alpha Gemini (Castor, SAO 60198)

Mag: 1.6 & 3.0, Sep: 5 arc-sec

R.A.: 7hr 35min, Dec.: 31deg 53'

Gamma Andromedae (Almach, SAO 37734)

Mag: 2.1 & 5.0, Sep: 10 arc-sec

R.A.: 2hr 5min, Dec.: +42deg 45'

Gamma Arietis (Mesarthim, SAO 92681)

Mag: 3.9 & 4.6, Sep: 7 arc-sec

R.A.: 1hr 55min, Dec.: +19deg 23'

Open Clusters (about 50 bright stars)

Double Cluster (NGC 869 and NGC 884)

Mag: 5.3 and 6.1, Size: 18 and 18 arc-min, centers 28 arc-min apart

R.A.: 2hr 22min, Dec.: +57deg 12'

M 37 (NGC 2099)

Mag: 5.6, Size: 14 arc-min

R.A.: 5hr 53min, Dec.: +32deg 33'

M 45 (Pleiades, binocular object)

Mag: 1.5, Size: 120 arc-min

R.A.: 3hr 48min, Dec.: +24deg 10'

Globular Clusters (about 200,000 dim stars)

M 79 (NGC1904)

Mag: 7.7, Size: 10 arc-min

R.A.: 5hrs 25min, Dec.: +24deg 31'

Galaxies (about 200,000,000 very dim and distant stars)

M 31 (Andromeda galaxy with M 32 & M 110)
Mag: 3.4 (7.9 & 8.0), Size: 180 x 70 arc-min (8 x 5 & 16 x 10)
R.A.: 0hr 44min, Dec.: +41deg 22'

M 82 and M 81 (Bode's nebula, NGC 3031 and NGC 3034)
Mag: 6.8 and 8.1, Size: 21 x 11, 11 x 5 arc-min, 37 arc-min apart
R.A.: 9hrs 55min, Dec.: +69deg 55'

M 77 (Cetus A)
Mag: 9.0, Size: 6 x 6 arc-min
R.A.: 2hr 44min, Dec.: +0deg 4'

*Diffuse Nebulae (gas and dust lit by a nearby star)
(The Orion Nebula is by far the best.)*

M 42 (Orion Nebula)
Size: 85 x 60 arc-min
R.A.: 5hrs 36min, Dec.: -5deg 26'

NGC 2261 (Hubble's Variable Nebula, small and dim)
Mag: 9, Size: 4 x 2 arc-min
R.A.: 6hrs 39min, Dec.: +8deg 45'

NGC 2024 (Flame Nebula)
Mag: 10, Size: 8 x 7 arc-min
R.A.: 5hrs 42min, Dec.: -1deg 52'

Planetary Nebulae (gas shell from exploding star, looks like Uranus in telescope)

NGC 2392 (Eskimo Nebula)
Mag: 9.2, Size: 0.8 arc-min
R.A.: 7hrs 29min, Dec.: +20deg 55'

NGC 1535 (Cleopatra's Eye)
Mag: 9.4, Size: 0.8 arc-min
R.A.: 4hr 15min
, Dec.: -12deg 42'

NGC 246 (Skull Nebula)
Mag: 10.4, Size: 3.7 arc-min
R.A.: 0hrs 47min, Dec.: -11deg 52'

Miscellaneous (Supernova Remnant)

M 1 (Crab Nebula)

Mag: 8.4, Size: 6 arc-min

R.A.: 5hrs 34min, Dec.: 22deg 01'

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 Jeff Stillman (jstillman50@cablone.net). You can also bring up the question at the meeting.

VOLUNTEERS NEEDED

Volunteers are needed for refreshment coordinator. If you would like to help and need additional information, please contact Jeff Stillman (jstillman50@cablone.net).

BOOKS AND MAGAZINES

Over the years astronomy books have been donated to PAC. Boxes of these books will be available at the regular meetings. For a donation to PAC of \$1 per book, anyone can have a book. Books that are not purchased at a regular meeting will be available at the following Third Thursday programs. Any remaining unsold books will be donated to the Friends of the Prescott Public Library. We also have copies of past Sky and Telescope magazine. These will be available to any member wishing to take them. Unclaimed magazines will be recycled.



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

Bill McDonald - Video Observing

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

Bright Nebulae

Dunlop 100

Globular Clusters

Herschel II

Messier

Planet Maps

Royal Astronomical Society of Canada Finest NGC

Saguaro Astronomy Club Best NGC

Telescope Showpieces

Binocular Showpieces

Caldwell

Face-On Spiral Galaxies

Herschel 400

Hidden Treasures

Open Clusters

Planetary Nebulae

S&T Lunar 100

The Secret Deep

PAC WEBSITE & YAHOO GROUPS

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

E-mail: <mailto:pacinfo@prescottastronomyclub.org>

Astrophotography special interest group:

<https://groups.yahoo.com/neo/groups/pacastrophotography/info>



BOARD OF DIRECTORS

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Treasurer: John Baesemann

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Newsletter: David Viscio

Refreshments: Open

Publicity: Adam England

Webmaster: Russell Chappell



ASTRONOMY PICTURE OF THE DAY: January 14, 2018

THREE GALAXIES AND A COMET

Image Credit & Copyright: Miloslav Druckmuller (Brno University of Technology)



Diffuse starlight and dark nebulae along the southern Milky Way arc over the horizon and sprawl diagonally through this gorgeous nightscape. The breath-taking mosaic spans a wide 100 degrees, with the rugged terrain of the Patagonia, Argentina region in the foreground. Along with the insider's view of our own galaxy, the image features our outside perspective on two irregular satellite galaxies - the Large and Small Magellanic Clouds. The scene also captures the broad tail and bright coma of Comet McNaught, the Great Comet of 2007.

Davis Learning Center
Embry-Riddle Aeronautical University

