AUGUST 2019

UPCOMING EVENTS

Wednesday, August 7 - Regular PAC meeting @ 6:30 PM at Touchmark Grand Lodge, 3180 Touchmark Blvd., Prescott, across from the Gateway Mall. John Carter will give two presentations. The first is ‘Experiencing Hubble’, a summary of the Great Courses video; the second is ‘Telescope Design: Advantages and Disadvantages’.

Wednesday, August 14 - METASIG @ 5:00 PM at a local restaurant. Sign up at the August 7 regular meeting.

Thursday, September 5 - Star party @ 7:00 PM at Touchmark. Sign up at the August 7 and September 4 regular meetings.

VOLUNTEERS NEEDED

At the August meeting, we will present a nomination for the Treasurer and take additional nominations from the floor.

Volunteers still needed are to take over the following PAC Coordinator positions: 1) Schools & Camps Outreach, and 2) Third Thursday Coordinator. A complete summary of what these tasks involve will be covered in the August meeting and posted in the PAC website. Please - Volunteers are desperately needed to take over these tasks. There is nothing complicated about these tasks, but it does involve a team effort by those who are involved during the months of September through December. Full training will be provided.
MT. WILSON OBSERVATORY TRIP

A trip to California is being planned for Monday, September 23, 2019 to visit Mount Wilson Observatory and use the 60-inch telescope for 1/2 night. The cost would be $1,050.00 divided among the number of people who attend the viewing.

The trip could include another day or two for side trips such as:

- Mt Palomar
- Cal Science Center
- La Brea tar pits and Page Museum
- Griffith Observatory
- JPL, but tough to get a tour

Most have free admission with paid parking. Special exhibits may have a charge.

For questions and additional details, contact Jack Szelka  radioai1k@gmail.com  401-580-0330

PAC ANNUAL PICNIC
By Doug Tilley

Our club picnic is scheduled for Saturday September 7th from 12 Noon until 4 PM. The location is at the large Ramada on the hill at Watson Lake. There will be a sign up sheet at our August 7 General Meeting or you can contact Doug Tilley at dougtil51@gmail.com so we have an idea of how many people will be in attendance and I can purchase the correct number of parking passes.

The club will supply the burgers and brats but you may wish to bring salads and beverages.

Hope to see you there

WHAT’S UP? URSA MAJOR AND BODE’S GALAXY
By Adam England

Possibly the most recognizable constellation to most children in the United States is the “Big Dipper”. In the Northern Hemisphere, we can always look Northward, find the big spoon in the sky, and follow the two end stars in a near straight line to the North Star, Polaris. In North
America we call it the Big Dipper, but in the United Kingdom it has long been known as the “Plough” for its visual similarity to the farmer’s equipment. These seven stars form a portion of the larger ancient constellation Ursa Major, “The Bear”.

The symbology of the bear traverses continents and millennia, with cultures from around the world visualizing the pattern in the sky as the great animal. Roman mythology tells of the king of the gods, Jupiter, lusting after a woman, Calisto. Calisto had a son, Arcas, and Jupiter’s wife, Juno, was jealous, thinking the son was from her husband. Juno turned Calisto into a bear, so that she would not be attractive to Jupiter. Arcas was hunting and almost shot Calisto, not knowing it was his mother, but Jupiter intervened just in time and turned Arcas into a bear also, placing him in the heavens with his mother. This is how Ursa Major (the Big Bear) and Ursa Minor (the Little Bear) came to be eternal neighbors in the stars. In North America, the Lakota, Iroquois, Wampanoag, and Wasco-Wishram tribes all named the constellation in their native tongue for the word “bear”, seeing the metaphoric resemblance when they connected the dots in the sky.

Off to the upper right of the bowl of the Dipper is a face-on galaxy first discovered in 1774 by Johann Bode and consequently named “Bode’s Galaxy”. It was classified in 1779 as part of the Messier catalog as M81. About half the size of our Milky Way at 90,000 light years across, being only 12 million light years distant it is regularly studied and photographed by both professional and amateur astronomers alike. The extremely active galactic center of this spiral galaxy houses a supermassive black hole – again, just like our Milky Way – and affords great viewing with both binoculars and telescopes on a clear night.

Image courtesy of Jeff Stillman. For more of his work and information on astrophotography visit www.StillmanImaging.com
If you would like to learn more about the sky, telescopes, or socialize with other amateur astronomers, visit our website at www.prescottastronomyclub.org or Facebook page @PrescottAstronomyClub to find the next star party, Star Talk, or event.

CHILL OUT: SPOT AN ICE GIANT IN AUGUST

By David Prosper

Is the summer heat getting to you? Cool off overnight while spotting one of the solar system’s ice giants: Neptune! It’s the perfect way to commemorate the 30th anniversary of Voyager 2’s flyby.

Neptune is too dim to see with your unaided eye so you’ll need a telescope to find it. Neptune is at opposition in September, but its brightness and apparent size won’t change dramatically as it's so distant; the planet is usually just under 8th magnitude and 4.5 billion kilometers away. You can see Neptune with binoculars but a telescope is recommended if you want to discern its disc; the distant world reveals a very small but discernible disc at high magnification. Neptune currently appears in Aquarius, a constellation lacking in bright stars, which adds difficulty to pinpointing its exact location. Fortunately, the Moon travels past Neptune the night of August 16th, passing less than six degrees apart (or about 12 Moon widths) at their closest. If the Moon’s glare overwhelms Neptune’s dim light, you can still use the its location that evening to mark the general area to search on a darker night. Another Neptune-spotting tip: Draw an imaginary line from bright southern star Fomalhaut up to the Great Square of Pegasus, then mark a point roughly in the middle and search there, in the eastern edge of Aquarius. If you spot a blue-ish star, swap your telescope’s eyepiece to zoom in as much as possible. Is the suspect blue “star” now a tiny disc, while the surrounding stars remain points of white light? You’ve found Neptune!

Neptune and Uranus are ice giant planets. These worlds are larger than terrestrial worlds like Earth but smaller than gas giants like Jupiter. Neptune’s atmosphere contains hydrogen and helium like a gas giant, but also methane, which gives it a striking blue color. The “ice” in “ice giant” refers to the mix of ammonia, methane, and water that makes up most of Neptune’s mass, located in the planet’s large, dense, hot mantle. This mantle surrounds an Earth-size rocky core. Neptune possesses a faint ring system and 13 confirmed moons. NASA’s Voyager 2 mission made a very close flyby on August 25, 1989. It revealed a dynamic, stormy world streaked by the fastest winds in the solar system, their ferocity fueled by the planet’s surprisingly strong internal heating. Triton, Neptune’s largest moon, was discovered to be geologically active, with cryovolcanoes erupting nitrogen gas and dust dotting its surface, and a mottled “cantaloupe” terrain made up of hard water ice. Triton is similar to Pluto in size and composition, and orbits Neptune in the opposite direction of the planet’s rotation, unlike every other large moon in the
solar system. These clues lead scientists to conclude that this unusual moon is likely a captured Kuiper Belt object.

Clockwise from top left: Neptune and the Great Dark Spot traced by white clouds; Neptune’s rings; Triton and its famed icy cantaloupe surface; close up Triton’s surface, with dark streaks indicating possible cyrovolcano activity. Find more images and science from Voyager 2’s flyby at bit.ly/NeptuneVoyager2 Image Credit: NASA/JPL

Finder chart for Neptune. This is a simulated view through 10x50 binoculars (10x magnification). Please note that the sizes of stars in this chart indicate their brightness, not their actual size. Moon image courtesy NASA Scientific Visualization Studio; chart created with assistance from Stellarium
LET'S PARTY FOR AUGUST
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, 8:00 PM in August, (when it
really gets dark). This list customized for Prescott, Arizona,
should work well anywhere in the state, and be usable anywhere in the old 48 states.

Double Stars (2 or 3 stars, close together)

Beta Cygni (Albireo, SAO 87301)
Mag: 3.4 (yellow) & 4.7 (blue), Sep: 35 arc-sec
R.A.: 19hr 31min, Dec.: +27deg 58'

Zeta Ursae Majoris (Mizar, SAO 28738)
Mag: 2.2 & 3.9, Sep: 14 arc-sec
R.A.: 13hr 24min, Dec.: +54deg 56'

Epsilon Lyrae (Double-Double, SAO 67310 & 67315)
Mag: 5.0 & 6.1, 5.3 & 5.4, Sep: 2 arc-sec, 2.5 arc-sec
R.A.: 18hr 44min, Dec.: +39deg 40'

70 Ophiuchus (SAO 123107)
Mag: 4.0, 6.0, Sep: 7 arc-sec
R.A.: 18hrs 06min, Dec.: +02deg 30'

Open Clusters (about 50 bright stars)

Collinder 399 (Coat-hanger)
Mag: 3.6, Size: 90 arc-min
R.A.: 19hr 25min, Dec.: +20deg 11'

IC 4665
Mag: 4.2, Size: 70 arc-min
R.A.: 17hr 46min, Dec.: +05deg 43'

NGC 6633 (use wide field)
Mag: 4.6, Size: 30 arc-min
R.A.: 18hr 27min, Dec.: +06deg 30'

M 7 (NGC 6475)
Mag: 3.3, Size: 80 arc-min
R.A.: 17hr 55min, Dec.: -34deg 47'
Globular Clusters (about 200,000 dim stars) (this is not a good season for globulars.)

M 5 (NGC 5904)
Mag: 5.6, Size: 3.5 arc-min
R.A.: 15hr 19min, Dec.: +02deg 05'

M 4 (NGC 6121)
Mag: 5.6, Size: 8.7 arc-min
R.A.: 16hr 24min, Dec.: -26deg 32'

M 13 (Hercules Cluster, NGC 6205)
Mag: 5.8, Size: 20 arc-min
R.A.: 16hrs 42min, Dec.: +36deg 28'

M 22 (NGC 6656)
Mag: 5.1, Size: 32 arc-min
R.A.: 18hr 38min, Dec.: -23deg 53'

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

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 106 (NGC 4258)
Mag: 8.3, Size: 17 x 7 arc-min
R.A.: 12hr 20min, Dec.: +47deg 12'

M 51 (Whirlpool Galaxy, NGC 5194, low but rising)
Mag: 8.0, Size: 14 x 12 arc-min
R.A.: 13hrs 30min, Dec.: +47deg 12'

Diffuse Nebulae (Gas and dust lit by a nearby star.)

M 17 (Omega Nebula, Swan Nebula, NGC 6618)
Mag: 6.0, Size: 46 x 37 arc-min
R.A.: 18hr 22min
, Dec.: -16deg 10'

M 8 (Lagoon Nebula, NGC 6523)
Mag: 6.0, Size: 90 x 40 arc-min
R.A.: 18hr 05min, Dec.: -24deg 23'
M 20 (Trifid Nebula, NGC 6514)  
Mag: 6.3, Size: 29 x 27 arc-min  
R.A.: 18hr 04min, Dec.: -23deg 02'  

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

M 57 (NGC 6720, Ring Nebula)  
Mag: 8.8, Size 1.4 x 1.1 arc-min  
R.A.: 18hr 54min, Dec.: +33deg 02'  

NGC 6826 (Caldwell 15, Blinking Planetary Nebula)  
Mag: 8.9, Size: 2.1 arc-min  
R.A.: 19hr 45min, Dec.: +50deg 31'  

NGC 6543 (Cat's Eye Nebula, Caldwell 6)  
Mag: 8.1, Size: 0.4 arc-min  
R.A.: 17hrs 59min, Dec.: +66deg 38'  

For additional information, see: [www.telescopius.com](http://www.telescopius.com)

**LET’S TALK ABOUT THE MOON**  
By John Carter, Sr.

Calling all members! Let’s have an open discussion on the Moon. The discussion can include:

1) Pictures with a DSLR and a tripod, single shot  
2) Observing on vacation  
3) Sharing the Moon with others  
4) Get your birding binoculars out  
5) Wherever the discussion goes

We’ll be asking for contributions during the short topic session at each meeting for the next few months. If you have pictures, bring them on a thumb drive to display on the big screen. For just talking about your experiences, the hand held mic will be passed around.

**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@icloudcom). You can also bring up the question at the meeting.

**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:


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
- 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](http://www.prescottastronomyclub.org)

E-mail: pacinfo@prescottastronomyclub.org

Astrophotography special interest group:

[https://groups.yahoo.com/neo/groups/pacastrophotography/info](https://groups.yahoo.com/neo/groups/pacastrophotography/info)

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Refreshments: Liz Dano & Kia Hurtley
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Third Thursday Coordinator: Volunteer needed
Membership: John Carter
Newsletter: David Viscio
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Starry Nights Coordinator: Pat Birck
Webmaster: Russell Chappell
A large coronal mass ejection occurred on our Sun five days before this 2012 image was taken, throwing a cloud of fast moving electrons, protons, and ions toward the Earth. Although most of this cloud passed above the Earth, some of it impacted our Earth's magnetosphere and resulted in spectacular auroras being seen at high northern latitudes. Featured here is a particularly photogenic auroral corona captured above Grotfjord, Norway. To some, this shimmering green glow of recombining atmospheric oxygen might appear as a large eagle, but feel free to share what it looks like to you. Although the Sun is near Solar Minimum, streams of the solar wind continue to impact the Earth and create impressive auroras visible even last week.