



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 2016

UPCOMING EVENTS



Wednesday, February 3 - Regular PAC meeting @ 6:30 PM in Rm 107, Bldg 74, Embry-Riddle Aeronautical University. Club member Marilyn Unruh will present "Star Hopping", a beginner's guide to visually locating objects in the sky. Star hopping is the technique of using easily recognizable stars as a guide to locating celestial objects not visible to the unaided eye.

NOTE: The regular PAC meetings will be held at a new venue. See details below.

Saturday, February 6 - Black Canyon Heritage Park @ 7:00 PM, located at 33955 South Old Black Canyon Highway in Black Canyon City. Star party for students and families from Black Canyon City, Anthem and surrounding area. See appendix for additional details. Sign up at meeting on February 3.

Wednesday, February 10 - METASIG @ 5:00 PM at a local restaurant. Sign up at meeting on February 3.

Tuesday, February 16 - Lake Valley Elementary School, Prescott Valley @ 6:30 PM. Star party for up to 90 5th graders and their families. Sign up at meeting on February 3.

Wednesday, February 17 - Board Meeting @ 6:30 PM.

Thursday, February 18 - Third Thursday Presentation @ 6:00 PM in the Founder's Suite, Prescott Public Library. Marek J. Szczepanczyk, Embry-Riddle Aeronautical University, will present "Gravitational Wave from Core-Collapse Supernovae". In September the Advanced Gravitational Wave Detectors started observations for gravitational waves, opening a new field in astronomy. Core-collapse supernovae are believed to be sources for gravitational radiation.

Saturday, February 27 - SciTech Fest @ 10:00 AM to 4:00 PM at the Gateway Mall near Dillard's. PAC will participate with solar observing telescopes. Sign up at meeting on February 3.

NEW REGULAR MONTHLY MEETING VENUE

Given the uncertainty of the availability of the Prescott Public Library meeting rooms later in the year, the PAC board explored other locations for the regular monthly meetings. Beginning with the January 6, 2016 meeting, the regular monthly meeting venue will be at Embry-Riddle Aeronautical University, Room 107 in Building #74 (Academic 1). A map of the location is included as an appendix to this newsletter. The easiest way to reach the meeting location is to enter ERAU at Haas Blvd. (north entrance) off Willow Creek Road, follow Haas until it ends at Parking Lot A. Building #74 is a short walk up the hill from the parking lot. For those who require them, there are several handicap parking spaces up the hill at the entrance of Building #74.



NAU/NASA SPACE GRANT PROGRAM

The Prescott Astronomy Club is a participant in NASA Space Grant program supporting a grant student at NAU. The board has voted to provide \$250 to defray travel expenses of the grant student to attend scientific conferences. This expenditure was not included in the recently approved budget and needs to be approved by the PAC membership at the upcoming February 3 meeting.



THE LONELIEST GALAXY IN THE UNIVERSE

By Ethan Siegel

Our greatest, largest-scale surveys of the universe have given us an unprecedented view of cosmic structure extending for tens of billions of light years. With the combined effects of normal matter, dark matter, dark energy, neutrinos and radiation all affecting how matter clumps, collapses and separates over time, the great cosmic web we see is in tremendous agreement with our best theories: the Big Bang and General Relativity. Yet this understanding was only possible because of the pioneering work of Edwin Hubble, who identified a large number of galaxies outside of our own, correctly measured their distance (following the work of Vesto Slipher's work measuring their redshifts), and discovered the expanding universe.



But what if the Milky Way weren't located in one of the "strands" of the great cosmic web, where galaxies are plentiful and ubiquitous in many different directions? What if, instead, we were located in one of the great "voids" separating the vast majority of galaxies? It would've

taken telescopes and imaging technology far more advanced than Hubble had at his disposal to even detect a single galaxy beyond our own, much less dozens, hundreds or millions, like we have today. While the nearest galaxies to us are only a few million light years distant, there are voids so large that a galaxy located at the center of one might not see another for a hundred times that distance.

While we've readily learned about our place in the universe from observing what's around us, not everyone is as fortunate. In particular, the galaxy MCG+01-02-015 has not a single known galaxy around it for a hundred million light years in all directions. Were you to draw a sphere around the Milky Way with a radius of 100 million light years, we'd find hundreds of thousands of galaxies. But not MCG+01-02-015; it's the loneliest galaxy ever discovered. Our Milky Way, like most galaxies, has been built up by mergers and accretions of many other galaxies over billions of years, having acquired stars and gas from a slew of our former neighbors. But an isolated galaxy like this one has only the matter it was born with to call its own.

Edwin Hubble made his universe-changing discovery using telescope technology from 1917, yet he would have found absolutely zero other galaxies at all were we situated at MCG+01-02-015's location. The first visible galaxy wouldn't have shown up until we had 1960s-level technology, and who knows if we'd have continued looking? If we were such a lonely galaxy, would we have given up the search, and concluded that our galaxy encompassed all of existence? Or would we have continued peering deeper into the void, eventually discovering our unusual location in a vast, expanding universe? For the inhabitants of the loneliest galaxy, we can only hope that they didn't give up the search, and discovered the entire universe.



Image credit: ESA/Hubble & NASA and N. Gorin (STScI); Acknowledgement: Judy Schmidt, of the loneliest void galaxy in the known: MCG+01-02-015.

IF IT'S CLEAR

By Fulton Wright, Jr., PAC

Celestial events (from Sky & Telescope magazine, Astronomy magazine and anywhere else I can find information) customized for Prescott, Arizona. Remember, the Moon is 1/2 degree or 30 arcminutes in diameter. All times are Mountain Standard Time.



On Saturday, February 6, about 6:30 AM, you can see 3 solar system objects near each other low in the Southeast. The easy one is Venus. To the left is the very thin crescent Moon. Below both, but nearer the Moon, is Mercury. Actually, Pluto is nearer Venus than any of the others, but at magnitude 14, it is beyond an observing challenge.

On Sunday, February 7, it is new Moon and you have all night to hunt for faint fuzzies.

On Sunday, February 14, the Moon is at first quarter phase and sets at 1:12 AM (Monday). Give yourself a Valentine present by looking for a straight string of 5 small craters at the northern end of Mare Serenitatis. See Astronomy magazine, February 2016, p.37 for details.

On the night of Monday, February 15, at 2:05 AM (Tuesday), the Moon occults Aldebaran again. (Remember January 19?) This one will be much harder to observe because the star will be only 1 1/2 degrees above the horizon.

On Monday, February 22, the full Moon rises at 6:34 PM (15 minutes after sunset) so you have to give up hunting for faint fuzzies for the whole night.

The night of Thursday, February 25, you can see some events with Jupiter's moons. Here is the schedule:

12:13 AM (Friday) Europa's shadow falls on Jupiter. (1 shadow)

12:47 AM Europa moves in front of Jupiter.

02:37 AM Io's shadow falls on Jupiter. (2 shadows)

02:53 AM Io moves in front of Jupiter.

03:02 AM Europa's shadow leaves Jupiter. (1 shadow)

03:32 AM Europa ends its transit of Jupiter.

04:52 AM Io's shadow leaves Jupiter.

05:07 AM Io ends its transit of Jupiter.

On Monday, February 29, you get one more day than usual to observe this month. It gets pretty dark by about 7:30 PM and the Moon doesn't come up till 12:50 AM Tuesday morning. Why not close out leap day with a few faint fuzzies?

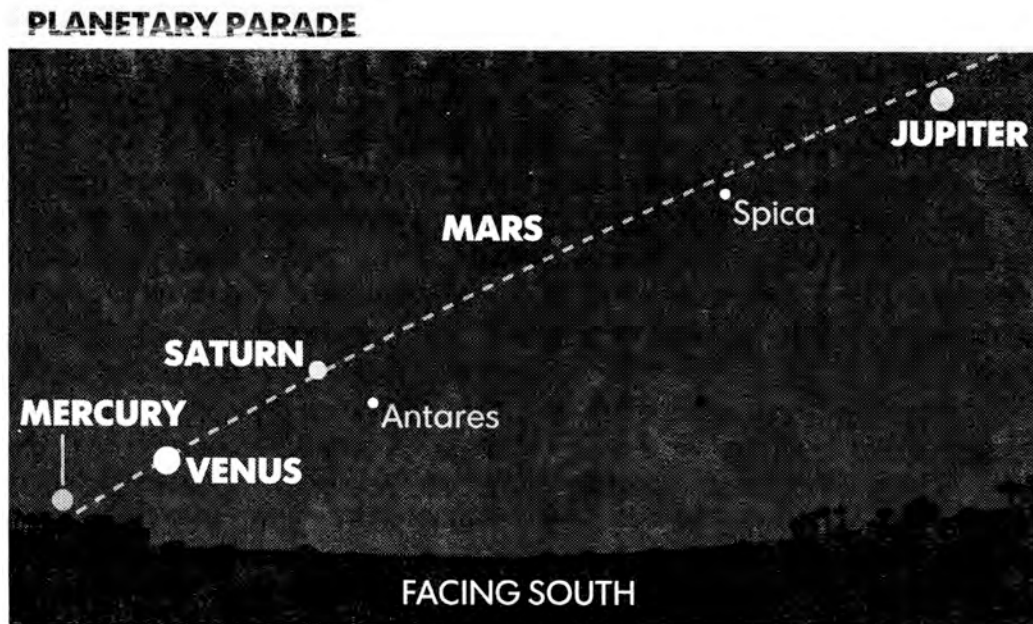
FIVE PLANETS WILL PUT ON A SHOW FOR EARTHLINGS

by Doyle Rice, USA TODAY

Morning skywatchers will get a special treat over the next few weeks as five of the solar system's other eight planets will all be visible at once with the naked eye in the chilly pre-dawn sky weather permitting. The five bright planets that will be lined up in a diagonal line, from left to right, are Mercury Venus, Saturn, Mars and Jupiter. Only distant Uranus, Neptune and Pluto won't be in on the show. (While Neptune and Pluto can only be seen with a telescope, Uranus can occasionally be spotted with a sharp eye in a dark sky).

The stars Antares and Spica will also twinkle in the same part of the sky. This is the first time that the five planets will appear in the same sky together since January 2005, according to EarthSky.org. All five bright planets will appear together in the morning sky from about Jan. 20 to Feb. 20. The waning crescent moon also will make an appearance toward the end of January.

Of course, bundling up is crucial, as this celestial spectacle occurs in what typically are the coldest hours of the day during the coldest weeks of the year. Some good news for folks not wanting to brave the cold: These five planets will be in the evening sky later this year, from about Aug. 13 to 19, according to EarthSky.org. However, Mercury and Venus will be low in the west at dusk and not that easy to spot.



Source EarthSky.org RAMON PADILLA, USA TODAY

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 advise on the purchase of astronomy equipment, setting up equipment, astrophotography, etc., contact a PAC mentor.

John R. Carter Sr. - General - 928-458-0570

Jeff Stillman - Astrophotography - 928-379-7088

David Viscio - General - 928-775-2918

Greg Lutes - Visual Observing - 928-445-4430



OBSERVING LISTS

Observing lists are available on the PAC website to provide guidance and goals for visual and astrophotography programs. Current lists are:

Astroleague Lunar 100

Caldwell

Face-On Spiral Galaxies

Hidden Treasures

Planet Maps

Saguaro Astronomy Club Best NGC

Telescope Showpieces

Binocular Showpieces

Dunlop 100

Herschel 400

Messier

Royal Astronomical Society of Canada Finest NGC

S&T Lunar 100

The Secret Deep



The lists are in PDF format and can be downloaded and printed for use.

PAC WEBSITE & YAHOO GROUPS

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

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

General PAC user group:

<https://groups.yahoo.com/neo/groups/Prescott-Astronomy-Club/info>

Astrophotography special interest group:

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



BOARD OF DIRECTORS

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Magazine Subscriptions: Stephen Eubanks

METASIG: Marilyn Unruh

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Astronomy Picture of the Day

January 9, 2016

Hubble Heritage Team, ESA, NASA



Embry-Riddle Aeronautical University



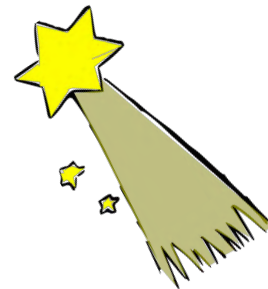


www.prescottastronomyclub.org

Come to the First Annual Stargazing Event
at Black Canyon Heritage Park
Saturday, February 6, 2016 at 7:00 pm
33955 S. Old Black Canyon Highway
In Black Canyon City



VIEW GALAXIES
AND
CELESTIAL OBJECTS



Amateur astronomers will aim their telescopes at celestial objects and invite visitors to view them. They will explain what the object is and where it is located in the sky. See what fascinating objects share the universe with us!

Coffee, hot chocolate and snack items will be available

Questions? Call 928-778-6324 or 623-512-9811

Brought to you by the Black Canyon Heritage Park
33955 S Old Black Canyon Highway
Black Canyon City, AZ 85324
www.bcheritagepark.org

