Prescott Astronomy Club

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

FEBRURAY 2017

UPCOMING EVENTS

Wednesday, February 1 - Regular PAC meeting @ 6:30 PM in Rm 107, Bldg 74, Embry-Riddle Aeronautical University. Neil Stokton will present "Project Phoenix: The restoration of a classic Newtonian reflector built in the 1950's". Neil will explain how he restored a 1950's Newtonian reflector. The telescope will be on display during his presentation.

Wednesday, February 8 - METASIG @ 5:00 PM at local restaurant. Sign up at meeting on February 1.

Wednesday, February 15 - Board meeting @ 6:30 PM.

Thursday, February 16 - Third Thursday Presentation @ 6:00 PM in the Founder's Suite, Prescott Public Library. Dr. Quentin Baily, Associate Professor of Physics, ERAU, will present "Tests of Special and General Relativity in the Solar System and Beyond". Physicists and astronomers have continually increased the precision of their measurements for tests of fundamental physics. In particular, a growing group of researchers are searching for hypothetical tiny deviations from the laws of Special and General Relativity which may give a glimpse of a much sought after fundamental theory of physics. This area of research will be reviewed along with a discussion of modern precision tests such as lunar laser ranging, pulsar observations and what we can learn from the first gravitational wave observations.

Saturday, February 25 - Arizona SciTech Fest @ 10AM to 4PM at the Prescott Gateway Mall. The Prescott Astronomy Club will set up telescopes to provide the public safe views of the sun. Flier advertising the event is in the appendix. Sign up at meeting on February 1.

NEW MEMBERS

The Prescott Astronomy Club welcomes 5 new members to the club:

Gary Goddard Billie Slocum

Margaret Houch Ryan Smith

Jeff Winslow

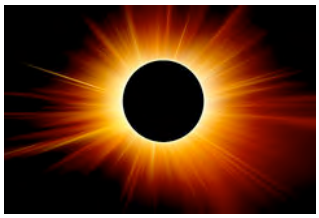
VOLUNTEERS NEEDED

Volunteers are needed for two club activities: refreshment coordinator and PAC Store Sales coordinator. If you would like to help and need additional information, please contact Jeff Stillman (jstillman50@cableone.net).

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@cableone.net). You can also bring up the question at the meeting.

2017 SOLAR ECLIPSE BALLOON PROJECT



On August 21, 2017, the moon's shadow will sweep eastward from Oregon to North Carolina across the United States during a rare total eclipse of the sun. During this eclipse, the moon's shadow will pass over Glenda State Park in Wyoming. The ASCEND! Project, funded by NASA Space Grant and headed by Jack Crabtree, will photograph the moon's shadow from a high altitude balloon. Members of the Prescott Astronomy Club have the opportunity to be part of this exciting project.

Arrival in Glendo State Park is scheduled for August 19, 2017, with departure no later than August 23.

The ASCENT! Team and members of the Prescott Astronomy Club will provide talks about the balloon project and telescope viewing during the eclipse and clear night observing at the campground. If you are interested in participating or want additional information, contact Jerry and Corinne Shaw at cmshaw0430@aol.com or (928) 772-0941.

COMET CAMPAIGN: AMATEURS WANTED

By Marcus Woo

In a cosmic coincidence, three comets will soon be approaching Earth—and astronomers want you to help study them. This global campaign, which will begin at the end of January when the first comet is bright enough, will enlist amateur astronomers to help researchers continuously monitor how the comets change over time and, ultimately, learn what these ancient ice chunks reveal about the origins of the solar system.

Over the last few years, spacecraft like NASA's Deep Impact/EPOXI or ESA's Rosetta (of which NASA played a part) discovered that comets are more dynamic than anyone realized. The missions found that dust and gas burst from a comet's nucleus every few days or weeks—fleeting phenomena that would have gone unnoticed if it weren't for the constant and nearby observations. But space missions are expensive, so for three upcoming cometary visits, researchers are instead recruiting the combined efforts of telescopes from around the world.

"This is a way that we hope can get the same sorts of observations: by harnessing the power of the masses from various amateurs," says Matthew Knight, an astronomer at the University of Maryland.

By observing the gas and dust in the coma (the comet's atmosphere of gas and dust), and tracking outbursts, amateurs will help professional researchers measure the properties of the comet's nucleus, such as its composition, rotation speed, and how well it holds together.

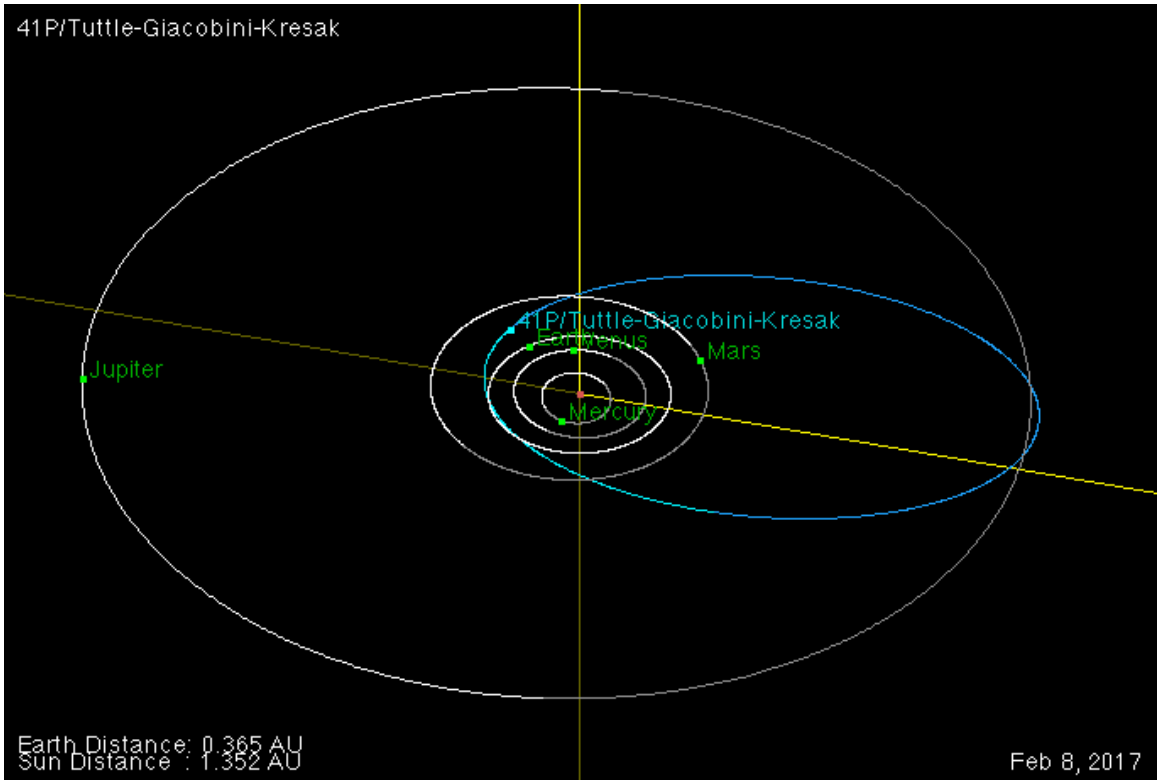
The observations may also help NASA scout out future destinations. The three targets are so-called Jupiter family comets, with relatively short periods just over five years—and orbits that are accessible to spacecraft. "The better understood a comet is," Knight says, "the better NASA can plan for a mission and figure out what the environment is going to be like, and what specifications the spacecraft will need to ensure that it will be successful."

The first comet to arrive is 41P/Tuttle-Giacobini-Kresak, whose prime window runs from the end of January to the end of July. Comet 45P/Honda-Mrkos-Pajdusakova will be most visible between mid-February and mid-March. The third target, comet 46P/Wirtanen won't arrive until 2018.

Still, the opportunity to observe three relatively bright comets within roughly 18 months is rare. "We're talking 20 or more years since we've had anything remotely resembling this," Knight

says. "Telescope technology and our knowledge of comets are just totally different now than the last time any of these were good for observing."

For more information about how to participate in the campaign, visit http://www.psi.edu/41P45P46P.



An orbit diagram of comet 41P/Tuttle-Giacobini-Kresak on February 8, 2017—a day that falls during the comet's prime visibility window. The planets orbits are white curves and the comet's orbit is a blue curve. The brighter lines indicate the portion of the orbit that is above the ecliptic plane defined by Earth's orbital plane and the darker portions are below the ecliptic plane. This image was created with the Orbit Viewer applet, provided by the Osamu Ajiki (AstroArts) and modified by Ron Baalke (Solar System Dynamics group, JPL). http://ssd.jpl.nasa.gov/sbdb.cgi?orb=1;sstr=41P

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.

During this month, Venus goes from 39% illuminated and 31 arc-seconds in diameter to 17% illuminated and 47 arc-seconds in diameter. These two changes leave the brightness unchanged at magnitude -4.6.

For the comet hunters among you, check out the article in Astronomy Magazine, February 2017, p.42. It's not unaided eye, but binoculars should be adequate.

On Wednesday, February 1, at 6:41 AM, Europa moves in front of Jupiter. 9 minutes later Europa's shadow (which has been on Jupiter since 4:22 AM) leaves the planet. Later that same night you can watch an entire transit of Ganymede. Here is the schedule:

11:26 PM Jupiter rises.

11:56 PM Ganymede's shadow falls on Jupiter.

02:26 AM (Thursday) Ganymede's shadow leaves Jupiter.

04:42 AM Ganymede moves in front of Jupiter.

06:42 AM Ganymede's transit ends.

07:01 AM Civil twilight (a few stars still visible) begins.

(You will have another chance to observe a shadow transit of Ganymede [but not the transit of the satellite itself] on February 9 between 3:55 AM and 6:22 AM.)

On Friday, February 3, the Moon will be at first quarter and set at 1:12 AM (Saturday).

On Saturday, February 4, after about 7:00 PM, you can see the northern part of the Moon at its best. Libration tips that part toward us. In particular, now is a good time to try to find those illusive craterlets in the floor of the crater Plato.

On Friday, February 10, the Moon is full and rises at 6:08 PM (1 minute before sunset) spoiling any chance of seeing faint fuzzies for the night. If the Moon looks a bit strange on rising, it is because it is in a deep penumbral (almost partial) eclipse at the time of its rising. The last vestige of eclipse will be visible around 7:15 PM and the last (unobservable, 4th contact with the penumbra) event will happen at 7:55 PM. Tonight will be a good time to observe the albedo (brightness) features of the full Moon with no shadows showing the topography of craters.

On Saturday, February 18, about 6:00 AM, you can see the southern part of the Moon at its best. Libration tips that part of the Moon toward us. In particular now is a good time to look at the giant crater, Clavius, with its string of decreasing size craters inside it. The Moon is at last quarter phase and rises at 12:50 AM.

On Saturday, February 25, the Moon is new and you have all night to hunt for faint fuzzies.

On Sunday, February 26, about 7:30 PM, Mars (magnitude 1) and Uranus (magnitude 6) are 35 arc-minutes apart.

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

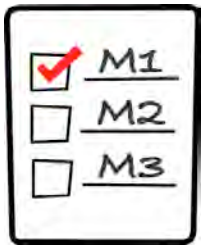
If you need advice on the purchase of astronomy equipment, setting up equipment, astrophotography, etc., contact a PAC mentor.

Jeff Stillman - Astrophotography - 928-379-7088

David Viscio - General - 928-775-2918

Greg Lutes - Visual Observing - 928-445-4430

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	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

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

Astrophotography special interest group:

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

BOARD OF DIRECTORS

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Vice President: Joel Cohen	At Large: Dick Lewis
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Starry Nights Coordinator: Open
Third Thursday Coordinator: Corinne Shaw & Pat Birck
Webmaster: Russell Chappell

APOD JAN. 20, 2017 - THE ELEPHANT'S TRUNK NEBULA

Image Credit & Copyright: Stephen Leshin

Explanation: *Like an illustration in a galactic Just So Story, the Elephant's Trunk Nebula winds through the emission nebula and young star cluster complex IC 1396, in the high and far off constellation of Cepheus. Also known as vdB 142, the cosmic elephant's trunk is over 20 light-years long. This colorful close-up view includes image data from a narrow band filter that transmits the light from ionized hydrogen atoms in the region. The resulting composite highlights the bright swept-back ridges that outline pockets of cool interstellar dust and gas. Such embedded, dark, tendril-shaped clouds contain the raw material for star formation and hide protostars within. Nearly 3,000 light-years distant, the relatively faint IC 1396 complex covers a large region on the sky, spanning over 5 degrees. This dramatic scene spans a 1 degree wide field, about the size of 2 Full Moons.*

Feb. 25, 2017

10am to 4pm

at the Prescott Gateway Mall

ANNUAL EVENT — FREE ADMISSION

FUN AND LEARNING FOR ALL AGES! EARN PRIZES!

Mission:

To promote a culture that celebrates and embraces education, research, collaboration, innovation, and economic growth in the Prescott region, related to science, technology, engineering, mathematics and the arts (STEM+A).

Past Participants:

American Association of University Women • Arizona Agribusiness and Equine Center • Arizona Public Service – APS • Arizona Science Center • AZ SciTech • BASIS School • Children's Museum Alliance, Inc. • City of Prescott-Water SMART • Embry-Riddle Aeronautical University • Freeport-McMoRan Mine • Guidance Aviation • Heritage Park Zoological Society • Highlands Center for Natural History • Humboldt Unified School District • K12 • Mountain Institute JTED • Mountain View Elementary Science Olympiad Team • Northern Arizona University – Yavapai • Prescott Astronomy Club • Primavera School • Sharlot Hall Museum • Smoki Museum • Taylor Hicks RoBoCats • Town of Prescott Valley • TriCity Prep • Unisource Energy Services • Universal Helicopter • University of Arizona – Yavapai County Cooperative Extension • Walnut Creek Center • Yavapai College

WANT TO GET INVOLVED?
Please contact: PRURIOUT@erau.edu

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