



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

NOVEMBER 2021

UPCOMING EVENTS



Wednesday, November 3 - 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.

We encourage all members to attend the meeting, as the primary task will be the election of PAC officers and board members for 2022.

Dr. Richardson, Embry-Riddle Aeronautical University, will present "*What is ERAU Doing in the Science and Space Area*". A few ERAU students will summarize their projects.

Wednesday, November 10 - 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, November 10 - Arizona Astrophotography Association @ 7:00 PM. Currently there is no new topic and speaker to hold a meeting. Jeff Stillman will inform the members if that status changes.

PAC HOLIDAY DINNER

The annual PAC Holiday Dinner is scheduled for the evening of Saturday, December 11 at Augie's Restaurant at 1721 Highway 69 in the Frontier Village Shopping Center in Prescott. The event will start at 5 PM with happy hour and cash bar. Dinner will be served at 6 PM. The cost is \$41 each (includes taxes and tips). The dinner consists of a salad, bread, an entree (with vegetables), a dessert and beverage (coffee, tea, water).

Entrée selections will be:

- 1) 8 oz New York Strip Steak with mushroom glaze, potatoes, vegetable
- 2) 8 oz Roasted Prime Rib with mashed potatoes and vegetable

- 3) Scottish Salmon with rice pilaf and vegetable
- 4) Chicken Piccata with rice pilaf and vegetable
- 5) Jumbo Lemon Garlic Butter Shrimp over angel hair pasta
- 6) Pasta Primavera (vegetarian)

The dinner will be in the private banquet room limited to a 40-person capacity, so only the first 40 people that sign up may attend, so sign up early by sending an email with your name (and if your spouse/significant other is attending), and choice(s) of entree. Please respond by November 20.

Susanne Vaughan
susanne.vaughan@gmail.com

NOMINATIONS FOR PAC OFFICERS

Art Arnold-Roksandich, Treasurer, Nomination Chariman

The following individuals have been nominated for the six open positions on the PAC board of directors:

- President: Art Arnold-Roksandich
- Vice-President: Brian Blau
- Secretary: Roland Albers
- Treasurer: Susanne Vaughan
- Directors-at-Large: EJ Van Horne and Ken Olson

An e-mail has been distributed to the full membership containing photos and biographies of each candidate.

Finally, although there are candidates for each of the six open positions, all club members who are interested in serving the club can put their name into nomination by sending it to t@prescottastronomyclub.org by the November 3 regular meeting. If you are interested, duties of each position are in the appendix.

The election will be held during the November 3 regular meeting.

MEASURE THE NIGHT SKY

David Prosper

Fall and winter months bring longer nights, and with these earlier evenings, even the youngest astronomers can get stargazing. One of the handiest things you can teach a new astronomer is how to measure the sky – and if you haven't yet learned yourself, it's easier than you think!



Astronomers measure the sky using degrees, minutes, and seconds as units. These may sound more like terms for measuring time - and that's a good catch! – but today we are focused on measuring *angular distance*. Degrees are largest, and are each made up of 60 minutes, and each minute is made up of 60 seconds. To start, go outside and imagine yourself in the center of a massive sphere, with yourself at the center, extending out to the stars: appropriately enough, this is called the celestial sphere. A circle contains 360 degrees, so if you have a good view of the horizon all around you, you can slowly spin around exactly once to see what 360 degrees looks like, since you are in effect drawing a circle from inside out, with yourself at the center! Now break up that circle into quarters, starting from due North; each quarter measures 90 degrees, equal to the distance between each cardinal direction! It measures 90 degrees between due North and due East, and a full 180 degrees along the horizon between due North and due South. Now, switch from a horizontal circle to a vertical one, extending above and below your head. Look straight above your head: this point is called the *zenith*, the highest point in the sky. Now look down toward the horizon; it measures 90 degrees from the zenith to the horizon. You now have some basic measurements for your sky.

Use a combination of your fingers held at arm's length, along with notable objects in the night sky, to make smaller measurements. A full Moon measures about half a degree in width - or 1/2 of your pinky finger, since each pinky measures 1 degree. The three stars of Orion's Belt create a line about 3 degrees long. The famed "Dig Dipper" asterism is a great reference for Northern Hemisphere observers, since it's circumpolar and visible all night for many. The Dipper's "Pointer Stars," Dubhe and Merak, have 5.5 degrees between them - roughly three middle fingers wide. The entire asterism stretches 25 degrees from Dubhe to Alkaid - roughly the space between your outstretched thumb and pinky. On the other end of the scale, can you split Mizar and Alcor? They are separated by 12 *arc minutes* - about 1/5 the width of your pinky.

Keep practicing to build advanced star-hopping skills. How far away is Polaris from the pointer stars of the Big Dipper? Between Spica and Arcturus? Missions like Gaia and Hipparcos measure tiny differences in the angular distance between stars, at an extremely fine level. Precise measurement of the heavens is known as *astrometry*. Discover more about how we measure the universe, and the missions that do so, at nasa.gov.

Handy Sky Measurements

Hold your hand out in front of your face as far as you comfortably can, and measure:



Measure the Sky with the Big Dipper

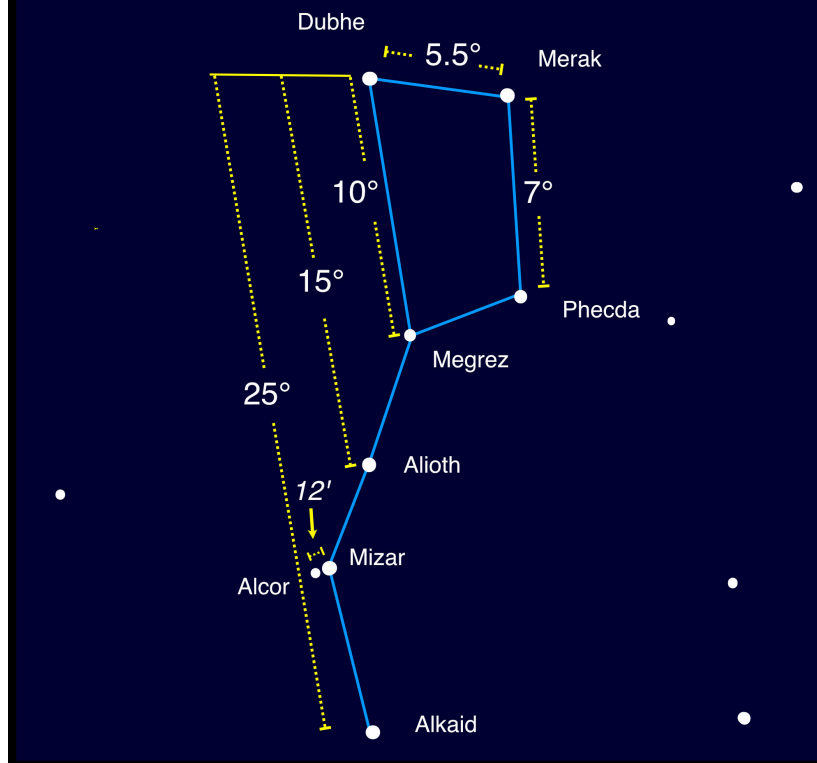


Image created with assistance from Stellarium

WHAT'S HAPPENING IN NOVEMBER 2021

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

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3 67P/Churyumov-Gerasimenko at perihelion Conjunction of the Moon and Mercury	4 New Moon Uranus at opposition	5 The Moon at perigee	6 The Moon at perihelion
7 67P/Churyumov-Gerasimenko reaches its brightest Conjunction of the Moon and Venus Close approach of the Moon and Venus Lunar occultation of Venus	8	9	10 Conjunction of the Moon and Saturn Close approach of the Moon and Saturn	11 Moon at First Quarter Conjunction of the Moon and Jupiter Close approach of the Moon and Jupiter	12 Northern Taurid meteor shower 2021	13 67P/Churyumov-Gerasimenko at perigee
14	15	16 The Moon at aphelion	17 Leonid meteor shower 2021 M45 is well placed	18	19 Full Moon Partial lunar eclipse	20 The Moon at apogee
21 α -Monocerotid meteor shower 2021	22	23	24	25	26	27 1 Ceres at opposition Moon at Last Quarter
28 November Orionid meteor shower 2021 Mercury at superior solar conjunction	29	30				

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.

ASTRONOMY PHOTOGRAPHER OF THE YEAR CONTEST WINNERS

My Modern Met announces Astronomy Photographer of the Year winners. Use the following link to see some spectacular astro-images and more.

<https://mymodernmet.com/astronomy-photographer-of-the-year-2021/>

CALL FOR ASTRO-IMAGES

David Viscio, editor

I request all astrophotographer members of the club submit examples of their astro-images to share with club members by inclusion in the Ephemeris. Images can be sent to me at pkmist@gmail.com. Please include description of equipment, cameras, image capture parameters and processing.

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.

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

President: Jeff Stillman

Vice President: Open

Acting Secretary: Roland Albers

Treasurer: Art Arnold-Roksandich

At Large: Jason Hoover

At Large: Dave Covey

At Large: Doug Tilley

At Large: Pat Bledsoe



PAC COORDINATORS

Astronomical League Coordinator: John Carter

Facebook: Adam England

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

PAC Store Sales - John Verderame

Property Records: Open

Public Relations: Adam England

Refreshments: Open

Schools & Camps Outreach: Don Beaman & Joel Cohen

Starry Nights Coordinator: Don Beaman & Joel Cohen

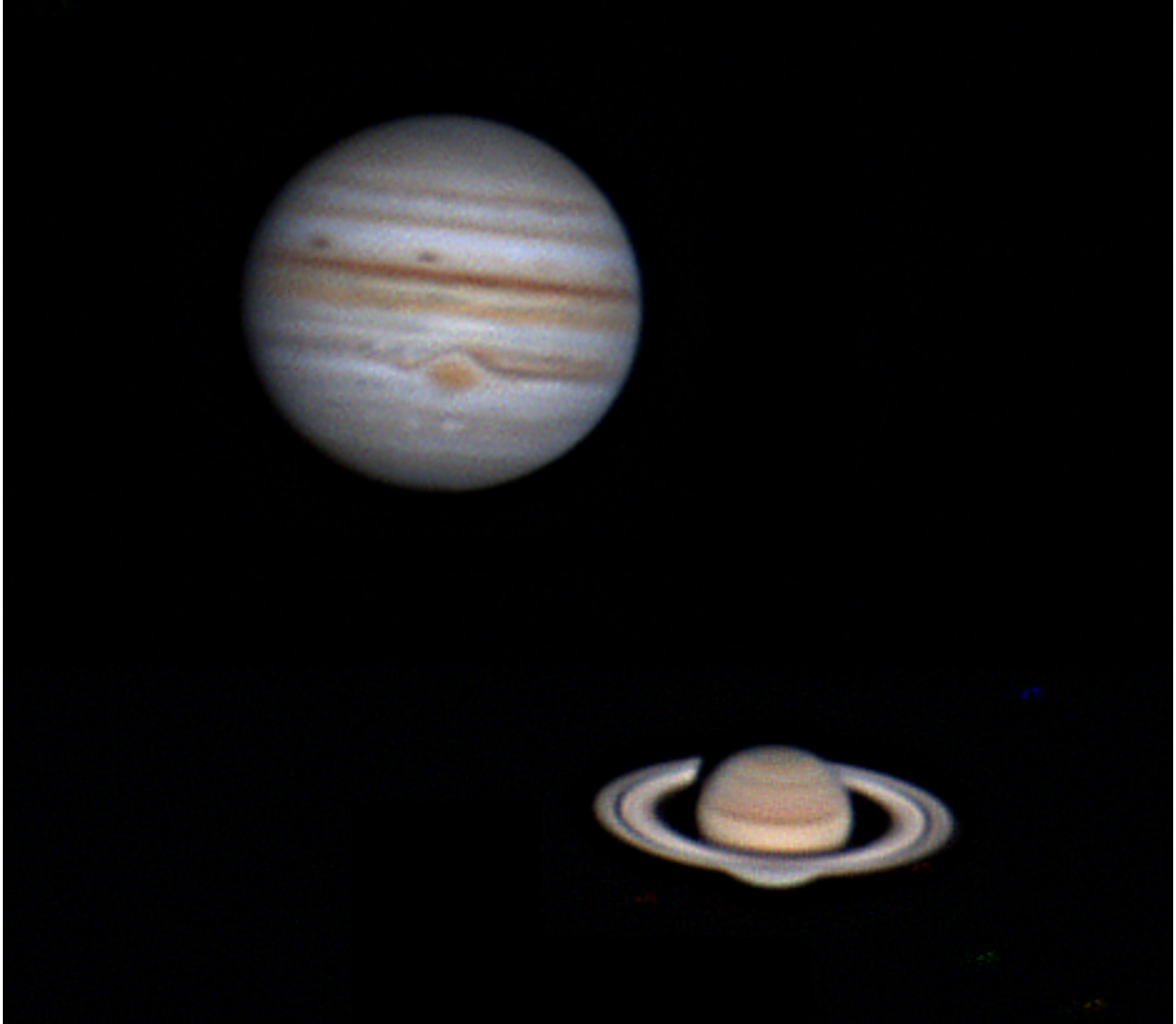
Third Thursday Coordinator: Dave Covey

Webmaster: Russell Chappell



JUPITER & SATURN: OCTOBER 15, 2021

Image Credit: David B. Viscio



Celestron C6 with Celestron Ultima 2x Barlow

Point Grey Flea3 640x480 16-bit Color Video Camera

Stack of 750 frames from 5000-frame video

Video camera control using Astro IIDC on MacBook Pro with OS 10.6.8

Frame stacking in Autostakkert! 2

Wavelet processing in RegiStax 6

Final image optimization in Adobe Photoshop CS6

DUTIES OF THE BOARD OF DIRECTORS:

1. Duties of the President shall be to:
 - a. Preside at all meetings.
 - b. Coordinate the activities of the board of Directors.
 - c. Call extra meetings as required, temporarily fill vacancies, and appoint and dissolve committees not otherwise provided for.
2. Duties of the Vice President shall be to:
 - a. Serve in the place of the president in case of president's absence or incapacitation.
 - b. Act in an official capacity (under the direction of the president) for the PAC at public functions.
3. Duties of the Secretary shall be to:
 - a. Keep all official documents and records of the PAC, and perform other duties delegated by the President
 - b. Record the minutes of all regular business meetings and the board of Directors, and at the request of any member, read aloud the minutes of the regular business or board meeting.
 - c. Conduct an annual inventory of all club property and present it to the general membership at the October business meeting.
4. Duties of the Treasurer shall be to:
 - a. Execute all financial transactions authorized by the club.
 - b. Receive and distribute all dues, subscriptions and bank receipts.
 - c. Account for all receipts and expenditures.
 - d. Report on club finances at each regular business meeting.
 - e. Maintain an up-to-date roster of members.
 - f. The duties of secretary and treasurer may be combined.
5. The duties of the Directors-at-large shall be to attend board meetings and assist the President in carrying out club activities.