WESTMINSTER ASTRONOMICAL SOCIETY, INC. (WASI)

Membership News

Volume 41 – Number 2 Spring 2025

Message from our Society's President, Wayne (Skip) Bird

Howdy People and Welcome to Wayne's World,

I sometimes wonder what I'm going to write so I just start righting (writing, just checking to see if you noticed) wrong to see what happens. Unfortunately it didn't take me anywhere I wanted to go, so here I go anyways.

I was going to go on a rant about visual observing versus enhanced (photography, electronic imaging, night vision, etc.) about which would you like to do, kiss your wife or kiss a picture of your wife, and decided I should put in a disclaimer before I start, in case I might offend anyone with my Personal Opinion.

Standard Disclaimer

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Message from our Society's President—Continued

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Please Note: Some quantum physics theories suggest that when the consumer is not directly observing this product, it may cease to exist or will exist only in a vague and undetermined state.

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Warning: This Product Attracts Every Other Piece of Matter in the universe, Including the Products of Other Manufacturers, with a Force Proportional to the Product of the Masses and Inversely Proportional to the Distance Between Them.

Caution: The Mass of This Product Contains the Energy Equivalent of 85 Million Tons of TNT per Net Ounce of Weight.

Handle With Extreme Care: This Product Contains Minute Electrically Charged Particles Moving at Velocities in Excess of Five Hundred Million Miles Per Hour.

Consumer Notice: Because of the "Uncertainty Principle," It Is Impossible for the Consumer to Find Out at the Same Time Both Precisely Where This Product Is and How Fast It Is Moving.

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Read This Before Opening Package: According to Certain Suggested Versions of the Grand Unified Theory, the Primary Particles Constituting this Product May Decay to Nothingness Within the Next Four Hundred Million Years.

This is a 100% matter product: In the Unlikely Event That This Merchandise Should Contact Antimatter in Any Form, a Catastrophic Explosion Will Result.

Public Notice as Required By Law: Any Use of This Product, in Any Manner Whatsoever, Will Increase the Amount of Disorder in the Universe. Although No Liability Is Implied Herein, the Consumer Is Warned That This Process Will Ultimately Lead to the Heat Death of the Universe.

Note: The Most Fundamental Particles in This Product Are Held Together by a "Gluing" Force About Which Little is Currently Known and Whose Adhesive Power Can Therefore Not Be Permanently Guaranteed.

Message from our Society's President—Continued

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New Grand Unified Theory Disclaimer: The Manufacturer May Technically Be Entitled to Claim That This Product Is Ten Dimensional. However, the Consumer Is Reminded That This Confers No Legal Rights Above and Beyond Those Applicable to Three-Dimensional Objects, Since the Seven New Dimensions Are "Rolled Up" into Such a Small "Area" That They Cannot Be Detected.

Please Note: Some Quantum Physics Theories Suggest That When the Consumer Is Not Directly Observing This Product, It May Cease to Exist or Will Exist Only in a Vague and Undetermined State.

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No animals were harmed during the creation of this homepage.

However I forgot what I wanted to say about the other subject.

I warned you "I'm a Rambling Man".

Until next time..... Astronomy is Looking Up!

Skip

WASI News

New Solar System Ambassador

For more than 25 years, the NASA Solar System Ambassadors program has been a public engagement effort that works with motivated volunteers across the nation to communicate the science and excitement of NASA's space exploration missions and discoveries with the people in their communities.

WASI's treasurer, Laurie Ansorge, has been accepted as a NASA Solar System Ambassador. She'll be involved in a lot of training, which no doubt will inform future What's Up Basics sessions at our meetings. The Ambassadors have a lot of events—find them here: https://solarsystem.nasa.gov/solar-system-ambassadors/events/ .

WASI Special Interest Session— DIY Monitoring of Space Weather

We're currently about at the peak of the sun's 11-year solar cycle. Members have expressed interest in having an educational meeting about ways to monitor "space weather" - the sea of particles the sun ejects that impact the Earth.

Did you see the wonderful aurora in October? That was the result of the solar wind, the protons and electrons hurled at us by the sun, and there's a reasonable chance we'll see more of those over the next year or two.

And did you know you can build simple devices to detect space weather and predict auroras?

Join us **7:00 PM Wednesday, April 23**, at Bear Branch Nature Center for an hour or so to learn all about solar flares, auroras, monitoring space weather, and how to build and use monitoring devices.

Bring your curiosity and your questions for this session. We promise there will be no math and the content will be accessible to all.

Winter Star Party Report

Al and Laurie Ansorge attended the Winter Star Pary, January 27-31 at Scout Key, Florida. It was sponsored by the Southern Cross Astronomical Society, Inc. (SCAS) .

Seeing averaged Fair-Good, Transparency mostly Clear (7/7 UMi); Nights @ dew point in 60s, days humid in ~80s, with beach bugs biting. Waterproof crates proved successful as everything was wet at night.

SQM (sky quality meter) readings: 20.87-21.47: Bortle 4.5-4, for naked eye magnitude of 6.

Birds seen: ibis, seagull, kestrel, osprey & fletchlings, frigate, heron, egret, vulture & crow.

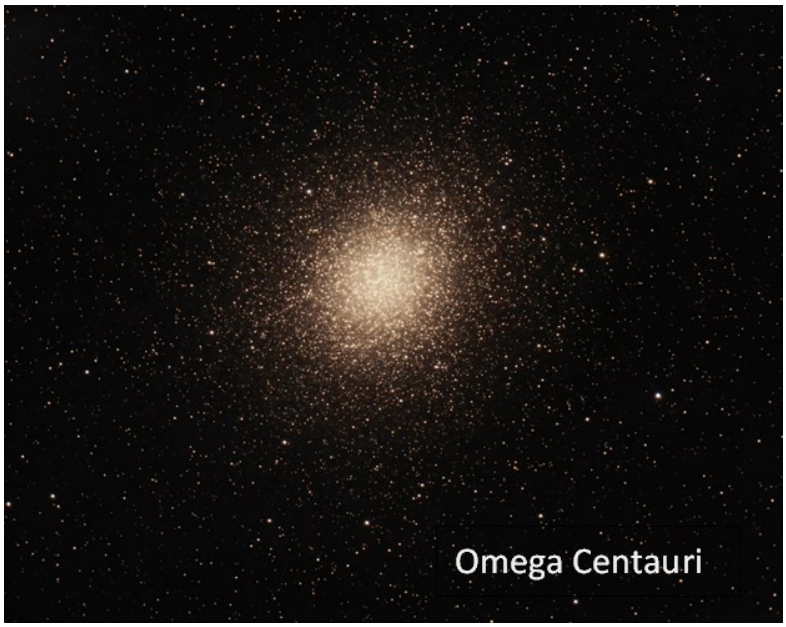
Observed >90 objects @ 15^{o} latitude south of home (grouped by A.L Observing programs) including:

- 3 Caldwells (for Gold level)
- 27 Planetary nebula
- 12 Southern Sky Constellations (Hunter program) including the Southern Cross
- 11 Bright nebula
- 15 open clusters
- 4 Binocular Messier w/10x50 & 2 with 25x100
- Venus crescent, Mars, Jupiter, Saturn, Moon waxing crescent
- Multiple meteors

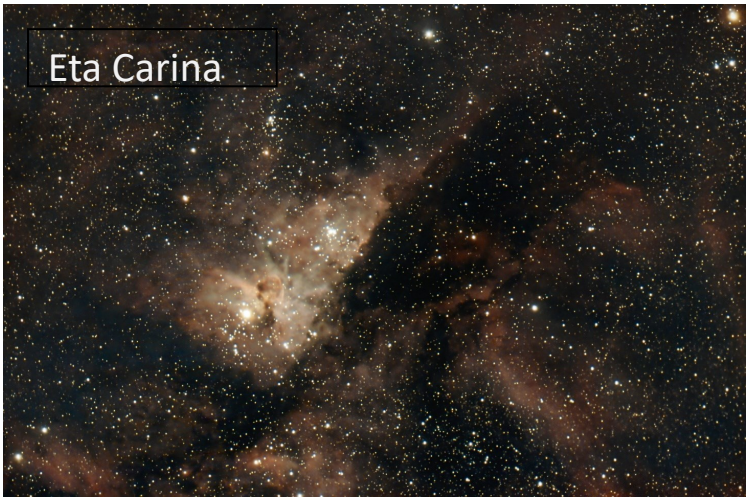
Observing sessions included after sunset, setting alarms for after midnight and pre-dawn.

Equipment used included 90mm Mak-Cas; 112mm Unistellar eV2scope; 6.5” Celestron Origin; 10x50 binoculars; 25x100 binoculars; and aluminum foil on eye piece to try occulting Sirius A & B.

Some image highlights (*just a little post imaging editing*):



Winter Star Party Report—continued

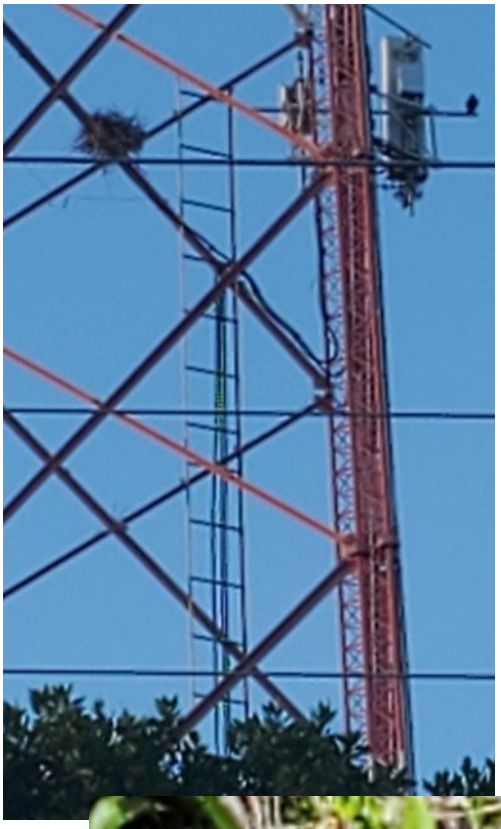


Head-to-Head comparison under the same skies the Horsehead within the approximate same hour and approximately same exposure times. The Unistellar exposure was adjusted during imaging to lighten up for comparison.

Winter Star Party Report—continued

Other Highlights:

- Met other members of clubs in the Mid East Region of A.L.
- Camped beside a NY Times bestselling author of science fiction
- Connected with the T-shirt designer for the A.L.: AstronomyTee.com
- Observed the new Pegasus smart eye piece (not sold)
- Viewed the sun through Day Star Quark telescopes
- Attended sessions including on the history of astrophotography and the Amateur Astronomy magazine
- Got a star party deal on the Explore Scientific 130mm APO refractor (as a Global Star Party/A.L. Live presenter)
- Watched baby osprey fly from their next and an iguana sun on a log near the camp site
- Traveled to Key West, “mile 0” of U.S. route 1, watching chickens cross the road in cross walks



Back to Basics — Astrophotography Filters

Hang out with a gang of astrophotographers, and you'll soon hear someone talking about hydrogen alpha, oxygen III and sulfur II filters. What's the scoop?

Plenty of us image the sky with a color camera. The sensor can only detect black and white, so these cameras have red, green, and blue filters over the pixels. But consider this image of the Crescent Nebula. There's an awful lot of red. Why waste pixels on blue and green?

There are many kinds of nebulas. Some reflect light from stars ("reflection nebulas"). Others are dark dusty areas that block light ("dark nebulas"). Some—many—emit light, and, unsurprisingly, are called "emission nebulas."

Much of the light from emission nebulas comes when a hydrogen atom's sole electron loses energy. Remember when you learned in grade school that electrons circle an atom's nucleus like planets circling the sun? Well, they were lying to you; things are rather more complex than that, though the planetary model is a useful way to think about these things. (If you'd like to see some pretty pictures of what these orbitals really look like, check out https://en.wikipedia.org/wiki/Atomic_orbital).

A hydrogen atom is a simple thing, consisting of but a single proton and one electron. The latter can be in "orbits" (a better word is "shell") at differing distances from the proton. The electron's energy is highest when it's in a shell far from the proton; lower-energy states see it closer in. The shells are numbered; 1 is the closest; larger numbers indicate shells further out. We call those numbers "n".

Here's the fun part: electrons like to be in low energy states (small n number). When one falls from n=3 to n=2 it loses energy. But that can't just disappear; energy is conserved. So the electron emits a photon whose energy is exactly the same as that lost in the transition. A simple formula tells us the wavelength of this photon: it's equal to a constant divided by the energy lost. In this case that wavelength is 656 nanometers: red! The n=3 to n=2 transition is called hydrogen alpha, or Hα for short.

Electrons transition between other shells, for example, from n=3 to n=1. But nearly all of these emit photons we cannot see as they are in the ultraviolet or the infrared (see the picture on the next page).

Sure, we could use a color camera to capture these photons. The pixels behind the red filters will do just fine. But the green and blue pixels will see nothing, which is a waste of good collecting area. Actually, it's much worse than that: those pixels will see plenty of light pollution, contaminating our image.

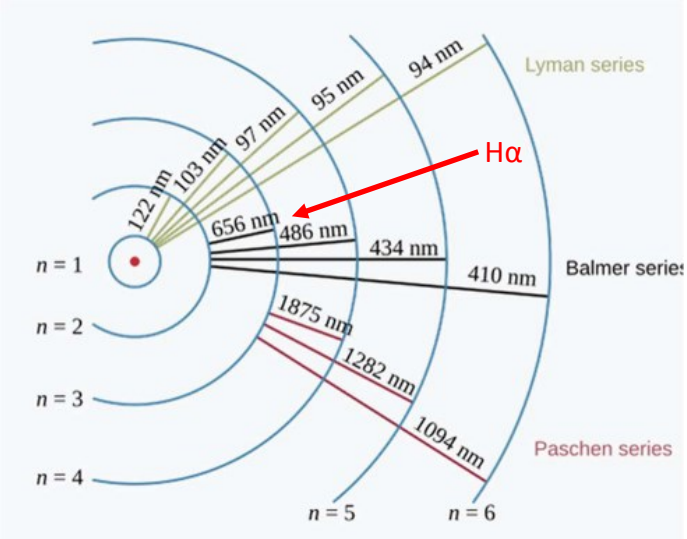
So some astrophotographers use a black and white camera with an Hα filter over all of the pixels. That filter only passes the photons at 656 nanometers, blocking everything else. Like light pollution.

Back to Basics — Astrophotography Filters, continued

Thus, we capture only what we want. This is called "narrowband imaging" as everything outside of the very narrow Hα band is rejected.

But there's more! The universe is a wild, dynamic place with all sorts of elements and molecules whose electrons are changing state. Two common emissions we see in nebulas are oxygen III (OIII for short) and sulfur II (SII). Oxygen atoms normally have 8 electrons, but in OIII two are missing. SII has one missing electron.

An electron transition in OIII generates a photon at 501 nanometers, in the blue part of the spectrum, and in SII at 672 nanometers, which, like Hα, is red. So you'll see narrowband imagers using filters for those two wavelengths as well as Hα.



A diagram showing many possible electron transitions in a hydrogen atom, with the wavelength of the associated photon that is emitted. n=3 to n=2 (Hα) gives a photon at 656 nm.

The OIII and SII transitions are rather more complex than a simple change of n number like we saw for Hα. In fact these are called "forbidden" transitions as they are not allowed under the rules of quantum mechanics. When W.H. Wright identified the OIII spectral line in 1918 he thought it was from an undiscovered element which he named "nebulium." Quantum mechanics never says never, though. It just assigns low probability to unlikely events, which include OIII and SII photon emissions.

These forbidden transitions are a story in themselves. Radio astronomers are fond of emissions from hydrogen atoms when the electron's spin flips, which is a highly-forbidden transition. It's so unlikely that an average hydrogen atom undergoes this once every *11 million years*! There's so much hydrogen in the universe, though, that this produces a weak but useful signal.

Professional astronomers use lots of narrowband filters to find specific elements and molecules in nebulas, stars, and free space. The Hubble Space Telescope has 48. An entire science, called spectroscopy, analyzes narrow bands of light to tease out the constituents of the universe.

OIII has two missing electrons. Why don't we call it OII? It's because we need a name for oxygen with all of its 8 electrons; that is, zero missing electrons. The Romans didn't understand the concept of zero, so never had a Roman Numeral to represent it. Scientists decided to call oxygen with all 8 electrons OI, missing one electron OII, and missing two OIII.

(For more detailed explanation of Hα , OIII and SII transitions see https://bit.ly/41uSIcb).

One last point: Solar telescopes have an Hα filter to block most of the sunlight. *Never use a conventional Hα filter to observe the sun!* The filter on a solar scope has a much narrower passband (as much as 100 times less), which is why these scopes tend to be so expensive. And, so much safer.

Observing Notes

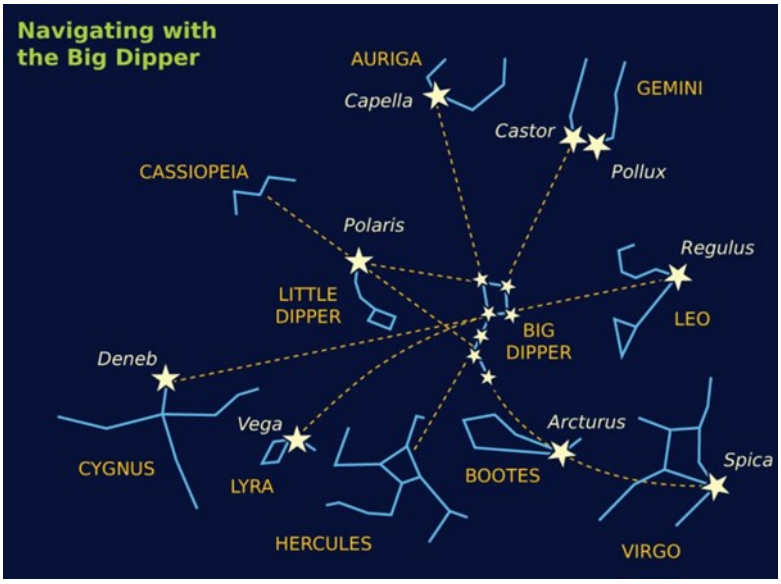
Vesta

Here's a fun chance to observe an asteroid. Vesta, which lurks in an orbit between Mars and Jupiter, will be in opposition May 1 and 2. "Opposition" means it will be on a line from the sun to Earth to Vesta; this is as close as it generally gets to our planet. If you're at a dark site it will be naked-eye visible at magnitude 5.6. But the rest of us, dwelling in light-polluted skies, can easily find it with binoculars. Astrophotographers can have some fun by imaging it over several nights and noting its motion against the background stars. It moves about 0.2˚ per day.

Vesta is 326 miles in diameter and, amazingly, contains 9% of all of the mass of the asteroid belt.

An Aid to Navigation

Here's a nifty aid to navigating the sky using the Big Dipper:



Astrophotos From Our Members

Brian Shoemaker sent some great photos. He wrote “Using Pixinsight to separate the RGB color channels, removing stars from each channel so I end up with 6 images. Adjust the starless images with curve transformation, once everything is back together for one image. I use NarrowbandNormalization to adjust color palette to HOO. For Rosette I also used a script called ImageBlend to combine the RBG and HOO versions.” HOO refers to using Hα and OIII filters, mapping the Hα to the red channel, and OIII to the green and blue.

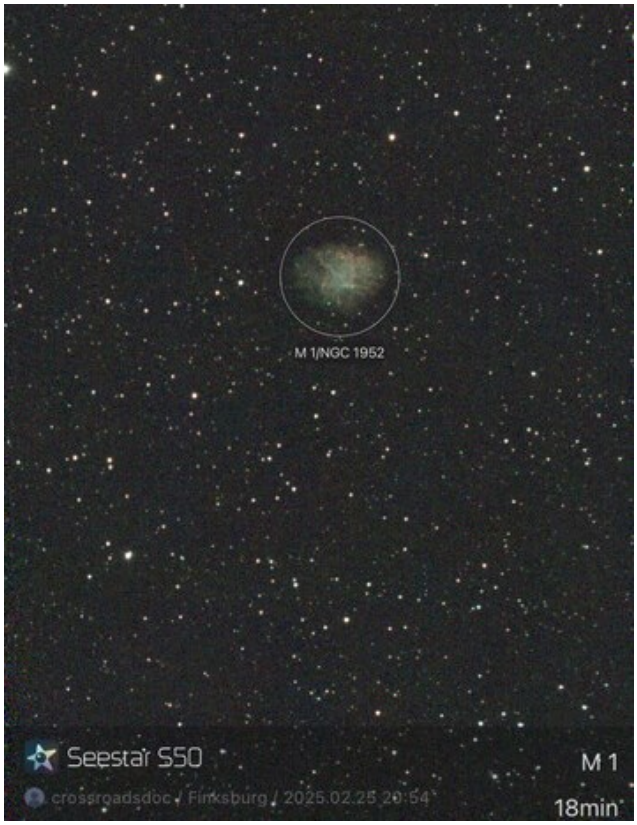
The Horsehead Nebula.

A very pretty Rosette Nebula.

And the Heart Nebula in haunting colors.

Doc Desai's Seestar is pulling in some compelling images. On the left is M1, the Crab Nebula, remnants of a supernova explosion seen in 1054 AD. Even though it is 6500 light years away, at the time the supernova was visible during the day.

On the right M44, the Beehive Cluster, which also goes by the moniker Praesepe, which is Latin for "Manger".



Martin Remmers took this stunning photograph using his SeeStar S50 of the Blood Moon during March's lunar eclipse.

Laurie Ansorge's beautiful sequence of the lunar eclipse.

Jackie Donaldson captured this aircraft—is it attempting to land on the sun?

Joe Kunkel also imaged the eclipsed moon. He said brining out the stars in the background was quite tricky.

Mikey Mangieri was also able to capture some stars in his eclipse image.

Edward Tian's eclipsed moon using a Canon R5 100-500, hand held at 500mm f/7, processed in in Lightroom to reduce noise.

Dave Weisman got this incredible shot of the moon and mars from January with lucky imaging .

Some more from Dave Weisman: the Rosette nebula, Horsehead and Flame nebula, and Leo Triplet. Each taken with Askar 500 refractor with ZWO ASI2600mm with Optolong filters with 2-3 hours integration time each.

Rosette was HSO palate, Horsehead was HRGB and Leo was RGB. All processed in PixInsight, with Askar 500 and AutoStakkert, Registax and Photoshop.

WASI FAQs

Library - Did you know we have over 700 books about astronomy in our WASI library? There are available to WASI members. Here's the complete card catalog: https://westminsterastro.groups.io/g/main/files.

Loaner telescopes - We also have a telescope lending library. If you'd like to borrow a scope, talk to Curt Roelle.

Astronomical League - All WASI members are also members of the Astronomical League. Check out their 80+ observing programs, many of which come with awards: https://www.astroleague.org/

Newsletter - Please send pictures, articles, and ideas for the newsleter to jack@ganssle.com.

Facebook - We're active and sharing images on our Facebook page, found here:

Join/Renew membership link: https://www.westminsterastro.org/join-wasi/

If you've already entered your contact information (renewing), skip the "database" link: https://paypal.me/WAstroSInc

Dues are payable via PayPal on the link above, by check or cash (and through your bank's on-line bill payment). Membership Dues are $25/year for individuals or family, and youth under 18 is $5/year.

- On time payment means eligibility for the annual incentive .
- Keep access to the members-only groups.io pages/information
- Receive members-only access/notifications on Night Sky Network
- Keep/get discount rates for popular astronomy magazines
- Borrow from the WASI scope/literature library

Files and club member correspondence & wiki links are found here: https://westminsterastro.groups.io/g/main. Remember to set your communication preferences.

Outreach/event calendar is found on: https://nightsky.jpl.nasa.gov/index.cfm. Set your communication preferences here as well.

Changed address, email or phone? Please update your information and send a message to the webmaster and/or treasurer@westminsterastro.org.

We meet monthly on the 2nd Wednesday of the month:
Back to Basics from 7:15 PM − 7:30PM; General Meeting 7:30PM − 9:30PM
Bear Branch Nature Center Carroll County; 300 John Owings Rd.; Westminster, MD 21158
Website: https://www.westminsterastro.org/ (Zoom info for hybrid meetings)