



# Howard Astronomical League Monthly Meeting

February 15<sup>th</sup>, 2024

# Tonight's Agenda, February 15<sup>th</sup>, 2024

- ⇒ • Introductions
- Announcements
  - 2024 Schedule of Star Parties
  - Looking for Inputs on All-Sky Cameras
  - Winter Star Party – Initial Trip Report – **Phil Whitebloom**
- Featured speaker – **Christine Hirst Bernhardt, Total Eclipse of the Heart: Is it Geometry, or Just a Phase**
- What's Out in the Sky This Month...
  - Shallow Sky – **Jim Tomney**
  - Space-Based Astronomy – **Wayne Baggett**
- Members' Astro-Images and Sketches
- Wrap-up & Discussion

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# HAL Star Parties...

## HAL's 2024 Scheduled Star Parties

Month	Date	Invitees
March	09	Members
March	16	Public
April	06	Members
April	13	Public
May	04	Members
May	18	Public
June	08	Members
June	15	Public
July	06	Members
July	13	Public
August	03	Members
August	10	Public
September	07	Members
September	14	Public
October	05	Members
October	26	Public
November	02	Members
November	09	Public



## Special Events This Year

- Eclipse on April 8<sup>th</sup>
  - HAL has no official event planned at the observatory
  - However, there may be an unofficial Impromptu caravan “day trip” being organized by Phil
  - HAL is/will be distributing eclipse glasses at the February and March Monthly meetings (nominally two per member)
- Stay tuned for info on other special events (IOTM night, etc.)

# 2024 Regional Star Parties/Events\*

- Staunton River Star Party (Spring), March 4-10. Staunton River State Park, VA. <http://chaosastro.org/starparty-home/>
- Northeast Astronomy Forum, April 20/21. Rockland Community College, NY <https://www.neafexpo.com/>
- South Jersey Astronomy Club Star Party, May 2-5. Belleplain State Forest, NJ <http://www.sjac.us/star-party/>
- Mega Meet at Pulpit Rock, May 3-5. Pulpit Rock, PA <https://lvaas.org/page.php?page=megameet>
- Northern Virginia Astronomy Club, Astronomy Day, May 4. <https://www.novac.com/wp/>
- York County Star Party #1 June 5-9. Susquehannock State Park in central Pennsylvania. <https://www.yorkcountystarparty.org/>
- Cherry Springs Star Party, June 6-9. Cherry Springs State Park, PA. <https://www.facebook.com/CherrySpringsStarParty/>
- Green Bank Star Quest, July 3- 6. Green Bank WV. <http://www.greenbankstarquest.org/>
- Astronomical League Convention, July 17-20. Kansas City, MO.
- Stellafane, August 1-4. Springfield, Vermont. <https://stellafane.org/>
- West Virginia Astrophotography Association Annual Conference August 2/3. Blackwater Falls State Park, WV.  
<https://www.facebook.com/WVAA1> <https://www.wvaa.us/>
- Almost Heaven Star Party August 30-September 3. Spruce Knob Mountain Center in Circleville, WV. <https://www.ahsp.org/>
- York County Star Party #2 September 4-8. Susquehannock State Park in central Pennsylvania. <https://www.yorkcountystarparty.org/>
- Blackwater Falls Astronomy Weekend, September 12-14. Blackwater Falls State Park, WV. <https://kvas.org/index.html>
- Northern Virginia Astronomy, Star Gaze, September 28. C.M. Crockett Park, Midland, VA. <https://www.novac.com/wp/>
- Staunton River Star Party (Fall), September 30-October 6. Staunton River State Park, VA. <http://chaosastro.org/starparty-home/>
- Black Forest Star Party. **No update as of February 14** <https://bfsp.org/>

\* Courtesy of Don Knabb, MERAL Chairperson

# Astronomy Festival on the Mall



PHYSICS AND ASTRONOMY

## ASTRONOMY FESTIVAL ON THE NATIONAL MALL

HOME > PHYSICS & ASTRONOMY - HOME  
> ASTRONOMY FESTIVAL ON THE NATIONAL MALL

Saturday, June 22, 2024, from 6-11 p.m.  
**7th to 9th Streets, SW**  
**In front of the Hirshhorn Museum**  
**Independence Avenue SW & 7th Street**  
**Metro: L'Enfant Plaza**

In association with the Smithsonian Solstice Saturday

**Free Admission**

EDUCATOR REGISTRATION

# 2024 Winter Star Party Initial Trip Report

- **Phil Whitebloom**

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Christine Hirst Bernhardt, PhD Candidate, Astronomy Professor, University of Maryland:

Topic: Total Eclipse of the Heart: Is it Geometry, or Just a Phase

## Christine Hirst Bernhardt

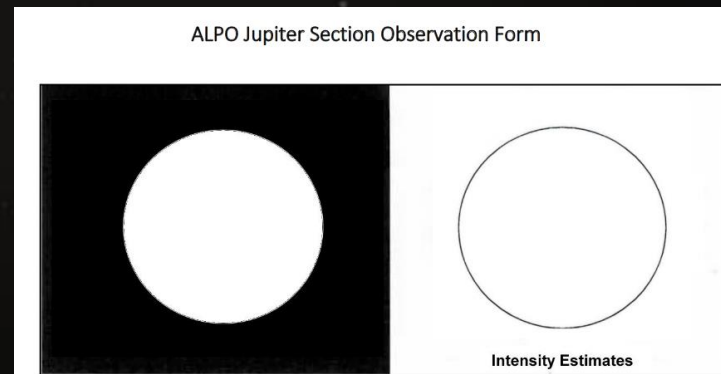
- Christine Hirst Bernhardt is a National STEM education leader and PhD candidate at the University of Maryland
- In 2021-2022 she served in Congress as an Albert Einstein Distinguished Educator Fellow to advance education policy initiatives
- Her passion for all things space fostered the Excellence in Astronomy Teaching award and participation on NASA's SOFIA mission.
- Christine identifies and addresses national needs in Earth and Space education as the chair of the National Astronomy Education Coordinator team and US member of the Global Leadership in Earth Science Education.
- Christine has developed programs and curricula such as a high-altitude balloon program, student space symposium and international space camp.
- She holds Master's in both Space Studies and Science Education.
- Her Doctoral research centers on international astronomy education and teacher learning with a social justice lens. She is interested in international science education and using Earth and Space topics as a gateway to STEM in early learning.

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# Shallow Sky Highlights for Feb-Mar 2024

- *Mercury, Venus, Mars, and Saturn are all poor targets currently – lost in the pre-dawn glow*
- *Jupiter is still a good target, starting at its highest point in the sky as soon as it emerges from the evening twilight.*
  - With Jupiter just past its Northern hemisphere solstice, try observing a shadow transit or occultation, sketching carefully its position on the globe. Hang on to it and repeat the observation in a couple years to document how the latitude at which the shadow appeared has shifted northward as the planet heads for its autumnal equinox.



# Comet 12P Pons Brooks

- Orbital period of 71 years (like Halley) – so now or never!
- Magnitude ~7 (but a history of outbursts!) => binoculars from Alpha Ridge?
- Should improve through April, possibly to 4<sup>th</sup> magnitude
- Well positioned for us in N. hemisphere through early April.

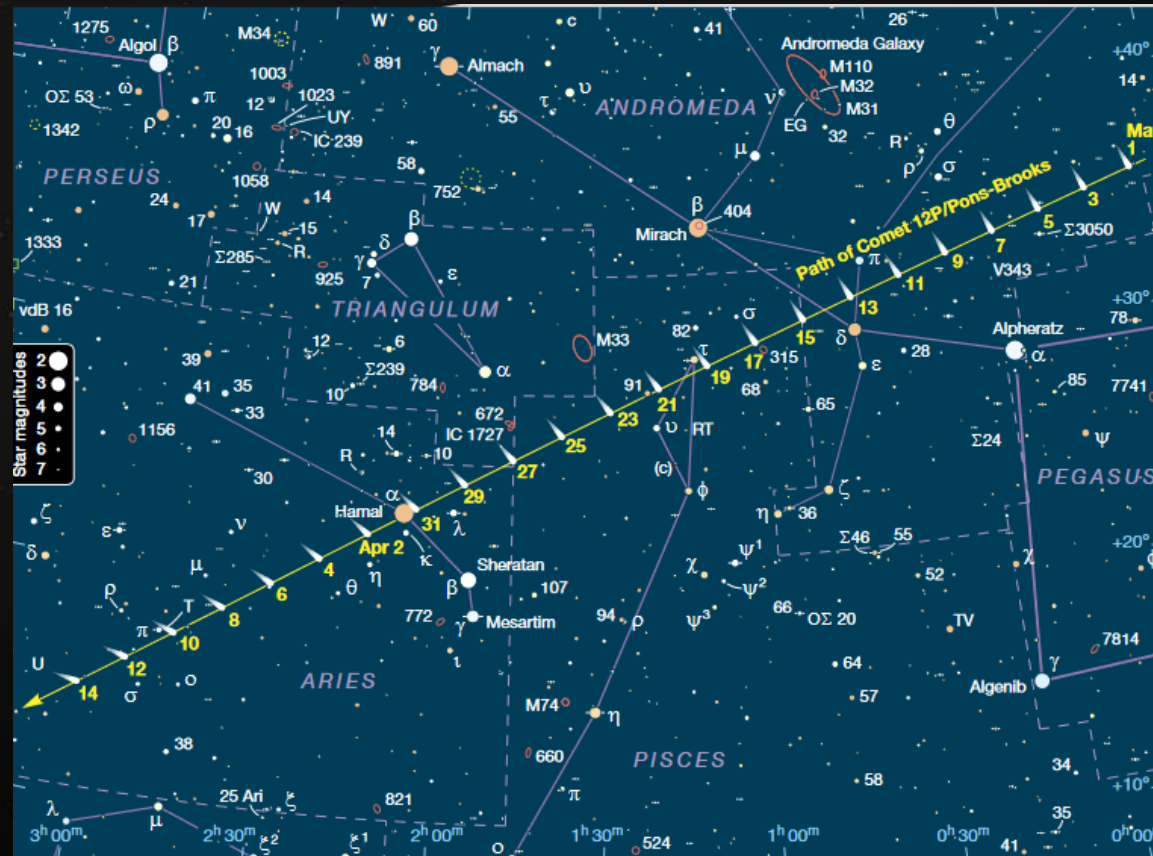


Image Credit: S&T Mar 2024, p.48

# Gemini Journey

## Finding Gemini

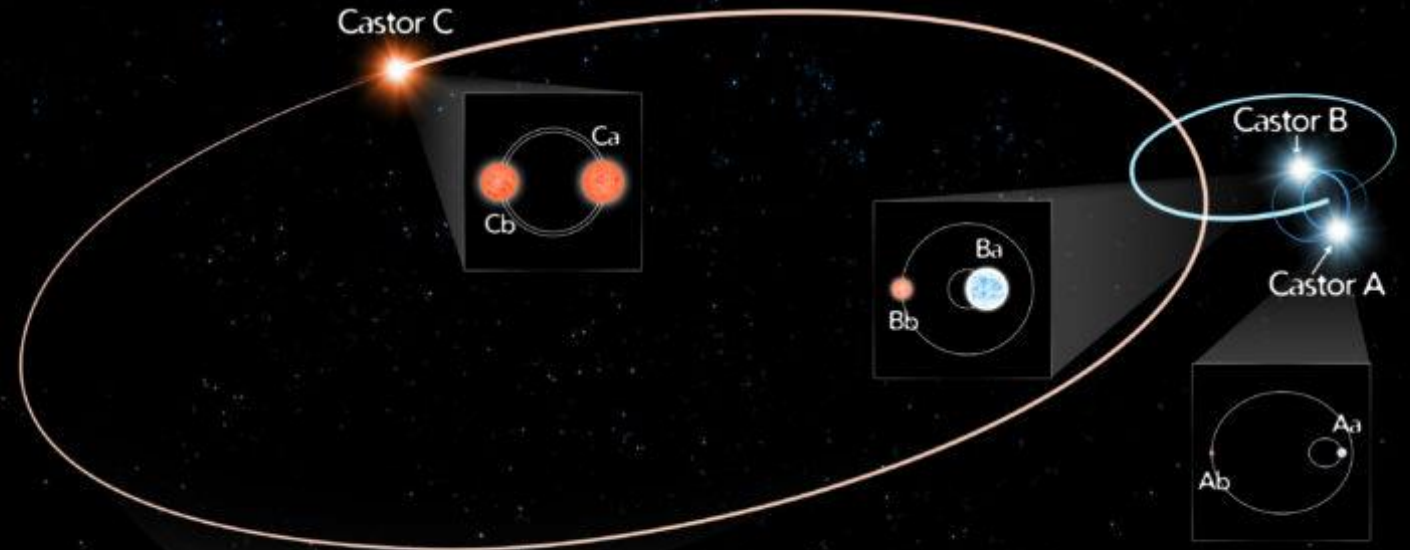
- 8pm ~ overhead
- Two 1<sup>st</sup> mag stars
  - Castor & Pollux
  - ~ 5° apart
- Above and to left of Orion
- Moon very close to Pollux on Feb 20<sup>th</sup>



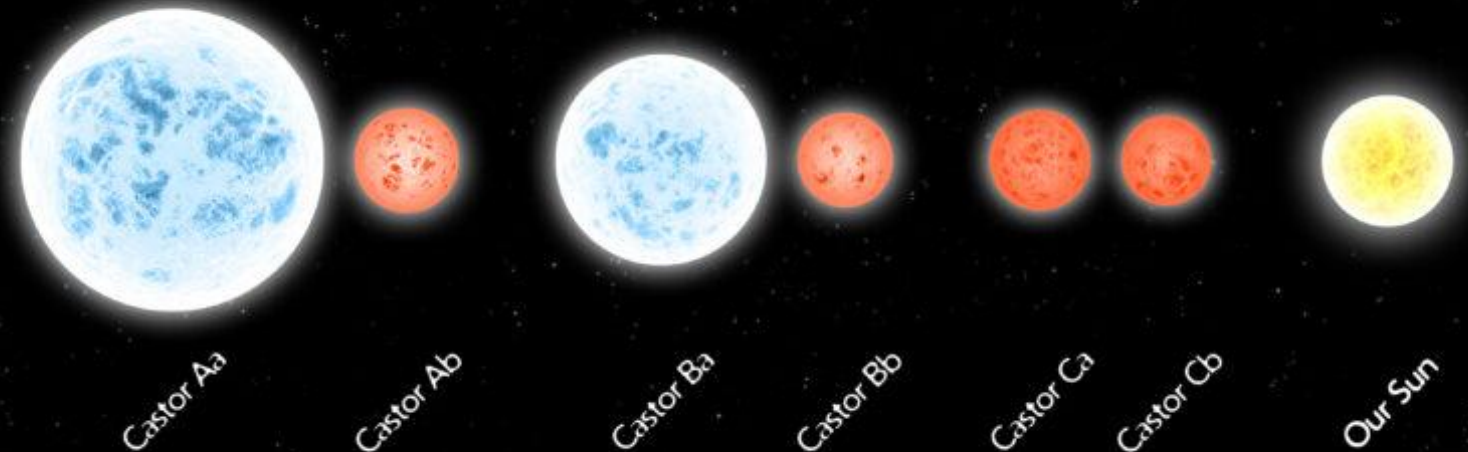
# Checking Out Castor

- A sextuple (6) star system! (but we can only see 3)
- Castor A – B currently have a separation of  $\sim 6''$  (High power in telescope)
  - Primary is 2<sup>nd</sup> magnitude
  - Secondary is 3<sup>rd</sup> magnitude
- Castor C (red dwarf) is a much dimmer 9.8 magnitude and  $73''$  away.
  - It's also known as YY Geminorum – a variable star that is an eclipsing binary

## CASTOR – THE 6-STAR SYSTEM

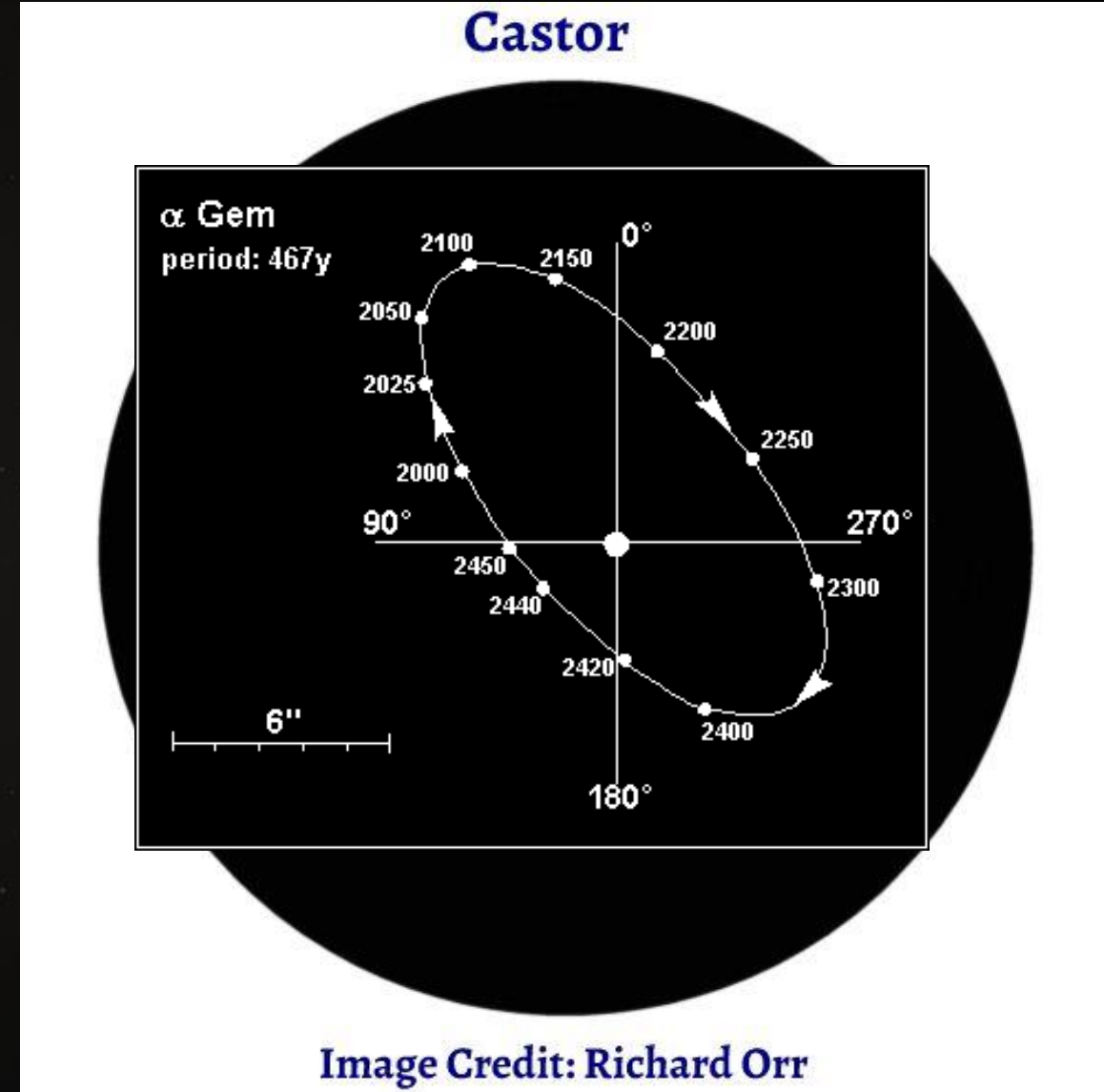


### SIZE COMPARISON



# Checking Out Castor

- A half century ago the distance between A and B was roughly 2''
- Today the two stars are at a different place in their orbit, making the separation about 6'' and gradually increasing with a decreasing Position Angle (PA)
- Castor holds the distinction of being the first true physical binary to be recognized as such (Herschel 1803), based on changes in the direction of the line joining the two stars observed over a few decades. This has been regarded by some as the first empirical evidence that Newton's laws of gravitation apply beyond the solar system.



# What's Up in Space: JWST's White Dwarf Exoplanets

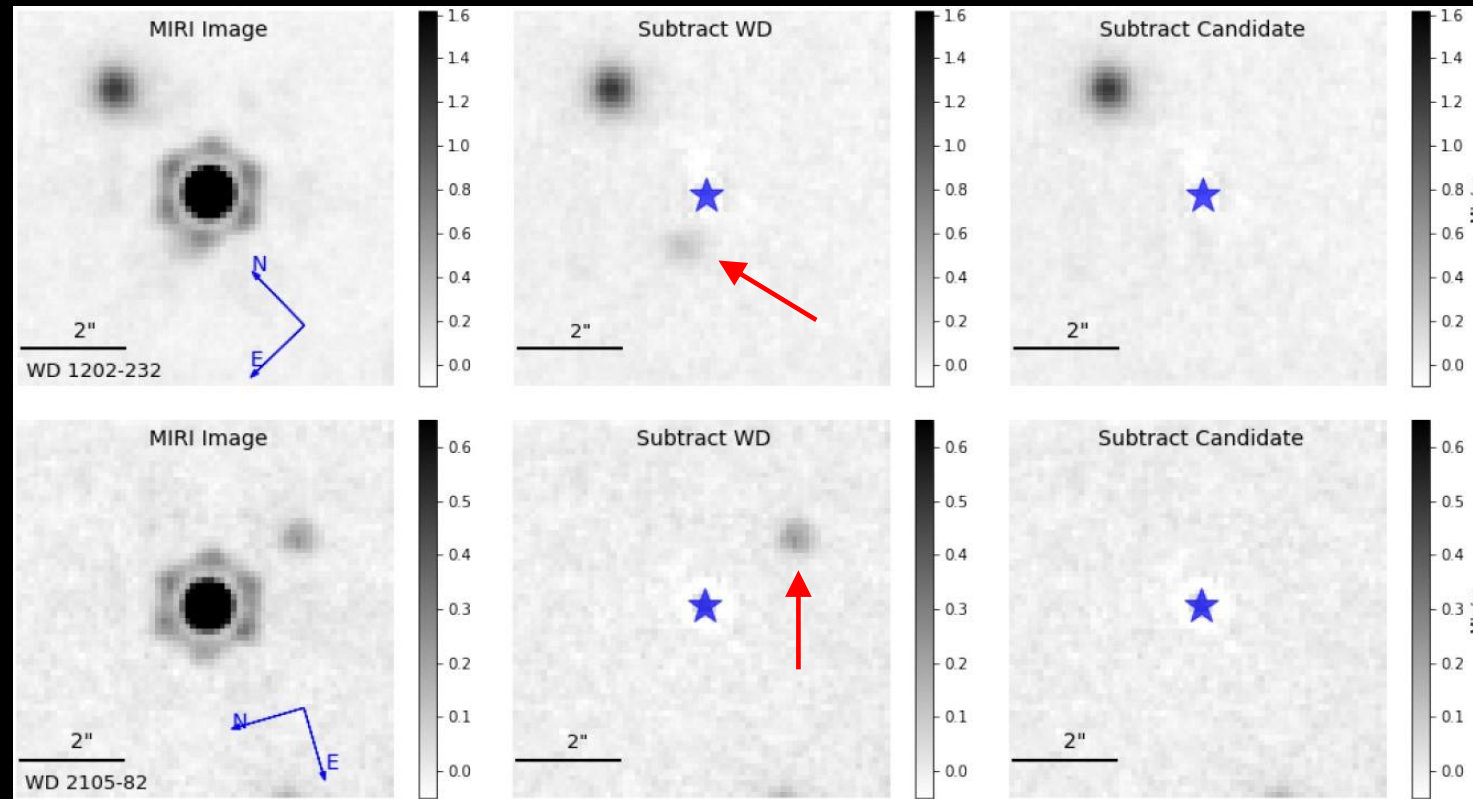
- Two white dwarf stars observed with JWST's Mid-IR Instrument (MIRI)
  - Both are metal-rich stars
  - $K_{\text{mag}}$  12.3 and 13.5
  - Masses  $0.6M_{\text{Sun}}$  and  $0.7M_{\text{Sun}}$  (Main Sequence masses  $1.3M_{\text{Sun}}$  and  $2.5M_{\text{Sun}}$ )
  - Ages 5.3Gyr and 1.6Gyr
  - Distances 10.43pc and 16.18pc (GAIA)
- Exoplanets identified via PSF subtraction
  - Separated from their WD hosts by 1.1arcsec and 2.1arcsec
  - Photometry used to estimate the planet masses by comparison with models
    - Expect exoplanets to increase in brightness with longer wavelengths
    - Shape of the energy distribution depends on the mass of the planet

# What's Up in Space: JWST's White Dwarf Exoplanets

Mullally, S. E., et al. 2024, accepted by *Astrophysical Journal Letters* (Figure 1);  
<https://arxiv.org/pdf/2401.13153.pdf>

11.47 AU, 1-7M<sub>Jup</sub>

34.62 AU, 1-2M<sub>Jup</sub>



- Further observations are needed to definitely exclude background sources (by observing common proper motion) and to further constrain the models of cool giant exoplanets
  - Probability of both candidates being background sources is about 1/3000

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Flame Nebula  
NGC2024  
Horsehead Nebula  
IC434

Celestron 14 SCT  
at f/2  
ZWO2600MC  
Optolong Ultimate filter  
3 section mosaic



Steve Gauss

7-Iris

6/14/2019

2147 to 2249

20-Massalia

1/26/2022

2026 to 2306



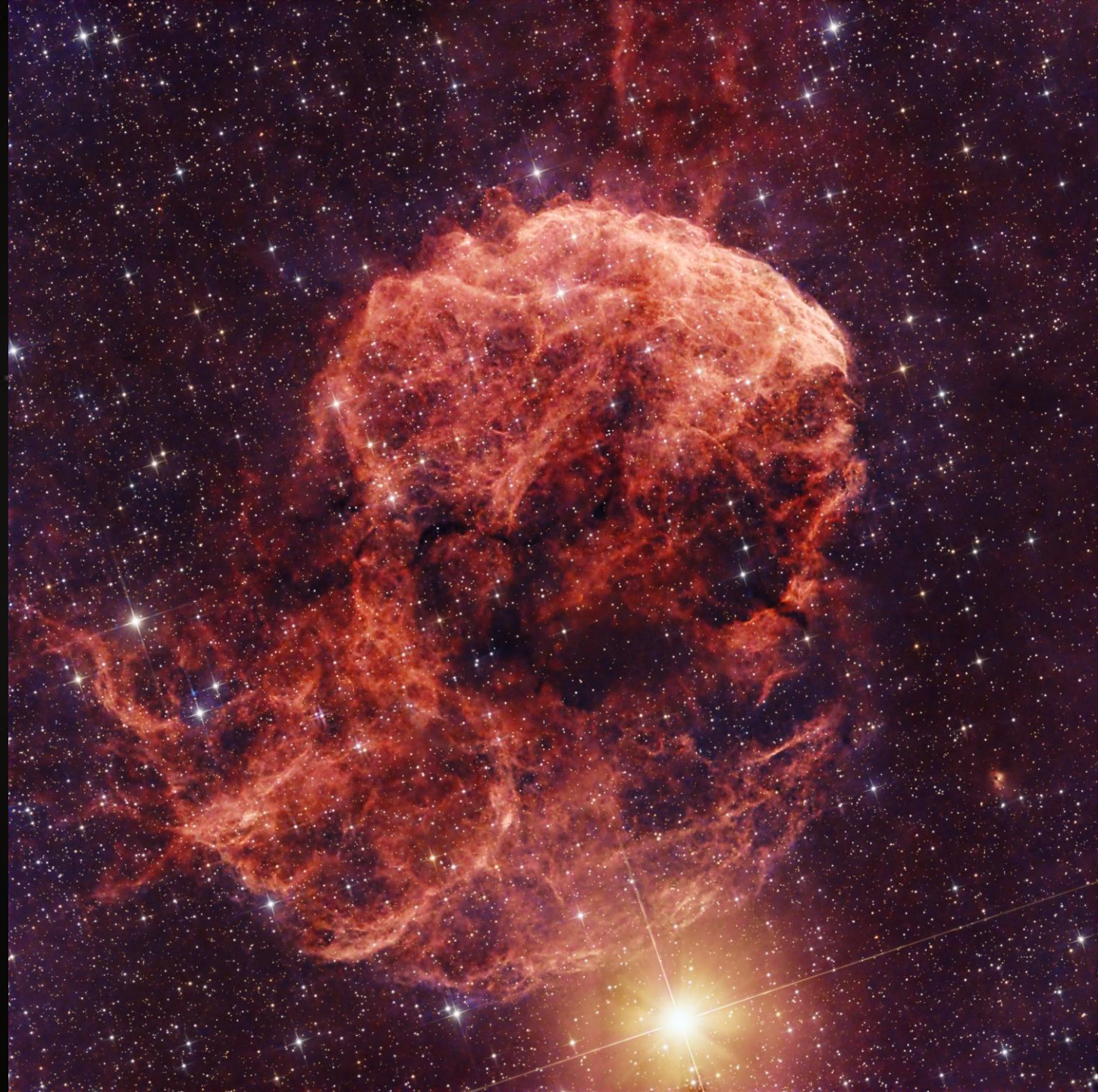
**Eta Carinae - 2024-02-06**

Jim Johnson

Winter Star Party 2024, Scout Key FL

TeleVue NP101is (4" f/5.4)





Mark Parsons

# Solar Eclipse – April 8, 2024

## 1. Eye and Sensor Safety

- Swift and permanent eye damage is possible when looking directly at the sun before totality
- Use proper filters for eyes and cameras

## 2. Path of totality

- Must be in the path at a location-specific time to see the corona.
- Closer to the path centerline = longer duration of totality

## 3. Plan/Arrangements

- Venues are booking quickly
- Complete plans and arrangements right away

## 4. Travel

- Millions will be travelling.
- Plan to be at your observing location hours before totality

# Solar Eclipse – April 8, 2024 (Cont.)

## 5. Imaging

- Best left for the pros in most cases.
- Easy to get distracted by a technical issue and miss what you worked so hard to see

## 6. Weather

- Need clear sky to see the corona
- Many other observables even under a cloudy sky

## 7. Observing Plan

- Know the celestial objects that will come out during totality and their locations
- Know the terrestrial observables and look for them

## 8. For more information:

- [\*An Amateur Astronomer's Guide to Solar Eclipses,\*](#)
- [\*HAL Lessons from the Great American Solar Eclipse of 2017,\*](#)