
# Howard Astronomical League Monthly Meeting

July 18th, 2024

# Tonight's Agenda, July 18th, 2024

- Introductions
- Announcements
  - Seestar Program
  - 2024 Schedule of Star Parties
  - Recent/Upcoming Outreach Events
  - Book of the Month – Krystal Rolon
- Featured speakers – Dr. Kelly Lepo - Two Years of Exploring the Universe with JWST
- What's Out in the Sky This Month…
  - Shallow Sky – Jim Tomney
  - What's up In Space – Wayne Baggett
- Members' Astro-Images and Sketches
- Wrap-up & Discussion

# Seestar S50 Loaner Program

HOWARD ASTRONOMICAL LEAGUE

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## HAL Seestar S50 Loaner Program

As announced by our president, Victor Sanchez, HAL is now offering a loaner-program for HAL members to check-out our ZWO Seestar S50 all-in-one smart telescope for their personal use. There is more detail on the Google form signup sheet linked below, but the highlights of the program are:

### Overview

- We have an online sign-up sheet for making the check-out request (thank you, VP Jim Tomney)
- Checkout period will be the duration between successive HAL meetings (approx. one month)
- Each month at the HAL public meeting conducted at the Robinson Nature Center, the Seestar will be given to the person in attendance who is highest on the list
- Once you check it out, it is expected that you will return it to subsequent meetings (work with the HAL observatory director if there is a problem)

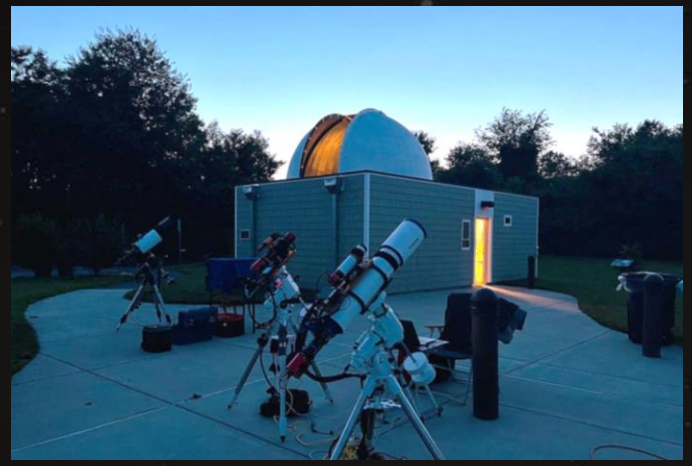
https://www.howardastro.org/seestar.php

| |
|---|
| ✓ Sundar Raghavachari |
| Salman Sheikh |
| Christopher Roper |

# 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 |



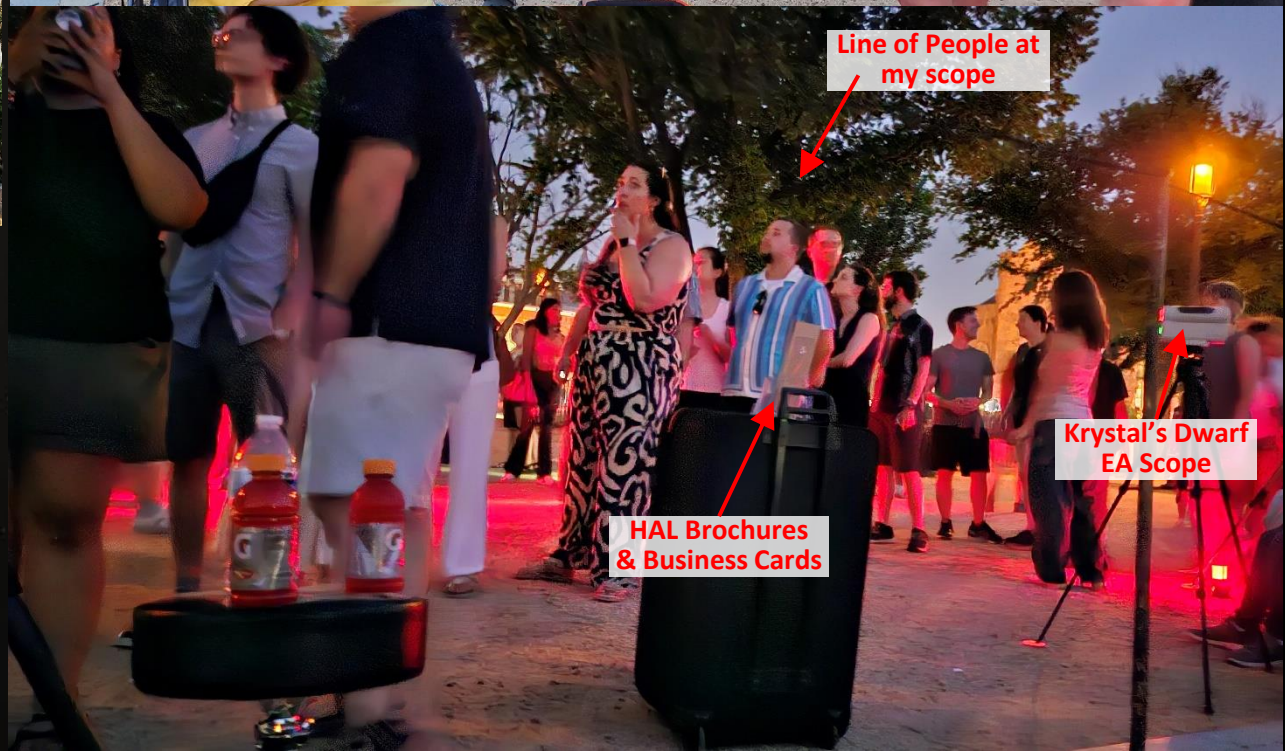
## Recent Events

- Last Saturday **public star party** drew over 100 guests despite the mostly cloudy skies.

Regional Star Party info…
https://skyandtelescope.org/astronomy-resources/annual-stargazing-events/

# June 22th Smithsonian Summer Solstice Astronomy Festival on the Mall in Washington, DC

## Thank you to HAL Members Krystal Rolon, Eric & Michelle Hymowitz, and Alin Tolea for supporting


- 1000s of People out on the Mall (museums open 'til midnight)
- Lots of Networking
  - Walked around booths and met people from numerous astronomy-related organizations
- Lots of Outreach
  - Had a line of 15 people at my telescope from 8:30 pm until 11:30 pm (mostly looking at M13) and handed out well over 100 HAL cards to Marylanders
- Some Issues w/Organization (booths moved inside due to heat dome)
- Next Year I'd like to return and set up an activities table

# June 29th HAL Observatory Maintenance & Clean-Up Day

## Thank you to Thorn Ransom, Ken Everhart and Gary Richardson for supporting

# Book of the Month

Title:

- Night Sky Atlas

Author:

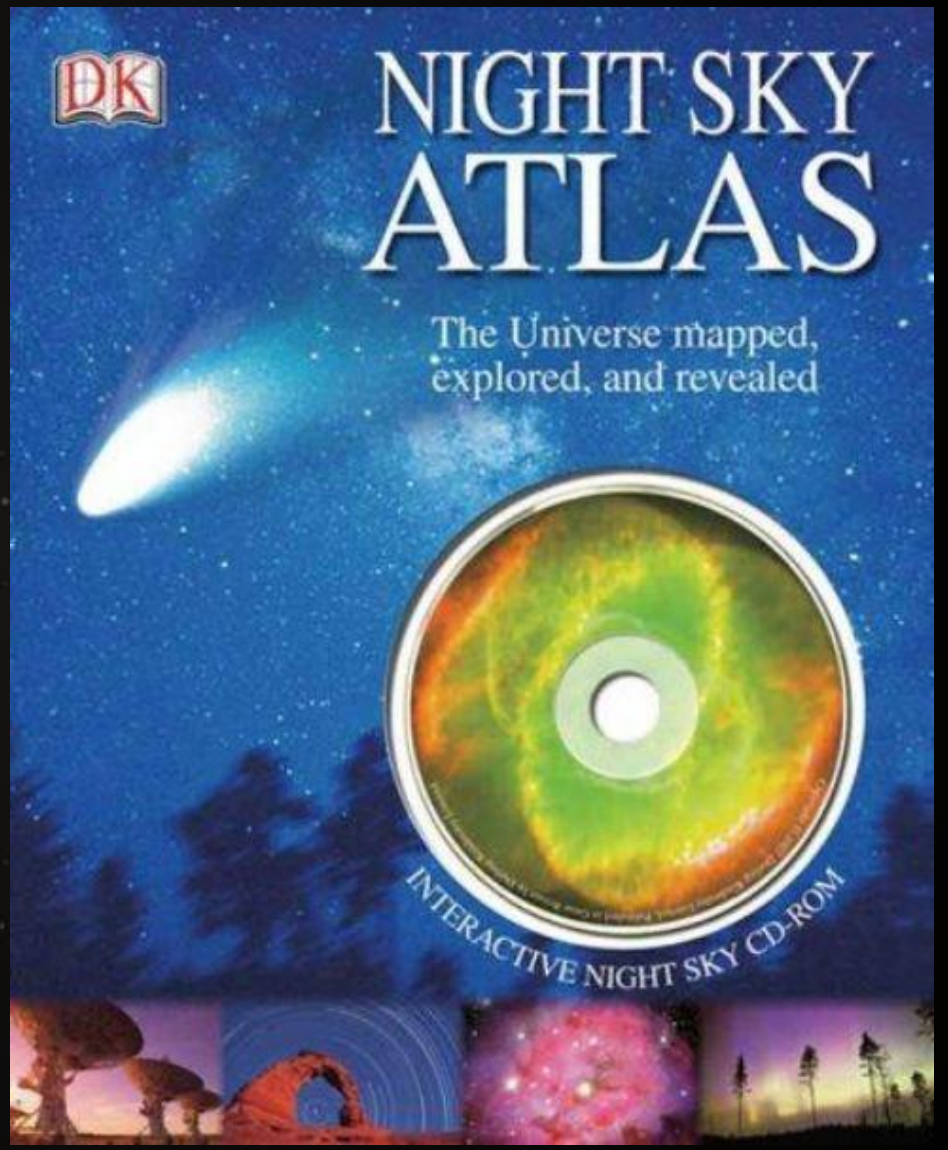
- Robin Scagell

Length:

- 96 pages

Audience Level:

- Beginner Friendly
- Intermediate
- Advance/Experienced



# Topic: Two Years of Exploring the Universe with JWST

## Dr. Kelly Lepo

- Education and Outreach Scientist at the Space Telescope Science Institute, supporting outreach efforts for the James Webb Space Telescope
- Graduate of University of Toronto with PhD in Astronomy & Astrophysics.
- During her time in Canada, she made numerous local and national media appearances to talk about everything from the 2012 Mayan Apocalypse to the Super Blue Blood Moon.
- She previously served as the Coordinator of the McGill Space Institute, taught physics at Gonzaga University, and was involved in the building of the Large Hadron Collider at CERN.

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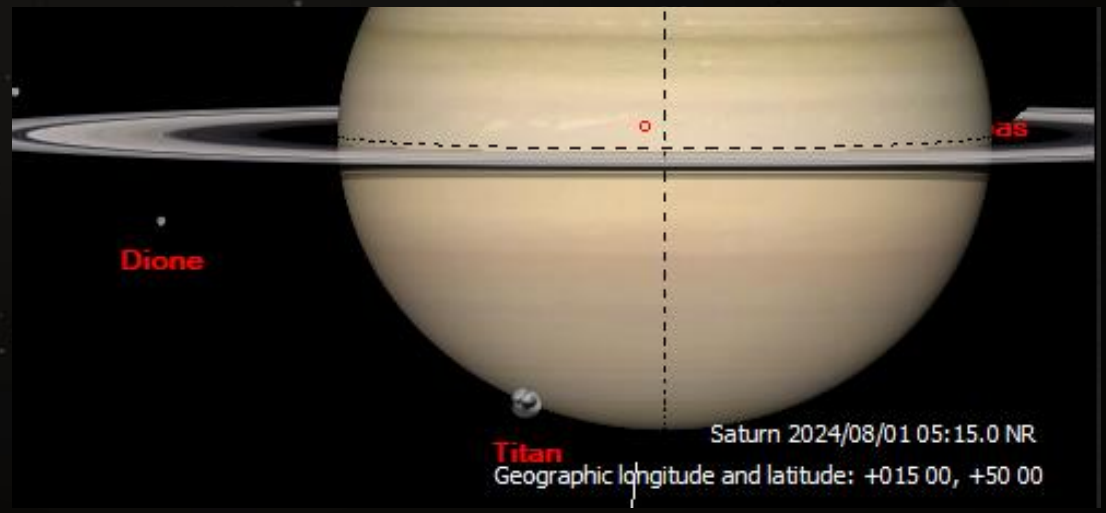
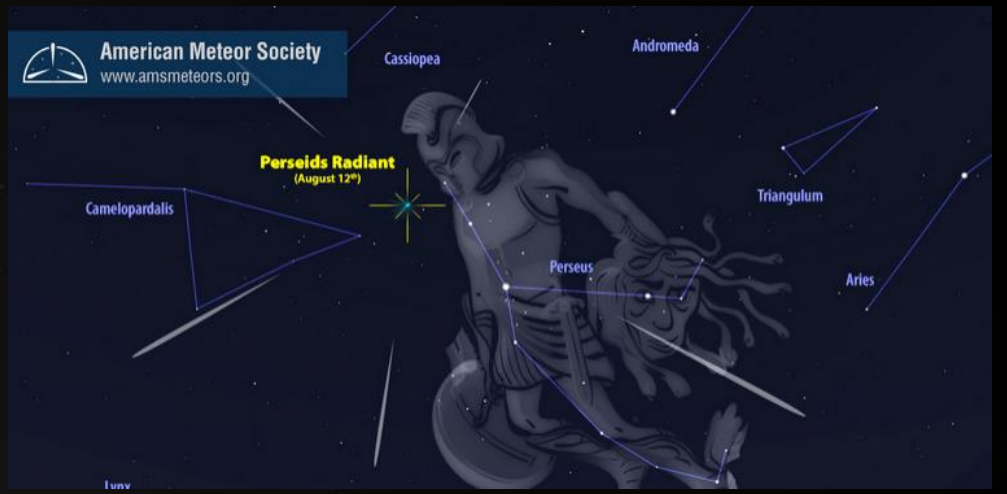
# Shallow Sky Highlights for July-August 2024

- *Mercury is currently in the evening sky, reaching greatest elongation this weekend. At only 13° above the horizon at sunset, it'll be a challenging target.*
- *Mars is tiny (5-6") as it makes its appearance in the early morning skies*
- *Jupiter is likewise climbing out of the solar glare and visible before sunrise*
- *Saturn is heading towards an early September opposition, starting to become a late-evening object for those who prefer not to drag the scope out in pre-dawn hours.*
  - ***Last Titan transit on early morning of August 1st at 1:15 AM***



# Perseids!




- One of the most reliable meteor showers – 60/hr
- Peak early morning of Tuesday August 13th
- First quarter Moon will set around midnight
- The days on either side of the peak can also see up to 20-30 meteors an hour. In 2021, there was an outburst the day after the peak that exceeded the peak.
- Find the darkest place possible in order to see the greatest number of meteors.
- Be comfortable – lounge chair works great. Don't forget a pillow and – depending on the temps – a light blanket. Insect repellant may be advisable as well.
- Binoculars are not needed but can allow you to inspect the "smoke train" that some of the brighter ones will leave.

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# What's Up in Space: Hubble Status

- One-gyro operations –
- Review of pointing control on HST
  - Slews performed by four reaction wheels
  - Magnetic torquer bars manage reaction wheel momentum buildup
  - Magnetometers measure the Earth's magnetic field
  - Suite of six rate gyros, used three at a time, monitor its pointing and track slews
  - Fixed Head Star Trackers look at the sky perpendicular to the optical axis and "plate solve" to determine the telescope's attitude
  - Three Fine Guidance Sensors refine the pointing and maintain it for science observations

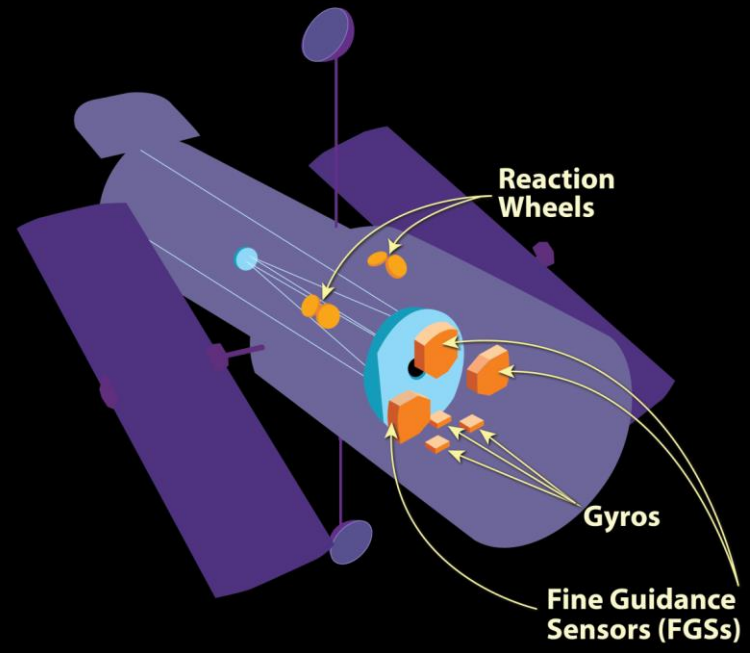


Image courtesy NASA from https://science.nasa.gov/mission/hubble/observatory/design/pointing-control/

# What's Up in Space: Hubble Status

- Alternate gyro modes developed years ago
  - In October 1999, HST dropped to two working gyros and science operations stopped until Servicing Mission 3b (December 1999) could replace them
  - In 2004 developed a two-gyro science mode, followed by a one-gyro mode
  - Two- and one-gyro modes allow science operations to be performed, and their use extends the life of the observatory
    - Both modes have reduced efficiency of science observations
      - Longer slew times
      - Reduced initial pointing accuracy
      - Reduced sky coverage
      - Impacts on certain operational modes
      - Observing efficiency in one-gyro mode is degraded by about 12%, and overall productivity decreases by 20% to 25%

# What's Up in Space: Hubble Status

- Current gyro status
  - Servicing Mission 4 (May 2009) installed 6 new gyroscopes
  - Three of these gyroscopes have failed
  - One of the remaining gyros is misbehaving
    - HST has repeatedly entered "safe mode" in the last 6 months
    - Safe mode interrupts the science program – observations stop
    - Safe mode recovery is hard on the operations staff

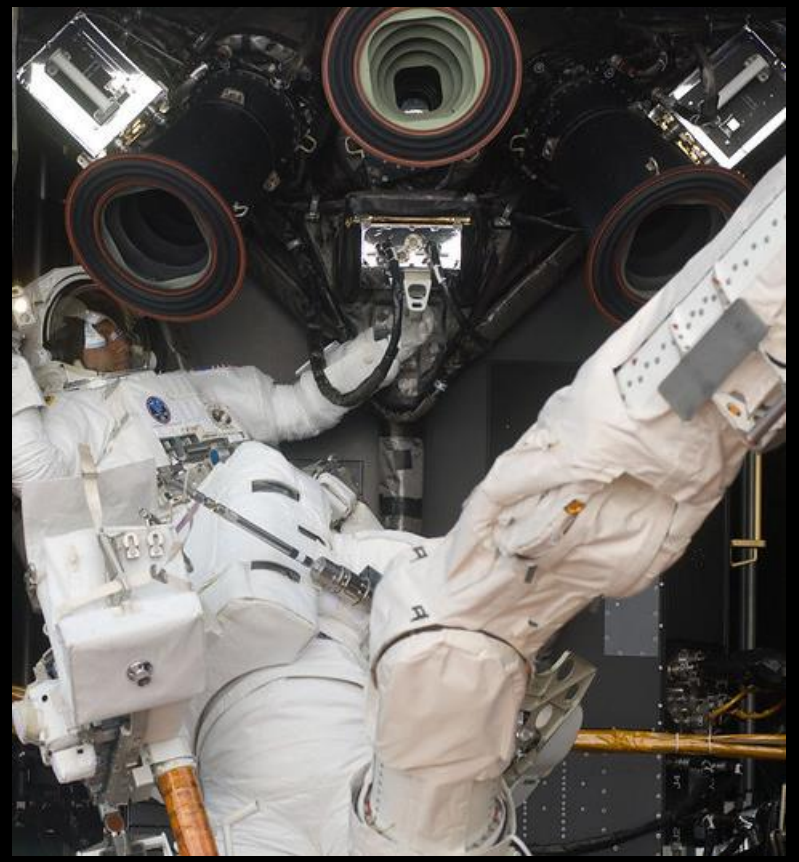

Image courtesy NASA from https://www.flickr.com/photos/nasahubble/33937007958/in/album-72157670398668456/

# What's Up in Space: Hubble Status

- How one-gyro operations work
  - Magnetometers and sun sensors replace the two "missing" gyros
    - Along with the one operating gyro these sensors get to within about 10 degrees of the desired pointing
  - The FHSTs then take over and get the pointing to within a few tens of arcsec
  - The FGSs then obtain the guide stars and update the pointing to around 20mas
    - They then maintain the pointing through the observation
  - The other remaining good gyro is not in use, saving it for a time when it is needed to continue science operations
    - The two gyros are expected to allow operations to continue for at least 5 more years

# What's Up in Space: Hubble Status

No decisions have been made!

- Operations Paradigm Change Review (OPCR) –
- NASA's Astrophysics Division (APD) is facing "reduced funding"
  - Among other actions, APD plans to balance "… investments in missions under development and future missions, against funding for large missions in *extended* science operations." (emphasis added)
  - The OPCR "… will assess proposed options for approaches to continue operations of missions in the *extended* operations phase, with reduced funding as proposed in the FY2025 President's Budget." (emphasis added)
  - They are specifically assessing the potential for limited productivity and decreased operating efficiency of the HST and Chandra missions under the budget realities
  - No decisions have been made yet – the review is ongoing
  - Possible decisions could be to maintain the status quo, restructure the project(s), or terminate the mission(s)

Source: https://science.nasa.gov/wp-content/uploads/2024/04/clampin-apd-apac-march2024.pdf

# What's Up in Space: Hubble Status

- The Space Telescope Science Institute is adopting the following principles in their planning for HST, should NASA direct reductions:
  - Maintain unique UV/optical capabilities;
  - Maintain essential mission operations (including standard calibrations and archive support);
  - Maintain community grants for science (at a reduced level), if possible;
  - Maintain support for broad community access, avoiding bias and inequity.
- Possible HST actions include (not a complete list!)
  - Halting of WFC3/IR operations - based on redundancy with JWST.
  - Halting of ACS/WFC operations - based on redundancy with WFC3/UVIS.
  - Reduction in support for outreach/science communication.
  - Potential cuts to other instruments or modes within instrument teams.

**No decisions have been made!**

Source: https://www.stsci.edu/contents/newsletters/2024-volume-41-issue-02.newsletter-detail.html

# What's Up in Space: Hubble Status

- OPCR: What's Next?
  - Astrophysics Advisory Committee meets July 23, 24, 2024
    - Meeting open to the public via telephone (using WebEx)
    - Instructions for joining the teleconference can be found at

https://science.nasa.gov/wp-content/uploads/2024/07/apac-july-2024-draft-agenda-if.pdf

    - OPCR planned to be discussed from 11:00am to 12:15pm on Tuesday, July 23
      - Public comments scheduled from 12:00pm to 12:15pm
    - Anonymous public comments may be added and upvoted by the public before the meeting at

https://nasa.cnf.io/sessions/dxmy/#!/dashboard

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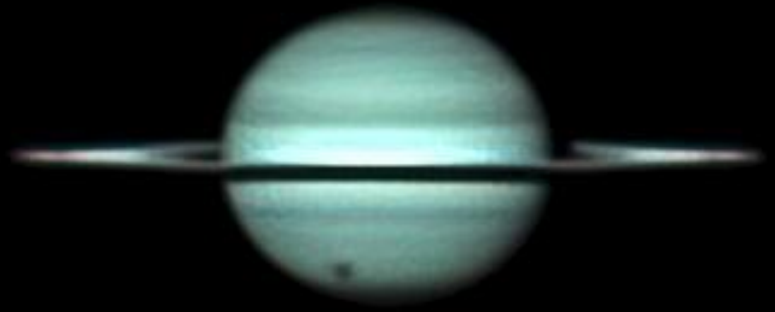
Jim Johnson

Saturn 2024-07-16 07:39.7 UT
CMI=252° CMII=72° CMIII=356°
Seeing: 4/10 Trans:7/10

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*Jim Tomney*
*Towson, MD US*

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# Thank you!