

# Star Dust

Newsletter of National Capital Astronomers, Inc.

[capitalastronomers.org](http://capitalastronomers.org)

November 2024

Volume 83, Issue 3

**Celebrating 87 Years  
of Astronomy**

## Next Meeting

**When:** Sat. Nov. 9th, 2024

**Time:** 7:30 pm

**Speaker:** Dr. Brian Williams

**Where:** In-Person (UMD Obs.) and  
Online (Zoom)

See instructions for joining the  
meeting via Zoom on Page 9.

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This Webb Space Telescope image of Westerlund 1, the largest known star cluster in our galaxy, is quite an impressive sight. More info on the image can be found at [www.flickr.com/photos/nasawebbtelescope/54043097600/in/album-72177720313923911/](https://www.flickr.com/photos/nasawebbtelescope/54043097600/in/album-72177720313923911/).

## Annual Membership Dues are **Past Due**

Instructions to join NCA or renew your membership, are available at [capitalastronomers.org/](http://capitalastronomers.org/) (top right corner). Please fill out the electronic form! Dues payment is electronic (preferred!) or by check (see information for doing so on Page 8). Please support NCA by applying for or renewing your membership at this time to continue receiving Star Dust.

**Thank you!**

## XRISM: A New Window into the X-ray Universe

*Dr. Brian Williams – NASA's Goddard Space Flight Center*



**Image Credit - NASA**

At 23:42 UTC on September 6th, 2023, the X-ray Imaging and Spectroscopy Mission (XRISM) lifted off from Tanegashima Space Center in Japan, ushering in a new era of high-energy astrophysics. XRISM, an international JAXA/NASA collaboration including participation from ESA, is an advanced X-ray observatory capable of carrying out a science program that will address some of the most important questions in astrophysics in the 2020s. XRISM is essentially a rebuild of the Hitomi (Astro-H) spacecraft that was lost due to an operational mishap early in the mission in 2016. Resolve, the primary instrument on XRISM, is a high-resolution, non-dispersive X-ray spectrometer operating between 0.3-12 keV, providing high-resolution (~5 eV) spectroscopic capabilities in this critical energy band with a response peaking around the ubiquitous 6.4 keV Fe K-alpha line. A wide-field imager, Xtend, will offer

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## Recent Astronomy Highlights

### Might Reionization Have Ended Earlier Than Previously Thought?

It seems like every other day, articles come out suggesting that readings gathered by the James Webb Space Telescope are calling into question long-held theories about the Universe. Now JWST seems to be doing that for one of the earliest epochs. From the Big Bang to approximately 380,000 years later, the Universe was comprised of plasma made up mostly of hydrogen and helium with trace amounts of other elements. As the Universe expanded, the plasma cooled, until around 380,000 years ago when it had cooled enough for the free electrons and protons in the plasma to form neutral hydrogen atoms. This transformation is known as the era of Recombination. With neutral hydrogen, it is believed that around 100 million years later, the first enormous stars began to form. Around 300 million years later such stars and early galaxies were emitting light energetic enough, and in sufficient amounts, to break the bonds between the protons and electrons in the hydrogen, once again forming plasma, a time known as the Epoch of Reionization. It has long been thought that this period ended approximately one billion years after the Big Bang, when basically all of the neutral gas was reionized. However, observations with the James Webb Space Telescope seem to indicate that there were far more galaxies present in the early Universe, emitting more ionizing radiation than was previously suspected, such that the Epoch of Reionization may have ended hundreds of millions of years earlier than previously suspected. What does this mean for the Universe? One consequence is that the more energetic plasma would have been harder to condense into smaller galaxies, leading to the preferential growth of larger galaxies. More information on these findings can be found at

[www.techno-science.net/en/news/james-webb-upends-our-understanding-of-the-universe-again-reionization-in-question-N25822.html](http://www.techno-science.net/en/news/james-webb-upends-our-understanding-of-the-universe-again-reionization-in-question-N25822.html)

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*Abstract and Biography – continued from page 1*

simultaneous coverage over nearly a 40' square field of view, with ~1' spatial resolution. XRISM will study all manner of astrophysical objects, including galaxies and clusters, AGN, X-ray binaries, supernova remnants, transient phenomena, stars, and the interstellar medium. In this talk, I will highlight some of the scientific topics that XRISM will address, in addition to providing a general status update on the mission. I will discuss the synergies between high-resolution X-ray spectroscopy and observations at other wavelengths, including optical, radio, and IR.



**Biography:** Dr. Brian Williams is an Astrophysicist in the X-ray Astrophysics Laboratory at NASA's Goddard Space Flight Center. He earned a B.S. in Physics from Florida State University and a Ph.D. in Physics from North Carolina State University. He came to Goddard in 2012. In 2017, he moved to the Space Telescope Science Institute in Baltimore, MD, where he worked in mission support for both the Hubble and JWST missions. In 2018, he returned to Goddard, where he currently works as the NASA Project Scientist for XRISM. From 2020-2022, he served as Chief Scientist for the Physics of the Cosmos Program Office at NASA. Dr. Williams was a 2020 recipient of the NASA Early Career Achievement Medal. He has approximately 90 refereed publications with approximately 4000 citations.

## Schedule of Upcoming NCA Meetings and Speakers

*Carl Biagetti*

November 9, 2024 -- Brian J Williams (GSFC) **A New X-ray Eye on the Sky: XRISM**

December 14, 2024 -- Geoff Chester (USNO) **Sky With Ocean Joined: Scaling the Stars at the U.S. Naval Observatory, 1830 to the Present**

January 11, 2025 -- Thomas Brown (STScI) **The Andromeda Galaxy**

February 8, 2025 – TBD

March 8, 2025 -- Heidi Hammel (AURA) - **Exploring the Solar System with the James Webb Space Telescope**

## Exploring the Sky



The Exploring the Sky program will take a hiatus until April of 2025.

**Exploring the Sky** is a joint program between the National Capital Astronomers and the National Park Service Rock Creek Park Nature Center and has been run since 1948 at this location, the field at the corner of Glover and Military Roads in the District. There is an adjacent parking lot. It is free and all are welcome who have an interest in observing the heavens. It's not an ideal dark-sky location but we can see Solar System objects, open and globular clusters and maybe a fuzzy galaxy or two.

More information can be found at NCA's web site, [www.capitalastronomers.org](http://www.capitalastronomers.org) or the Rock Creek Park web site, [www.nps.gov/rocr/planyourvisit/expsky.htm](http://www.nps.gov/rocr/planyourvisit/expsky.htm). You can also call the Nature Center at (202) 895-6070. For general information on local astronomical events visit [www.astronomyindc.org](http://www.astronomyindc.org).

**The submission deadline for December's Star Dust, is November 29th.**

**Clear Skies**

## President's Corner

*Guy Brandenburg*

I've had the opportunity to work with some younger NCA members in doing some daytime and nighttime sidewalk astronomy at a variety of venues in and around DC Public astronomy events. It can be physically exhausting, but the expressions of amazement and gratitude, particularly when folks see the Sun in hydrogen alpha for the first time, are very rewarding. In particular, I'd like to thank Zach Gleiberman, Chong Wang, and Gael Gomez for their initiative and enthusiasm.



By the time this issue of Star Dust reaches its readers, we will have completed our last regular 'Exploring the Sky' session in Rock Creek Park, and we probably will know who will be the next President of the US. I hope it's not a science denier.

Meanwhile, NCA has now shipped over seven thousand eclipse glasses to Algeria for roughly six cents a pair.

## Viewing the April 8, 2024 Total Solar Eclipse from Shelburne, Vermont

*Jeff Guerber*

The total solar eclipse on Monday, April 8 took a path across the US, passing from Mexico into southern and middle Texas, then crossing SW Oklahoma, middle Arkansas, far SE Missouri, southern Illinois and Indiana, western and northern Ohio, Erie PA, upstate New York, northern Vermont and New Hampshire, and finally northern Maine, before exiting into New Brunswick. Lakes Erie and Ontario were almost entirely within the path. The path ranged from about 100 to 120 miles wide, depending on location along the path. Crucially, the chance of clouds increased steadily going from Texas to New England, which had a high likelihood of clouds.

I should perhaps mention that if you are anywhere outside the path, even by possibly just hundreds of yards, you'll miss the best part of the show! In particular, you won't get to see the delicate white corona, because the remaining full-strength sunlight will completely swamp it. (And with ANY

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# Sky Watchers

## November/December

Mercury will appear very low in the sky after sunset, reaching greatest eastern elongation on Nov. 16 <sup>th</sup> (see below). Venus will be higher than Mercury in the evening sky. Mars rises late in the evening. Jupiter will rise early in the evening, finally reaching opposition on Dec. 7 <sup>th</sup> (see below). Saturn will be high in the eastern sky at sunset, having a conjunction with the Moon on 10/14 (see below). As of the writing of this column, there is still no sign of the expected nova of T CrB.	
11/10	Moon–Saturn Conjunction – The Moon and the ringed planet will appear approximately 4.7 arcminutes apart, less than one sixth of the diameter of the full Moon, at their closest approach which takes place at 8:38 p.m.
11/11	Lunar Occultation of Neptune – In the DC area, the Moon will pass in front of Neptune at 7:02 p.m. Neptune will reappear from behind the Moon at 10:48 p.m.
11/15	Full Moon and Supermoon – 5:30 p.m.
11/16	Mercury will be at greatest eastern elongation, 22.5 degrees from the Sun in the evening sky.
11/17-18	The Leonids Meteor Shower peaks from the evening of the 17 <sup>th</sup> into the morning of the 18 <sup>th</sup> with approximately 15 meteors/hour. Unfortunately, a nearly full Moon will cause less than ideal viewing conditions throughout the night.
12/7	Jupiter reaches opposition and will be viewable throughout the night.
12/13-14	The Geminids Meteor Shower peaks on the evening of the 13 <sup>th</sup> into the morning of the 14 <sup>th</sup> with approximately 120 meteors/hour. Unfortunately, a nearly full Moon will make viewing conditions less than ideal. Best viewing will be in the early morning hours.

All times are in EST (Eastern Standard Time)

[Viewing the April 8, 2024 Total Solar Eclipse... – continued from page 3](#)

full-strength sunlight, it would be dangerous to even try!) And of course, it is CRUCIAL to use proper filters such as eclipse glasses during the partial phases before and after totality.

I hadn't made firm plans for where to go for the eclipse, but was tentatively planning to drive to Columbus or Canton, Ohio, both of which were near the southern edge, accessible, and had reasonable weather prospects, then driving deeper into the path on eclipse morning. But about a week beforehand, the short-range weather forecasts came out, revealing that there would be a frontal system from Texas to the Midwest and clear weather in New England! So, I called up an old family friend, Sharon, who is now retired and living in SW Vermont near the New York state line, outside the path but well within driving distance of it. Sharon enthusiastically agreed to put me up for a few nights. This would be my fourth total solar eclipse (following 1991 in Mexico, 1998 in Curacao, and 2017 in Kentucky), and Sharon's first.

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[Recent Astronomy Highlights – continued from page 2](#)

### Supernova H0pe



**NASA, ESA, CSA, STScI, B. Frye (University of Arizona), R. Windhorst (Arizona State University), S. Cohen (Arizona State University), J. D'Silva (University of Western Australia, Perth), A. Koekemoer (Space Telescope Science Institute), J. Summers (Arizona State University).**

A supernova that took place approximately 10.3 billion years ago has been designated Supernova H0pe due to the hope that it could help resolve the Hubble Tension, a difference in separate measurements of the Hubble Constant ( $H_0$ ), which quantifies the expansion rate of the Universe. The difference is between results of studies of the Cosmic Microwave Background and studies of Cepheid Variables and supernovae in nearby galaxies. In the above image, three circled dots are gravitationally lensed images of Supernova H0pe. The light of those images traveled different paths and distances and therefore the images show slightly different phases of that supernova. These differences have been used to infer a Hubble constant value close to the one derived from studies of nearby supernovae. More info is at [www.space.com/james-webb-space-telescope-hubble-tension-supernova-hope](http://www.space.com/james-webb-space-telescope-hubble-tension-supernova-hope).

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# Occultation Notes

- D following the time denotes a disappearance, while R indicates that the event is a reappearance.
- The times are for Greenbelt, MD, and will be good to within +/-1 min. for other locations in the Washington-Baltimore metropolitan areas unless the cusp angle (CA) is less than 30 deg., in which case, it might be as much as 5 minutes different for other locations across the region.
- Some stars in Flamsteed's catalog are in the wrong constellation, according to the official IAU constellation boundaries that were established well after Flamsteed's catalog was published. In these cases, Flamsteed's constellation is in parentheses and the actual constellation is given in the notes following a /.
- Mag is the star's magnitude.
- % is the percent of the Moon's visible disk that is sunlit, followed by a + indicating that the Moon is waxing and - showing that it is waning. So 0 is new moon, 50+ is first quarter, 100+ or - is full moon, and 50- is last quarter. The Moon is crescent if % is less than 50 and is gibbous if it is more than 50. E indicates a lunar eclipse is in progress, and the value is the percent of the Moon's disk that is NOT in the umbra. So 0E means during the total phase.
- Cusp Angle is described more fully at the main IOTA Web site.
- Sp. is the star's spectral type (color), O,B,blue; A,F,white; G,yellow; K,orange; M,N,S,C red.
- Also in the notes, information about double stars is often given. "Close double" with no other information usually means nearly equal components with a separation less than 0.2". "mg2" or "m2" means the magnitude of the secondary component, followed by its separation in arc seconds ("), and sometimes its PA from the primary. If there is a 3rd component (for a triple star), it might be indicated with "mg3" or "m3". Double is sometime abbreviated "dbl". Often, rather than the separation, I give "dTime" or "dT", the time difference of the secondary star occultation relative to the primary star's occultation.
- Sometimes the Axis angle (AA) is given. It is the angle measured around the Moon's disk, from the Moon's axis of rotation. It can be used with a lunar map to tell where a star will reappear relative to lunar features.

# Mid-Atlantic Occultations

David Dunham

2024		Star		Asteroidal Occultations		Asteroid		dur.		Ap.		Location	
Date	Day	EST	Cat.	Mag.	#	Name	dmag	s	"	"	"		
Nov 9	Sat	1:14	TYC	9.7	3902	Yoritomo	7	2.0	4	nRm, Lb, Bb, Ro, VA			
Nov 10	Sun	3:16	TYC	9.4	76813	2000 QC164	11	0.5	4	Ff, Ax, VA; SDC; UM, MD			
Nov 11	Mon	21:42	UC4	12.7	165682	2001 OY65	6	0.8	7	Ph, PA; Bw, MD; DC; nVA			
Nov 14	Thu	3:42	UC4	12.8	2249	Yamamoto	3	3	8	SDE, CMD, DC, nVA, SOH			
Nov 16	Sat	21:57	TYC	9.5	4059	Balder	7	2.0	3	Hr, Gb, PA; Tm, MD; HbV			
Nov 17	Sun	23:50	TYC	11.8?	7607	Billmerline	6	4	8	Lg, VA; RV, Lr, SP, MD?			
Nov 19	Tue	2:07	TYC	10.2	222	Lucia	5	4	4	SNJ, SDE, CMD, DC, nVA			
Nov 23	Sat	0:22	UC4	10.3	33585	1999 JC38	8	0.9	4	nBt, Cb, MD; PV, SC, VA			
Nov 26	Tue	6:23	TYC	9.9	4791	Ohre	7	1.5	4	NP, OH; Ht, Bt, CH, MD			
Nov 29	Fri	5:56	TYC	9.9	3232	Brest	8	0.6	4	wPA; Fd, Co, GB, WM, MD			
Nov 29	Fri	20:45	UC4	11.9	6642	Henze	4	3	6	ACY; UM, MD; SDC; wbVA			
Nov 29	Fri	23:27	SAO	8.2	3122	Florence*	7	0.3	3	nWr, Hr, PA; DE; SH, NJ			
Dec 1	Sun	19:07	TYC	10.4	812	Adele	5	1.1	4	SMC, MD; Tp, Rm, VA			
Dec 1	Sun	21:35	UC4	11.0	3870	Mayre	6	1.0	5	Bw, MD; DC; Ax, Sn, VA			
Dec 5	Thu	21:50	UC4	11.9	513	Centesima	2.1	6	6	SNJ, CMD, DC, nVA, CAR			
Dec 8	Sun	23:44	UC4	11.1	75	Eurydike	1.7	5	5	SDE, CMD, SDC, nVA			
Dec 9	Mon	5:01	TYC	12.1	691	Lehigh	1.6	7	6	ec+nVA, sw-nMD, DC			
Dec 9	Mon	23:22	SAO	8.4	888	Parysatis	4	6	2	cVA, CWV, swOH, nMO			
Dec 15	Sun	19:52	TYC	9.0	679	Pax	2.8	4	3	SNJ, nDE, neMD, SPA			

\* after the asteroid name is for a valuable near-Earth asteroid

## Lunar Grazing Occultations

Date	Day	EST	Star	Mag	% alt	CA	Dist. & azimuth from Greenbelt
Nov 23	Sat	3:21	SAO 99162	8.7	47- 41	9S	46km, az. 14 deg.
Dec 4	Wed	18:58	ZC 2914	4.8	14+ 4	19S	174km, az. 322 deg.
Dec 6	Fri	17:15	SAO 164637	7.5	31+ 31	19S	41km, az. 309, Sun alt. -6
Dec 9	Mon	23:02	ZC 58	7.2	66+ 27	10S	33km, az. 344 deg.

## Lunar Total Occultations

2024	Date	Day	EST	Ph Star	Mag	% alt	CA	Sp.	Notes
Nov 10	Sun	17:46	D	SAO 165373	7.7	69+	34	69S	K0 Sun altitude -10 deg.
Nov 10	Sun	22:14	D	ZC 3375	6.8	70+	31	67N	F2
Nov 11	Mon	19:27	D	20 Piscium	5.5	80+	46	43N	G8 ZC 3505,mg2 10,dT -69s
Nov 11	Mon	21:11	D	Neptune	7.8	80+	48	88S	duration about 6s
Nov 11	Mon	21:17	D	SAO 146935	7.9	80+	48	59S	K0
Nov 16	Sat	3:01	R	Electra	3.7100-	51		5N	B6 AA 318,ZC 537,double?
Nov 16	Sat	3:17	D	Alcyone	2.9100-	48	-69S	B7	AA 75,ZC 552,dbl?,eta T
Nov 16	Sat	3:49	R	Merope	4.1100-	42	61N	B6	AA 264,ZC 545,dbl?,TmD5
Nov 16	Sat	4:19	R	24 Tauri	6.3100-	36	37N	A0	AA 289,ZC 549,dbl?,TmD2
Nov 16	Sat	4:22	R	Alcyone	2.9100-	36	41N	B7	AA 286,ZC 552,dbl,TmD3"
Nov 16	Sat	5:05	R	Atlas	3.6100-	28	66N	B8	AA 262,ZC 560,dbl?,TmD6
Nov 16	Sat	5:07	R	Pleione	5.1100-	27	49N	B7	AA 279,ZC 561,dbl?,TmD4
Nov 20	Wed	4:21	R	omega Cnc	5.9	76-	76	8N	G8 ZC 1206
Nov 20	Wed	5:32	R	4 Cancri	6.3	75-	68	69N	A1 ZC 1211
Nov 23	Sat	2:40	R	SAO 99157	7.4	47-	33	58N	F2 mg2 9, dTime +0.2sec
Nov 25	Mon	2:35	R	SAO 119114	7.2	28-	10	43N	F2 Azimuth 97 deg.
Nov 25	Mon	5:03	R	ZC 1730	6.2	28-	36	26N	K2 mg2 12,sep 15",dT+60s
Nov 26	Tue	6:24	R	SAO 138924	7.7	19-	37	26N	F2 Sun alt. -8 deg.
Nov 27	Wed	5:34	D	Spica	1.0	13-	20	-70S	B1 AA 110,ZC1925,closedbl?
Nov 27	Wed	5:44	R	SAO 157912	7.8	13-	22	64N	F0
Nov 27	Wed	6:48	R	Spica	1.0	12-	30	72N	B1 Sun -3, ZC1925, dbl??
Nov 28	Thu	7:10	R	ET Vir	4.9	7-	24	35N	M1 Sun 0, ZC2029
Dec 4	Wed	16:51	D	omega Sgr	4.7	13+	21	89N	G3 Sun -2, ZC2910, dbl??
Dec 4	Wed	17:42	D	SAO 188749	8.1	14+	16	77S	G1 Sun-11
Dec 5	Thu	19:42	D	ZC 3062	7.5	22+	11	84S	K2 Az.230
Dec 6	Fri	18:03	D	AP Cap	7.7	31+	32	55N	B9 SAO164653,mg2 11,dT-11s
Dec 6	Fri	19:49	D	ZC 3197	6.4	32+	21	55N	K3
Dec 7	Sat	18:26	D	SAO 165228	7.9	42+	39	59S	K3
Dec 8	Sun	16:52	D	SAO 146724	7.0	53+	41	90N	K2 Sun alt. -2 deg.
Dec 8	Sun	20:26	D	ZC 3472	6.9	54+	39	87S	F5 cclose double??
Dec 8	Sun	21:54	D	SAO 146789	7.2	55+	27	59N	F2
Dec 9	Mon	17:27	D	SAO 109142	7.6	65+	46	89N	G5 Sun alt. -8,close dbl??
Dec 11	Wed	0:53	D	ZC 201	7.5	78+	21	82N	G5
Dec 14	Sat	3:26	D	chi Tauri	5.4	98+	33	40S	B9 ZC 647,TmD 13"

Much more on mid-Atlantic occ's page at [iota.jhuapl.edu/exped.htm](http://iota.jhuapl.edu/exped.htm) David Dunham, [dunham@starpower.net](mailto:dunham@starpower.net)

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*Viewing the April 8, 2024 Total Solar Eclipse... – continued from page 4*

I reached Sharon's home late Sunday evening, and we studied the maps to make our plans for Eclipse Day. The weather forecasts now showed thin cirrus clouds moving in ahead of the front, but that they would not be heavy enough to affect the views. Relying on Sharon's local knowledge of the roads, we decided to just drive north towards Burlington, and look for a place to stop once we got inside the path of totality. Burlington was expecting about 50000 people for the eclipse, so we planned to stop somewhere before there. Sharon lives about an hour south of the path, and totality would not occur until 3:26 pm, so we would have plenty of time.

Eclipse Day afforded us a lovely drive north through the New England countryside, along the Green Mountains (which were still mainly brown, actually, spring having just begun to arrive). I noted that there was a steady stream of cars heading north, and very few heading south, but there were no backups. After about an hour we passed through the small college town of Middlebury, which was just inside the path of totality, and people were already setting up in most of the open areas. While there are some advantages to being just inside the path edge, the length of totality does drop rapidly.

Continuing north, we saw small groups setting up in fields and alongside the roads. Eventually we came to the town of Shelburne, which is about 7 miles south of Burlington. Several places were attracting crowds, including the Shelburne Museum, but they turned out to be holding ticketed events that had already sold out. A bit further, and we found a restaurant that was closed that day, with a small parking area in front, a gas station next door (restrooms!), and only about half a dozen cars. So, we pulled in there, and began to set up. Besides my binoculars, which I find to be excellent instruments for viewing the corona, I had brought my 80 mm f/6 Explore Scientific ED refractor (with solar filter for the partial phases). My DSLR isn't working (probably needs to go back to Nikon), so I bought a tripod bracket and manual camera-control software for my Pixel 6a phone and had made a solar filter for it using some extra Thousand Oaks filter material. Several more cars joined us, though the small lot never filled up, and we had the opportunity to meet some of our fellow eclipse watchers as the partial phase progressed.

As more and more of the Sun disappeared, the temperature plummeted, and it began to get noticeably darker. People often ask me if being in totality is as dark as nighttime: No, it doesn't get that dark, it's more like late twilight, or better, like wearing dark sun glasses, because the color doesn't change. We could hear a flock of birds in the tree across the road chirping madly, and annoyingly, the parking lot light we were next to turned on. Just before totality, in the telescope I saw Bailey's Beads, where the last sliver of the Sun breaks up as it shines through valleys on the Moon's edge. I didn't see the shadow bands, but didn't really think to look for them.

Then suddenly, there was the corona, with the last bit of sun briefly forming the Diamond Ring! As forecast, the thin clouds had little effect. To see the glowing white ring of the corona, with its sharp inner edge, in the sky where the Sun should be, is something that truly must be experienced to be fully appreciated. This corona was not as wispy as

*continued on page 7*

previous ones I've seen, probably because the Sun had been fairly quiet (and perhaps partially due to the clouds?), yet somehow it also seemed more brilliant than I remember the others. The 80 mm refractor with my widest-field eyepiece gave a superb view, and I made sure Sharon had a look. Meanwhile, I also tried running through the camera settings on my phone. Venus was easily visible, below the Sun and Moon about halfway to the horizon, but I was busy enough with the camera that I forgot to also look for Jupiter.

Probably the most extraordinary thing about this eclipse, compared to the others I've seen, was the enormous, bright red, triangular prominence jutting out from behind the Moon. A prominence is essentially a giant fountain of gas erupting off the surface of the Sun. I've seen prominences during eclipses before, but never one this big!

Then the Diamond Ring returned, followed quickly by the first sliver of the Sun, and totality was over! Overall, we were in totality for about 3 minutes and 15 seconds. Following totality, I was surprised at how long the Sun appeared as nearly a point light source, perhaps because the other eclipses I've seen were higher in the sky. We took our time packing up, and joined the long, LONG line of cars heading south, most of them probably coming out of Burlington. It took us two and a half HOURS just to get back as far as Middlebury, where we stopped for dinner at a good restaurant Sharon knew. Our waitress said they had been jammed all day – except for about 20 minutes around totality, so they all got to go outside and see it too.

Overall, the trip was almost completely successful! Sharon told me later how delighted she was that I had come, because besides getting to visit, she probably wouldn't have seen totality if I hadn't. Unfortunately, none of the cell-phone photos I took have turned out decently so far, despite trying to use the manual camera controls.

The next total solar eclipses will be in August 2026 across Greenland and Spain, August 2027 across northern Africa, and July 2028 across Australia. North America will have its next eclipse in March 2033 but only in parts of Alaska (Anyone up for a trip to Barrow?), then, in August 2044 in Canada, Montana, and North Dakota, and August 2045 across the western and southern US. For information about eclipses, both solar and lunar, I recommend Fred Espenak's web sites [eclipsewise.com](http://eclipsewise.com) and [mreclipse.com](http://mreclipse.com).

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## Aurora Over Observatory



NCA's host and UMD Obs. Director Elizabeth Warner caught the above image of the aurora during an ASTR310 lab she was assisting on October 10, 2024. She and her students took a short break to marvel at the spectacle before resuming lab. Additional pictures: [photos.app.goo.gl/qVaij42XHtcqQzoQ7](https://photos.app.goo.gl/qVaij42XHtcqQzoQ7)

*Recent Astronomy Highlights – continued  
from page 4*

### **JWST Spots First Steam World**

An exoplanet designated GJ 9827 d, which lies approximately 100 light years away, was first discovered in 2017 by the Kepler Space Telescope. More recently, JWST spectroscopic observations of the exoplanet were taken after earlier data from the Hubble Space Telescope indicated that its atmosphere contains water. With its more sensitive instruments, JWST not only confirmed Hubble's finding, but indicates that GJ 9827 d's atmosphere is comprised almost entirely of water vapor. Such planets, designated steam worlds, have been theorized in the past, but this is the first confirmation of such a world. GJ 9827 d, with its steam atmosphere is a harsh world indeed, two times the size of Earth and far closer to its host star, orbiting it in only six days.

More information on this discovery can be found at [www.space.com/james-webb-space-telescope-steam-exoplanet](http://www.space.com/james-webb-space-telescope-steam-exoplanet).

## **Calendar of Events**

### **NCA Telescope Making, Maintenance, and Modification Workshop (TM3W) (previously the NCA Mirror- or Telescope-making Classes): The Chevy Chase Community Center has reopened and classes have resumed.**

Classes will be Tuesdays and Fridays, from 6:00-9:00 pm at the Chevy Chase Community Center (intersection of McKinley Street and Connecticut Avenue, N.W.) Please contact instructor Guy Brandenburg at 202-635-1860 (leave message) or at [gfbrandenburg@yahoo.com](mailto:gfbrandenburg@yahoo.com) if you plan to attend. Info is at [guysmathastro.com](http://guysmathastro.com).

**Open House talks and observing at the University of Maryland Observatory in College Park are temporarily suspended.** When they resume, they will be on the 5th and 20th of every month at 8:00 pm (Nov.-Apr.) or 9:00 pm (May-Oct.). Updates are posted at [www.astro.umd.edu/openhouse](http://www.astro.umd.edu/openhouse).

**Next NCA Meeting: 14 December at 7:30 p.m. Geoff Chester (USNO) Sky With Ocean Joined: Scaling the Stars at the U.S. Naval Observatory, 1830 to the Present**

**The APS Mid-Atlantic Senior Physicists Group:** Tuesday, Dec. 10th at 1:00 p.m., Dr Howard Milchberg, UMD, will give a talk entitled "Relativistic Optics and Laser-driven Particle Accelerators". Participants can attend in person at the American Center for Physics at One Physics Ellipse, College Park, MD 20740 or via Zoom. A Zoom link to register and attend is [apsphysics.zoom.us/meeting/register/tZAuc-ijrDovGNTgRzQSnofl2gWFt4ps6JmG#/registration](https://apsphysics.zoom.us/meeting/register/tZAuc-ijrDovGNTgRzQSnofl2gWFt4ps6JmG#/registration).

## **National Capital Astronomers**

### **Online Membership Application and Renewal**

To submit or renew a membership to the National Capital Astronomers, and pay dues, please visit [capitalastronomers.org/](http://capitalastronomers.org/). There is a Google form for membership on the upper right. Please fill out the Google form, including your email address, in order to continue receiving issues of Star Dust.

#### **Membership Rates**

\$ 15 – 1 year Individual/Family  
\$ 35 – 3 years Individual/Family  
\$ 5 – 1 year Student  
\$200 -- Life Member

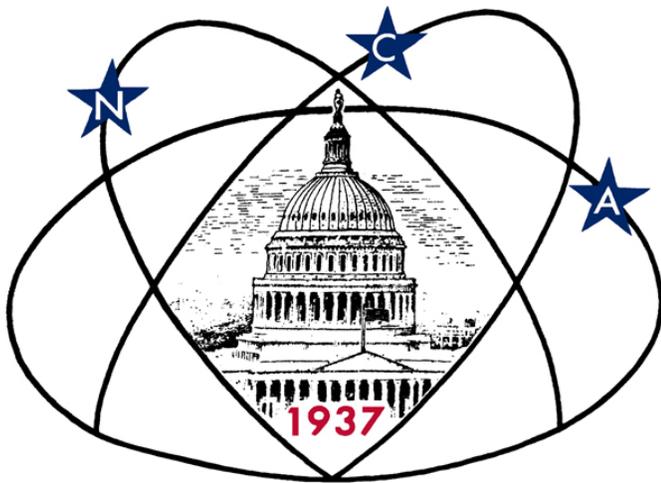
(Please note that membership dues will go up in coming years, so consider joining/renewing with the 3-year option in order to save money.)

If you prefer to pay membership dues by check,

- make check payable to **National Capital Astronomers** then
- mail to: **Jim Simpson, NCA Treasurer; 3845 Wayson Road, Davidsonville, MD 21035.**
- Don't forget to also fill out the [membership Google form](#), even if renewing!

**NCA can use your help!** Please indicate on the [membership Google form](#) which astronomy activities are of interest to you. In addition, we are also looking for volunteers! We need new officers, help with our website and social media, and help with outreach and science fair events.

**Thank you!**



*Celebrating 87 Years of Astronomy*



**Image Credit: NASA/Don Pettit**

While many people enjoyed looking up to view the spectacular northern lights on October 10<sup>th</sup>, a lucky few on the International Space Station got to look down at them. More information on the image above is at [www.space.com/nasa-astronauts-supercharged-red-auroras-iss-photo](http://www.space.com/nasa-astronauts-supercharged-red-auroras-iss-photo).

*To join or renew online, visit [capitalastronomers.org](http://capitalastronomers.org) and look in the right column for the Membership Form and PayPal links.*

**Next NCA Meeting:**  
**2024 Nov. 9<sup>th</sup>**  
**7:30 pm**  
**Dr. Brian Williams**

- *Virtual attendees:* To join the meeting via Zoom, use the following link:  
[umd.zoom.us/j/91273752763?pwd=XKZL9V94XIDzwWg7FYDKLbVUQb5YRP.1](https://umd.zoom.us/j/91273752763?pwd=XKZL9V94XIDzwWg7FYDKLbVUQb5YRP.1)
- *In-person attendees:* The UMD Astronomy Observatory is at 3255 Metzert Road, College Park, MD 20740. Directions:  
[www.astro.umd.edu/openhouse/1visiting/directions.html](http://www.astro.umd.edu/openhouse/1visiting/directions.html)

**Please note that NCA Zoom meetings are often recorded.**

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