

# Star Dust

Newsletter of National Capital Astronomers, Inc.  
[capitalastronomers.org](http://capitalastronomers.org)

May 2024

Volume 82, Issue 9

**Celebrating 87 Years  
of Astronomy**

## Next Meeting

**When:** Sat. May 11th, 2024

**Time:** 7:30 pm

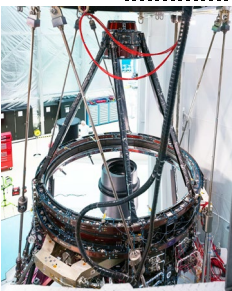
**Where:** In-Person and Online  
(Zoom)

See instructions for joining the meeting via Zoom on Page 11.

**Speaker:** Dr. Terry Kucera

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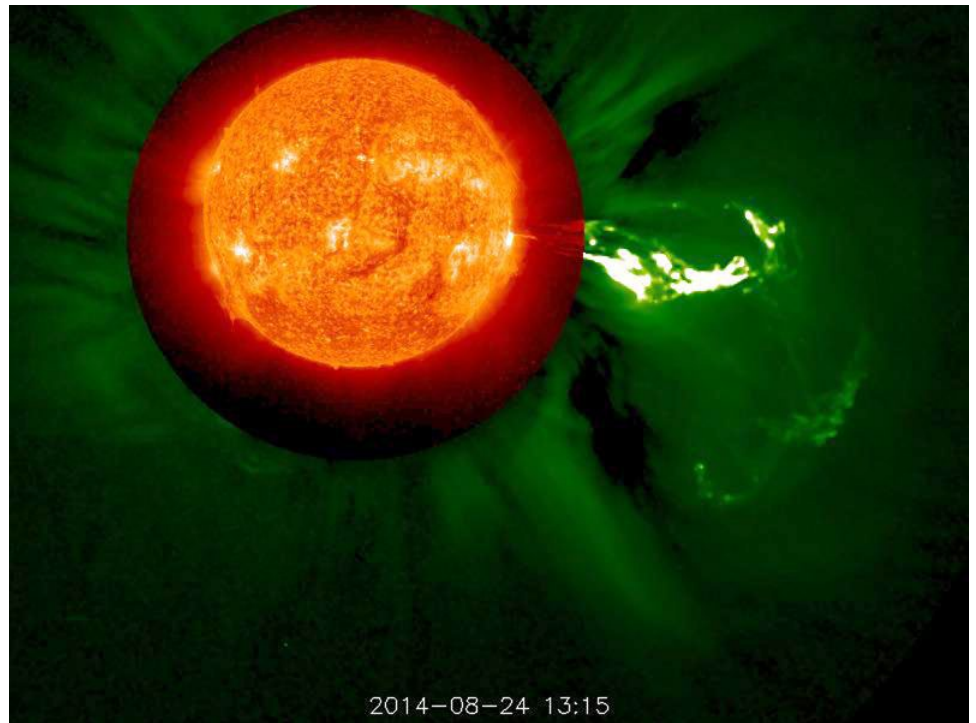


**Image Credits – NASA and Chris Gunn**

All ten mirrors in the Image Optics Assembly of the Nancy Grace Roman Space Telescope, named after the longtime NCA member, have been aligned and tested. More info about this landmark is available at [phys.org/news/2024-04-nasa-](http://phys.org/news/2024-04-nasa-)

## The Sun From Different Points of View

Dr. Terry Kucera



**Image Credit – NASA/STEREO**

**Abstract:** The Sun, our star, is a dynamic variable star exhibiting a range of active phenomena, while its outer atmosphere expands into the Solar System as the solar wind, flowing past the Earth and other planets. The talk will be an overview of the Sun and solar wind with a focus on how we observe them from various vantage points in the Solar System, especially using the STEREO mission, which has recently completed a circuit of the Sun relative to Earth. I'll discuss solar flares, coronal mass ejections, the solar wind, and how all of these vary over the solar cycle and can affect Earth and human technologies.

**Biography:** Dr. Terry Kucera is an astrophysicist in NASA's Goddard Space Flight Center's Solar Physics Laboratory. Her research interests center on the solar atmosphere, especially solar prominences and prominence cavities. She currently serves as STEREO Project Scientist and is a member of the Solar Orbiter science team working with the SPICE instrument.

*continued on page 2*

[roman-space-telescope-eyes.html](https://www.ncaastronomers.org/roman-space-telescope-eyes.html).

## Recent Astronomy Highlights

### DESI Survey Points to Possible Changes in Dark Energy

The Dark Energy Spectroscopic Instrument, DESI, uses a 4-meter diameter telescope at the Kitt Peak National Observatory to provide spectra of millions of galaxies out to about 11 billion light years from Earth. The instrument does so by taking the spectra of up to 5000 galaxies simultaneously. With all of this data, astronomers have been able to create one of the most extensive and precise maps of the locations of those galaxies.

So how does this lead to a greater understanding of Dark Energy, the most prominent part of DESI's name? The logic involved takes a little bit of explanation, starting with an understanding of what a Standard Ruler is. For years, astronomers have used what are known as Standard Candles to measure distances to various galaxies. Standard Candles include Type 1a supernova and Cepheid Variable stars, the former being events with a known luminosity and the latter being objects with a known luminosity based on the cycle time with which they brighten and dim. Using this brightness and the apparent brightness of such an event or object as seen by telescopes, their distance from Earth can easily be derived.

A Standard Ruler would not be an object but instead some sort of distance between astronomical objects that can be determined. It turns out that Baryonic Accoustic Oscillations, can serve this purpose. Bubble-like pressure waves in the plasma of the early Universe, BAOs were frozen in place when the Universe expanded and cooled enough for atoms to form from the ions in the plasma about 370,000 years after the Big Bang. The slightly greater density of matter at the locations where BAOs were frozen is where galaxies and galaxy clusters predominantly formed. Knowing how the BAOs formed and how big they should be allows astronomers to use their radii as standard rulers. But finding those radii is a complicated process. It involved considerable statistical analysis of various distances between galaxies.

*continued on page 4*

*Abstract and Biography – continued from page 1*



Dr. Kucera came to NASA/Goddard after receiving her doctorate from the University of Colorado, Boulder, where she studied radio emissions from solar flares. She followed this with a postdoctoral fellowship studying X-ray flare emissions. She joined the SOHO team as an operations scientist for the CDS and SUMER spectrometers in 1995 and eventually also served as US Deputy Project Scientist. She has also detailed at NASA Headquarters as the Solar Discipline Scientist and the Science Mission Directorate Education and Public Outreach Manager.

## CANDIDATES FOR MAY 2024 ELECTIONS TO NCA BOARD

A formal vote for the 2024-2025 Officers, as well as the 2024-2028 Trustee, will take place at the May meeting as per the Constitution and By-Laws\*. Currently the nominations are:

- |                           |                 |
|---------------------------|-----------------|
| 1. President              | Guy Brandenburg |
| 2. Vice-President         | Carl Biagetti   |
| 3. Secretary-Treasurer    | Jim Simpson     |
| 4. Assistant Secy-Treas   | Jeff Norman     |
| 5. Trustee (expires 2028) | Chong Wang      |

(Please note that other nominations, including self-nominations, of NCA members for the open offices are allowed for the upcoming election.)

\* You can look up the procedures for elections and so on here:

[capitalastronomers.org/documents/NCAconstitutionAdoptedNov2011.pdf](https://www.capitalastronomers.org/documents/NCAconstitutionAdoptedNov2011.pdf)

## President's Corner

*Guy Brandenburg*

Don't miss the rock-bottom prices on telescopes and other equipment at the upcoming NCA silent auction!

We have recently received a number of donated telescopes and other equipment, and we are holding a silent auction of it over the next month or so.

*continued on page 3*

## Exploring the Sky



### 2024 Exploring the Sky Sessions

01 Jun	9:00 P.M.	Leo, Bootes, Hercules, M13
13 Jul	9:00 P.M.	Venus, Mercury, Moon, Hercules, M13, Summer Triangle
10 Aug	8:30 P.M.	Venus, Moon, Hercules, M13, Summer Triangle, M57
07 Sep	8:00 P.M.	Venus, Moon, Summer Triangle, Great Square of Pegasus
05 Oct	7:30 P.M.	Summer Triangle, Great Square of Pegasus, M31, Saturn
02 Nov	7:00 P.M.	Venus, Summer Triangle, Pegasus, M31, Saturn

**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.

Planetarium programs can be found at:

[www.nps.gov/rocr/planyourvisit/calendar.htm](http://www.nps.gov/rocr/planyourvisit/calendar.htm). You can also search "astronomy", "dark skies" or call the Nature Center at: (202)-895-6070.

*President's Corner – continued from page 2*

Here is the schedule:

1. A spreadsheet has been prepared with links to photos, descriptions, current open-market prices for the items, and the starting bidding prices listed.
2. The items for sale have been brought to the University of Maryland observatory lecture hall, where they were assembled and labeled.
3. May 11 (Sat, 7-9:30 PM): NCA members and others can attend the regular NCA meeting and look at the items on display at the lecture hall.
4. May 12 through May 30 - Online bidding for items (details to be explained later).
5. June 1 - Winners announced online, payments begin (details to be explained later).
6. June 8 (Saturday, afternoon through 9:30 pm) - Items will be picked up from the UMD observatory before, or immediately after, the regular NCA meeting there.

So far, we have:

- Five different Cassegrain computerized telescopes by Celestron and Meade, diameters 4 to 8 inches, complete with paddles, tripods, manuals, etc.
- Two refractors, both on computerized mounts and tripods, 80 mm and 130 mm
- Five Newtonians, from 130 mm through 16 inches, three on alt-az mounts, two with home-made mounts (one of them with excellent home-made optics). The 12" Dob is a truss-tube Meade LightBridge with JMI motors and JMI wheeley bars.
- Giant 25x100 binoculars with parallelogram mount and tripod
- One Sigma 150-600 mm zoom telephoto lens for Canon EF series DSLRs
- Over a dozen different MA, Kellner, and Plossl 1.25" eyepieces
- Four higher-quality 2" eyepieces
- 1.25" Barlow
- 1.25" variable polarizer system
- Sturdy observing chair
- Two multi-channel controllers for dew shields with wires and connectors (dew straps and dew shields included)
- AudioStar hand controller for Meade telescopes
- Additional high-quality tripods
- Anti-vibration pads for tripods
- 2 wheeley bars
- Telrads
- Green laser pointers
- Collimators (one laser, one solid)
- Astrolabe, plastic, with manual, multiple retes and other overlays
- Books: celestial navigation; finder charts for Messier objects; suburban astronomy, etc.
- Red dot finders
- Sky Scout finder
- Other miscellaneous items like Velcro lifting straps, camera shoe and cell phone eyepiece holder
- Four steel counterweights, 2 weighing 5 lbs. and 2 weighing 11 lbs.; holes are for 18 mm (0.709") shafts

And more! Details will come later. All income from this sale will go to NCA, which is a 501(c)(3) charitable and educational non-profit.

# Sky Watchers

May/June

Mercury will drop lower in the morning sky as the period progresses. Venus will be very low in the predawn sky, probably not very viewable as it begins to transit to the evening sky from late May into June. Mars remains in the predawn sky. Jupiter will largely be unviewable throughout the period as it moves to the morning sky. Meanwhile Saturn will continue to appear higher each morning. So far, as of the writing on this column, there is no sign of the expected nova of T CrB.

5/23

Full Moon at 9:55 p.m.

Time is in EDT (Eastern Daylight Savings Time).

## Plan for Rock Creek Golf Course—Bad for Exploring the Sky

*Guy Brandenburg*

If you have never visited the Rock Creek Golf Course before, then you have been missing out on one of the very greatest places in the entire city.

It's true that the grass on much of the course is poorly maintained and that there are lots of alien, invasive vines and other weeds, but when I visited the place for the very first time, last week, I was amazed. There is nowhere inside the borders of DC with such enormous, wild-ish meadows, except for the National Arboretum. Most of the trees on the RCGC are a full century old and give very pleasant dappled shade on the various golf fairways. Right now, every single bit of Rock Creek Park is dark at night, which is great both for neighbors and wildlife. **And for us!**

NCA and the National Park Service have been "Exploring The Sky" just a few thousand feet to the west of that course, and, for obvious reasons, we like dark skies.

You may have heard that there is a plan to rehabilitate that golf course. Removing all of those nasty vines and putting in actual putting holes and greens on the back nine holes are excellent ideas, but unfortunately a group called National Links Trust also wants to cut down over a thousand of those trees and build an illuminated night-time golf driving range.

The NLT and their supporters claim that the lights on this driving range will be magic: they can't be seen beyond 50 yards, so the golfers will look at monitors to see how far their balls went. They also claim the lighting is already approved by Dark Sky International.

Every single golfer I recently spoke to about this told me that sort of lighting is impossible and that no such low-light golf driving exists anywhere in the world. They also all hated the idea of cutting down all of those lovely mature trees. Local DSI people say that the NLT is simply lying about the levels of illumination at the proposed driving range and that nobody at NLT asked the local DSI for any input. Apparently, there were thousands of public comments a year ago, most in opposition to cutting the trees, but those comments were ignored. I gave testimony last week, but more work is needed!

NCA members had better get on the ball (pun intended) and do what we can to oppose those two parts of the plan: No night-time illuminated golf driving range! Leave the trees alone! Instead, remove the invasive alien vegetation and pay a competent gardening outfit to do what's needed to improve the lawns, greens, and brushy areas without tons of pesticides. Or else we can just give up on "Exploring the Sky".

Right now, there are still a few steps to go before chain saws and bulldozers start their destruction. But we had better get organized to make sure that only the good parts of this plan happen, and none of the bad parts!

**Star Dust** is published ten times yearly September through June, by the National Capital Astronomers, Inc. (NCA).

**ISSN: 0898-7548**

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*Recent Astronomy Highlights – continued from page 2*

As the Universe has expanded, the frozen-in BAOs have expanded as well. Since, as we look farther away, we are looking further and further back in time, determining the distance to and diameters of the BAOs gives an expansion history of the Universe which in turn gives clues about the nature of Dark Energy and its strength over time. The preliminary conclusion, after processing one year's worth of DESI data is that there may have been a change in the strength of Dark Energy. More information is available at [newscenter.lbl.gov/2024/04/04/desi-first-results-make-most-precise-measurement-of-expanding-universe/](https://newscenter.lbl.gov/2024/04/04/desi-first-results-make-most-precise-measurement-of-expanding-universe/).

### **JWST Maps an Exoplanet's Weather**

Clear on the day side and likely extremely cloudy on the night side, with an eastward wind reaching up to 5000 miles per hour – that's the weather forecast for WASP- 43b, an exoplanet 280 light years away. Orbiting a star that's smaller and cooler than our Sun, but at a distance of only 1.3 million miles, WASP-43b is a Hot Jupiter. Orbiting so close to its star, it is tidally locked, meaning one side always faces that star. The weather mapping was accomplished using Phase Curve Spectroscopy a process of measuring the extremely small differences in infrared radiation seen as the exoplanet orbits its host star over a period of 19.5 hours. More information is available at [science.nasa.gov/missions/webb/nasas-webb-maps-weather-on-planet-280-light-years-away/](https://science.nasa.gov/missions/webb/nasas-webb-maps-weather-on-planet-280-light-years-away/).

*continued on page 10*

# 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

## Asteroidal Occultations

May 10	Fri	21:31	TYC	12.2	3063	Makhaeon	4.1	4	6	w+seNY, nePA, nNJ
May 11	Sat	23:18	TYC	11.5	4582	Hank	5.6	2.1	5	WB-HB, PA; BT-AP, MD
May 13	Mon	4:11	4UC	13.2	13529	Yokaboshi	4.5	1.7	8	NJ, CMD, nDC, nVA
May 13	Mon	4:20	4UC	12.6	1081	Reseda	4.1	14	6	ePA; e+SMD; NN, VA
May 14	Tue	1:54	G	13.7	80348	1999 X0115	6	0.7	9	sPH, PA; BT-RV, MD; VA
May 16	Thu	23:59	TYC	11.7	31227	1998 BC41	4.8	1.9	6	BB, VA; eCL, MD; SC, PA
May 17	Fri	4:26	4UC	13.8	1306	Scythia	1.8	7	10	MD; DC; nVA; swPA; nOH
May 23	Thu	4:04	4UC	11.3	939	Isberga	3.5	3.5	5	cNJ, CMD, DC, n+CVA
May 25	Sat	0:53	4UC	12.8	33729	1999 NJ21	3.2	1.4	7	sNJ; CMD; DC; n+CVA
May 25	Sat	2:13	4UC	12.0	25823	Dentrujillo	7	0.7	7	nBT-HT, MD; WL, WV
May 27	Mon	5:09	SAO	7.6	45550	2000 CX46	11	1.1	3	NYC; nNJ; swP, PA
May 28	Tue	2:00	4UC	9.1	23141	2000 AB163	8	0.9	4	ne-swNC, nGA, nAL
May 28	Tue	3:27	4UC	12.3	23867	Cathsoto	6	0.9	7	nBT-HT, MD; WL, WV
May 28	Tue	5:04	4UC	11.8	76353	2000 EB166	7	0.9	8	LP, MD; nFB-CV, VA
May 30	Thu	1:35	4UC	15.2	28978	Ixion	4	32	12	QC; NE, NY, PA?
May 30	Thu	2:08	4UC	11.9	41326	1999 XY212	7	0.9	8	nNJ; AT-HB, PA; CL, MD
May 30	Thu	21:41	TYC	11.4	2927	Alamosa	9	2.1	6	CT; nNJ; YK, PA; HT, MD
Jun 1	Sat	3:45	4UC	12.0	17163	Vasifedoseev	6	0.7	9	nNJ; ne-swPA; MT, WV
Jun 2	Sun	1:28	4UC	12.7	1081	Reseda	3.6	4	9	SMD; SDC; CVA; nKY
Jun 7	Fri	3:18	4UC	12.0	8882	Sakaetamura	6	0.5	8	WD, MD; WB-Luray, VA
Jun 7	Fri	4:24	SAO	9.1	2421	Nininger	7	3.8	2	sOnt.; ncen-swOhio
Jun 8	Sat	3:57	4UC	11.5	82213	2001 HK49	6	0.4	8	sLC, PA; FD, MD; EB, VA
Jun 8	Sat	22:29	TYC	10.0	29452	1997 WP2	8	0.6	4	swSC, PA; neBT-OC, MD
Jun 9	Sun	1:10	ZC	6.6	60288	1999 XW114	11	0.6	2	nNN-nEP, VA; nChrtNC
Jun 10	Mon	0:37	4UC	13.6	924	Toni	1.0	10	8	MD; DC; nVA; nWV; SOH
Jun 10	Mon	2:32	TYC	10.3	101712	1999 DU2	8	0.5	4	AP, MD; SDC; AX-CV, VA
Jun 10	Mon	4:23	TYC	11.9	1178	Irmela	4.4	2.1	6	UM, MD; SDC; AX-WT, VA

## Lunar Grazing Occultations

2024	Date	Day	EDT	Star	Mag	% alt	CA	Location, Notes
May 13	Mon	21:12	SAO	80370	9.7	36+	49 16N	Gambr, Catonsvil, GlnBurnie, MD
May 23	Thu	21:53		Antares	1.1	99-	7 22N	Malvrn, PHL, PA; AtlantcCity, NJ

## Lunar Total Occultations

2024	Date	Day	EDT	Ph Star	Mag	% alt	CA	Sp. Notes
May 10	Fri	21:07	D ZC	885	5.6	10+	24 89N	G7 Sun-11, close dbl?
May 10	Fri	21:18	D SAO	77621	7.5	10+	21 21S	M3
May 10	Fri	21:24	D SAO	77639	8.3	10+	20 68S	K0
May 10	Fri	21:29	D SAO	77638	8.2	10+	20 52N	B8
May 10	Fri	22:18	D 136	Tauri	4.6	11+	11 19S	A0 Azimuth 297 deg.
May 10	Fri	22:56	D SAO	77724	7.0	11+	5 64S	B1 Azimuth 302 deg.
May 11	Sat	23:07	D SAO	78873	7.8	18+	12 53S	A2 Azimuth 295 deg.
May 11	Sat	23:08	D ZC	1056	7.2	18+	12 63S	B9 Azimuth 295 deg.
May 13	Mon	23:19	D ZC	1317	8.2	37+	26 65N	A2
May 16	Thu	1:23	D ZC	1524	8.2	57+	14 84S	A2 Azimuth 275 degrees
May 18	Sat	0:46	D SAO	119068	7.8	74+	29 41N	F5
May 18	Sat	1:35	D	Zavijava	3.6	75+	20 71S	F8 =beta Vir = ZC 1712
May 23	Thu	21:38	D	Antares	1.1	100-	5 -2N	M1 Az 130, AA 39, ZC 2366
May 23	Thu	22:05	R =alpha	Sco	1.1	99-	9 44N	M1 Az 135, AA 352, TrmDst 2"
May 26	Sun	0:30	R ZC	2688	7.0	92-	11 66S	G6 Azimuth 142 deg.
May 27	Mon	4:06	R SAO	188429	7.7	84-	23 10S	K4 Terminator Distance 14"
May 28	Tue	2:05	R SAO	189469	7.7	76-	12 75N	K0 Azimuth 136 deg.
May 28	Tue	3:22	R ZC	3012	6.9	76-	21 75N	A7
May 28	Tue	4:46	R SAO	189555	7.2	75-	27 86S	G1 Sun altitude -10 deg.
May 29	Wed	4:45	R	epsilonCap	4.5	65-	28 86S	B3 Sun alt. -10, ZC 3164
May 29	Wed	5:09	R SAO	164528	7.5	65-	30 60N	B8 Sun alt. -7 deg.
May 30	Thu	5:30	R SAO	165149	7.7	54-	33 80S	G0 Sun alt. -3
Jun 3	Mon	4:16	R SAO	92700	7.6	12-	8 89S	G5 Azimuth 80 deg.
Jun 8	Sat	21:38	D ZC	1131	7.3	7+	14 64S	A2 Sun alt. -11, Aziuth 293
Jun 9	Sun	20:04	D	lambda Cnc	5.9	13+	39 68N	B9 Sun alt. +4, ZC 1251
Jun 9	Sun	21:38	D SAO	80146	8.0	14+	22 76S	A2 Sun alt. -11 deg.
Jun 9	Sun	22:28	D SAO	80173	8.3	14+	13 59N	K0 Azimuth 290 deg.

More information at <http://iota.jhuapl.edu/exped.htm>. See p. 6 of the April *Stardust* for information about the new format for asteroidal occultations.

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- Benson Simon (2025)
- Michael Brabanski (2026)
- Bernard Kaufman (2027)

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## Racing Against Clouds – An Eclipse Story

*Todd R. Supple*

At an NCA meeting a couple of months ahead of the April 8th Eclipse, Guy Brandenburg, NCA President, asked members to say where they were going to witness it. Members named locations up and down the path of totality. When it came time for me to answer, I simply said, "Wherever the Sun is shining." My answer got the laugh I was going for, but I also meant it seriously. April is notorious for having bad afternoon weather, so I was mentally preparing myself for driving anywhere from Texas to Maine, depending on the forecasts, and sleeping in the backseat of my car, as I had done in a Walmart parking lot in Carthage, Tennessee the night before the August 2017 Solar Eclipse.

But in looking at the path of the eclipse, I also realized that a friend of mine named Warren lived right in the path of totality in Malone, New York, up near the border with Canada. I also knew that Warren would be down in the DC area the weekend before to help with the year-end show of Gymkana, a gymnastics group I help coach. But getting there would mean a lot more driving than going to western Pennsylvania or Ohio.

As the weekend before the eclipse progressed, upstate New York began looking better and better, while close sites looked like they might have more questionable weather. So, on Sunday, Warren and I drove up to Albany where he'd parked his truck the week before and taken the train down. Then we drove separately up to his home about three hours farther north. A long drive, but it was much nicer sleeping at his house than in the backseat of my car in a Walmart parking lot.

The next morning, I looked at satellite images and saw bands of clouds coming in from the west. Maybe it would be clear in Malone during the eclipse, maybe not, I realized. After already driving eleven hours the day before, I was pretty exhausted, but I was also determined to drive at least a few more in order to get where the clouds weren't. So, Warren and I decided to go east into Vermont (after going northward to get to the bridge at the north end of Lake Champlain) where forecasts were more promising. We drove about three hours in all, always staying in the path of totality and often looking back and seeing the clouds following us. Fortunately, as tired as I was, I had people cheering me on through texts and calls, including both of my brothers, my sister, who viewed the eclipse in Alabama, my uncle in Michigan, my aunt in Alaska, my former boss and a former coworker, and my dentist's assistant. Yeah, I guess my reputation for wanting to see the eclipse was rather widespread.

Finally, Warren and I came upon a garage parking lot outside of North Troy, Vermont, about a mile from the Canadian border. At that point, it looked like maybe we had put enough distances between us and the worst of the clouds. In addition, there were people already in the parking lot setting up telescopes. My kind of crowd. So, we stopped and I set up my solar telescope.

One of the people in that crowd was Ken Defillipo, who had set up his telescope and camera to take pictures. Meanwhile, I took pictures using a little point-and-click camera I've had for years, some through the eyepiece of my solar telescope.

*continued on page 7*

*Racing Against Clouds – An Eclipse Story – continued from page 6*

As the Moon began to cross in front of the Sun, light, wispy clouds did come in, not enough to obscure the view, but with totality over an hour away, I did wonder if Warren and I should have gone farther to beat the thicker clouds sure to arrive eventually.

Meanwhile, a lot of people came up to look through my solar telescope at the Sun and its prominences as the Moon took more and more of a bite out of it.

Fortunately, the thicker clouds held off. Just before totality, the increasing darkness caused the automatic lights on the garage to come on. With well over a hundred adults, teenagers and children staring upward, totality finally arrived, greeted by a cheer from the crowd of strangers.

Some people shouted about seeing stars and planets. I noticed Venus and knew that other planets were supposed to be visible, but I really only had eyes for the eclipse, only taking my eyes away from it to briefly glance down at the camera display, making sure I was getting some good pictures.

The deep-blue sky was as I remembered it with the 2017 eclipse, but the corona was far different, more uniform this time, as shown in the totality picture Ken took and graciously allowed me to use for this article (below, left), than the three-prong corona I'd seen seven years before. I heard someone in the crowd say, "A once-in-a-lifetime experience." Even though this was my second eclipse, I agreed with the sentiment.



**Image Credit – Ken Defillipo**



**Image Credit – Todd R. Supple**

All too quickly, the eclipse ended. As the Sun peeked out from behind the Moon, I managed to get a diamond ring picture of the Sun's reappearance, (above, right), albeit a split second past the ideal time for such a picture. The wispy clouds added a little color to the shot. As the sky brightened, the end of the eclipse was also greeted with a cheer from the crowd.

As time passed, I and others continued to look at the Sun through my solar telescope. Eventually, faced with another three-hour drive back to Warren's house, he and I said goodbye to the people we had shared our eclipse experience with, including Ken, wishing each other safe travels.

Fourteen hours of additional driving lay ahead of me, almost thirty hours in all in the three days around the date of the eclipse. But it was so worth it.

Astronomers sometimes like to greet others with the phrase, "Clear skies!" Fortunately, partly cloudy skies were good enough that day, even seeming to enhance a picture or two.

Once in a lifetime indeed.

## Observing the 2024 April 8th Total Solar Eclipse from the Southern Limit in Maine

*David and Joan Dunham*

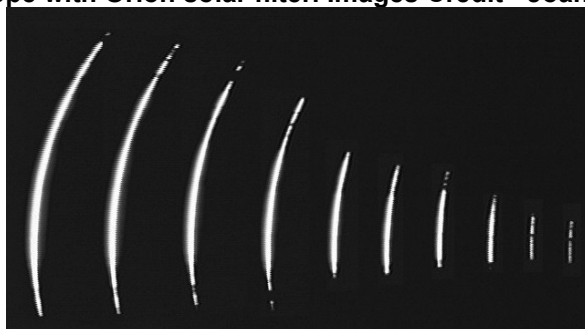
We had planned to observe this eclipse from a location near the northern limit in northern Texas and had booked a motel in Ft. Worth months in advance, expecting to drive there from home in Arizona. But five days before, the cloud forecasts were the opposite of the climatological prognosis, favoring northern New England with poor conditions expected over Texas. At that late date, we were able to secure a reservation for an SUV for 5 days at the Manchester, NH airport, and were also able to book flights on Southwest to and from there and return to Phoenix.

On our rather late arrival in Manchester, we stayed at a motel there overnight, then on April 5th, we drove to Falmouth, Maine, where Joan's sister, Gail, lives with her husband, Dan Knowles. They were delighted to have us for the eclipse adventure and were crucial for our arrangements, including securing a parking spot at a campground with a restaurant in Bingham for Apr. 7-8, about a 2-hour drive from Falmouth and 8 miles north of the southern limit of totality. We used one of their mattresses, blankets, and sleeping bags so we could sleep in the SUV, although it was near freezing that night. It was quite cloudy during most of our stay in New England, but the sky cleared nicely late the afternoon of the 7th and stayed clear all the next day.

Our eclipse site was at the Over Look Mobile Home Park north of Solon, 3 km north of the southern limit. The GPS WGS84 coordinates were: Latitude 44° 58' 38.6" N, Longitude 69° 52' 03.7" W,  $h$  114 m, confirmed with Google Earth, that gave  $h$  as 121m. We obtained a black-and-white video recording of the eclipse with the same equipment we used for the annular eclipse last October; see pages 4 and 6 of the 2023 December Stardust. We didn't try any other imaging of the eclipse, but Gail took some pictures with a color digital camera, one of them shown below. We had about 43 seconds of totality, during which I could see the chromosphere and several red prominences with our finder scope. More will be in a future issue of IOTA's Journal for Occultation Astronomy with videos expected at [occultations.org/publications/rasc/2024/nam24grz.htm](https://occultations.org/publications/rasc/2024/nam24grz.htm).



**Fig. 1. (Left) Joan Dunham (seated looking at a laptop shaded under a mylar space blanket, taped down but billowing in the wind), and Gail (seated) and Dan (standing) Knowles at our site, Solon, Maine. Fig. 2. (Right) Our 127mm Schmidt-Maksutov telescope with Orion solar filter. Images Credit - Joan and David Dunham**



**Fig. 3. Sequence of Baily's beads at 3-second intervals from 19:30:34 to 19:31:02 UT (3:30:34 – 3:31:02 pm EDT) shortly before the start of totality (2<sup>nd</sup> contact). Images Credit – Joan and David Dunham**

*continued on page 9*



Observing the 2024 April 8th Total Solar Eclipse from the Southern Limit in Maine – continued from page 8

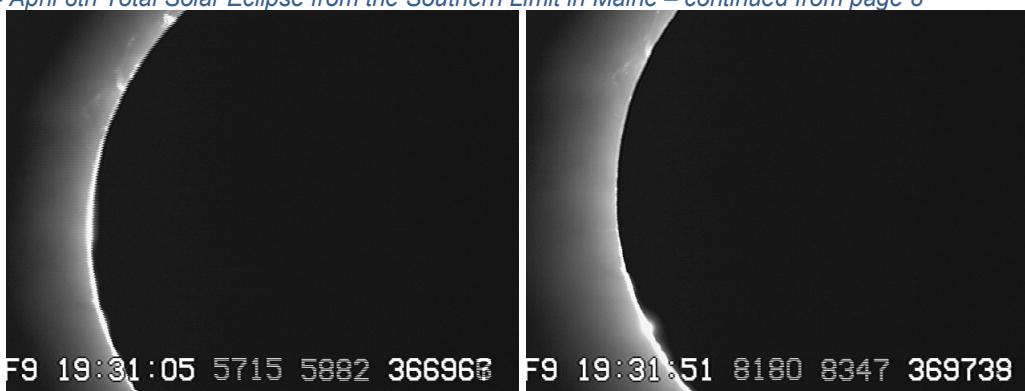


Fig. 4. (Left) Just after the solar filter was removed, showing the chromosphere and prominences. Fig. 5. (Right) The first bead reappearing at the end of totality (3<sup>rd</sup> contact); just when 3<sup>rd</sup> contact occurred is uncertain by 2 or 3 seconds. Images Credit – Joan and David Dunham

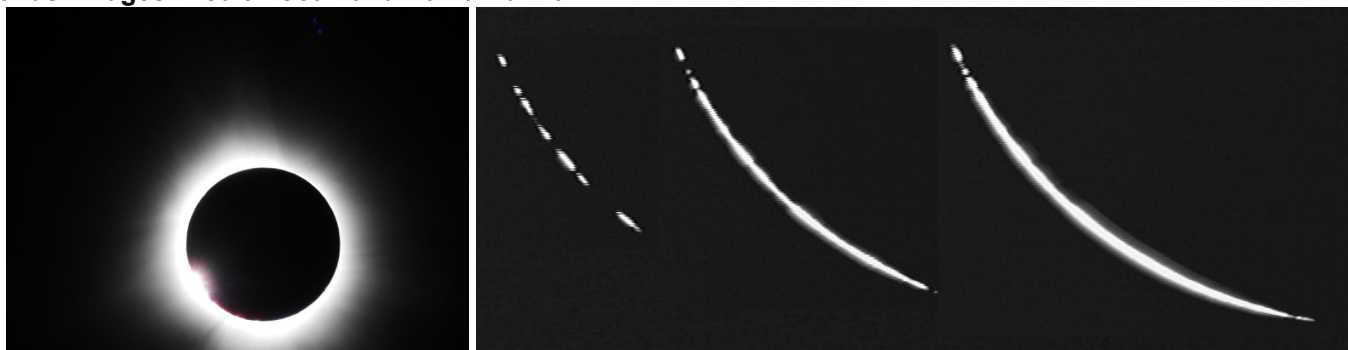


Fig. 6. (Left) Totality showing 2<sup>nd</sup> contact beads and the inner corona, taken with a COOLPIX-B700 camera. Image Credit - Gail Knowles. Fig. 7. (Right) Bailey's Beads at three times after 3<sup>rd</sup> contact, at 19:32:13, 19:32:25, and 19:32:37 UT, from left to right. Image Credit – Joan and David Dunham

We had hoped to see my brother, Douglas, who had a fairly good view of the eclipse through high broken clouds in Dallas. We also missed seeing Djounai Baba Aissa, an astronomer from Algiers Observatory, who travelled to Dallas with four Algerian amateurs to observe the eclipse, in preparation for a total solar eclipse in Algeria in 2027, and to collaborate with IOTA on observation near the limits. We helped them obtain expedited service from the American embassy in Algiers, to receive their visas in time for their travel. They debated driving northeast of Texas for possibly clearer skies, but the forecasts showed better conditions near the northern limit of the path in Texas, so they selected a site 3 km inside the limit at a community park in Corinth, a suburb northwest of Dallas. Eclipse cooling caused the scattered daytime clouds there to dissipate, giving them a great view of the eclipse (see two pictures below); that was also the case for another group of eclipse chasers who recorded the flash spectrum close to the northern limit from Stephenville, about 100 miles southwest of Corinth.



Fig. 8. (Left) Djounai Baba Aissa and four other Algerians participating in IOTA observations near the northern limit at Corinth Community Park, Texas. Image Credit - Djounai Baba Aissa. Fig. 9. (Right) First 3<sup>rd</sup> contact bead, chromosphere, and prominences from Corinth, Texas. Image Credit - Djounai Baba Aissa.

Recent Astronomy Highlights – continued from page 4

Enormous Stellar-Mass Black Hole Detected in the Milky Way

A wobble in the motion of its companion star pointed to the existence of a stellar-mass black hole 33 times the mass of the Sun approximately 2000 light years away. This is the largest stellar-mass black hole so far discovered in the Milky Way. That motion was discovered from observations made by the European Space Agency’s Gaia mission and subsequently verified using ground-based telescopes. It is dubbed GAIA BH3. It is theorized that the star massive enough to create such a black hole would have had a low metallicity content, i.e. it would have contained very low concentrations of elements heavier than hydrogen and helium. Such stars are theorized to shed less mass and therefore remain larger when they reach the supernova phase in which a black hole is formed. More information is available at phys.org/news/2024-04-massive-stellar-black-hole-galaxy.html.

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 gbrandenburg@yahoo.com if you plan to attend. Info is at 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.

Next NCA Meeting: 8 June at 7:30 p.m.

The APS Mid-Atlantic Senior Physicists Group: (at the American Center for Physics and on Zoom) May 22nd at 1:00 p.m., Dr. Leo Singer, NASA’s Goddard Space Flight Center, will give a talk entitled “Black and Gold: Capturing Neutron Star Mergers from the Ground and Space”. A link to register and attend the meeting via Zoom is apsphysics.zoom.us/meeting/register/tZ0odeCqgTiiH9KNcF8zAfDFn7POXqeX0ePe

National Capital Astronomers Membership Form

Name: \_\_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

Address: \_\_\_\_\_ ZIP Code: \_\_\_\_\_

Home Phone: \_\_\_-\_\_\_-\_\_\_ E-mail: \_\_\_\_\_ (necessary for delivery of Star Dust)

Membership (circle one): Student..... \$ 5; Individual / Family.....\$10; Optional Contribution.....\$\_\_

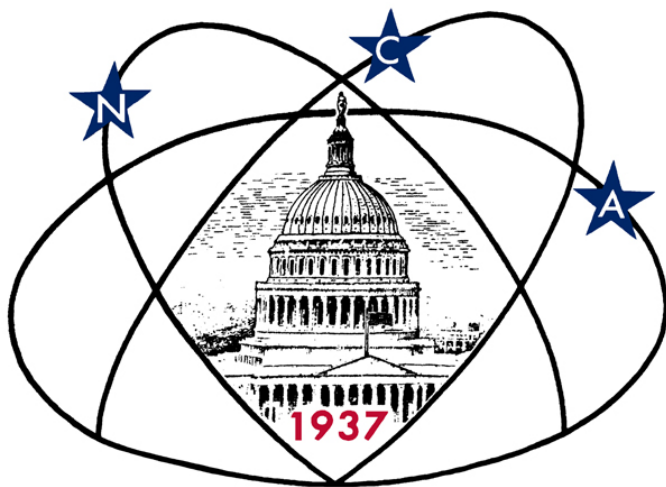
Please indicate which activities interest you:

- Attending monthly scientific lectures on some aspect of astronomy
Making scientific astronomical observations
Observing astronomical objects for personal pleasure at relatively dark sites
Attending large regional star parties
Doing outreach events to educate the public, such as Exploring the Sky
Building or modifying telescopes
Participating in travel/expeditions to view eclipses or occultations
Combating light pollution

Do you have any special skills, such as videography, graphic arts, science education, electronics, machining, etc.?

Are you interested in volunteering for: Telescope making, Exploring the Sky, Star Dust, NCA Officer, etc.?

Please mail this form with check payable to National Capital Astronomers to: Jim Simpson, NCA Treasurer; 3845 Wayson Road, Davidsonville, MD 21035



*Celebrating 87 Years of Astronomy*



**Image Credit – NASA**

In honor of the Hubble Space Telescope's 34<sup>th</sup> anniversary, NASA released an image it created of the Little Dumbbell Nebula. More info is at [science.nasa.gov/missions/hubble/hubble-celebrates-34th-anniversary-with-little-dumbbell-nebula/](https://science.nasa.gov/missions/hubble/hubble-celebrates-34th-anniversary-with-little-dumbbell-nebula/).

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

**Next NCA Meeting:**  
**2024 May 11<sup>th</sup>**  
**7:30 pm**  
**Dr. Terry Kucera**

To join the meeting via Zoom, use the following link:  
<https://umd.zoom.us/j/95154535739?pwd=cERBUE9XM3AvNE40TXYrNUptVETzUT09>

Please download and import the following iCalendar (.ics) files to your calendar system:

[https://umd.zoom.us/meeting/tJEscu2trT4tGd1QOonrqcTNP3fs8VY-InJt/ics?icsToken=98tyKuCtrz4uH9eQtxqORowMBY\\_4LOztiVajacMrTDqDTJCYTfyBrFElepJKZX5](https://umd.zoom.us/meeting/tJEscu2trT4tGd1QOonrqcTNP3fs8VY-InJt/ics?icsToken=98tyKuCtrz4uH9eQtxqORowMBY_4LOztiVajacMrTDqDTJCYTfyBrFElepJKZX5)

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

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