Star Dust

Newsletter of National Capital Astronomers, Inc.

capitalastronomers.org

October 2022 ***Volume 81, Issue 2***

Celebrating 85 Years of Astronomy

Next Meeting

When: Sat. Oct 8th, 2022

Time: 7:30 pm

Where: Online (Zoom)

See instructions for joining the meeting on Page 8.

Speaker: Dr. Rita Sambruna

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Image Credit - ESA/Hubble & NASA, W. Keel

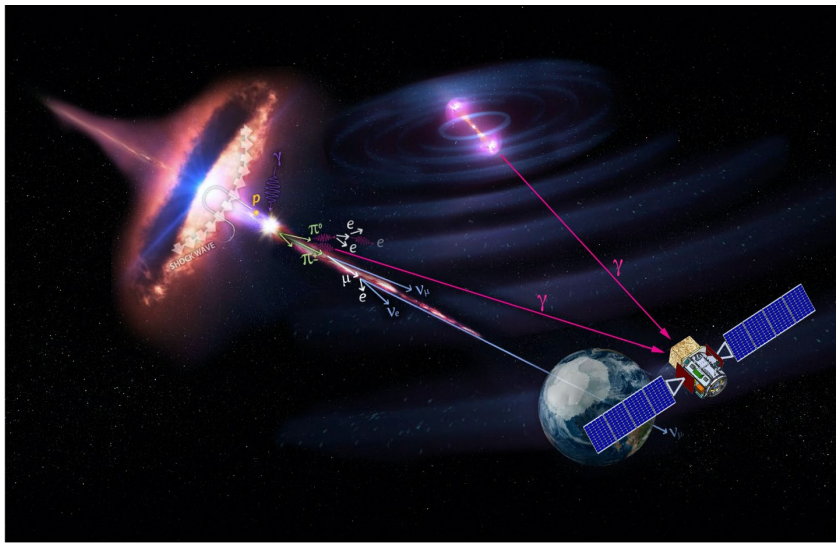
While it looks like the two galaxies are interacting, they just happen to line up with each other in this captivating image. More information is at www.space.com/hubble-space-telescope-overlapping-galaxies-photo.

Annual Membership Dues are Due

Please support NCA by joining or renewing your membership! The membership form, p7, can be printed and mailed in with a check. Or, you may also fill it out online and pay via PayPal! Thank you.

Multi-messenger and Time Domain Astrophysics at NASA

Rita Sambruna, NASA GSFC



Graphic Credit - NASA

The 2020 Astrophysics Decadal Survey has recommended Multi-Messenger and Time Domain Astrophysics as the top priority of the Sustaining Activities in Space program. In the words of the Decadal report, "The New Messengers and New Physics theme embodies the dual revolutions brought about by the marriage of observations of light with those from gravitational waves and elementary particles (multi-messenger astrophysics) along with the expansion of measurements of the sky over time (time-domain)". Realizing the science expectations of New Messengers and New Physics requires establishing an efficient, effective, and sustained infrastructure for communication, collaboration, and cooperation of all stakeholders, and sustained funding for programs and new missions. In this talk, I will review recent results from NASA missions and describe the operational landscape of the 2020s, with particular emphasis on MOSSAIC – the Multimessenger Operational Science Support and Astrophysics Information Collaboration, which addresses the needs of the Multi Messenger community in the next decade.

Recent Astronomy Highlights

Vibrations in Outer Disk of Milky Way
Using data from the Gaia Space Telescope, an ESA mission that has measured the trajectories of over a billion stars, astronomers have discovered vibrations in the Milky Way's outer disk. The cause of the vibrations is an encounter with a dwarf galaxy known as Sagittarius hundred of millions of years ago. The encounter also seems to have disrupted Sagittarius, leaving it much smaller than it originally was. Astronomers believe that the dwarf galaxy might have been as much as twenty percent the size of the Milky Way billions of years ago. Meanwhile Gaia continues its mission of astrometry and is expected to continue at least through late 2024. More information on the discovery can be found at: www.sciencedaily.com/releases/2022/09/220923121707.htm

Motions of Stars in the Small Magellanic Cloud Give Clues About Star Formation in the Early Universe

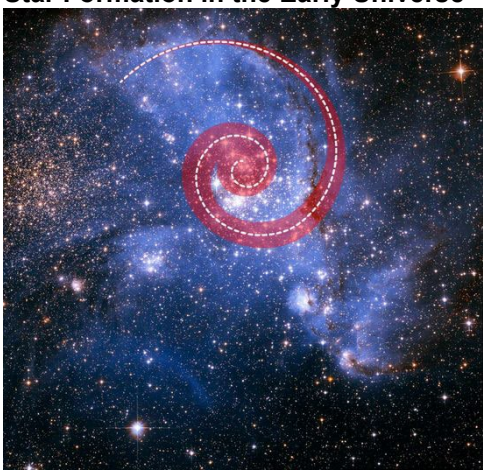


Image Credit - NASA, ESA, Andi James (STScI)
Measurements of star motions over an eleven-year period show that stars formed in a cluster known as NGC 346 in the Small Magellanic Cloud are spiraling in toward the center of the cluster along with large amounts of gas. Since the SMC has a simpler chemical makeup, it is a proxy for studying star formation in the early Universe. More information can be found at scitechdaily.com/nasas-hubble-space-telescope-finds-window-into-early-universe/

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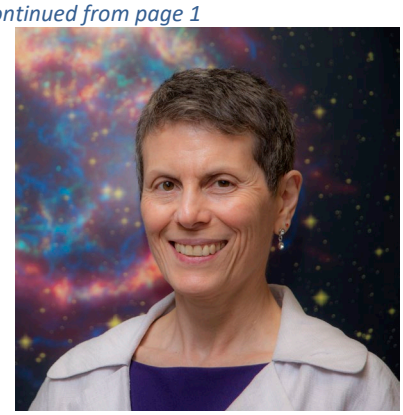
Abstract and Biography – continued from page 1



Biography: An Astrophysicist, Dr. Rita Sambruna studies black holes in galaxies, relativistic jets, and multi-messenger sources. She is the Deputy Director of the Astrophysics Science Division and the Acting Deputy Director of the Science Exploration Directorate at NASA's Goddard Space Flight Center in Greenbelt, MD. She is a Fellow of the American Astronomical Society and of the American Physical Society, and received the NASA Exceptional Achievement Medal in 2019. She lives in Fairfax, VA.

President's Corner

Guy Brandenburg

If you own a telescope, but have not shared the views through it with the public, then both you and they (the public) are missing out. Take the opportunity to enthrall youngsters safely and legally with an out-of-this world phenomenon! Listening to the oohs and aahs from both adults and kids when they see Saturn, Jupiter, the Moon, or other deep-sky objects, is quite gratifying, and just might help some of them to make the serious study of astronomy a part of their lives.

In my own case, the fact that I made my telescopes, from scratch, via the NCA telescope-making, modification, and maintenance workshop, is another source of pride. But any telescope that you own will do.

"Exploring The Sky" is a monthly opportunity for you to do this, right here in Northwest Washington's Rock Creek Park. Volunteers are always needed! The next two events are October 1 and November 5. In fact, October 1st is Observe the Moon Night; it will be just past first quarter and about 37% illuminated.

Halloween is another such opportunity, but it only happens once a year. This time, the Moon will be at first quarter, a time when many beautiful sights on its surface are easy to see, even before the sun sets. I bet that your local neighborhood goblins, monsters, princesses and superheroes would love the treat of seeing the Moon, and Jupiter, and Saturn!

As usual, this month there will public observing events organized by other groups, on the following dates; follow the links for details:

October 1, Smithsonian Udvar-Hazy Museum

October 15, Hopewell Observatory

October 22, Rapahannock County Park

October 29, Sky Meadows State Park and Crockett State Park

Every Friday night (but only from 7:30 – 9:30) at the Analemma Society

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Exploring the Sky

Exploring the Sky is a joint public observing program between the National Capital Astronomers and the National Park Service. We have been holding these sessions for more than 70 years. We supply the telescopes and you supply the eyes. We meet in the field just south of the intersection of Military and Glover Roads, NW, near the Rock Creek Park Nature Center. A parking lot is located next to the field. The sessions will be canceled in the event of rain or cloudy skies.

Although this is not an optimal observing site, many of the objects people are interested in looking at are visible. At times we can see some of the planets, double stars, open clusters, globular clusters, the occasional comet or asteroid, nebulae and fuzzy galaxies. The latter two will never look like the magazine pictures!

Remaining 2022 Exploring the Sky Sessions

1 Oct. 7:30 p.m. – Moon, Jupiter, Saturn

5 Nov. 7:00 p.m. - Moon, Pleiades, Jupiter, Saturn

More information can be found at NCA's web site, www.capitalastronomers.org or the Rock Creek Park web site, 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.

The article-submission deadline for November's issue of Star Dust, is October 18th.

Clear Skies!

President's Corner – continued from page 3

If you want up-to-date announcements and such from members of the National Capital Astronomers, you can **join our message list-serve** by sending an email to capitalastronomers+owner@groups.io . I do not recall having seen any spam at all, ever, on this message list.

If you haven't renewed your membership for this academic year, this issue of Star Dust might be the last one you receive. You now have two basic ways to pay your $10 annual dues:

- Printing out the membership form provided with this newsletter, filling it out, writing a check, and mailing both of them to our extremely efficient and helpful secretary-treasurer, Jim Simpson; or
- Navigating to CapitalAstronomers.org, filling out the membership form with your mouse, and then paying via either PayPal, Venmo, or a credit/debit card.

On October 15, the Hopewell Observatory is holding its first public open house in over two years. We have made a number of improvements during the pandemic, including a brand-new drive for our venerable Ealing mount, using stepper motors, modern integrated circuits, and an open-source operating system called OnStep. Plus a brand-new outhouse. Details can be found below.

If you haven't noticed, the Sun is a lot busier than it was for the past two years. The NCA's Coronado Solar Max Double-Stacked H-alpha telescope has unfortunately developed a problem. When H-alpha scopes work properly, you can safely see prominences, sunspots, and lots of texture on the surface of the sun. H-alpha scopes have a series of complex filters that block everything except for a very narrow band surrounding 656 nanometers.

When I got the NCA Solar Max from Jay Miller a week or two ago, I thought it would be a simple matter of replacing an oxidized ITF filter like I did in my own Coronado 'Personal Solar Telescope' a month or so ago for about $80. But after taking the Solar Max apart, I now fear that it's something more complicated.

Stay tuned.

Hopewell Observatory Open House
October 15, 2022

Guy Brandenburg

You and your friends and family are invited to an Open House at the Hopewell Observatory near Haymarket, Virginia on Saturday, October 15, 2022. There is no charge.

Our location is rather remote. The site is on top of the first ridge of the Blue Ridge mountains that one can see if heading west on I-66. The altitude is about 1200 feet above sea level, and we have Bortle 4-5 skies, which are unfortunately getting a little worse each year. The Milky Way is still visible on clear, moonless nights.

The observatory was started about 50 years ago by a group of DC-area scientists and engineers, many of whom were active in the National Capital Astronomers. They designed, built, and maintained just about everything, including the buildings, and some of the telescopes and mounts, with their own hands. We have a photo of the late Bob Bolster operating the bulldozer that cleared the land!

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Sky Watchers

October/November

Mercury will appear lower in the morning sky before sunrise as October progresses into November. Venus will also be low on the horizon and likely unviewable. Saturn and Jupiter will be in the eastern sky after sunset with Mars joining the gas giants, rising approximately three hours after sunset. The DC region will witness part of a total eclipse in the early morning hours of 11/8 (see below).	
10/9	Full Moon – 4:55 p.m.
10/21-22	The Orionids Meteor Shower peaks on the evening of the 21st into the morning of the 22nd with approximately 20 meteors/hour. A crescent Moon will not rise until 3:05 a.m., leaving viewing conditions ideal through most of the night.
11/4-5	The Taurids Meteor Shower peaks on the evening of the 11/4, usually producing 5-10 meteors per hour. A nearly full Moon will interfere with viewing all but the brightest meteors. The best time for viewing is just after midnight.
11/8	Full Moon at 6:03 a.m. and Total Eclipse of the Moon. The Moon will enter the penumbra of the Earth starting at 4:10 a.m. and will be totally within the Earth's umbra at 5:17 a.m. The Moon will then set at 6:47 a.m. just a few minutes after it begins reentering the penumbra.

All times are in EDT (Eastern Daylight Savings Time) until November 6th, after which they are EST (Eastern Standard Time)

Hopewell Observatory Open House – continued from page 3

We have acquired a variety of telescopes, some of which are sheltered under a roll-off roof, and some that we wheel out and set up on our lawn. Our largest scopes are a 14" Celestron Schmidt-Cassegrain on an Astro-Physics mount and a 14" home-made Newtonian, and we also have two long-focal-length 6" refractors.

One of our mounts was manufactured by a company called Ealing for the University of Maryland in the '70's as a university-grade push-to scope. Its original electro-mechanical drive and its optics, which had always been problematic, have been replaced by us. The current drive and go-to system uses the OnStep system, which you can read about here:

onstep.groups.io/g/main/wiki

Our current members are not electrical engineers, and none of us had ever designed or built anything nearly as complex as this scope drive. Installing the stepper motors and setting up the electronics to get the new drive working took us nearly a year of hard work and lots of head-scratching. We were inspired by NCA member Prasad Agrahar's success in doing an OnStep conversion for two of his own telescopes, and we were helped immensely and materially (but remotely) by Ken Hunter, Howard Dutton, Khalid Bahayeldin, George Cushing, Dave Schwartz, and Bob Benward, who are some of the leading lights of the OnStep community. Without the extremely experienced and knowledgeable hands-on assistance of NOVAC member and retired engineer Arlen Raasch, I don't think we would have reached the finish line.

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

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Editor: Todd Supple

Editorial Advisors:

- Michael Chesnes
- John D. Gaffey, Jr.
- Jeffrey Norman
- Elizabeth Warner
- Wayne Warren
- Marjorie Weissberg
- Harold Williams

Electronic Distributor: Jay Miller

Recent Astronomy Highlights – continued from page 2

Original Nucleus of Milky Way May Have Been Charted

Gaia, ESA's astrometry space telescope mission, has provided a treasure trove of data concerning over a billion stars in the Milky Way, including their motions and compositions. Searching that database, astronomers now claim to have discovered the original nucleus of our home galaxy, approximately 18,000 light years in diameter and containing roughly 100 million times the mass of our Sun. Those astronomers did so by searching among millions of stars near the center of the Milky Way for ones that have no more than 3% of the metal-to-hydrogen ratio of the Sun. (Astronomers classify any element not hydrogen or helium as 'metals'.) This low ratio indicates that those stars are among the earliest in the galaxy, unlike younger stars that are usually created with metal-rich gas expelled by older stars at the ends of their lives. The astronomers then looked at the motions of the candidate stars, trying to find ones that remain within the Milky Way, instead of moving out into the halo, where they might have formed from metal-poor gas. Approximately 18,000 stars were found, which leads to an estimate that the mass of the original disk was between 50 and 200 million times the mass of the Sun. More information on this study can be found at www.sciencenews.org/article/milky-way-galaxy-nucleus-oldest-stars-protogalaxy

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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

Planetary and Asteroidal Occultations

2022 Date	Day	EDT/ EST	Star	Mag.	Asteroid	dmag	dur. s	Ap. "	Location
Oct 8	Sat	2:59	4UC56416075	12.6	Phobos	0.5	3	7	nVA,ncMD,ePA,nNJ
Oct 8	Sat	23:59	TYC17302044	11.2	Leonora	1.9	10	4	ne-cwPA,ce-swOH
Oct 12	Wed	0:40	4U419145965	14.5	Leona	1.1	8	9	seMD,seVA,eNC
Oct 13	Thu	23:25	4U674114597	12.0	Gudy	2.9	2.1	5	ePA,cMD,nVA;DC?
Oct 16	Sun	2:38	4UC55236689	14.6	Margarita	1.3	2	12	nVA,DC,cMD,sNJ
Oct 22	Sat	20:29	TYC68842215	11.0	Tone	4.5	4	5	c+nVA,DC,cMN,nNJ
Oct 23	Sun	6:53	TYC08380757	11.8	Makharadze	7.1	0.5	6	cOH,nVA,DC,scMD
Oct 30	Sun	3:34	4UC57010158	11.5	Clusius	6.4	1.2	5	cMD,DC,nVA,sOH
Nov 4	Fri	6:49	SAO 98866	9.1	Kyokuchiken	10.	0.4	2	nAZ,nOK,nTN,cNC
Nov 5	Sat	23:31	4UC52209135	14.2	Matogawa	3.1	0.6	9	sNJ,cMD,DC,nVA
Nov 6	Sun	1:26	4UC54506525	14.8	1999 JC30	2.6	1	12	sNJ,cMD,DC,nVA
*** Dates and times above are EDT, those below are EST ***									
Nov 10	Thu	19:40	4U473120147	12.3	Ennomos	4.3	4	6	sIA,sOH,c-seVA
Nov 13	Sun	3:14	4UC56141866	14.2	Hamburga	0.5	18	11	nVA,DC,n+cMD,sNJ
Nov 14	Mon	0:33	4UC57905990	10.3	1999 RJ32	6.8	1.2	3	cMD,DC,nVA,sOhio
Nov 14	Mon	5:53	TYC08060754	10.2	Didymos	6.2	.33	4	cenFL, eNC, seMA

Lunar Grazing Occultations

2022 Date	Day	EDT/ EST	Star	Mag	% alt	CA	Location, Notes
Oct 18	Tue	1:50	SAO 80070	7.5	44- 18	11N	ClearSpg,MD;Fortney,n.Bath,PA
*** Dates and times above are EDT, those below are EST ***							
Nov 8	Tue	6:40	X 63561	10.4	0E 11	26U	StnyFrk,PA;Params,NJ;Ynkrs,NY

Lunar Total Occultations

2022 Date	Day	EDT/ EST	Ph	Star	Mag	%	alt	CA	Sp.	Notes
Oct 15	Sat	3:11	R	ZC 849	6.5	72-	62	90N	G9	Close double??
Oct 16	Sun	0:49	R	ZC 994	6.6	64-	26	68S	F5	Maybe close double
Oct 16	Sun	3:24	R	SAO 78501	7.8	63-	55	38S	K0	
Oct 16	Sun	5:19	R	ZC 1013	7.0	62-	75	83S	G0	Close dbl, dTime -2.2s
Oct 18	Tue	1:58	R	SAO 80070	7.5	44-	19	30N	K0	
Oct 19	Wed	3:27	R	SAO 80677*	7.6	34-	25	61N	F0	
Oct 19	Wed	5:33	R	ZC 1373	6.5	34-	48	69S	A2	
Oct 20	Thu	7:37	D	eta Leonis	3.5	24-	58	-88N	A0	Sun +2,AA 91,ZC1484,dbl?
Oct 20	Thu	9:04	R	eta Leonis	3.5	24-	68	72N	A0	Sun+18,ZC1484,close dbl?
Oct 21	Fri	6:12	R	SAO 99317*	8.1	17-	33	89N	K0	
Oct 24	Mon	10:17	D	Mercury	-1.1	1-	37	-67N		Sun alt. +28, dur. 16s
Oct 24	Mon	11:32	R	Mercury	-1.1	1-	43	44N		Sun alt. +36, dur. 16s
Oct 27	Thu	18:51	D	ZC 2336	6.7	8+	7	79N	B9	Sun alt. -8,Az. 231 deg.
Oct 31	Mon	19:39	D	SAO 189406	7.3	46+	26	43N	K4	
Oct 31	Mon	19:44	D	ZC 2998	6.4	46+	26	70N	A0	
Oct 31	Mon	20:45	D	SAO 189433	8.3	47+	22	25N	K2	
Oct 31	Mon	22:58	D	ZC 3012	6.9	48+	7	30N	A7	Azimuth 231 deg.
Nov 1	Tue	21:47	D	SAO 190462	8.1	59+	26	53N	M2	
Nov 1	Tue	23:08	D	BQ Cap	8.0	59+	16	52S	F3	SAO 190504
Nov 3	Thu	18:21	D	SAO165597*	8.0	78+	24	39N	F8	Sun alt. -4 deg.
Nov 3	Thu	21:39	D	ZC 3438*	7.7	79+	42	45S	B3	
Nov 3	Thu	22:44	D	ZC 3442*	7.9	79+	40	67S	F5	
Nov 4	Fri	21:37	D	ZC 20	6.7	87+	47	88N	G5	
Nov 5	Sat	2:46	D	ZC 36	7.1	89+	18	59N	G5	
Nov 5	Sat	2:48	D	ZC 37	7.2	89+	18	77S	K2	
*** Dates and times above are EDT, those below are EST ***										
Nov 6	Sun	2:31	D	SAO109664*	7.3	94+	33	88N	K0	
Nov 6	Sun	19:17	D	UZ Piscium	6.6	98+	34	74S	A2	ZC 258, spec. binary
Nov 9	Wed	18:52	R	ZC 621*	6.1	97-	12	77S	B9	Az. 70,AA 252,spec.bin.
Nov 11	Fri	20:20	R	ZC 912	7.0	87-	11	21S	B8	Azimuth 65 degrees
Nov 12	Sat	5:30	R	ZC 958	6.7	85-	57	83S	K1	spectroscopic binary
Nov 12	Sat	21:56	R	SAO 78957	7.5	80-	19	88S	G8	
Nov 12	Sat	23:39	R	SAO 79022	8.0	79-	38	58S	K0	
Nov 13	Sun	4:39	R	47 Gem	5.8	78-	74	69S	A4	ZC 1088
Nov 14	Mon	2:10	R	omega Cnc	5.9	70-	56	60S	G8	ZC 1206
Nov 14	Mon	5:18	R	SAO 79936	8.1	70-	74	21N	K5	

*in Kepler2 program so occultation light curves are sought.

More information at http://iota.jhuapl.edu/exped.htm.

David Dunham, dunham@starpower.net

2022-2023 Officers

President:
Guy Brandenburg
gfbrandenburg@yahoo.com
202-635-1860 (leave message)

Vice-President:
John Hornstein
jshgwave@yahoo.com
301-593-1095 (h)

Secretary-Treasurer:
Jim Simpson
simpsonj@verizon.net
240-232-2820

Asst. Secretary-Treasurer:
Jeffrey B. Norman
jeffreynorman@comcast.net

Trustees:
- Michael Chesnes (2023)
- Jack Gaffey (2024)
- Benson Simon (2025)
- Michael Brabanski (2026)

Appointed Officers and Committee Heads:

Exploring the Sky
Jay Miller
jhmiller@me.com

Telescope Making
Guy Brandenburg
gfbrandenburg@yahoo.com
202-635-1860 (leave message)

NCA Webmaster
Elizabeth Warner
warnerem@astro.umd.edu
301-405-6555

Star Dust Editor
Todd Supple
NCAStardust@gmail.com
301-595-2482 (h)

Social Media
Twitter: @NatCapAstro

Hopewell Observatory Open House – continued from page 4

NCA and Hopewell member Alan Tarica's contributions and efforts have been critical to the whole project, and Jim Simpson's encouraging words were good to hear. In any case, and at long last, this mount and its telescopes now work very well indeed. Phew!

Full directions to the Observatory can be found here.

Please don't block access with your vehicle. Our lawn area is not very large, so you can't park there. You may certainly bring your own telescope(s) or binoculars! Those with physical handicaps, or who are bringing your own telescope, can drop the person or the objects off, and then return to park near the cell phone tower roughly 300 yards north of our site.

Keep in mind that while we do have electricity, and a warming cabin, **we do NOT have running water**. Instead of a bathroom, we have a brand-new outhouse and hand sanitizer. We bring up jugs and bottles of water for drinking and washing.

We will have on hand makings for hot cocoa, hot cider, coffee, and tea, at no charge. We also have red plastic sheets, rubber bands, and tape that you can fashion use to cover any white-light flashlights.

This is a remote, wooded location, so you are advised to take precautions such as your choice of bug spray (I like DEET and permethrin-impregnated long pants tucked into socks) against insects such as ticks, mosquitoes, and chiggers (aka 'trombiculid mites').

Even though we are only about 300 yards from the cell phone tower where you will park, whether you get good cell-phone service up there, or not, seems to depend on which phone company you are signed up with.

You can stay as long as you like, even until the wee hours of the 16th! (One of the benefits of Hopewell membership is that instead of driving home late at night, dead tired, after an observing session, one can simply go to sleep on the couch or on one of the cots in our Operations cabin,)

If the weather is rainy or hopelessly cloudy, we will postpone the event until October 22, exactly one week later.

Feel free to email me at gfbrandenburg at yahoo dot com or call me at 202-635-1860 if you have questions.

Image of the eruption of debris from the collision of the DART probe with the asteroid Dimorphos on Sept. 26th. The image was taken by the Light Italian CubeSat for Imaging of Asteroids (LICIACube), a cubesat that hitched a ride on DART, then was released on September 11th so that it could be at a safe distance from the collision while recording the aftermath. Image Credit - ASI Italian Space Agency

Recent Astronomy Highlights – continued from page 4

Bubble of Hot Gas Found Going Around Sagittarius A*

A bubble of gas, orbiting our galaxy's central black hole at approximately the distance of Mercury from our Sun, has been detected by ALMA, the Atacama Large Millimeter/submillimeter Array. At that distance the bubble is orbiting once every 70 minutes, at approximately 30% of the speed of light. The bubble was likely formed and heated up by magnetic interactions in the gas surrounding the supermassive black hole. Such bubbles or 'hot spots' have previously been detected using X-ray and infrared observations. Speculation is that the radio emissions increase as the hot spots cool off over time. The observations are allowing astronomers to devise more precise models of the magnetic fields surround Sagittarius A*. More information about the hot spot can be found at phys.org/news/2022-09-astronomers-hot-gas-swirling-milky.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 5:00 to 7:30 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 if you plan to attend. More 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: **12 November** 7:30 p.m. Jens Barosch, Carnegie Earth & Planets Laboratory**, Presolar Stardust in Asteroid Ryugu**

The APS Mid-Atlantic Senior Physicists Group: **(Zoom Meeting)** October 19th at 1:00 p.m., Dr. Michael Mascagni, Florida State University, will give a talk entitled "Stochastic Computational Electrostatics and Applications: Computing Capacitance". You can register and receive the Zoom link for the meeting at apsphysics.zoom.us/meeting/register/tZAqc-goqDIuE9JldRS91ezmMJ4Q8RxPy1Ji. More information will be made available at www.aps.org/units/maspg/meetings/meeting.cfm?name=SENIOR1022.

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 84 Years of Astronomy

Image Credit - NASA, ESA, CSA, STScI

Neptune's rings show up brightly in infrared in the image take by JWST. More info is available at www.nasa.gov/feature/goddard/2022/new-webb-image-captures-clearest-view-of-neptune-s-rings-in-decades.

To join or renew online, visit capitalastronomers.org and look in the right column for the Membership Form and PayPal links.

Next NCA Meeting:

2022 October 8th

7:30 pm

(On Zoom)

Dr. Rita Sambruna

To join the Zoom meeting, use the following link: umd.zoom.us/j/98702044833?pwd=UTg1bFJpMmxvcXpEUGtUcDNmZnNrdz09

Please download and import the following iCalendar (.ics) files to your calendar system: umd.zoom.us/meeting/tJwqd-uoqj8iGdfUoJKHH8U2tt2u7lPmVFFS/ics?icsToken=98tyKuCgqTsoGtCRuBqERow-B4iga_TwiClHjadbqRDPKAh7OjakIvYQJ-VzINXm

Please note that NCA Zoom meetings are often recorded.

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