Star Dust

Newsletter of National Capital Astronomers, Inc.

capitalastronomers.org

June 2022 ***Volume 80, Issue 10***

Celebrating 85 Years of Astronomy

Next Meeting

When: Sat. June 11th, 2022

Time: 7:30 pm

Where: Online (Zoom)

See instructions for joining the meeting on Page 8.

Speaker: Science Fair Winners

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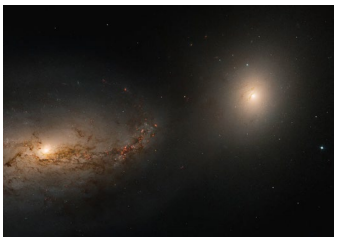

Image Credit - NASA, ESA, H. Ford (Johns Hopkins University), and DSS; Image Processing: G. Kober (NASA Goddard/Catholic University of America)

Known as Arp 94, the two galaxies are gravitationally warping each other. More information is at www.nasa.gov/image-feature/goddard/2022/hubble-

Science Fair Winners

John Hornstein

Each spring, NCA members judge local regional science fairs in order to identify good projects in astronomy. Our awards consist of:

- A certificate
- An invitation to speak at our June meeting
- One year of free membership in the NCA
- A one-year subscription to Sky & Telescope

The 2022 winners are (in alphabetic order):

Orion Foo, 'Powerful Quasar-Driven Outflows in the Local Universe from the Cosmic Origins Spectrograph Hubble Space Telescope Far-Ultraviolet Spectroscopic Archive'

David Fritz, 'The Life and Death of Sunspots - Tracking Longevity of Active Regions on the Sun'

Helen Mengistu, 'Effects of Space Radiation on the Medial Prefrontal Cortex and Behavior'

NCA Elections and Astro-photos

John Hornstein

All members of the NCA can vote during the elections on June 12. Self nominations are encouraged. If you are nominating someone else, please contact that person to make sure they are willing to serve in that office before nominating them. Nominations can be taken during the election.

Currently the candidates are:

President	**Guy Brandenburg**
Vice President	**John Hornstein**
Asst. Secy-Treasurer	**Jeff Norman**
Secy-Treasurer	**Henry Bofinger**
Trustee	**Michael Chesnes (to June 2023)**
Trustee	**Michael Brabanski (to June 2026)**

When the beginning of the voting is announced, go to the bottom of your Zoom screen and note the 'Reactions' icon. To vote, click on that icon to see the options. When each combination of a candidate and a position is announced, click on either 'thumbs up' or on 'thumbs down' to indicate your choice. If there are multiple candidates for any office, alternate procedures for that election will be explained at that time.

At the end of the meeting, we would like to see any interesting astro-photos that you have taken since last June. When Elizabeth tells you go ahead, either share your screen, or hold the photo up in front of you. We will be eager to hear how you made the photo.

captures-a-galactic-dance.

Recent Astronomy Highlights

New Study Indicates That The Mass Distribution Of Stars In Other Galaxies Skews Heavier

A study of the light from 140,000 galaxies at various distances from the Milky Way seems to contradict an assumption held by astronomers for decades, that assumption being that the mass-distribution of stars in other galaxies is similar to that in our own galaxy. This assumption was made in part because the stars of other galaxies are simply too far away for them to be seen individually by any current telescope. The contradictory finding is that the mass distribution tends to skew heavier in those other galaxies. This finding has implications for theories about the lives of galaxies. It also indicates that supernovae should be more common, and the population of black holes in most galaxies should be higher than previously believed. More information can be found at nbi.ku.dk/english/news/news22/new-discovery-about-distant-galaxies-stars-are-heavier-than-we-thought/.

Discovery Of An Ultra-Long-Period Radio-Emitting Neutron Star

Astronomers using the MeerKAT radio telescope, composed of 64 antennas, in South Africa, discovered a flash or pulse of radio waves lasting approximately 300 milliseconds. Looking back into archives, those astronomers found repeated recordings of such a flash. Those observations were missed before because the astronomers were looking for signals of a much shorter duration. The source of the flash, designated PSR J0941-4046, shares characteristics with pulsars and magnetars, but all of those objects that have been detected so far have rotational periods much shorter than its 76-second period. Such long rotational periods are usually associated with white dwarfs, but PSR J0941-4046 actually appears to be a neutron star, possibly the first of a theorized class of objects, ultra-long-period magnetars. More information can be found at www.sciencealert.com/unusual-pulse-detected-in-the-sky-may-be-a-completely-new-class-of-stellar-object.

Event Horizon Telescope Images Shadow of Sagittarius A*

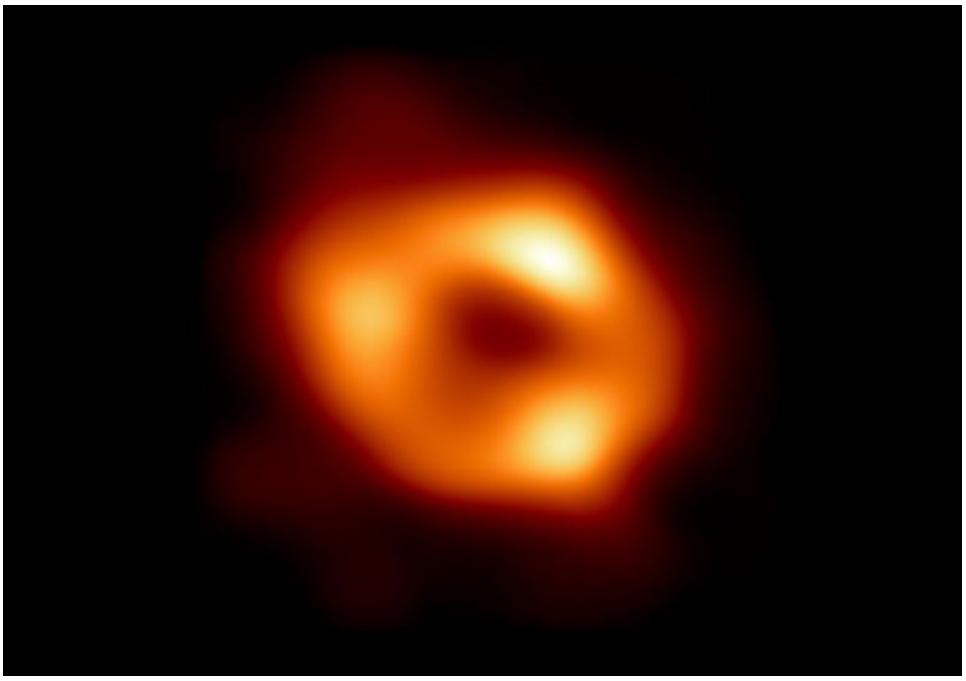

Image Credit – Event Horizon Telescope collaboration

Three years after the release of an image of the shadow of M87*, a supermassive black hole at the heart of Messier 87, a supergiant elliptical galaxy, members of the Event Horizon Telescope team recently released the first image of the shadow of Sagittarius A*, the supermassive black hole at the center of the Milky Way, and the gas swirling around it. The dark area at the center of the image shown above is the actual shadow of the black hole, while the brighter regions show the gas.

While the sets of data for the images of M87* and Sagittarius A* were both taken in 2017, the image of Sagittarius A* proved to be a far more difficult challenge. One reason is that changes in the gas disk around the much larger M87* happened much more slowly, in a matter of days. By comparison, changes around Sagittarius A* could take place in only minutes. In addition, our galaxy's supermassive black hole is much less active in terms of feeding on the surrounding gas. Finally, gas and dust in the Milky Way's disk, along the path between Sagittarius A* and Earth, can deflect the submillimeter radio waves from which the recently released image was ascertained.

Despite the difficulties, the Event Horizon Telescope, comprised of radio telescopes around the world, did manage to gather the necessary data. In fact, so much data were recorded by the various radio telescopes in 2017 that they could not be sent over the internet. Instead, the data were copied onto hard disks that were taken back to a central facility for processing.

Once again, as with the results from M87*, the image from Sagittarius A* validates Einstein's Theory of General Relativity due to the fact that the shadow is the size that the theory predicted. More information is at www.space.com/milky-way-monster-black-hole-first-image-eht.

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!

2022 Exploring the Sky Sessions

2 July 9:00 p.m. – Moon, Summer Triangle, M13
6 Aug. 8:30 p.m. – Moon, M13, Andromeda
3 Sep. 8:00 p.m. – Moon, Vega
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 September's issue of Star Dust, is August 21st.

Clear Skies!

James Webb Space Telescope – Taking Images and Tracking An Asteroid

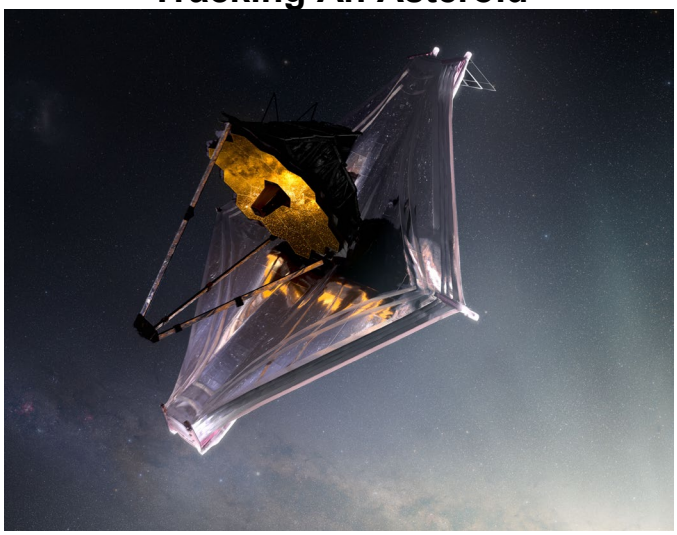

Illustration credit - NASA GSFC/CIL/Adriana Manrique Gutierrez

While we will have to wait until July 12th for the release of the James Webb Space Telescope's first full-color images, the ones taken during its startup are already dazzling astronomers and astronomy enthusiasts. The side-by-side infrared images, shown below, of the same region in the Large Magellanic Cloud, give a comparison of the stunning resolving abilities of JWST in comparison to those of the now-retired Spitzer Space Telescope.

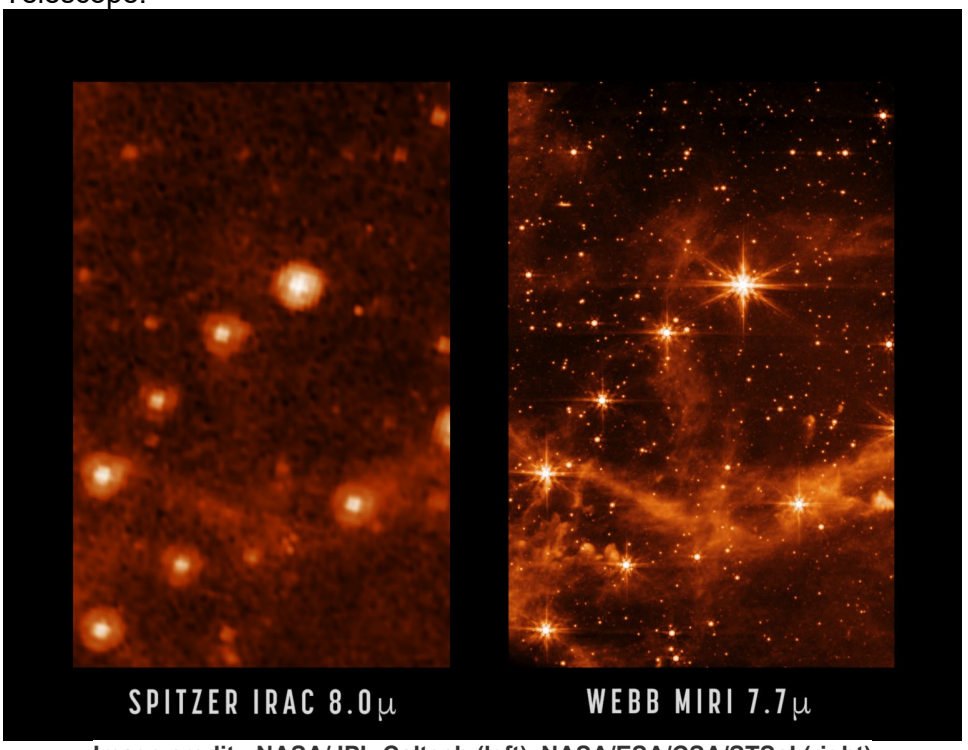

Image credit - NASA/JPL-Caltech (left), NASA/ESA/CSA/STScI (right)

Meanwhile JWST also passed a test of its tracking abilities by following the movement of an asteroid, designated 6841 Tenzing, named after Tenzing Norgay, who was one of the first people to reach the summit of Mount Everest, along with Sir Edmund Hillary, in 1953.

Sky Watchers

Summer Overview

Summer brings three Supermoons in a row, the one in August unfortunately interfering with the Perseids Meteor Shower. Mercury joins the other planets in a line in the morning sky, reaching Greatest Western Elongation on June 16th (see below), before transiting again to the night sky and reaching Greatest Eastern Elongation on August 27th (see below). Venus remains in the morning sky throughout the Summer. Mars rises around 3:00 a.m. at the beginning of the Summer and near midnight toward the end of the season. Jupiter and Saturn will rise in the late evening/early morning with Saturn reaching opposition on August 14th (see below).

Late June

6/14	Full Moon and Supermoon – 7:52 a.m.
6/16	Mercury at Greatest Western Elongation. It will be 23.2º from the Sun in the morning sky.
6/21	Summer Solstice – 5:05 a.m.

July

7/13	Full Moon and Supermoon – 2:38 p.m.
7/22	Conjunction - The Moon and Uranus will appear only 13.3 arcminutes (less than half the width of the Moon) apart from each other.
7/28, 29	Peak of the Delta Aquarids Meteor Shower – 20 meteors/hour. With a new Moon down throughout the night, conditions will be ideal for viewing.

August

8/11	Full Moon and Supermoon – 9:36 p.m.
8/12, 13	Peak of the Perseids Meteor Shower – 60 meteors/hour. Unfortunately, a near Full Moon will interfere with viewing. Best viewing in the hours before dawn.
8/14	Saturn at Opposition, closest to Earth and viewable all night long.
8/27	Mercury at Greatest Eastern Elongation. It will be 27.3º from the Sun in the evening sky.

September

9/10	Full Moon – 5:58 a.m.

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Thank you!

Recent Astronomy Highlights – continued from page 2

The Cause Of The Difference In The Colors of Uranus and Neptune

Although Uranus and Neptune are similar in mass and size, they have somewhat different colors, Neptune being a brighter blue than its sister planet. Results from a model of aerosol layers in the planetary atmospheres seem to indicate that the difference is caused by the buildup of a thicker layer of haze particles in Uranus's upper atmosphere than in Neptune's. The latter planet's more turbulent, active atmosphere tends to keep its layer of haze particles thinner. Uranus's thicker layer of haze particles then tends to dull the bluish color in the same way fog dulls the colors of objects. More information can be found at www.sciencedaily.com/releases/2022/05/220531140128.htm.

continued on page 7

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

2022 Date	Day	EDT	Star	Mag.	Asteroid	dmag	dur. s	Ap. "	Location
Jun 12	Sun	4:37	TYC51330546	11.6	Echemmon	6.3	2	5	neMD,swPA,neOH
Jun 13	Mon	3:20	4U332123588	14.5	Suleika	0.3	4	12	sNJ,cMD,DC,cVA
Jun 14	Tue	2:44	4U397107010	13.1	Hesperia	0.5	11	8	sMD,s+cVA,sWV,KY
Jun 18	Sat	0:58	4UC39271791	10.7	1999 RU208	5.8	2	4	cVA,cWV,cOH,nIN
Jun 19	Sun	2:36	4UC41670475	13.7	Nealley	1.6	4	10	sNJ,sMD,sDC,nVA
Jun 24	Fri	1:05	4U387117889	11.3	Tuchkova	4.5	3	5	c+wMD,nDC,swPA
Jun 27	Mon	1:28	4UC49699150	14.4	Riga	1.1	6	12	sMD,n+cVA,cWV
Jul 2	Sat	3:37	4UC39384949	13.0	Trusanda	3.0	3	9	sNJ,cMD,nDC,nVA
Jul 6	Wed	21:33	SAO 186499	9.6	Lucia	3.8	6	4	ec to nw N. Car.
Jul 7	Thu	2:57	4UC42168073	13.5	Susanna	1.2	4	9	sNJ,cMD,DC,nVA
Jul 8	Fri	4:15	4U406106516	13.9	Iphidamas	3.4	3	11	sMD,cVA,sWV;DC?
Jul 9	Sat	2:30	4U326182348	13.5	Alekto	0.7	7	9	sNJ,MD,DC,nVA
Jul 9	Sat	22:19	4UC41366537	12.4	Nephthys	0.5	12	6	ePA,cMD,n-scVA
Jul 10	Sun	22:50	TYC63020045	10.7	Deira	3.8	3	4	se+cVA,sMD,cOhio
Jul 14	Thu	22:58	4U315167211	13.4	Marconia	1.8	4	9	sMD,DC,nVA,cOhio
Jul 16	Sat	2:50	4U533142117	10.8	Helio	3.2	8	5	seNC,se+cVA,cOH
Jul 20	Wed	3:17	4U354192857	11.2	Didymos	6.8	.18	9	sQC,nME,sNB,sNS
Jul 24	Sun	4:55	TYC63891164	11.7	Didymos	6.0	.19	9	neMS,nAL,wc-seGA
Jul 25	Mon	23:57	4U545148798	13.8	Adelheid	1.0	43	9	MD,sNJ,nDC,s+wPA
Jul 21	Thu	3:40	4U311256561	11.5	Padua	1.4	8	6	sePA,cMD,DC,nVA
Jul 28	Thu	0:21	4U354171572	12.5	Palmys	5.8	2	7	sePA,cMD,DC,nVA?
Aug 8	Mon	3:14	SAO 189554	9.2	Antiope	2.6	13	4	sON,seMI,wOH,nIN
Aug 16	Tue	4:34	TYC24630303	9.9	Florence	7.3	.11	5	sNJ,DE,sMD,c+sVA
Aug 19	Fri	22:54	4UC36767521	11.9	Vanadis	3.3	6	6	sPA,nMD,nVA,DC
Aug 28	Sun	0:40	4U401123482	10.8	Cloanthus	6.3	3	6	sNJ,sMD,cVA;DC?

Lunar Grazing Occultations

2022 Date	Day	EDT	Star	Mag	% alt	CA	Location, Notes
Jun 12	Sun	22:40	Dschubba	2.3	97+ 31-20S		Gladstn,wSkiprs,VA;Gumbery,NC
Jul 6	Wed	23:52	ZC 1866	5.8	50+ 11 6N		Plmyra,KngPrusia,PA;MtHollyNJ
Jul 26	Tue	4:22	SAO 78490	8.9	5- 6	18N	DaleCty, JonesPt,VA; Bowie,MD
Aug 23	Tue	4:34	SAO 79164	7.4	14- 21	16N	Milen,WV;nFrakvil,sHazlton,PA

Lunar Total Occultations

2022 Date	Day	EDT	Ph	Star	Mag	%	alt	CA	Sp.	Notes
Jun 11	Sat	20:58	D	ZC 2136	6.6	92+	28	11S	K1	Sun -5, Term.Dist. 8"
Jun 11	Sat	23:24	D	ZC 2147	6.9	92+	33	69N	K0	Close double?
Jun 12	Sun	22:23	D	Dschubba =	2.3	97+	26	6S	B0	ZC2290, see notes for
Jun 12	Sun	22:56	R	delta Sco	2.3	97+	28	-46S	B0	AA 222, for VA-NC graze
Jun 15	Wed	0:46	R	ZC 2643	6.7	99-	22	83S	K1	AA 287, Term. Dist. 17"
Jun 16	Thu	2:30	R	ZC 2848 *	5.6	95-	24	32N	K1	AA 340,mg2 9,dTime +47s
Jun 17	Fri	0:54	R	SAO 189406	7.3	89-	13	88S	K4	Azimuth 138 deg.
Jun 17	Fri	1:07	R	ZC 2998	6.4	89-	15	69S	A0	Azimuth 140 deg.
Jun 17	Fri	5:08	R	SAO 189555	7.2	88-	26	36N	G1	Sun altitude -6 degrees
Jun 18	Sat	3:00	R	BQ Cap	8.0	80-	25	58N	F3	SAO 190504
Jun 20	Mon	5:20	R	ZC 3458	6.2	58-	38	69S	K0	Sun alt. -4 degrees
Jun 21	Tue	2:52	R	ZC 25	7.4	48-	14	54S	G6	Azimuth 107 deg.
Jun 22	Wed	4:09	R	SAO109613*	7.6	37-	25	68N	F6	close double??
Jun 24	Fri	4:31	R	SAO 93012	8.2	19-	19	26S	G5	Sun alt. -12
Jul 1	Fri	21:48	D	ZC 1348	8.1	8+	10	59N	G5	Azimuth 289 deg.
Jul 2	Sat	22:04	D	SAO 98813	8.4	14+	13	57S	F8	Azimuth 282 deg.
Jul 3	Sun	22:33	D	SAO 99227	8.2	21+	13	14S	K0	Az. 276 deg.
Jul 4	Mon	22:20	D	SAO 118841	7.6	30+	21	56N	F5	
Jul 6	Wed	21:05	D	SAO 139044	7.7	49+	39	65S	F5	Sun alt. -6 deg.
Jul 6	Wed	23:47	D	44 Vir	5.8	50+	13	21N	A3	Az. 254, ZC1866, triple
Jul 7	Thu	23:01	D	ZC 1973	6.2	61+	24	52N	K5	Close double from HIP
Jul 9	Sat	20:38	D	ZC 2214	6.3	81+	30	67N	A5	Sun alt. -1 deg.
Jul 10	Sun	0:38	D	ZC 2228	5.8	82+	16	80S	K0	
Jul 13	Wed	21:49	R	omega Sgr	4.7	100-	6	54S	G3	Az131,AA284,ZC2910,TmD5
Jul 13	Wed	23:15	R	60 Sgr	4.8	100-	17	68S	G8	AA 295,ZC2914,TrmDst 7"
Jul 15	Fri	4:32	R	ZC 3102	7.0	96-	24	43S	A0	AA 237, close double??
Jul 17	Sun	3:15	R	ZC 3396	7.7	83-	36	16S	A8	
Jul 19	Tue	2:16	R	ZC 95	7.0	63-	25	34S	F8	close double??
Jul 19	Tue	3:10	R	SAO 109441	7.7	63-	35	75S	G5	
Aug 20	Sat	0:57	R	upsilonTau	4.3	40-	6	78S	A8	Azimuth 66 deg.,ZC 660
Aug 20	Sat	1:25	R	72 Tauri	5.5	40-	11	80N	B7	Az. 69,ZC 664,close dbl
Aug 20	Sat	3:24	R	SAO 76636	7.1	39-	33	86N	K2	
Aug 21	Sun	4:58	R	ZC 809	8.4	29-	43	89S	F5	
Aug 22	Mon	3:47	R	SAO 78172	8.3	21-	21	65S	K0	
Aug 22	Mon	4:14	R	SAO 78195	8.0	21-	25	35S	K2	close double??
Aug 22	Mon	5:32	R	SAO 78245	8.3	21-	40	42S	A0	Sun alt. -11 deg.

continued on page 6

2021-2022 Officers

Occultations – continued from page 5

Lunar Total Occultations (continued)

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Aug 23 Tue  3:13 D SAO  79122 7.6 14-  6   8N K2 Azimuth 61 deg.
Aug 23 Tue  3:20 R SAO  79122 7.6 14-  7  23N K2 Azimuth 62 deg.
Aug 23 Tue  4:31 R ZC 1089    6.7 14- 19  84N K0
Aug 23 Tue  4:43 R SAO  79164 7.4 14- 22  37N G8 close double? PA graze
Aug 25 Thu  5:22 R ZC 1334    7.0  4-  8  21S G5 Azimuth 69 deg.
Aug 30 Tue 20:33 D ZC 1905    8.3 13+ 10  41S F5 Sun alt. -11,Az. 253
Aug 31 Wed 20:43 D SAO 158343 8.3 21+ 12  63S F3 Azimuth 242 deg.
Sep  2 Fri 20:05 D SAO 183858 7.7 41+ 23  36S F7 Sun alt. -6 deg.
Sep  2 Fri 21:54 D ZC 2274*   6.9 42+ 10  63S B9 Az.230,mg2 12 dT -17sec
Sep  3 Sat 21:55 D ZC 2427    7.2 53+ 15  47N G0 Azimuth 218 deg.
Sep  3 Sat 22:04 D SAO 184779 8.2 53+ 14  40N A2 Azimuth 220 deg.
Sep  4 Sun 21:29 D ZC 2583    5.8 65+ 21  40S A7
Sep  5 Mon 20:03 D ZC 2765    7.9 75+ 21  67S A3 Sun alt. -7 deg.
Sep  5 Mon 23:48 D tau Sag    3.3 76+ 15  77N K1 Az.215,ZC2784,spec.bin.
Sep  6 Tue 22:15 D SAO 188955 7.2 85+ 25  36S F5 in star cluster
Sep  7 Wed 21:25 D SAO 190087 7.4 92+ 24  87N G6
Sep  7 Wed 23:26 D ZC 3102    7.0 93+ 29  77S A0 close double??
Sep  8 Thu  0:28 D SAO 190165 7.2 93+ 27  49N K0
Sep 13 Tue  5:33 R Torcular   4.3 90- 49  71N K0 ZC 257=omicronPsc,dbl?

*in Kepler2 program so occultation light curves are sought.

More information at http://iota.jhuapl.edu/exped.htm.
Sometime soon, the URL will change to iota.jhuapl.edu/exped.htm.

David Dunham, dunham@starpower.net
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Hubble Images 'Hidden' Galaxy

Image credit - NASA, ESA, P. Sell (University of Florida), and P. Kaaret (University of Iowa); Image processing: G. Kober (NASA Goddard/Catholic University of America)

Approximately 11 million light years away and half the diameter of the Milky Way, the spiral galaxy designated IC 342 is a difficult object to image, even for the Hubble Space Telescope. The reason for that difficulty? From Earth, IC 342 is seen to be near the equator of the Milky Way, which means there is a lot of obscuring dust, gas and stars in between it and our planet.

Fortunately, Hubble has some ability to capture infrared light. With longer wavelengths than those of visible light, infrared light is generally less obscured by the gas and dust of our galaxy's disk.

In actuality, 'Hidden' proves to be something of a misnomer in that IC 342 was previously imaged by the Wide-field Infrared Survey Explorer, WISE, in 2010, and by Hubble itself on another occasion in 2017. But neither of those images are as stunning as the image just recently released by NASA. More information about that image and the difficulties involved in taking it, can be found at www.space.com/hubble-space-telescope-photo-hiding-galaxy.

Recent Astronomy Highlights – continued from page 4

Approximately A Thousand New Asteroids Discovered In Hubble's Archived Data

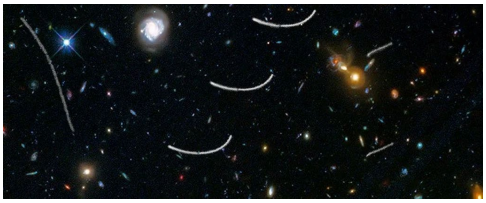

Image Credit - (NASA/ESA/B. Sunnquist/J. Mack/J. Lotz/STScI/HFF Team)

Thousands of volunteers, as part of the Hubble Asteroid Hunter project, pored over images from Hubble Space Telescope's archive and were able to discover approximately a thousand new asteroids. Because of the orbital motion of Hubble while taking the images, the streaks indicating the presence of asteroids appear as curves which could not be easily identified by computers. More information can be found at www.sciencealert.com/over-1-000-new-asteroids-discovered-hiding-in-old-hubble-images.

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 8:30 pm at the Chevy Chase Community Center (intersection of McKinley Street and Connecticut Avenue, N.W.) Please contact instructor Guy Brandenburg at 202-262-4274 (leave message) or at gfbrandenburg@yahoo.com if you plan to attend. Note that masks are mandatory, as in all DC government buildings. 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: **10 September** 7:30 p.m.

The APS Mid-Atlantic Senior Physicists Group: **(Zoom Meeting)** June 15th at 1:00 p.m., Dr. Harold Williams, Montgomery College, will give a talk entitled "The Nature of Time from the Planck Time Until Now, and Maybe Beyond." Information on the meeting will be made available at www.aps.org/units/maspg/meetings/meeting.cfm?name=SENIOR0622. If you're interested in attending the meeting, please email units@aps.org.

National Capital Astronomers Membership Form

Name: _____ **Date:** ___/___/___

Address: _____ **ZIP Code:** _____

Home Phone: ____-____-_____ **E-mail:** _____ **Print / E-mail Star Dust (circle one)**

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:
Henry Bofinger, NCA Treasurer; 727 Massachusetts Ave. NE, Washington, DC 20002-6007

National Capital Astronomers, Inc.

If undeliverable, return to
NCA c/o Elizabeth Warner
400 Madison St #2208
Alexandria, VA 22314

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Next NCA Meeting:

2022 June 11th

7:30 pm

(On Zoom)

Science Fair Winners, NCA Elections and Astro-photos

To join the Zoom meeting, use the following link: umd.zoom.us/j/96856095178?pwd=cWhyNE92bGFYUkYxZnl6eWVIK0lKdz09

Please download and import the following iCalendar (.ics) files to your calendar system: umd.zoom.us/meeting/tJIlcu-opz4rHdxfgBb8Lh5wRlgETFQ8lnI5/ics?icsToken=98tyKuCupj4sGt2QsR6PRowAGo_4M_TxmCVcgqdFmhjHAXh_albhBO5FF4ZZIYDc

Please note that NCA Zoom meetings are often recorded.

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