

Star Dust

Newsletter of National Capital Astronomers, Inc.

capitalastronomers.org

September 2021

Volume 80, Issue 1

**Celebrating 84 Years
of Astronomy**

Next Meeting

When: Sat. Sep. 11th, 2021

Time: 7:30 pm

Where: Online (Zoom)

See instructions for registering to participate in the meeting on Page 6.

Speaker: Dr Heidi B. Hammel

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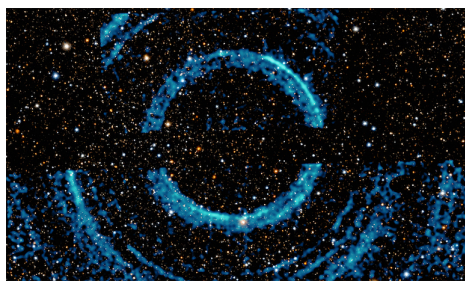


Image Credit - NASA/ CXC/ U. Wisc-Madison/ S. Heinz et al./ Pan-STARRS/ Chandra X-ray Observatory

The rings in the image above were created by an X-ray flare from a black hole located 7800 light years away in the region around which the rings appear to be centered. More information can be found in this month's **Recent Astronomy**

Annual Membership Dues are Due

The membership form, which contains instructions for where to mail it, is on Page 7. Please support NCA by applying for or renewing your membership at this time in order to keep receiving Star Dust. Thank you.

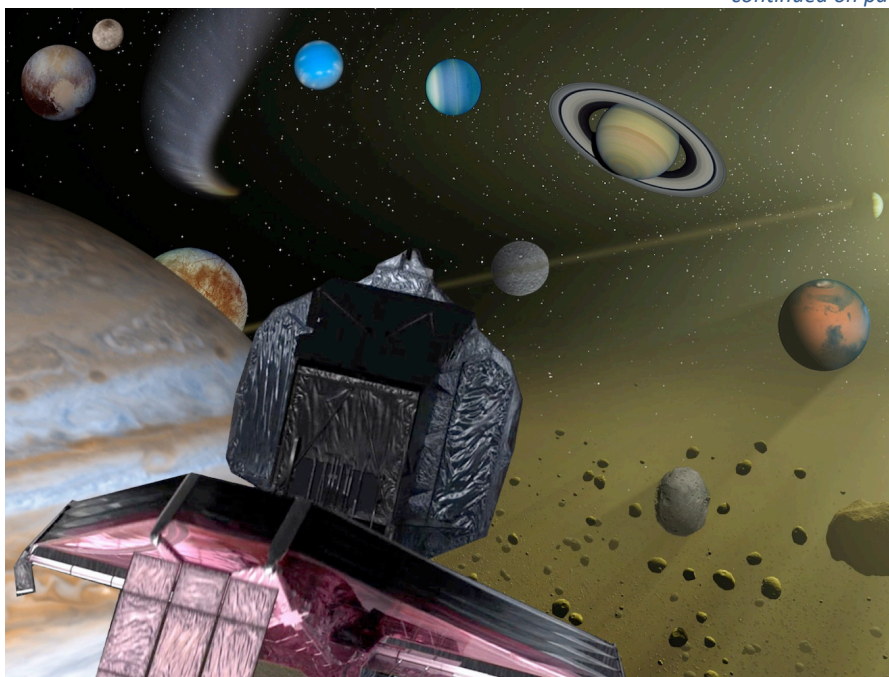
What the James Webb Space Telescope Will Tell Us About the Solar System

Heidi B. Hammel

Association of Universities for Research in Astronomy (AURA)

The James Webb Space Telescope will be the premier space telescope of the next decade. Webb will make revolutionary advances across astronomy with its infrared capability and high sensitivity. Dr. Heidi B. Hammel is one of the six Interdisciplinary Scientists for Webb; she leads a program designed to use Webb to explore the Solar System. Her team's targets run the gamut of planetary science: asteroids, Mars, Jupiter and its moon Europa, Saturn, its rings, and its moons Titan and Enceladus, Uranus and Neptune, comets, and the denizens of the distant Kuiper Belt including Pluto. The latter objects in particular give us insight into the

continued on page 2



Highlights on Page 7.

Recent Astronomy Highlights Fastest Asteroid, So Far Discovered, In The Solar System

Designated 2021 PH27, the asteroid discovered on August 13th orbits the Sun in a mere 113 days. Only Mercury is known to orbit the Sun in less time – 88 days. However, 2021 PH27's highly elliptical orbit takes it closer to the Sun than Mercury, then outward to a point between the orbits of Venus and Earth. The asteroid's orbit is also inclined 32 degrees from the plane of the ecliptic. Astronomers have already begun speculating about the origin of the asteroid, whether it came from the Asteroid Belt where gravitational interaction with one or more planets caused it to be sent toward the inner part of the solar system, or if it is the remnant of an extinct comet from the Oort Cloud. More details can be found at www.space.com/solar-system-fastest-orbiting-asteroid-2021-ph27.

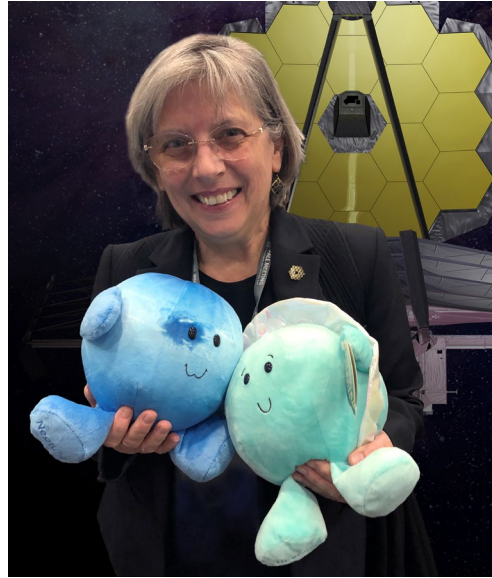
“The Accident”

Brown dwarfs are larger than gas giants, but not massive enough to generate fusion in their core. Sometimes called failed stars, they are often very dim, radiating mostly in the infrared portion of the spectrum. A recently discovered brown dwarf, designated WISE 1534-1043, is among the smallest and coolest of this category of objects. It is so small that it might actually be a sub-dwarf, the first of its kind to be discovered. Nicknamed “The Accident” because it was unexpectedly found by the Wide-Field Survey Explorer (WISE) in 2018, WISE 1534-1043 is only about 50 light years away and is moving through the galaxy at roughly 200 km/s. The ‘colors’ of 1534-1043 appear to be different from those of most brown dwarfs. Possibly it was among the first formed in the galaxy, and is very metal poor. (Astronomers designate all elements except hydrogen or helium as metals.) More information is at aasnova.org/2021/07/02/observing-the-accident-an-enigmatic-brown-dwarf/

continued on page 4

Abstract – continued from page 1

formation of our Solar System. In this talk, Dr. Hammel will provide a status update of the Webb Telescope, briefly review the main science themes for JWST, and conclude with anticipated science from JWST's exploration of the objects in our Solar System.



Biography: Dr. Heidi B. Hammel received her undergraduate degree from MIT in 1982 and her Ph.D. in physics and astronomy from the University of Hawaii in 1988. After a post-doctoral position at the Jet Propulsion Laboratory, she returned to MIT, where she spent nearly nine years as a Principal Research Scientist. She then worked as a Senior Research Scientist and co-Director of Research at the Space Science Institute until 2011.

Dr. Hammel is now the Executive Vice President of the Association of Universities for Research in Astronomy (AURA). AURA -- a consortium of 46 U.S. universities and institutions, as well as four international affiliates -- operates world-class astronomical observatories including Hubble, the National Optical Astronomy Observatory, the National Solar Observatory, and the Gemini Observatory. AURA is also building the Daniel K. Inouye Solar Telescope on Maui, and the Large Synoptic Survey Telescope in Chile. She also serves as Vice President of The Planetary Society, which advocates for the advancement of the exploration of the solar system, alerts about bodies that might collide with the Earth, and the search for extraterrestrial life.

Dr. Hammel primarily studies planets. Her current research involves studies of Uranus and Neptune with Hubble, the Keck 10-m telescope, and other Earth-based observatories. In 1994 when comet Shoemaker-Levy 9 crashed into Jupiter, Dr. Hammel was the leader of the Hubble Space Telescope team that analyzed images of the event. She was also a member of the team that first spotted Neptune's Great Dark Spot with the Voyager 2 spacecraft, and led the Hubble team that later documented that Great Dark Spot's disappearance. Since 2003, she has served as one of six Interdisciplinary Scientists advising NASA on the science development of the James Webb Space Telescope, the space observatory that will succeed Hubble.

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Exploring the Sky



"Exploring the Sky" is an informal program that, for over 70 years, has offered monthly opportunities for anyone in the Washington area to see the stars and planets through telescopes from a location within the District of Columbia. Presented by the National Park Service and National Capital Astronomers, sessions are held in Rock Creek Park once each month on a Saturday night from April through November. Beginners (including children) and experienced stargazers are all welcome—and it's free!

Hosted by: [National Capital Astronomers, Inc](#) and [Rock Creek Park](#)

Due to the ongoing Coronavirus Pandemic, Exploring the Sky sessions are canceled. When the situation changes, sessions will once again be scheduled.

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 September 21st.

Clear Skies!

Biography – continued from page 2

Dr. Hammel has been widely recognized for her science. She was profiled by the New York Times in 2008^[1], Newsweek Magazine in 2007^[2], and was identified as one of the 50 most important women in science by Discover Magazine in 2002^[3]. She was elected a Fellow of the American Association for the Advancement of Science in 2000. In 1996, she received the Urey Prize from the American Astronomical Society's Division for Planetary Sciences.

Dr. Hammel has also been lauded for her work in public outreach, including the 2002 Sagan Medal for outstanding communication by an active planetary scientist to the general public, the 1996 "Spirit of American Women" National Award for encouraging young women to follow non-traditional career paths, and the San Francisco Exploratorium's 1998 Public Understanding of Science Award. Asteroid "1981 EC20" has been renamed *3530 Hammel* in her honor.

[1] www.nytimes.com/2008/09/02/science/02conv.html

[2] www.newsweek.com/id/70975

[3] www.discovermagazine.com/the-sciences/the-50-most-important-women-in-science

2021-2022 NCA Speakers Schedule (Partial)

John Hornstein

September 11 Heidi Hammel (AURA) **The Formation of the Solar System: What the James Webb Space Telescope Might Tell Us**

October 9 Lynn Wilson (GSFC) **The Most Energetic Particles from the Sun**

November 13 Julie McEnery (GSFC) **The Nancy Grace Roman Space Telescope**

December 11 Brian Williams (GSFC) **Remnants of Supernovae**

January 8 Peter Driscoll (Carnegie Earth and Planets Lab) **Planetary Magnetic Fields and Habitability**

February 12 Rita M. Sambruna (GSFC) **Relativistic Jets from Black Holes (Tentative)**

March 12 Ira Thorpe (GSFC) **The LISA Pathfinder Mission: Gwaves and Micrometeoroids**

April and May talks still to be determined.

June 11 Science Fair Winners, Election, Astrophoto Show and Tell

Sky Watchers

September/October

Mercury will be in the evening sky throughout the month, reaching Greatest Eastern Elongation on Sept. 14 th (see below). Venus will also shine in the evening sky. Mars will not be very visible due to being on the opposite side of the Sun from Earth and setting within minutes of sunset. Having gone through opposition, Jupiter and Saturn will be in the Eastern sky at sunset and remain up most of the night.	
9/14	Mercury reaches Greatest Eastern Elongation and will be 26.8° away from the Sun at sunset.
9/20	Full Moon at 7:54 p.m.
9/22	Autumnal Equinox at 3:14 p.m.
10/8	The Draconids Meteor Shower peaks in the evening with approximately 10 meteors/hour. A nearly new Moon means that viewing should be good throughout the night. (Best viewing for this meteor shower is in the early evening, unlike with other meteor showers when it is during the pre-dawn hours of the night.)

All times are in EDT (Eastern Daylight Savings Time)

Disturbing Racist Clauses Found in Early NCA Constitutions & Bylaws

While doing research for a recent presentation, NCA member Guy Brandenburg discovered disturbing language in a proposed change in the NCA Constitution seventy-five years ago. Quoting the January 1946 issue of Star Dust - **"Art. III. Now: only Caucasians over 16 years old are eligible for membership. Proposed: to include all ages (see by-laws), exclude only the Black race."** * Obviously both clauses are racist and unacceptable.

Research into the origins and reasons for this discrimination, as well as how it was officially ended, is ongoing. In online discussions and at the August 26th NCA Business Meeting this language was roundly condemned. Additionally, the proposal was made to publish an in-depth article on the findings concerning this unfortunate chapter in NCA history, as well as a statement of condemnation by the current officers and members of the National Capital Astronomers. Currently the plan is to publish that article in the October 2021 edition of Star Dust.

*capitalastronomers.org/SD_year/1946/StarDust_1946_01.pdf

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Please Get Star Dust Electronically

NCA members able to receive Star Dust, the newsletter of the NCA, via e-mail as a PDF file attachment, instead of hardcopy via U.S. Mail, can save NCA a considerable amount of money on the printing and postage in the production of Star Dust (the NCA's single largest expense), save some trees and have one-click access to all the embedded links in the document. If you can switch from paper to digital, please contact Henry Bofinger, the NCA Secretary-Treasurer, at hbofinger@earthlink.net

Thank you!

Recent Astronomy Highlights – continued from page 2

Seeing Behind a Black Hole

While doing research on the corona of a supermassive black hole 800 million light years away, astronomers recorded X-ray flares as well as 'echoes' of those flares that seemed to have come from behind the black hole. Gas heated to millions of degrees in the black hole's corona causes powerful magnetic fields that are spun up by the black hole. X-ray flares are created by the breakdown of those magnetic fields. According to General Relativity, the gravity of the black hole so distorts the space surrounding it that some of the X-rays can go around the black hole, before radiating away in various directions, but this is the first time the phenomenon has been observed. More info is at www.sciencedaily.com/releases/2021/07/210728111256.htm.

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Occultation Notes

- D following the time denotes a disappearance, while R indicates that the event is a reappearance.
- When a power (x; actually, zoom factor) is given in the notes, the event can probably be recorded directly with a camcorder of that power with no telescope needed.
- 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.
- 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".
- 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

2021	Day	EDT	Star	Mag.	Asteroid	dmag	dur.	Ap.	Location
Sep 9	Thu	3:17	4U497138791	14.0	Hybris	1.5	3	11	eMD,SDC,nVA
Sep 13	Mon	20:41	4U359140446	12.3	Aurelia	0.8	9	7	WV,VA,DC,s&cMD
Sep 15	wed	3:06	4U617133738	14.3	1999 CK103	2.3	3	12	SMD,nVA;CMD,DC?
Sep 19	Sun	22:49	4U365166687	13.9	Idelsonia	1.5	2	11	nOH,nVA,DC,eMD
Sep 21	Tue	21:21	4UC38387447	13.2	Nekrasov	4.3	0.9	9	COH,nMD;nVA,DC?
Sep 23	Thu	5:54	4UC44525704	13.3	Malabar	1.8	3	9	n&eVA,swMD;DC?
Sep 24	Fri	6:08	TYC24051007	11.1	Caecilia	3.9	3	4	nVA,DC,CMD,sNJ
Sep 25	Sat	4:06	4UC53519322	12.4	4P/Faye	1.4	1.7	6	nAZ,nVA,SDC;CMD?
Sep 25	Sat	5:30	TYC17472075	11.1	Modestia	2.4	6	4	sVA,swV,neKY
Oct 2	Sat	21:03	4UC45431462	13.0	Mayrhofer	3.5	4	9	neOH,c&eMD;DC?
Oct 7	Thu	3:57	TYC19220066	11.8	S2000-762-1	2.0	1.0	5	OH,PA,NY;DC,VA?
Oct 9	Sat	3:56	4UC52611684	13.4	Briseis	1.7	8	10	OH,WV,n&eCVA
Oct 9	Sat	22:28	4U516146303	12.7	Rostovdon	3.5	3	7	ne-swMD;DC,nVA?

Lunar Grazing Occultations

2021	Day	EDT	Star	Mag	% alt	CA	Location, Notes
Sep 28	Tue	2:53	SAO 77531	8.7	57- 45	15N	BeaverCkMD;Gettysburg&Lawn,PA
Sep 30	Thu	2:46	ZC 1146	8.9	38- 24	13N	Cntrv1,VA;Kensngtn,Hanover,MD
Oct 2	Sat	3:52	ZC 1390	7.7	19- 15	12N	Frostbrg,MD;Cr11l,nHarsbrg,PA

Lunar Total Occultations

2021	Day	EDT	Ph Star	Mag	% alt	CA	Sp.	Notes
Sep 11	Sat	19:58	D SAO 159286	8.2	29+ 21	48N	G6	Sun -8,mag2 10,dT +.4s
Sep 11	Sat	21:24	D SAO 159309	7.7	29+ 8	21N	A2	Az.238,mag2 11,dT -140s
Sep 13	Mon	19:12	D ZC 2514*	6.4	51+ 25	15S	B9	Sun alt. 0
Sep 13	Mon	19:57	D SAO 185433	7.2	51+ 24	32N	F3	Sun -8,mag2 8.5,dT +.7s
Sep 16	Thu	23:06	D ZC 3018	6.4	83+ 26	85S	G8	
Sep 17	Fri	21:52	D 38 Cap	6.7	90+ 29	62N	F7	ZC 3160
Sep 18	Sat	1:05	D SAO 164544	7.3	91+ 25	17N	F7	Terminator Distance 19"
Sep 18	Sat	2:13	D SAO 190556	7.0	91+ 16	23S	K1	
Sep 18	Sat	3:03	D ZC 3178	6.2	91+ 9	22S	A0	Az. 236, spect. binary
Sep 22	wed	3:17	R ZC 128	7.0	98- 49	53N	G5	Axis angle 322 degrees
Sep 23	Thu	22:26	R ZC 350	7.6	90- 20	19S	G5	
Sep 25	Sat	0:31	R SAO 93331	7.5	83- 39	63N	K5	
Sep 26	Sun	1:12	R ZC 595	6.8	75- 40	46N	K1	close double??
Sep 26	Sun	1:33	R SAO 93729*	8.0	75- 44	45S	A2	
Sep 27	Mon	2:53	R ZC 734	6.6	66- 52	68N	K0	
Sep 27	Mon	4:45	R SAO 76853*	7.5	66- 71	43S	F5	
Sep 28	Tue	0:04	R SAO 77375	7.1	58- 12	44S	K0	Azimuth 68 degrees
Sep 28	Tue	2:21	R SAO 77485	7.9	57- 38	67S	G5	
Sep 28	Tue	2:56	R SAO 77513	7.5	57- 44	82N	K0	
Sep 30	Thu	3:35	R SAO 79521	7.4	38- 32	20S	G2	Spectroscopic binary
Sep 30	Thu	4:51	R SAO 79544	8.4	37- 47	37S	F0	
Oct 1	Fri	3:01	R ZC 1267*	8.1	28- 15	41S	A0	Az.73,mg2 10 dT -16s
Oct 2	Sat	4:01	R ZC 1390*	7.7	19- 15	33N	G0	Az. 76; wMD,PA graze
Oct 4	Mon	6:35	R SAO 99505	7.5	5- 19	41N	K2	Sun alt. -7 deg.
Oct 9	Sat	20:08	D ZC 2319*	7.1	16+ 6	90S	A0	Azimuth 235 deg.
Oct 10	Sun	20:01	D ZC 2469	6.5	26+ 13	66N	A0	Azimuth 221 deg.
Oct 10	Sun	20:12	D SAO 185145*	8.3	26+ 12	58N	G2	Azimuth 223 deg.
Oct 11	Mon	21:10	D ZC 2650	4.7	37+ 11	59S	K3	Azimuth 221 deg.

*in Kepler2 program so occultation light curves are sought.

More information is at iota.jhuapl.edu/exped.htm
David Dunham, dunham@starpower.net

Occultations by Near-Earth Asteroids is an exciting new endeavor that contributes to planetary defense by refining the orbits of these small but possibly dangerous objects. IOTA's first success with NEA events was with (3200) Phaethon in 2019, but more spectacularly with (99942) Apophis earlier this year; much information about the occultations, their value, and how they helped retire the threat of Apophis, is given in a paper presented at the 7th Planetary Defense Conference that you can obtain at iota.jhuapl.edu/NEOccultationsDunham.pdf.

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NCA Zoom Meeting Information

Elizabeth Warner

This year, I have set up the Zoom meetings so that there is *no registration required*. This is the **direct** Zoom link; it is the **same for everybody for every meeting** this year (2021-22). If we have problems with Zoom bombing at a meeting, then I'll cancel the link and create a new one with registration for subsequent meetings.

As usual, the Zoom room "doors" open at 7pm with the actual meeting starting on time at 7:30pm! While you do not need to sign in right at 7pm, please do not wait until 7:35pm!! And since we are not registering folks, it will be important that you have a recognizable name showing so that I can let you in from the virtual waiting room.

Finally, as last year, we will be recording the meetings.

Join Zoom Meeting

umd.zoom.us/j/96856095178?pwd=cWhyNE92bGFYUkYxZnl6eWVlK0lKdz09

Meeting ID: 968 5609 5178

Passcode: telescope

Download and import the following iCalendar (.ics) files to your calendar system.

Monthly: umd.zoom.us/meeting/tJlIcu-opz4rHdxfgBb8Lh5wRlqETFQ8lnI5/ics?icsToken=98tyKuCupj4sGt2QsR6PRowAGo_4M_TxmCVcqqdFmhjHAXh_albhBO5FF4ZZIYDc

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Dial by your location

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Meeting ID: 968 5609 5178

Find your local number: umd.zoom.us/u/ajDYcPkIk

Join by SIP

96856095178@zoomcrc.com

Join by H.323

162.255.37.11 (US West)

162.255.36.11 (US East)

115.114.131.7 (India Mumbai)

115.114.115.7 (India Hyderabad)

213.19.144.110 (Amsterdam Netherlands)

213.244.140.110 (Germany)

103.122.166.55 (Australia Sydney)

103.122.167.55 (Australia Melbourne)

149.137.40.110 (Singapore)

64.211.144.160 (Brazil)

149.137.68.253 (Mexico)

69.174.57.160 (Canada Toronto)

65.39.152.160 (Canada Vancouver)

207.226.132.110 (Japan Tokyo)

149.137.24.110 (Japan Osaka)

Meeting ID: 968 5609 5178

Passcode: 062267852

Recent Astronomy Highlights – continued from page 4

Black Hole X-rays Dust Clouds

V-404 Cygni, a black hole 7800 light years away, feeds on gas from a companion star, a process that can generate X-ray flares. One particularly bright X-ray event from the black hole, seen in 2015, allowed astronomers to image multiple rings that seem to surround the black hole, but are actually echoes of those X-rays off of dust in interstellar clouds between V-404 Cygni and Earth. These light echoes allow astronomers to glean information about the composition of the dust clouds. The image in the sidebar on Page 1, captured using the NASA's Chandra X-ray Observatory and Neil Gehrels Swift Observatory, is a composite of those observations taken at multiple times. The various diameters of the rings indicate different distances to the dust clouds. More information about the image and the discoveries that are being gathered from it can be found at chandra.si.edu/photo/2021/v404cyg/.

Calendar of Events

NCA Mirror- or Telescope-making Classes: The Chevy Chase Community Center is currently closed due to the coronavirus pandemic. When it reopens, classes will be Tuesdays and Fridays, from 6:30 to 9:30 pm at the Chevy Chase Community Center (intersection of McKinley Street and Connecticut Avenue, N.W.) Contact instructor Guy Brandenburg at 202-262-4274 (leave message) or at gfbrandenburg@yahoo.com. 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: 9 October 7:30 p.m. Lynn Wilson (GSFC) **The Most Energetic Particles from the Sun**

The APS Mid-Atlantic Senior Physicists Group: (Zoom Meeting) Sept 15th at 1:00 p.m., Dr. Peter M. Valone, NIST, will give a talk entitled "An Introduction to Forensic DNA Typing". (Postponed from June.) More information on the meeting is available at www.aps.org/units/maspg/meetings/meeting.cfm?name=SENIOR0921. If you're interested in attending the meeting, please email units@aps.org. the information.

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.?

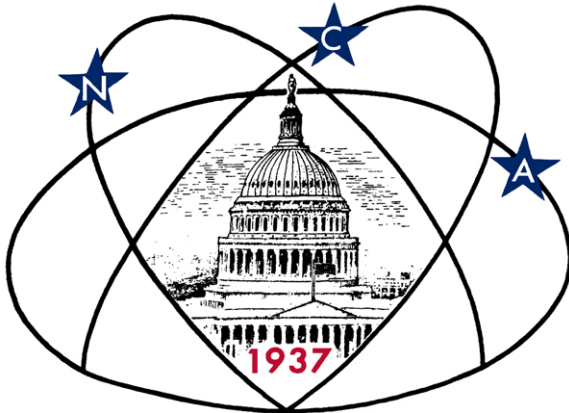
Are you interested in volunteering for: Telescope making, Exploring the Sky, Star Dust, NCA Officer, etc.?

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

First Class
Dated Material



Celebrating 84 Years of Astronomy

Next NCA Meeting:

2021 September 11th

7:30 pm

(On Zoom)

Dr Heidi B. Hammel

Instructions for logging into all of the
2021-2022 Zoom meetings are on
Page 6.

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