

Star Dust

Newsletter of National Capital Astronomers, Inc.

capitalastronomers.org

January 2025

Volume 83, Issue 5

**Celebrating 88 Years
of Astronomy**

Next Meeting

When: Sat. Jan. 11th, 2025

Time: 7:30 pm

Speaker: Dr. Tom Brown

Where: **Online only (Zoom)**

See instructions for joining the meeting via Zoom on Page 8.

Table of Contents

| | |
|-------------------------------------|---|
| Preview of Jan. 2025 Talk..... | 1 |
| Recent Astronomy Highlights..... | 2 |
| Upcoming NCA Speakers..... | 2 |
| President's Corner..... | 2 |
| Exploring the Sky..... | 3 |
| Sky Watchers..... | 4 |
| Astrophotography by Gael Gomez..... | 4 |
| Occultations..... | 5 |
| Calendar of Events..... | 7 |

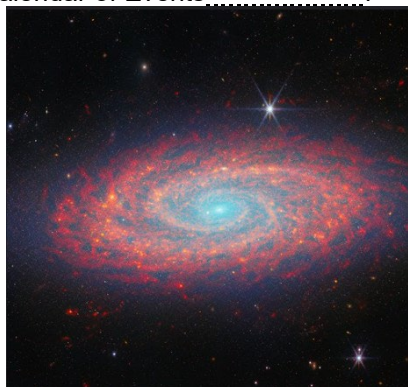


Image Credits – ESA/Webb, NASA & CSA, A. Leroy

JWST's near- and mid-infrared image of NGC 2090 highlights the galaxy's gas and dust. More info is at www.flickr.com/photos/nasawebstelescope/54167157727/in/album-72177720313923911/.

Please note that the January Meeting will be online only.

On the Trail of the Missing Galaxies: The Oldest Stars in the Neighborhood

Dr. Tom Brown – Space Telescope Science Institute

In the past two decades, wide-field surveys have revealed increasingly faint galaxies orbiting the Milky Way and Andromeda. They are the least luminous, most dark-matter dominated, and least chemically-evolved galaxies known. This growing census has largely resolved the missing satellite problem - the long-standing discrepancy that theory predicts many more satellite galaxies than the number observed around the Milky Way and Andromeda. As the best candidates for fossils from the early universe, these faint galaxies are ideal places to test the physics of galaxy formation. Data from the Keck Observatory and the Hubble Space Telescope demonstrate that the smallest seeds of galaxy formation had their star formation suppressed shortly after the Big Bang, precluding their discovery until relatively recently.

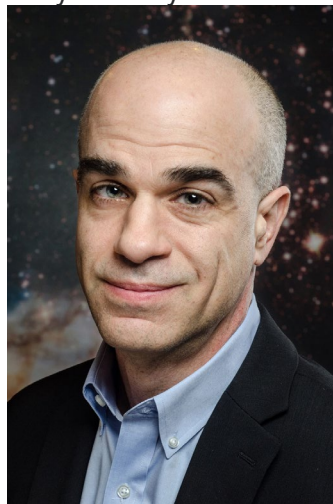


Image Credit - STSci

Biography: Tom Brown is the head of the James Webb Space Telescope (JWST) mission office at the Space Telescope Science Institute (STScI). He leads science and flight operations, collaborates with mission stakeholders, engages the scientific community and public, and works to maximize the mission's scientific return. From 2016 to 2024, he served in an analogous role as the head of the Hubble Space Telescope (HST) mission office. At STScI, he previously served as the JWST

continued on page 2

Recent Astronomy Highlights

JWST Confirms That Planetary Disks Can Exist Far Longer Than Previously Theorized



Image Credit - NASA, ESA, CSA, STScI, Olivia C. Jones (UK ATC), Guido De Marchi (ESTEC), Margaret Meixner (USRA)

It has long been thought that planetary formation was unlikely in the very early Universe, in which the planetary disks contained hydrogen and helium and not much else. The theory was that in such environments, without heavier elements present, planetary formation would progress too slowly to get very far in the brief 2 to 3 million years that such planetary disks were believed to exist. But a couple decades ago, the Hubble Space Telescope took images of NGC 346, a star-forming region in the Small Magellanic Cloud, that seemed to indicate the existence of stars that were 20 to 30 million years old and still had planetary disks. This region of the SMC has relatively low abundances of elements heavier than hydrogen and helium and therefore serves as a proxy for the early Universe. Unfortunately, the Hubble images were not conclusive since the telescope did not have the sensitivity to take spectra of the stars and their environments. However such spectra were possible with JWST, and those spectra indicate that such long-lived planetary disks do indeed exist. More information is available at science.nasa.gov/missions/webb/nasas-webb-finds-planet-forming-disks-lived-longer-in-early-universe/.

continued on page 4

Abstract and Biography – continued from page 1

mission scientist and as an instrument scientist for two of Hubble's scientific instruments.

Earlier in his career, Tom was a postdoctoral research associate at NASA's Goddard Space Flight Center and an adjunct professor at Loyola University in Baltimore. As a graduate student at Johns Hopkins University, he was involved in the integration, testing, and ground control of the Hopkins Ultraviolet Telescope (HUT) for the Astro-2 space shuttle mission.

Tom is also an Astronomer on the STScI research staff. He has been the principal investigator of 20 space-based observing programs, mainly exploring stellar and galactic evolution in the nearby universe, with a focus on high-precision ages. His research has appeared in over 100 peer-reviewed papers and on one album cover.

(Biography material gathered and edited from www.stsci.edu/who-we-are/leadership/tom-brown.)

Schedule of Upcoming NCA Meetings and Speakers

Carl Biagetti

January 11, 2025 -- Thomas Brown (STScI) *On the Trail of the Missing Galaxies: The Oldest Stars in the Neighborhood*

February 8, 2025 -- Matt Clement (JHU/APL) *Planet Formation (exact title tbd)*

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

Apr 12, 2025 -- Kevin Stevenson (JHU/APL) *Searching for Rocky Exoplanet Atmospheres with JWST (exact title tbd)*

May 10, 2025 -- Rob Zelman (GSFC/RST) *The Nancy Grace Roman Space Telescope (exact title tbd)*

Sep 13, 2025 -- Kristin Sotzen (JHU/APL) *The Dragonfly Mission*

Oct 11, 2025 -- David DeVorkin (NASM) *George R. Carruthers: The Quiet Genius Who Was the First to Send an Astronomical Telescope to the Moon*

President's Corner

Guy Brandenburg

This year, our organization will celebrate its 88th anniversary!

If you are reading this, you probably know that among other activities, NCA has been holding public viewing sessions called Exploring the Sky (ETS) every month except during winter in Rock Creek Park, in partnership with the National Park Service, for 76 straight years! Many thanks to Jay Miller for coordinating ETS with NPS on this for quite a few seasons now. The first ETS program for 2025 will be in April. However, some NCA members will continue to hold impromptu, pop-up sidewalk-astronomy events before that time. If you'd like to help, email me.

continued on page 3

Exploring the Sky



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

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

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

The submission deadline for February's Star Dust is January 24th.

Clear Skies

President's Corner – continued from page 2

After looking at the index of Star Dust, which you can see at docs.google.com/spreadsheets/d/1VzQZqkFDCxoT0h1J4wb09nglcA_ma6wu/edit?usp=sharing&ouid=111175617069962318367&rtpof=true&sd=true, it looks like I'm the 42nd president of NCA, and this is my second year at it. I hope my leadership has been helpful, but I am far from being any sort of acclaimed professional astronomer! Being president of NCA has taken quite a bit of time, and I hope someone else will agree to take over this position this summer.

You may recall quite a bit of controversy last year over a plan to remove over 1200 trees from Rock Creek Golf Course and to install a restaurant and a lighted night-time golf driving range there. Those lights would be less than a mile from where we hold our ETS events. The golf course is now run by National Links Trust, which won final approval for its plans. The course is closed for the winter, and NLT is using machines to get rid of the alien and invasive vines that have nearly smothered most of the trees - which they should have been doing starting in 2020. It is not clear what kind of lighting they will end up having at the driving range and restaurant, but NLT and NPS personnel have told us they would turn off those lights early on ETS nights.

We should also talk to the folks at the Carderock Tennis Center in Rock Creek Park about their useless lighting, and about the extravagantly bright, high-K lighting they are installing on certain roadways inside Rock Creek Park. All the artificial night-time lighting is having a major impact on wildlife, especially the insects and the birds.

It is indeed ironic and sad that while the past 100 years have been a time of incredible discoveries in astronomy, the wider and wider adoption of outside lighting at night over that century has prevented more and more people from ever seeing the Milky Way at all.

One of those discoveries is the measurement of actual distances to the center of our galaxy and to other galaxies. Another two are the launching of countless satellites and other vehicles which have produced amazing images and data about the planets in our own solar system, and the detection of thousands of exoplanets around other stars, including our closest neighbor, Proxima Centauri, which is about 4.26 light-years away. But don't get your hopes up about ever visiting the place: The very fastest object ever made by humans, the Parker Solar Probe, reached a speed of 191 kilometers per second on its recent tour around the Sun - which is around 6.4 ten-thousandths of the speed of light. That means that if we shot a spacecraft towards Proxima Centauri at the very fastest rate we humans have ever achieved, it would take 4.26 light-years divided by 0.00064 times the speed of light, or roughly 6700 years to reach that exoplanet system – sixty-seven centuries!

Reminder: This month's NCA meeting will be entirely on-line. See page 8 for details on logging in.

Sky Watchers

January/February

Mercury will be lower in the predawn sky before each succeeding sunrise until it begins to transition to the evening sky in early February. Venus remains high and bright in the evening sky. Mars rises earlier each evening, until it reaches opposition on 1/16 (see below) climbing higher with each day. Jupiter will rise higher in the eastern sky each evening. Saturn will drop lower in the western evening sky as the period progresses. Despite predictions that it would already have happened, there is still no sign of the expected nova of T CrB.

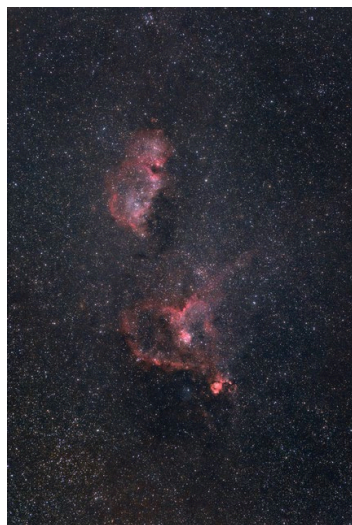
| | |
|------|--|
| 1/13 | Full Moon – 5:28 p.m. |
| 1/16 | Mars at Opposition – Mars will be its closest to Earth and will rise at sunset, remaining in the sky all night long. |

All times are in EST (Eastern Standard Time)

Astrophotography by Gael Gomez

Due to space limitations in last month's issue of Star Dust, we were only able to show a few of the incredible images that Gael has taken. We are glad to now be able to include some more. Of his work, Gael says: *To process all of these I used a variety of different programs for several purposes. For stacking I mainly used DeepSkyStacker, except for the Orion Core image, for which I used a Siril stacking script. The bulk of the image processing is done in Siril. Some minor edits like denoising and color calibration were done in RawTherapee and Paint.net (this is NOT a website, that's the name of the program.)*

I should also emphasize that I didn't follow any specific set of instructions to process all these, but rather it's an iterative process that requires trial and error, as well as quick thinking. In total, I'd say I spent anywhere between 40 minutes and an hour processing each photo, not counting the time my computer (Ryzen 7 1800x, Nvidia RTX 2080, 32gb ddr4) spent processing everything.



The Heart and Soul Nebula - Hopewell Observatory
Nikon D5200 | 209 x 90s | ISO 800 | Samyang 135mm F/2

continued on page 6

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

ISSN: 0898-7548

Editor: Todd Supple

Editorial Advisors:

- James Kaiser
- Jeffrey Norman
- Brian Tomich
- Elizabeth Warner
- Marjorie Weissberg

Electronic Distributor: Elizabeth Warner

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

Parker Solar Probe Survives Its Closest Orbit to the Sun



Illustration Credit - NASA/Johns Hopkins APL/Steve Gribben

On December 24th, the NASA's Parker Solar Probe orbited the Sun a mere 3.8 million miles from its surface doing so at 430,000 miles per hour, the fastest speed any human-made object has ever achieved. On December 26th, the probe sent a signal back to Earth indicating that it had survived its relatively close encounter with Earth's star. Having entered the elliptical orbit it will remain in, the Parker Solar Probe will make upcoming encounters at the same orbital distance in March and June of 2025. The data that has been collected and will be collected by the probe during these close encounters will help in understanding the workings of the Sun's corona, including the acceleration of the solar wind that can take some particles up to a velocity of half the speed of light. The data from the just-completed pass is expected to be downloaded in the near future. More information is available at www.msn.com/en-us/science/astronomy/nasa-s-parker-solar-probe-phones-home-after-surviving-historic-close-sun-flyby-it-s-alive/ar-AA1wAi3K.

continued on page 7

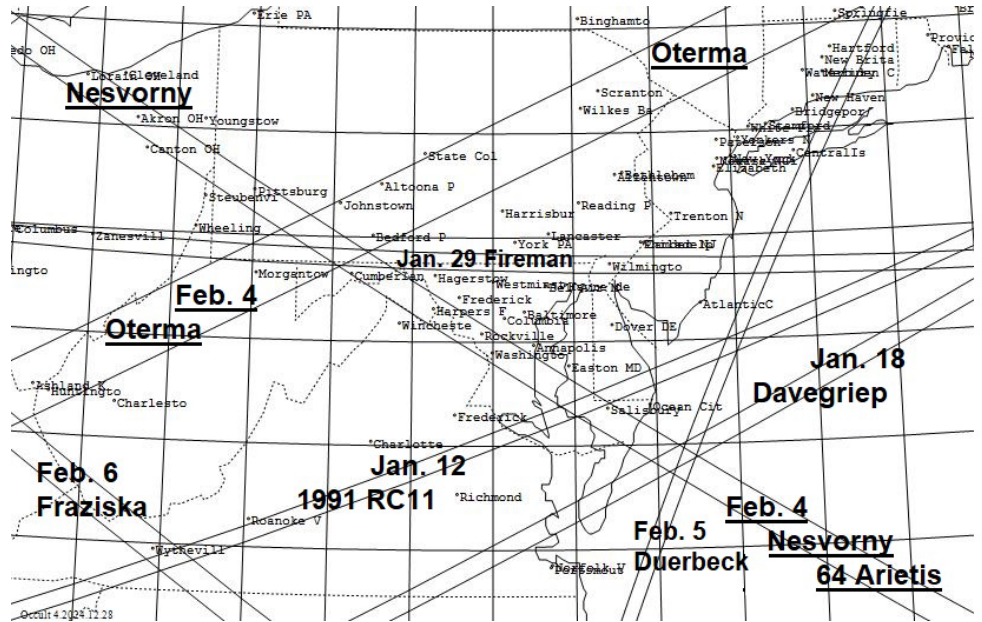
Occultation Notes

- 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



| 2025 Date | Day | EST | Star Name | Mag. | Asteroid # Name | dur. dmag | Ap. s | Path |
|-----------|-----|-------|------------|------|-----------------|-----------|-------|--------------|
| Jan 12 | Sun | 19:35 | SAO 129880 | 9.0 | 43807 1991 RC11 | 9 1.2 | 4 | TN-DE ? |
| Jan 18 | Sat | 19:31 | XZ 91444 | 10.1 | 8456 Davegriep | 8 1.5 | 4 | VA-NC |
| Jan 29 | wed | 1:11 | HIP 49540 | 9.2 | 4231 Fireman | 8 1.4 | 3 | NJ-OH |
| Feb 4 | Tue | 20:34 | SAO 93614 | 7.6 | 1529 Oterma | 8 5 | 2 | KY-MA |
| Feb 4 | Tue | 22:19 | 64 Arietis | 5.2 | 7999 Nesvorny | 13 1.8 | 2 | OH-DC-seMD |
| Feb 5 | wed | 21:54 | SAO 76839 | 8.6 | 9327 Duerbeck | 10 11 | 3 | Cape Hat*-MA |
| Feb 6 | Thu | 4:08 | PPM 128072 | 9.6 | 520 Fraziska | 6 2.5 | 4 | NC-KY |

? after the path shows it may be in error due to high Gaia RUWE
 Events with stars brighter than mag. 8.0 are underlined on map and list

Lunar Grazing Occultations

| 2025 Date | Day | EST | Star | Mag | % alt | CA Dist. | # for 2025 grazes link or & az. from Greenbelt |
|-----------|-----|-------|------------|-----|-------|----------|--|
| Jan 23 | Thu | 3:44 | SAO 183168 | 7.1 | 35- | 13 17S | 117km, az. 39 deg. |
| Jan 24 | Fri | 4:50 | pi Scorpii | 2.9 | 26- | 12 17S | nNJ, #18 of 2025 grazes site |
| Feb 2 | Sun | 21:36 | SAO 109485 | 7.5 | 25+ | 9 3S | 84km, az. 183 deg. |

2025 grazes link:
occultations.org/publications/rasc/2025/nam25grz.htm

Lunar Total Occultations

| 2025 Date | Day | EST | Ph Star | Mag | % alt | CA Sp. | Notes |
|-----------|-----|-------|--------------|-----|-------|-----------|---------------------------|
| Jan 11 | Sat | 19:11 | D ZC 885 | 5.6 | 96+ | 47 62S G7 | mag2 7, sep 0.01" |
| Jan 13 | Mon | 4:28 | D 47 Gem | 5.8 | 99+ | 31 41N A4 | ZC 1088, Term. Dist. 4" |
| Jan 21 | Tue | 5:15 | R ZC 1949 | 5.9 | 54- | 38 71S A0 | mag2 7.3, dTime +1.5s |
| Jan 23 | Thu | 4:00 | R ZC 2157 | 6.1 | 35- | 16 49N K0 | |
| Feb 4 | Tue | 20:11 | D ZC 375 | 6.8 | 46+ | 52 41N A5 | close double?? |
| Feb 6 | Thu | 23:38 | D ZC 701 | 6.6 | 70+ | 39 72N F2 | mag2 7.2, sep 4", dT -5s |
| Feb 8 | Sat | 3:58 | D ZC 885 | 5.6 | 81+ | 4 84N G7 | Azimuth 303 deg. |
| Feb 8 | Sat | 19:22 | D 49 Aurigae | 5.3 | 87+ | 62 79S A0 | ZC 1008 |
| Feb 8 | Sat | 22:18 | D 54 Aurigae | 6.0 | 87+ | 76 15N B7 | ZC 1022, mg2 8, dTime +9s |
| Feb 10 | Mon | 0:45 | D 76 Gem | 5.3 | 94+ | 59 56N K5 | ZC 1169 |

Much more on mid-Atlantic occ's page at iota.jhuapl.edu/exped.htm.
 David Dunham, dunham@starpower.net

continued on page 6

2024-2025 Officers

President:

Guy Brandenburg
gfbrendenburg@yahoo.com
 202-635-1860 (leave message)

Vice-President:

Carl Biagetti
carlbiagetti@gmail.com
 301-655-2762 (message or text)

Secretary-Treasurer:

Jim Simpson
simpsonj@verizon.net
 240-232-2820

Asst. Secretary-Treasurer:

Jeffrey B. Norman
jeffreynorman@comcast.net

Trustees:

- Benson Simon (2025)
- Michael Brabanski (2026)
- Bernard Kaufman (2027)
- Chong Wang (2028)

Appointed Officers and Committee Heads:

Exploring the Sky

Jay Miller
jhmill@me.com

Telescope Making

Guy Brandenburg
gfbrendenburg@yahoo.com
 202-635-1860 (leave message)

Star Dust Editor

Todd Supple
NCAStardust@gmail.com
 240-687-8193

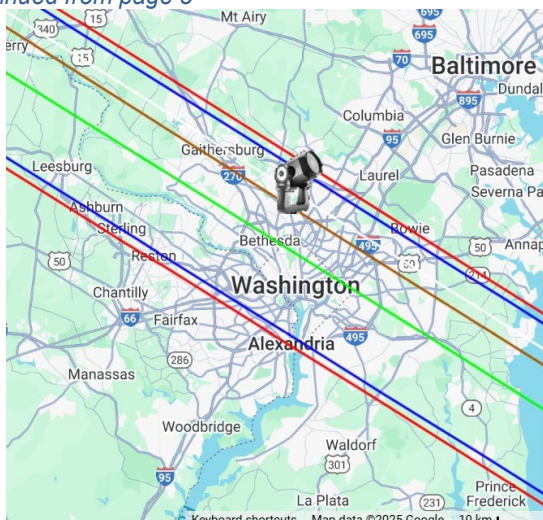
NCA Webmaster

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

Social Media

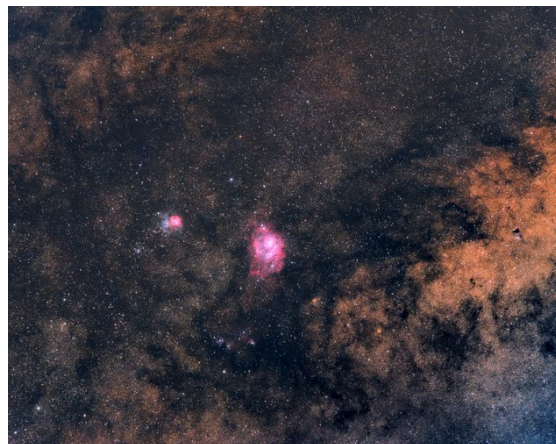
Facebook: [NatCapAstro](#)
 Twitter: [@NatCapAstro](#)

Occultations— continued from page 5



The occultation of 5.2-mag. 64 Arietis by 23-km (7999) Nesvorny at 10:19pm Feb. 4 is a binoculars event, by far the brightest occultation by a sizeable asteroid that will be visible from DC this year; see p. 5 for more. The telescope symbol shows R. Kelley's planned location for the event. Image credit - D. Dunham, Occult Watcher and Google Maps.

Astrophotography by Gael Gomez— continued from page 4



Lagoon Nebula - Sky Meadows State Park
 Nikon D5200 | 97x30s | ISO 800 | Samyang 135mm F/2



Jupiter - Hopewell Observatory
 Nikon d5200 | 60fps x 30s | ISO 1000 | Meade 10in SCT F/10

Recent Astronomy Highlights – continued
from page 4

Binary Star Discovered Near Sagittarius A*

Using data from the European Space Agency's Very Large Telescope, VLT, astronomers have discovered a binary-star system near Sagittarius A*, the supermassive black hole at the heart of the Milky Way. The discovery came about because of variations seen in the velocity of the binary pair, originally thought to be a single star. This discovery goes against the previous belief that such binary systems could not form in the extreme gravitational field of a supermassive black hole. Designated D9, the system may also hint at the nature of the G objects, also near Sag A*, which look like stars but seem to have characteristics of gas clouds. The discovery also means that it may even be possible for planets to form in such extreme environments. More info on this discovery is available at www.sciencedaily.com/releases/2024/12/241217130904.htm.

Calendar of Events

NCA Telescope Making, Maintenance, and Modification Workshop (TM3W) (previously the NCA Mirror- or Telescope-making Classes): The Chevy Chase Community Center has reopened and classes have resumed. Classes will be Tuesdays and Fridays, from 6:00-9:00 pm at the Chevy Chase Community Center (intersection of McKinley Street and Connecticut Avenue, N.W.) Please contact instructor Guy Brandenburg at 202-635-1860 (leave message) or at gfbrandenburg@yahoo.com 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.

February 8, 2025 -- Matt Clement (JHU/APL) Planet Formation (exact title tbd)

The APS Mid-Atlantic Senior Physicists Group: Wednesday, Jan. 15th at 1:00 p.m. (Zoom only meeting), Dr David Bader, New Jersey Institute of Technology, will give a talk entitled "Accelerating Artificial Intelligence through High Performance Computing." A Zoom link to register and attend is apsphysics.zoom.us/meeting/register/tZEIcO6prj4sGdbrHW6LNo96LmJnzZz5uddb.

National Capital Astronomers

Online Membership Application and Renewal

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

Membership Rates

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

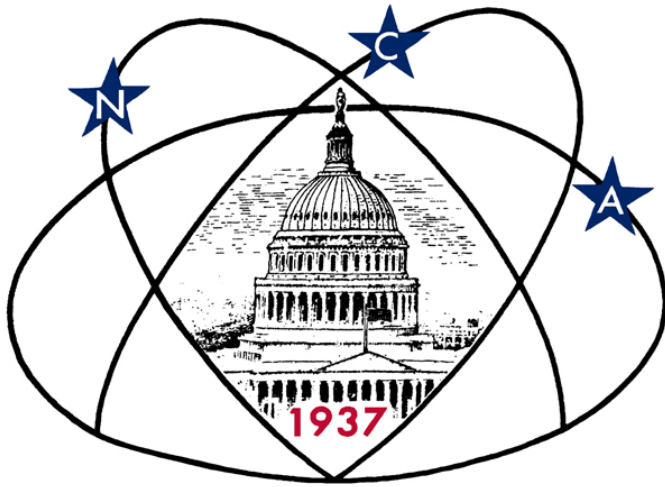
(Please note that membership dues will go up in coming years, so consider joining/renewing with the 3-year option in order to save money.)

If you prefer to pay membership dues by check,

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

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

Thank you!



Celebrating 88 Years of Astronomy



Orion Molecular Cloud Complex - Cave Mountain Observatory Retreat, Nikon D5200 | 16x90s | ISO 500 | Samyang 135mm F/2 - Image Credit: Gael Gomez

More of Gael's astrophotography can be found on pages 4 and 6 of this issue of Star Dust.

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

Next NCA Meeting:
2025 Jan. 11th
7:30 pm
Dr. Thomas Brown
(Zoom Only)

- To join the meeting via Zoom, use the following link:

umd.zoom.us/j/91273752763?pwd=XKZL9V94XIDzwWg7FYDKLbVUQb5YRP.1

Please note that NCA Zoom meetings are often recorded.

Inside This Issue

| | |
|-------------------------------------|---|
| Preview of Jan. 2025 Talk..... | 1 |
| Recent Astronomy Highlights..... | 2 |
| Upcoming NCA Speakers..... | 2 |
| President's Corner..... | 2 |
| Exploring the Sky..... | 3 |
| Sky Watchers..... | 4 |
| Astrophotography by Gael Gomez..... | 4 |
| Occultations..... | 5 |
| Calendar of Events..... | 7 |