# Star Dust

***Newsletter of National Capital Astronomers, Inc.***

*capitalastronomers.org*

***March 2023*** ***Volume 81, Issue 7***


***Celebrating 86 Years of Astronomy***

## *Next Meeting*

**When:** Sat. Mar. 11th, 2023

**Time:** 7:30 pm

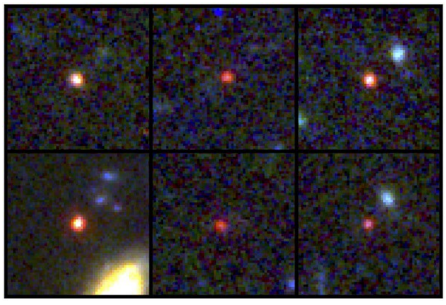
**Where:** Online (Zoom)

*See instructions for joining the meeting on Page 8.*

**Speaker: Alex Dittmann**

## *Table of Contents*



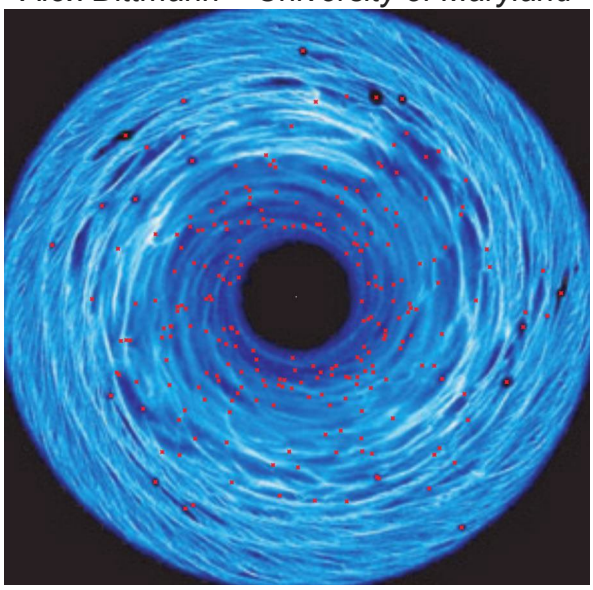


**Images Credit - NASA/ESA/CSA/I. Labbe**

They may not be the most beautiful of the images provided by the James Webb Space Telescope, but the dots in them are faraway galaxies, already formed by 700 million years after the Big Bang that are challenging current theories of galaxy formation in the early Universe. More information is available on Page 4.

# Stars in Accretion Disks That Orbit Black Holes

*Alex Dittmann – University of Maryland*



**A simulation of a gravitationally unstable accretion disk around an Sgr A*-like black hole. Red dots mark the positions of stars which have formed within the disk. Taken from Nayakshin, Cuadra, and Springel 2007 (MNRAS 379, 21-33)**

The accretion disks which power active galactic nuclei (AGN) may harbor large populations of stellar-mass objects. Stars may form in-situ due to the gravitational instability of outer regions of the disk, and stars and black holes may be captured into the disk from a nuclear star cluster through a number of mechanisms. These populations of embedded objects may be responsible for a large fraction of the gravitational wave events observed by LIGO, the chemical evolution of AGN disks over cosmic time, the rapid growth of supermassive black holes in the early universe, and numerous anomalous transients observed in time-domain surveys. Stellar populations in the Milky Way's center may also have been sculpted during our Galaxy's most recent active phase. I will review earlier work on stars irradiated by accreting supermassive black holes and how accretion disks may capture stars on intersecting orbits. Subsequently, I will present recent developments in understanding the evolution of stars within AGN disks: how accretion can rapidly grow stars to hundreds of solar masses, sustain "immortal" stars which cease to chemically evolve, and how disk properties affect these modes of evolution.

*continued on page 2*

## *Recent Astronomy Highlights*

**Possible 'Runaway' Supermassive Black Hole**

'Runaway' supermassive black holes, which have left their original galaxy, have been theorized for decades. Now one may have actually been discovered. The evidence – a bright line approximately 200,000 light years long that lies behind the theorized 20-million-solar-mass black hole. Astronomers located the line while studying the dwarf galaxy RCP 28 which is located 7.5 billion light years away. Made up of compressed gas and newly formed stars, that line is sort of the wake of the black hole. The line also seems to point directly back to the galaxy in which the black hole originally resided. Astronomers theorize that the runaway black hole was ejected from that host galaxy through gravitational interactions, perhaps with another supermassive black hole that also resided in the host galaxy or was part of another galaxy that collided with it in the past. Further study will be necessary to confirm the discovery. More info is at www.space.com/runaway-black-hole-20-million-suns-newborn-stars and a paper on the discovery can be found at arxiv.org/pdf/2302.04888.pdf.

**Dwarf Planet's Ring Defies Explanation**

Quaoar, a dwarf planet about four billion miles from the Sun, has been discovered in recent years to have a ring. Saturn, asteroids and even Haumea, another dwarf planet, have rings, but Quaoar's is unusual in that it exists outside the Roche Limit. Discovered during occultations by Quaoar of distant stars, the ring has a radius of 2420 miles. Quaoar itself is 697 miles in diameter. Rings form when the tidal forces of a larger astronomical object overcome the internal gravity of a smaller object. The Roche limit is the farthest out that such a disruption should take place, but Quaoar's ring lies well beyond that limit, leading astronomers to wonder how it formed. More info is at www.space.com/mysterious-ring-around-dwarf-planet-puzzles-astronomers.

*continued on page 4*

*Abstract and Biography – continued from page 1*

**Biography:** Alex Dittmann is a PhD candidate in Astronomy at the University of Maryland. He received undergraduate degrees in Physics and Astronomy from the University of Illinois in 2018, where he won the Stanley Wyatt Memorial Award. In 2022 he was a co-recipient of the Bruno Rossi Prize as part of the NICER team.

A few of his research interests include compact objects and astrophysical constraints on the equation of state of dense matter; accretion disks, particularly their interaction with binaries; and developing new high-order algorithms for solving differential equations.

## President's Corner

***Guy Brandenburg***

We have some good news this month!

(1) We have obtained permission from the UMD Astro Department Chair Dr. Andrew Harris to start meeting again at the University of Maryland Astronomy Observatory (UMDAO) on Metzerott Road. There is still work that needs to be done to finalize some details and to get the lecture hall back in order, so we will start meeting there in September. The meetings will be hybrid, so those members who cannot attend in person can continue to participate remotely. This will also allow us to have speakers from further afield to "visit." (Note: records indicate that monthly attendance at our meetings went down dramatically when COVID forced us to be all-virtual.)

(2) The one big change in policy for meeting at the UMDAO in the Fall is that UMD will no longer pay the students who do the work of setting up and closing down the telescopes and lecture hall each time we meet there. Exactly how we will manage paying them remains to be seen and decided. My very rough estimates of possible costs, which I posted recently to the NCA email list, indicate that we have enough cash in the NCA bank account to pay students for that for quite a few years.

(3) If you haven't already done so, consider joining the NCA email list. To do so, just send an email to capitalastronomers+subscribe@groups.io .

(4) Milt Roney has volunteered to be our membership coordinator. Thank you! Milt has access to the Google Form results spreadsheet listing which members were interested in which club and astro activities. Hopefully that will allow us to tap members' potential contributions. Thanks also to our very meticulous and organized Secretary-Treasurer, Jim Simpson, and to Elizabeth Warner, the indefatigable UMDAO director.

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## Exploring the Sky


**Exploring the Sky – 2023 Sessions**

15 Apr 9:00 P.M.Venus, Orion
20 May 9:00 P.M.Venus, Mars, M13
17 June 9:00 P.M.Venus, Mars, M13
15 July 9:00 P.M.Venus, Mars, M13, Summer Triangle
19 Aug. 8:30 P.M.Moon, Venus, Mars, M13, summer triangle
23 Sept. 8:00 P.M. Moon, M31, Venus, Mars
21 Oct. 7:30 P.M. Moon, Jupiter
18 Nov. 7:00 P.M. Jupiter, M45, outer planets

**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 still see solar system objects (even the occasional comet), open and globular clusters and maybe a fuzzy galaxy or two.

This year, as an added feature, you can come one hour early and see a planetarium program in the Nature Center and then come to the field to observe. Also, if the sky is cloudy or it's raining there will be a planetarium program at that one hour earlier time so Exploring the Sky will no longer be canceled! Planetarium programs can be found at: www.nps.gov/rocr/planyourvisit/calendar.htm. You can also search "astronomy", "dark skies" or call the Nature Center at: (202)-8985-6070.

*President's Corner – continued from page 2*

(5) The NCA's Coronado Solar Max Hydrogen-alpha telescope is now working just fine, our sign is in hand with beautiful graphics by Alexandra Brandenburg, and the Sun is putting on quite a show. We need a team of folks to put this to use more! The previous custodian of this scope, Jay Miller, has just had hip surgery, and cannot manage the weight of the equipment for the next few months.

(6) If you missed last month's meeting, you missed an excellent presentation by Dr Thaddeus Komacek. I was most impressed by the information he presented on the thousands of exo-planets that have been detected. The sample of planets that have been discovered by both the transit and the radio velocity methods is very much biased towards close-in heavyweight planets, simply because of the geometry: the farther an exoplanet is from its host star, the less likely that we can detect it by using either the transit or radial velocity method. Even so, it looks like our Solar System, and the Earth, are not at all typical of other exoplanet systems! We have found no planet that we could actually live on, even if we could magically arrive at one during a human lifetime. There is no planet B -- everything out there is extremely hostile to life as we know it. If we continue to screw up planet Earth by wiping out species and habitats and raising the global temperature on this sweet and fragile planet, our descendants (if any) will not thank us.

(7) Remember: Earth Hour is happening this March 25, from 8:30 to 9:30 PM. Please turn off all non-essential lights visible from out-of-doors to help promote the awareness of light pollution. Encourage your neighbors and local institutions (especially those with lit-up spires, statues, domes, advertising displays, flagpoles, or office buildings with big windows) to do the same. NCA has formally joined with the DC Chapter of the International Dark-Sky Association on this campaign. See www.earthhour.org/ for more information, including marketing materials.

(8) Only a handful of T-shirts with the NCA logo are known to exist. These days, it's pretty simple to get any logo one likes printed on hats, mugs, tote bags, T-shirts, pens, and so on, at reasonable prices. We have enough cash in our bank account that we could even have one or more of these items printed up and given out for free (!) to every single NCA member. Whatever item(s) we decide to have printed could also be given to our speakers and science fair winners.

Perhaps we could even get the printer to mail them directly to club members so that no club member would need to store them and keep track of who has received what, but this would most likely increase the cost. A survey of interest would be needed.

## Telescope-Making News: Somebody Called the Cops!

***Guy Brandenburg***

I swear I'm not making this up - somebody called the cops on us because we were looking through a newly re-built scope just outside the Chevy Chase Community Center (CCCC) in Northwest Washington, DC.

Yes, I had read stories of cops responding to 911 calls about dangerous-looking people in dark locations doing mysterious things with tubes -- that just turned out merely to be amateur astronomers, but IIRC this was my first such incident. Fortunately, the officers who responded reacted very well, and we all had a good laugh.

Here are the details -- At the regular telescope-making workshop on Tuesday evening (2/22/2023) at the CCCC, Alan Tarica and I thought we had reached the point in the rebuilding process of a 50-year-old telescope where we could finally take it outside and test it on whatever was distant and visible.

*continued on page 4*

# *Sky Watchers*

## March/April

Mercury will only become viewable low in the evening sky just after sunset in late March, then climb higher as the days progress. Venus will continue to rise higher in the evening sky. Mars will be high above in the evening sky, setting well after midnight. Jupiter will be lower in the evening sky each evening, headed toward its transition to the morning sky in April where it will join Saturn which will be getting higher in the predawn sky each morning.

| | |
|---|---|
| 3/20 | Vernal Equinox – The Sun will be directly overhead at the equator at 5:17 p.m. ushering in Spring in the Northern Hemisphere. |
| 4/6 | Full Moon – 12:37 a.m. |

All times are in EDT (Eastern Daylight Savings Time)

*Telescope Making News: Somebody Called the Cops! – continued from page 3*

The original maker of the scope, Mary Jane Boswell, had donated it to us at the Telescope Making, Modification and Maintenance Workshop (TMMMW) sponsored by the National Capital Astronomers (NCA), about a year ago. She gave it to us because it was just too big for her to use any more, with the intention that we would refurbish it and put into the hands of someone who will use it. She told us she had originally made it in 1971 at the long-established telescope-making workshop at Chicago's Adler Planetarium, under the guidance of Ken Wolf. Our testing revealed that she had done a marvelous job on figuring the mirror!

Over the past year, I had slowly rebuilt the mount as a classic Dobsonian with an alt-az base, large and inexpensive plastic bearings, a clamping cradle, a large azimuth circle, a shorter aluminum tube, a better (used) focuser that takes both 1.25 and 2-inch eyepieces, and a new paint job for the tube -- dark green instead of creamy white. I also re-aluminized the mirror. The tube was originally mounted on the sort of plumbing pipe mount that was so common half a century ago, before John Dobson's improvements became so widespread.

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*Recent Astronomy Highlights – continued from page 2*

**Massive Galaxies That Theoretically Shouldn't Exist May Have Been Found in Images of Early Universe**

A galaxy that formed a hundred billion stars by the time the Universe was only 700 million years old seems impossible, at least according to current theories, but that's exactly what astronomers claim may have been found in recent images from the James Webb Telescope. Five other such candidate galaxies were also discovered in other JWST images in quick succession (See the image on Page 1). However, one of the candidates was subsequently discovered, using spectroscopy, to be a 'baby' quasar, a system where a supermassive black hole is feeding on gas at an enormous rate, creating massive amounts of light. Since quasars can outshine their host galaxies, they may account for the relatively enormous amount of light coming from the other candidates as well, instead of requiring a 100 billion of stars. While this might alleviate problems with theories of galaxy formation, this explanation would bring up concerns about how the supermassive black holes necessary for such quasars could form so quickly. Follow-up studies are due to take place in the future to determine which is the more likely explanation for these unexpected galaxies. More information can be found at astronomy.com/news/2023/02/giant-young-galaxies-shake-up-our-understanding-of-the-early-universe.

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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***

Asteroidal Occultations

| 2023 Date | Day | EST/ EDT | Star | Mag. | Asteroid | dmag | dur. s | Ap. " | Location |
|---|---|---|---|---|---|---|---|---|---|
| Mar 9 | Thu | 21:28 | 4UC49456901 | 10.6 | Painleva | 3.7 | 1.8 | 4 | neNC,sVA,sKY,nOK |
| Mar 11 | Sat | 3:34 | TYC09270734 | 11.0 | Elektra | 2.6 | 15 | 4 | cNC,wcVA,wPA,eOH |
| *** Dates and times above are EST, those below are EDT *** | | | | | | | | | |
| Mar 12 | Sun | 23:48 | TYC08131352 | 9.6 | Elpis | 3.2 | 23 | 3 | cNC,wVA,WV,c+sOH |
| Mar 19 | Sun | 20:45 | 4UC73026287 | 11.8 | 2001 CC21 | 6.4 | .14 | 8 | nSC,wNC,eTN,cKY |
| Mar 20 | Mon | 1:36 | 40 Leonis | 4.7 | 1991 PK8 | 13.0 | 1.5 | 1 | cNC,wVA,eKY,sAB |
| Mar 21 | Tue | 2:09 | IY Virginis | 9.4 | Galilea | 8.7 | 5 | 3 | s+cMD,DC,nVA,cOH |
| Mar 26 | Sun | 21:59 | TYC32890314 | 11.7 | 2001 CC21 | 7.4 | .12 | 8 | SC,wNC,eTN,eKY |
| Apr 2 | Sun | 2:26 | SAO 159297 | 8.2 | Euboea | 7.0 | 11 | 2 | ne-swPA,wMD,sOH |
| Apr 2 | Sun | 4:11 | 4UC42384998 | 12.5 | Asporina | 1.2 | 3 | 6 | sw-nVA,DC,cMD |
| Apr 3 | Mon | 22:21 | 4UC60015410 | 13.8 | Achilles | 2.0 | 4 | 8 | nw-sePA,n+eMD;DC |
| Apr 4 | Tue | 20:48 | 4UC51404708 | 12.4 | Kleopatra | 0.5 | 3 | 8 | sVA,neNC |
| Apr 4 | Tue | 20:50 | 4UC65705525 | 12.5 | 2001 CC21 | 8.4 | .10 | 9 | cVA,nWV |
| Apr 5 | Wed | 0:24 | 4UC47054789 | 13.8 | Lyyli | 3.8 | 2.1 | 8 | MD,nVA,nOH;DC? |
| Apr 6 | Thu | 0:47 | 4UC40863459 | 12.6 | Forsytia | 3.2 | 6 | 7 | DE,cMD,nDC,nVA |
| Apr 6 | Thu | 20:02 | TYC24130102 | 10.3 | Ilmatar | 2.8 | 3 | 5 | sePA,nwMD,DE,sNJ |
| Apr 8 | Sat | 1:53 | 4UC61044628 | 12.3 | Scylla | 3.2 | 3 | 6 | ePA,cMD,DC,seVA |
| Apr 10 | Mon | 3:24 | 4UC37669705 | 12.3 | Sibylla | 1.5 | 12 | 6 | neNC,se-cVA,Ohio |

Lunar Grazing Occultations (none in the area in March and early April)

Lunar Total Occultations

| 2023 Date | Day | EST/ EDT | Ph | Star | Mag | % | alt | CA | Sp. | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| Mar 11 | Sat | 23:55 | R | ZC 2119 | 6.6 | 79- | 12 | 54N | F6 | Azimuth 125 |
| *** Dates and times above are EST, those below are EDT *** | | | | | | | | | | |
| Mar 13 | Mon | 1:40 | R | ZC 2249 | 6.7 | 69- | 8 | 58S | K1 | Very lose equal double |
| Mar 13 | Mon | 4:42 | R | ZC 2262 | 7.5 | 68- | 27 | 86S | F5 | |
| Mar 14 | Tue | 5:30 | R | ZC 2420 | 7.5 | 57- | 23 | 72S | A3 | |
| Mar 14 | Tue | 6:31 | R | SAO 184724 | 7.5 | 57- | 24 | 70S | F0 | Sun alt. -10 deg. |
| Mar 14 | Tue | 6:34 | R | SAO 184734 | 8.2 | 57- | 24 | 35S | M0 | Sun alt. -10 deg. |
| Mar 15 | Wed | 5:03 | R | ZC 2568 | 8.4 | 46- | 14 | 38S | B9 | Az.147,dbl 0 |
| Mar 15 | Wed | 5:28 | R | X145226 | 8.3 | 46- | 17 | 84S | | Close double?? |
| Mar 15 | Wed | 6:09 | R | X 43016 | 7.9 | 46- | 20 | 47S | K0 | Close double?? |
| Mar 24 | Fri | 21:40 | D | 44 Arietis | 7.0 | 13+ | 14 | 60N | A3 | ZC 429, Azimuth 282 deg |
| Mar 25 | Sat | 21:58 | D | 76221 | 8.4 | 21+ | 22 | 57S | F0 | |
| Mar 25 | Sat | 22:40 | D | ZC 566 | 6.1 | 21+ | 15 | 61N | B8 | Azimuth 287 degrees |
| Mar 25 | Sat | 23:19 | D | ZC 573 | 6.7 | 22+ | 8 | 55S | K0 | Az. 292, close double?? |
| Mar 26 | Sun | 20:02 | D | ZC 703 | 6.2 | 30+ | 56 | 83N | A5 | Sun altitude -8 degrees |
| Mar 27 | Mon | 19:30 | D | SAO 77258 | 7.8 | 39+ | 72 | 84N | K0 | Sun alt. -2 deg. |
| Mar 27 | Mon | 20:04 | D | SAO 77266 | 8.1 | 39+ | 66 | 42N | F0 | Sun alt. -8 deg. |
| Mar 27 | Mon | 20:22 | D | SAO 77272 | 7.6 | 39+ | 63 | 46S | F7 | Sun -12, double?? |
| Mar 27 | Mon | 21:47 | D | ZC 844 | 5.8 | 40+ | 46 | 32S | B9 | equal dbl, dTime -5sec |
| Mar 27 | Mon | 21:48 | D | X 75950 | 6.6 | 40+ | 46 | 32S | | |
| Mar 27 | Mon | 23:38 | D | SAO 77389 | 8.1 | 40+ | 26 | 80S | A0 | |
| Mar 28 | Tue | 22:12 | D | SAO 78480 | 7.5 | 49+ | 52 | 34N | K5 | close double?? |
| Mar 29 | Wed | 0:03 | D | ZC 1013 | 7.0 | 50+ | 31 | 42S | G0 | mg2 9.0, dTime -1.4s |
| Mar 29 | Wed | 2:22 | D | ZC 1028 | 7.5 | 51+ | 7 | 52S | G8 | Azimuth 300 deg. |
| Mar 30 | Thu | 20:21 | D | SAO 80070 | 7.5 | 68+ | 74 | 89N | K0 | Sun alt. -11 deg. |
| Mar 31 | Fri | 1:31 | D | SAO 80165 | 7.5 | 69+ | 31 | 59S | F2 | |
| Apr 2 | Sun | 4:11 | D | ZC 1479 | 6.4 | 86+ | 14 | 21S | F2 | Azimuth 279 deg. |
| Apr 9 | Sun | 2:09 | R | ZC 2216 | 7.2 | 90- | 26 | 75S | B9 | |
| Apr 9 | Sun | 6:23 | R | ZC 2234 | 7.6 | 89- | 17 | 57N | K5 | Sun alt. -4 deg. |
| Apr 10 | Mon | 1:24 | R | ZC 2364 | 7.0 | 82- | 13 | 74N | A1 | Aziuth 139 deg. |

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

### Occultations by (98943) 2001 CC21, a flyby target of JAXA’s Hayabusa2 spacecraft

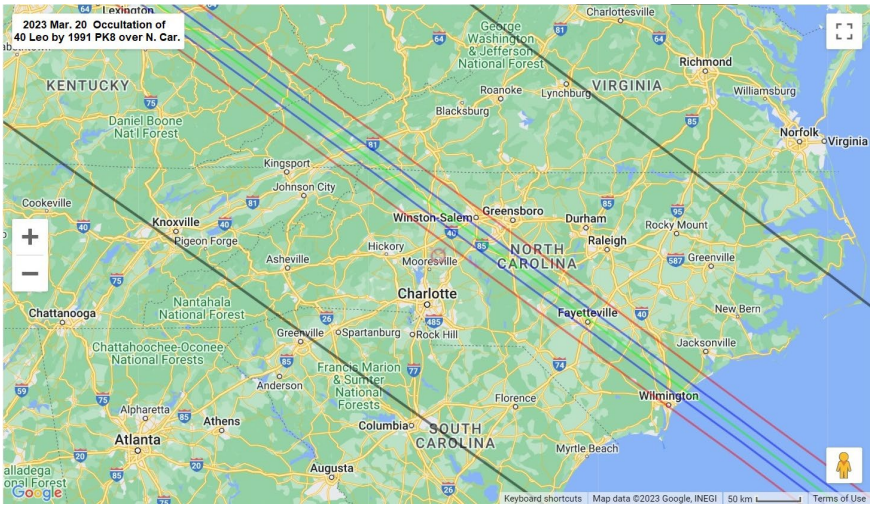
This small (600m) near-Earth asteroid will occult stars a few times over different parts of the Mid-Atlantic, but only the one the evening of April 4 is close enough (central VA) to consider an expedition for it. Let me know if you might be interested in joining an effort for it. Currently, we are trying to obtain a first detection of an occultation by this object in a coordinated effort to cover the large uncertainty area with other observers around the world, especially in Japan. If before April 4th, someone observes that first occultation during another event, we will be able to predict the path much more precisely for valuable follow-up.

*continued on page 6*

*Occultations – continued from page 5*

**Occultation of 40 Leonis by (7585) 1991 PK8, path across Virginia and North Carolina**

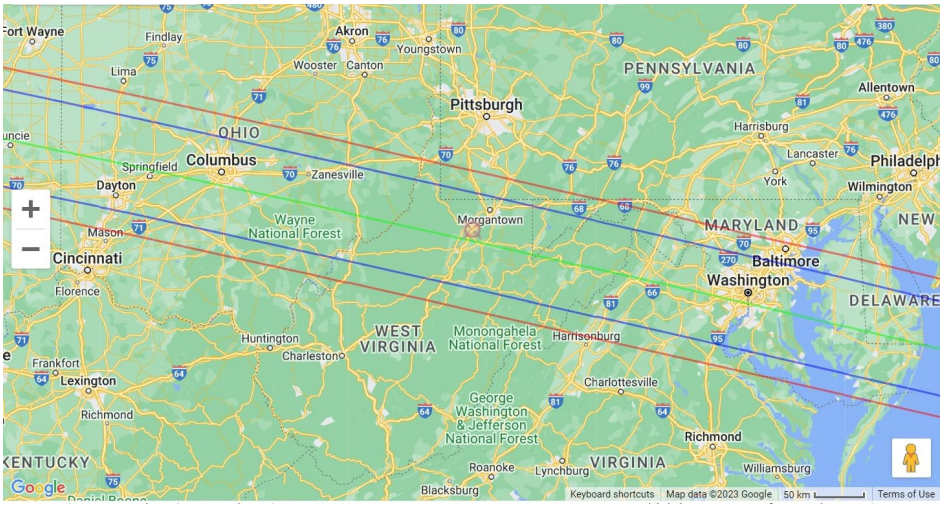
On Monday March 20, at 1:36am, the 17-km main-belt asteroid 1991 PK8 will occult 4.7-mag. 40 Leonis in a path across parts of Virginia and North Carolina, as shown in the map just below or at iota.jhuapl.edu/20230320-40LeoNC.jpg. The blue lines show the predicted limits of the path, while the red lines show the area where the limits might be in case of a 1-sigma path error either to the north or south. The central line is a fainter green line between the limits. The two gray lines enclose the zone from which a possible satellite of 1991 PK8 might occult the star briefly. 40 Leonis can be seen with binoculars, or recorded with small "mighty-mini's". You are welcome to join our expedition to observe the event from multiple stations, if the weather forecast is good enough. This is the 2nd brightest occultation of a star by an asteroid predicted to occur in the USA during 2023. 40 Leonis is easy to find, being only 22' south of 2.2-mag. Algieba, which in turn is 8° north of Regulus. On Dec. 12, there will be an even brighter event, in southern Florida, when Betelgeuse will be occulted by (319) Leona.




**Map Credit - D. Dunham, S. Preston, and D. Breit, IOTA, and Google Maps**

**Occultation of IY Virginis by (697) Galilea, path across the DMV**

On Tuesday March 21, at 2:09am, the 76-km main-belt asteroid Galilea will occult 9.4-mag. IY Virginis (= HIP 58372) in a path crossing the DMV, as shown in the map just below or at iota.jhuapl.edu/20230321GalileaMidAtlantic.jpg. The blue lines show the predicted limits of the path, while the red lines show the area where the limits might be in case of a 1-sigma path error either to the north or south. The central line is a fainter green line between the limits. Anyone living in the map area is encouraged to observe, since anywhere there a possible satellite of Galilea might occult the star briefly. IY Virginis is bright enough to be seen with any small telescope; many of you probably live within the path, having a high chance for an occultation.




**Map Credit - D. Dunham, S. Preston, and D. Breit, IOTA, and Google Maps**

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*Telescope Making News: Somebody Called the Cops! – continued from page 4*

I let Ms Boswell keep the old mount, and took only the optical tube with all of its optics and such (focuser, finder, secondary mirror and its holder, spider, and the primary mirror and its holder). I did not keep track of the number of hours I put into this with help from others, but most of the materials were things we had around the workshop, except for the focuser and the new end cap (3D printed by Alin Tolea).

I found that collimating the scope was very simple, the optics were good, and the motions of the focuser and the mount were excellent. The azimuth scale, used together with a hardware-store clinometer and any astronomy app that gives altitude and azimuth data for objects in the sky, should make finding faint galaxies and star clusters rather easy. The only question was, had I guesstimated the correct distance from the primary mirror to the secondary and focuser? To find out, we had to take the scope outside and point it at some very distant objects.

So, shortly after sunset, we carried the Boswell scope out the back door of the CCCC and over to McKinley Street, where the lights weren't quite so awful, and where we had decent views to the south and west. We used an inexpensive, low-power Plossl eyepiece and found we could focus nicely on some radio towers a mile or so. This immediately got us an onlooker who had always been in love with astronomy. We then noticed that we had lucked out - the sky was nice and clear, and Venus and Jupiter soon became very obvious to our west. We moved away from a street light and some trees to look at them with the scope, and found we could also get a clear view of the very thin, brand-new crescent Moon not far above the horizon. (My wife later showed me some nice photos that friends of hers, elsewhere, had made of that same beautiful grouping.)

To our great pleasure, the scope worked well on those objects as well -- except for the fact that the atmosphere's "seeing" was very turbulent and unsteady, so the craters and highlands on the Moon kept shimmering back and forth, and Venus was a bright rainbow-colored blob but the moons and stripes or bands on Jupiter (much higher in the sky) were very clear - the higher the altitude of the object you are looking at, the less atmosphere you have to look through.

Over and over, by-passers walked up to us and asked us what we were doing. Once we explained, they all wanted to have a look as well and were delighted with what they saw. Soon we had a bit of a crowd. Some of the folks asked if we had also anything to do with the monthly sky viewing sessions in Rock Creek Park near Military and Glover Roads and the Nature Center. We allowed that yes, we were the same group, NCA (National Capital Astronomers), and that those sessions would start up again in April.

Soon, two DC MPD officers showed up on foot (fortunately without any siren or blinking lights). They told us that a concerned citizen had called 911 on us because they thought what we were doing out there after sunset with that unknown device might be a military threat. I laughed and said they had to be joking. But no, one of the officers showed us part of the text exchanges they had had with the dispatcher concerning this 911 call! They apologized that they had to check out each and every such call, even though they knew immediately this was just a telescope. We all got a good laugh out of this, and both officers, and one of the CCCC staff, also took us up on the opportunity to see the Moon, Jupiter, and Venus.

Eventually Alan and I were able to escape the crowds and take the scope back inside the workshop, before anybody else could stop us, and we then helped Pratik Tambe start using polishing pads on his mirror... who had been busy playing a tune from Grieg's Peer Gynt suite on a piano in the hallway while he waited for us to re-appear in the workshop.

Now that the scope is finished, it needs a new owner. Who is interested?

*Recent Astronomy Highlights – continued from page 4*

**A Real-Life 'Forbidden' Planet**
M-dwarf stars are the smallest and most common in the Milky Way Galaxy. At only four times the mass of Jupiter, TOI 5205 is just such a star, but one that comes with a surprise for astronomers. It is orbited by a gas giant with approximately the mass of Jupiter. Prior to the discovery, astronomers had not believed that such a configuration, with a planet so large in comparison to its host star, was possible since in theory there would not be enough material left over from the formation of that star to make such a large planet. Nevertheless, the Transiting Exoplanet Survey Satellite, TESS, discovered the unusual nature of the system by recording the largest drop in light received from a star being transited by a planet, seven percent. More study will no doubt take place, possibly including imaging by JWST. More info can be found at www.space.com/forbidden-planet-orbiting-tiny-star.

## 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**: **8 April** 7:30 p.m. Joe Pesce (GMU and NSF) **The Atacama Large Millimeter/submillimeter Array (ALMA) and Game-changing Science**

**The APS Mid-Atlantic Senior Physicists Group**: **(Zoom Meeting)** March 16th at 1:00 p.m., Robert Ehrlich, George Mason University Physics & Astronomy Department, Chairman (Retired). will give a talk entitled "Tachyons: Messengers from the future?". You can register for the Zoom meeting at apsphysics.zoom.us/meeting/register/tZUsdeuhqjotH9esV_UKLDhOrLB0Wfn3rUhB.

## 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 86 Years of Astronomy*

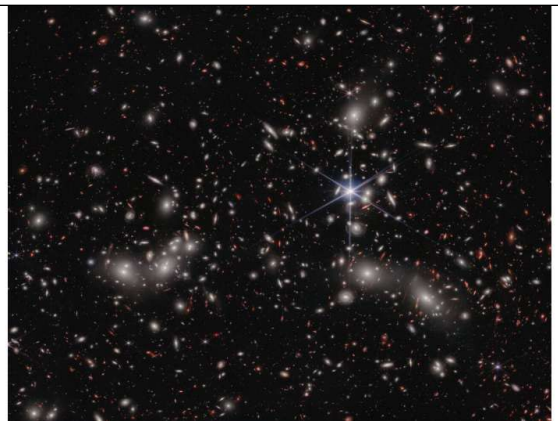

**Image Credit - NASA**

JWST provided the image of Pandora's Cluster (Abell 2744), a group of galaxy clusters approximately four billion light years away. More information is at phys.org/news/2023-02-james-webb-space-telescope-uncovers.html.

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

*Next NCA Meeting:*

## 2023 March 11th
## 7:30 pm
## (On Zoom)
## Alex Dittmann

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-VzlNXm

Please note that NCA Zoom meetings are often recorded.

# Inside This Issue