

# Star Dust

Newsletter of National Capital Astronomers, Inc.  
[capitalastronomers.org](http://capitalastronomers.org)

October 2021

Volume 80, Issue 2

**Celebrating 84 Years  
of Astronomy**

## Next Meeting

**When:** Sat. Oct. 9th, 2021  
**Time:** 7:30 pm  
**Where:** Online ([Zoom](#))  
**Speaker:** Dr. Lynn B. Wilson III

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**Image Credit - ESA/Hubble & NASA, T. Treu. Acknowledgment: J. Schmidt**  
This image of an Einstein Ring was made possible by gravitational lensing of light from two galaxies and a quasar by two intervening galaxies. More information can be found at [esahubble.org/images/potw2132a/](http://esahubble.org/images/potw2132a/).

## 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.

## Particle Energization Within Collisionless Shock Waves

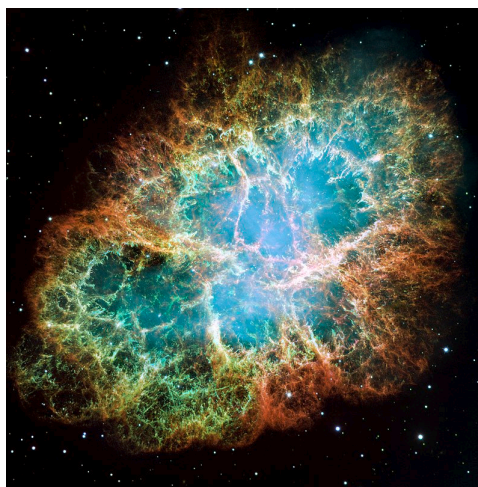
Lynn B. Wilson III

NASA's Goddard Space Flight Center

A shock wave is a discontinuous transition between supersonic and subsonic flows, characterized by an abrupt change in pressure, temperature, velocity, and density in the medium. Shock waves can arise from the nonlinear steepening of compressional waves when the steepening is balanced by some form of irreversible dissipation of energy. Nonlinear wave steepening can result when the phase speed of the parts of a wave is largest where the wave's amplitude is largest. The parts of the wave where the amplitude is large will then "out run" the parts of the wave where the amplitude is small. If the irreversible dissipation of energy is not too great, the steepening wave will reach a "gradient catastrophe" and undergo breaking (e.g., think of breaking water waves). In Earth's non-ionized atmosphere, the dissipation of the energy of a shock wave results from collisions between the particles in the wave.

Space plasmas, however, are *ionized* gases, where long-range electrostatic forces produce non-local collective behavior. Space plasmas

*continued on page 2*



**Crab Nebula Image Credit - NASA, ESA, J. Hester and A. Loll (Arizona State University)**

## Recent Astronomy Highlights

### Intermediate-Mass Black Hole Reveals Itself While Eating a Star

Intermediate-mass black holes, between 100 and 100,000 times the mass of the Sun, are predicted to be common, but they have proven to be hard to find. However, one, with an upper mass limit of 22,000 solar masses, has recently made its presence known by disrupting and consuming a star that came too close. The black hole appears to be in a star cluster near a galaxy 750 million light years away. Study of the flare also shows that the black hole is spinning extremely fast. On a scale where 0 indicates no spin and 1 indicates that the black hole is spinning as fast as possible for its mass, the newly-discovered one is spinning at approximately 0.8. How it got so much spin is a mystery, with one possible solution being that the black hole was created directly from the collapse of a large cloud of gas. More information can be found at [www.sciencealert.com/another-missing-link-mass-black-hole-has-been-caught-devouring-a-star](http://www.sciencealert.com/another-missing-link-mass-black-hole-has-been-caught-devouring-a-star).

### Never-Before-Seen Type of Supernova

Clues discovered years apart, including an X-ray flare in 2014, and radio emissions more recently detected, all coming from a region 480 million light years from Earth, have allowed astronomers to theorize that they have witnessed a type of supernova not seen before. The event is known as a merger-triggered, core-collapse supernova. In such a supernova the black hole or neutron-star remnant of one star of a binary-star system spirals into the other star, spewing out gas from that star. Scientists theorize that from its first contact with the companion star, the black hole or neutron star took hundreds of years to spiral down to the core, where it caused the collapse of that core and the subsequent supernova. More information on the event can be found at [scitechdaily.com/stellar-collision-triggers-supernova-explosion-this-is-the-first-time-weve-actually-seen-such-an-event/](http://scitechdaily.com/stellar-collision-triggers-supernova-explosion-this-is-the-first-time-weve-actually-seen-such-an-event/).

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*Abstract – continued from page 1*

are often only weakly collisional - often even essentially collisionless - which led to the question of whether shocks could exist in such plasmas. Yet spacecraft have been observing phenomena that appear to be magnetized shocks since the 1960s, despite the fact that the peak amplitudes of these shocks cannot be controlled by collisions. This led to the concept of a *collisionless* shock wave. Collisionless shocks are ubiquitous phenomena in astrophysical plasmas in the form of bow shocks upstream of magnetized planetary bodies (and upstream of unmagnetized objects like comets and Venus), interplanetary shocks, supernova blast waves, and stellar astrospheres. Despite their ubiquity, there are still numerous poorly understood processes associated with collisionless shocks. We will focus on one topic that is of particular interest, the energizing of charged particles within the plasma, because collisionless shocks are thought to generate some of the most energetic particles in the universe. We will discuss some of the known and observed mechanisms by which collisionless shocks energize particles, and will discuss unknowns that motivate present and planned research.



**Biography:** Lynn B. Wilson III graduated from St. John's University in 2005 with a BA in physics and went on to the University of Minnesota to work with Cynthia Cattell. He defended his dissertation entitled, "The microphysics of collisionless shocks," in September 2010 and started working at NASA's Goddard Space Flight Center about a week later, where he's been ever since. His graduate work primarily used data from the Wind spacecraft, so he was chosen as the deputy project scientist for Wind, by the then project scientist Adam Szabo, in 2012. He took over as the Wind project scientist in July 2016 and continues in this role today. He was recently (Feb. 2021) selected as the mission scientist for the upcoming SunRISE mission. He was awarded the NASA Exceptional Scientific Achievement Medal "For exceptional scientific discoveries in collisionless shock physics and the kinetic physics of space plasmas" in 2019. His work has focused on multiple topics: from collisionless shocks to radiation belt dynamics to interstellar and interplanetary dust. He is an active participant in the American Physical Society and American Geophysical Union. He is a team leader for an International Space Science Institute (ISSI) collaboration on collisionless shocks, and a Focus Group leader on collisionless shocks for Geospace Environment Modeling (GEM) community.

## 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](http://www.capitalastronomers.org) or the Rock Creek Park web site, [www.nps.gov/rocr/planyourvisit/expsky.htm](http://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](http://www.astronomyindc.org)

**The article-submission deadline for November's issue of Star Dust, is October 21st.**

**Clear Skies!**

## Disturbing Racist Clauses Found in Early NCA Constitutions & Bylaws

*Guy Brandenburg*

Recently, while preparing to give a talk at this year's Stellafane telescope-makers' convention, I was disappointed to discover that the National Capital Astronomers specifically excluded Black members for nearly 30 years: from about 1940 all the way up to mid-1969.

But NCA didn't start out being overtly racist. The original 1937 NCA founding document has no such language. It reads, in part, "The particular business and objects of [the NCA] shall be the education and mutual improvement of its members in the science of Astronomy and the encouragement of an interest in this science among others. (...) The activities of this Association are designed for the enjoyment and cultural profit of all interested in astronomy, whether the member be a beginner, an advanced student, or one whose pursuit of the science is necessarily desultory."

And today's NCA home page reads, "All are welcome to join. *Everyone who looks up to the sky with wonder is an astronomer* and welcomed by NCA. You do not have to own a telescope, but if you do own one that is fine, too. You do not have to be deeply knowledgeable in astronomy, but if you are knowledgeable in astronomy that is fine, too. You do not have to have a degree, but if you do that is fine, too. **WE ARE THE MOST DIVERSE local ASTRONOMY CLUB anywhere.** Come to our meetings and you will find this out. **WE REALLY MEAN THIS!**"

But in the 1940's, the original open-minded and scientific NCA membership policy changed. The January 1946 *Star Dust* listed a number of changes to be voted on by the membership in the club's founding documents. (See [capitalastronomers.org/SD\\_year/1946/StarDust\\_1946\\_01.pdf](http://capitalastronomers.org/SD_year/1946/StarDust_1946_01.pdf) ) The organization voted to change article III of its constitution as follows:

From: **"only Caucasians over 16 years old are eligible for membership."**

To this: **"to include all ages (see by-laws), exclude only the Black race."**

While it may be shocking that a scientific organization like NCA had such a policy, people often forget how racist a nation the USA used to be, and for how long. If you look up actual pages of DC area newspapers from the 1950s, you will note that the classified advertisements were largely segregated both by race and by gender – want ads would very often specify male or female, single or married, White-only or Colored-only jobs, apartments, and so on.

Schools in DC, MD, and Virginia were mostly segregated, either by law or in practice, up until the late 1960s or early 1970s. The 1954 *Brown v Board* decision had very little real impact in most areas until much, much later. Queens (NYC), PG County (MD) and Boston (MA) had violent movements **against** integrating schools in the 1970s. I know because I attended demonstrations against those racists and have some scars to prove it.

While the Federal and DC governments offices were integrated immediately after the Civil War, that changed for the worse when Woodrow Wilson was elected President in 1912.

Many scientists in the USA and in Europe believed the pseudo-scientific ideas of racial superiority and eugenics that arose around 1900 and were still widespread 50 years ago – and even today, as recent events have sadly shown.

I don't know exactly when the 'Caucasian'-only policy became part of the NCA rules, but it seems to have been between the club founding in 1937, and October 1943 when Volume 1, Number 1 of *Star Dust* was printed. At one point, perhaps around 1940, NCA decided that only 'Caucasians' over 16 could join. But as indicated above, in 1946, the racial exclusion policy was narrowed to only exclude Black people. Apparently, Jews, Italians, young people, Latin Americans,

*continued on page 4*

# Sky Watchers

## October/November

Mercury transits to the morning sky mid-October and reaches Greatest Western Elongation on October 25 <sup>th</sup> (see below). Venus will remain in the evening sky, reaching Greatest Eastern Elongation on October 29 <sup>th</sup> (see below). Mars will transit to the morning sky, but will still not be very visible due to being on the opposite side of the Sun from Earth. Jupiter and Saturn will be in the Eastern sky at sunset.	
10/20	Full Moon at 10:57 a.m.
10/21-22	The Orionids Meteor Shower peaks on the evening of the 21 <sup>st</sup> into the morning of the 22 <sup>nd</sup> with approximately 20 meteors/hour. Unfortunately, with a nearly full Moon, viewing conditions will be less than ideal this year.
10/25	Mercury reaches Greatest Western Elongation and will be 18.4° away from the Sun, visible in the morning sky before the Sun rises.
10/29	Venus reaches Greatest Eastern Elongation and will be 47° from the Sun, shining bright after sunset.
11/4-5	The Taurids Meteor Shower peaks on the evening of the 11/4, usually producing 5-10 meteors per hour. A New Moon will allow for ideal viewing conditions. The best time for viewing is just after midnight.

All times are in EDT (Eastern Daylight Savings Time)

*Disturbing Racist Clauses... – continued from page 3*

and Asians were eligible to join NCA from 1946 to 1969. But not African-Americans.

While researching my talk, I found that the NCA held amateur telescope-making classes at a number of all-white DC, MD, and VA high schools, from the 1940s through about 1970, both during the days of de jure segregation and the merely de facto type: McKinley, Roosevelt, Central, Bladensburg, Falls Church, and McLean high schools are listed. While Star Dust mentions a telescope-making course at (the largely-Black) Howard University in 1946, there is no mention of any assistance for that course from NCA.

I also found no evidence in any issue of Star Dust from that era that anybody at the time raised any vocal objections to racial exclusion. Not in 1946, nor 23 years later when the rule prohibiting Black members was quietly dropped (in 1969) when a new constitution was adopted.

A few current or past NCA members confirmed to me that at some point, they noticed that racist language and privately wondered about it. One person told me that they definitely recalled some now-deceased NCA members who were openly racist and not shy about expressing those views. Others told me that they had never heard any discussion of the subject at all.

(As one who grew up in DC and Montgomery County, and attended essentially-segregated public schools there, I am sorry that neither I nor my family actively spoke up at the time, even though a farm adjacent to ours in Clarksburg was owned by a Black family [with no school-age children at the time]. Amazing how blind one can be! The racists of those days were not shy about committing violence to achieve their ends. Fear might be one reason for silence.)

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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](mailto:hbofinger@earthlink.net)

**Thank you!**

*Recent Astronomy Highlights – continued from page 2*

### Cold Planets Throughout the Milky Way

Using observations of microlensing events, where the gravitational fields of planets bend the light from their stars, along with modeling of such microlensing events, astronomers have determined that cold planets, planets orbiting far from their stars, exist around stars throughout the Milky Way Galaxy and even in the galactic bulge. With the stars of the bulge being older and more closely packed, there had been speculation that planets might not exist in such an environment. The finding may ultimately lead to a better understanding of the process of planet formation. More information is at [www.sciencedaily.com/releases/2021/08/210830140249.htm](http://www.sciencedaily.com/releases/2021/08/210830140249.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

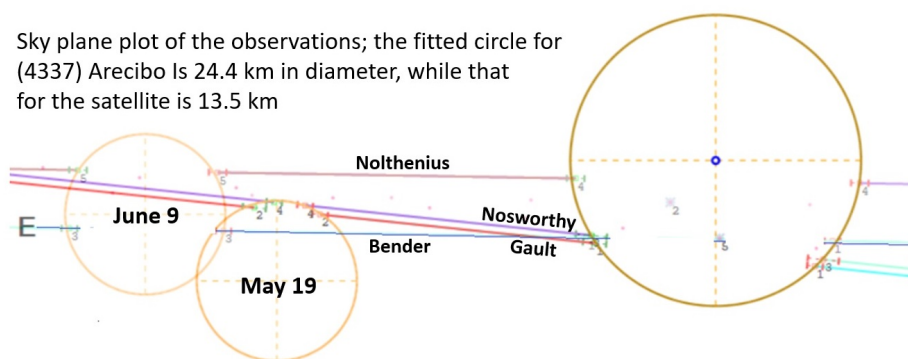
David Dunham

This month's Occultation list will be available at [iota.jhuapl.edu/exped.htm](http://iota.jhuapl.edu/exped.htm).

### Discovery and confirmation of the satellite of (4337) Arecibo, 2021

Discovery by Peter Nosworthy & Dave Gault, May 19, west of Sydney, NSW, Australia  
Confirmation by Richard Nolthenius and Kirk Bender, June 9, central California, USA

Sky plane plot of the observations; the fitted circle for (4337) Arecibo is 24.4 km in diameter, while that for the satellite is 13.5 km



For a good account of these observations, including the videos, please visit [https://www.youtube.com/watch?v=w\\_Cc5Or1FFw](https://www.youtube.com/watch?v=w_Cc5Or1FFw) Diagram by Dave Herald using the Occult4 program

On 2021 May 19, Peter Nosworthy and Dave Gault, observing from their observatories west of Sidney, NSW, Australia, both recorded two occultations of a 13.6-mag. star in Sagittarius by the asteroid (4337) Arecibo, discovering a moon of the asteroid. On 2021 June 9, Richard Nolthenius and Kirk Bender observed another occultation, of a 12th-mag. star, by Arecibo with portable telescopes in central California, USA, confirming the satellite and showing that it is 13.5 km across, just over half the size of Arecibo, which Dave Herald's analysis of the observations found to be 24.4 km across. More information about these observations can be found at [www.hazelbrookobservatory.com/4337arecibo/](http://www.hazelbrookobservatory.com/4337arecibo/) and Peter's good account of the discovery is on YouTube at [www.youtube.com/watch?v=w\\_Cc5Or1FFw](https://www.youtube.com/watch?v=w_Cc5Or1FFw).

*Disturbing Racist Clauses... – continued from page 4*

One possibility is that some of the early NCA meetings might have been held at private residences; perhaps some of the racist members insisted in preventing non-'Caucasian' or 'Black' people from attending. It is too bad the other NCA members didn't take the other route and stay true to the original ideas of the club, and tell the racist members to get lost.

Very ironic: the late George Carruthers, a celebrated Naval Research Lab and NASA scientist, and an instrument-maker for numerous astronomical probes and satellites, gave a talk to the NCA in September of 1970 – not too long after the NCA apparently dropped its racist membership rules (April, 1969). So, a mere year and a half before he gave his talk, he could not have legally joined the organization. Nor could he have done so when he was making his own telescopes from scratch as a teenager in the 1940s. See [en.wikipedia.org/wiki/George\\_Robert\\_Carruthers](https://en.wikipedia.org/wiki/George_Robert_Carruthers) on the life and work of this great African-American scientist and inventor.

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## 2021-2022 Officers

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 240-461-4948

### Vice-President:

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[jshgwave@yahoo.com](mailto:jshgwave@yahoo.com)  
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 202-675-1075

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### Trustees:

- Michael Brabanski (2022)
- Guy Brandenburg (2023)
- Jack Gaffey (2024)
- Benson Simon (2025)

### Appointed Officers and Committee Heads:

#### Exploring the Sky

Jay Miller  
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#### Telescope Making

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### *Disturbing Racist Clauses... – continued from page 5*

To NCA's credit, we have done better in the past few decades at encouraging participation in telescope viewing parties, telescope making, and lectures by members of all races and ethnic groups. However, I often find that not very many NCA members bring telescopes to viewing events, or show up to judge science fairs, in mostly-minority neighborhoods. Often, it's just me. That needs to change. We need to encourage an interest in science, astronomy, and the Universe in children and the public no matter their skin color or national origin, and we need to combat the racist twaddle that passes for eugenics.

The current NCA officers have released a statement repudiating the club's former unscientific and racist policies and behavior. I hope we will redouble our efforts to promote the study of astronomy to members of all ethnic groups, especially those historically under-represented in science.

We could do well to note the words that Albert Einstein wrote in 1946, after he had been living in the US for a decade, and the same year that NCA confirmed that Black people could not join: *"What, however, can the man of good will do to combat this deeply rooted prejudice? He must have the courage to set an example by word and deed, and must watch lest his children become influenced by this racial bias."*<sup>1</sup>

*"I do not believe there is a way in which this deeply entrenched evil can be quickly healed. But until this goal is reached there is no greater satisfaction for a just and well-meaning person than the knowledge that he has devoted his best energies to the service of the good cause."*<sup>1</sup>

I am indebted to Morgan Aronson, Nancy Byrd, Richard Byrd, Geoff Chester, Jeff Guerber, Jay Miller, Jeffrey Norman, Rachel Poe, Todd Supple, Wayne Warren, Elizabeth Warner, and Harold Williams for documents, memories, and/or technical support.

<sup>1</sup> Pageant 1 (January 1946), No. 12, 36-37; Einstein 1956, 132-134. The full text can be found at [www.kganu.net/sitebuildercontent/sitebuilderfiles/alberteinsteinonthenegroquestion-1946.pdf](http://www.kganu.net/sitebuildercontent/sitebuilderfiles/alberteinsteinonthenegroquestion-1946.pdf)

Editor's Note – Unfortunately, due to space limitations, Guy's article had to be trimmed. The full article, which contains a more detailed explanation of pertinent history, is available at [guysmathastro.com/2021/09/29/disturbing-racist-clauses-found-in-early-nca-constitutions-bylaws/](http://guysmathastro.com/2021/09/29/disturbing-racist-clauses-found-in-early-nca-constitutions-bylaws/)

## Statement from the Officers of the National Capital Astronomers

We, the officers of the National Capital Astronomers, thank Guy Brandenburg for bringing this unfortunate period in the organization's history to our attention. As representatives of NCA, we condemn the discriminatory language used in early NCA Bylaws and Constitutions, all of which was finally removed in 1969. We also wish to affirm that the National Capital Astronomers is dedicated to the principle of being open to membership by everyone, regardless of race. As is pointed out in Guy's article and is stated on our webpage, "All are welcome to join. *Everyone who looks up to the sky with wonder is an astronomer and welcomed by NCA.*" Thank you.

Recent Astronomy Highlights – continued from page 4

Hubble and ALMA Find Galaxies Already “Dead” Over Ten Billion Years Ago

Three billion years after the Big Bang, the star formation rate in most galaxies was many times what it is currently in the Universe. Yet, a recent study, using the Hubble Telescope and ALMA, Atacama Millimeter/sub-millimeter Array, a radio-telescope array in Chile, has found six galaxies that had already used up their available hydrogen for making new stars, and therefore were ‘dead’ by then. Those galaxies are so distant that seeing them was only possible with current technology because the light from them underwent strong gravitational lensing, by intervening galaxies or galaxy cluster, while that light was on its way to Earth. How these galaxies went through their supply of hydrogen so quickly is a mystery still to be solved. More information can be found at www.sciencedaily.com/releases/2021/09/210922121920.htm.

Calendar of Events

NCA Mirror- or Telescope-making Classes: The Chevy Chase Community Center is reopening and classes are resuming. 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. DC’s Department of Parks and Recreation wants folks to formally register. Also 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: 13 November 7:30 p.m. Julie McEnery (GSFC) The Nancy Grace Roman Space Telescope

The APS Mid-Atlantic Senior Physicists Group: (Zoom Meeting) October 20th at 1:00 p.m., Bhagirath Joshi, will give a talk entitled "Excess Neutron Shell Model of Nuclei". More information on the meeting is available at www.aps.org/meetings/meeting.cfm?name=SENIOR1021 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.?

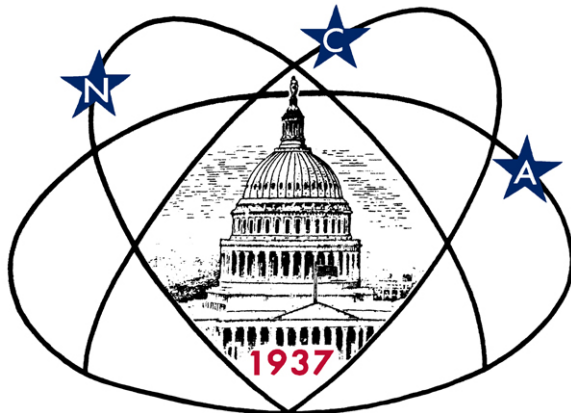
Are you interested in volunteering for: Telescope making, Exploring the Sky, Star Dust, NCA Officer, etc.?

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

First Class  
Dated Material



*Celebrating 84 Years of Astronomy*

*Next NCA Meeting:*

**2021 October 9<sup>th</sup>**

**7:30 pm**

**(On Zoom)**

**Dr. Lynn B. Wilson III**

To join the Zoom meeting, use the following link:  
[umd.zoom.us/j/96856095178?pwd=cWhyNE92bGFYUkYxZnl6eWVlK0lKdz09](https://umd.zoom.us/j/96856095178?pwd=cWhyNE92bGFYUkYxZnl6eWVlK0lKdz09)

Please download and import the following iCalendar (.ics) files to your calendar system. Monthly:

[umd.zoom.us/meeting/tJllcu-opz4rHdxfgBb8Lh5wRlgETFQ8lnI5/ics?icsToken=98tyKuCupj4sGt2QsR6PRowAGo\\_4M\\_TxmCVcgqdFmhjHAXh\\_albhBO5FF4ZZIYDc](https://umd.zoom.us/meeting/tJllcu-opz4rHdxfgBb8Lh5wRlgETFQ8lnI5/ics?icsToken=98tyKuCupj4sGt2QsR6PRowAGo_4M_TxmCVcgqdFmhjHAXh_albhBO5FF4ZZIYDc)

Please note that all NCA Zoom meetings will be recorded.

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