

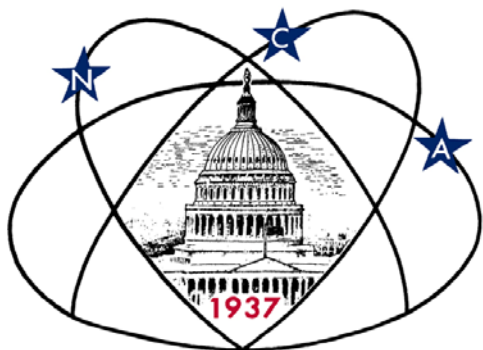
# Star Dust

Newsletter of National Capital Astronomers, Inc.

[capitalastronomers.org](http://capitalastronomers.org)

February 2014

Volume 72, Issue 6



## Next Meeting

**When:** Sat. Feb. 8th, 2014

**Time:** 7:30 pm

**Where:** UMD Observatory

**Speaker:** Holly Gilbert

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## Directions to Dinner/Meeting

Our time and location for dinner with the speaker before each meeting is 5:30 pm at Mulligan's Grill and Pub on the UM Golf Course. Mulligan's is one intersection closer to the observatory on Route 193 than UMUC. One turns on to "Golf Course Road" and drives a few hundred feet to the golf course building, where "Mulligan's Grill and Pub" is located.

The dinner menu can be downloaded from <http://mulligans.umd.edu/>

The meeting is held at the UMD Astronomy Observatory on Metzert Rd about halfway between Adelphi Rd and University Blvd.

## Need a Ride?

Please contact Jay Miller, 240-401-8693, if you need a ride from the metro to dinner or to the meeting at the observatory. Please try to let him know in advance by e-mail at [rigel1@starpower.net](mailto:rigel1@starpower.net).

## Our Dynamic Sun

Holly Gilbert, GSFC

**Abstract:** Our closest star has been an object of mystery and inspiration for millennia; but, over the last 50+ years, solar scientists have made great strides in understanding the inner workings of what makes the Sun tick. The layers of the solar atmosphere lead to dynamic behavior and act as the birthplace of space weather. NASA has a fleet of spacecraft dedicated to studying the Sun and its domain, the heliosphere, and its effects on Earth. I will take you on a journey through the Sun's varying moods, focusing on coronal mass ejections and associated activity, and discuss the implications for Earth in the past, present, and future.



**Biographical Sketch:** Dr. Holly Gilbert is Chief of the Solar Physics Laboratory in the Heliophysics Science Division at NASA's Goddard Space Flight Center. She obtained a BS in physics from the University of Colorado, Boulder and her PhD in theoretical astrophysics from the

*continued on page 2*

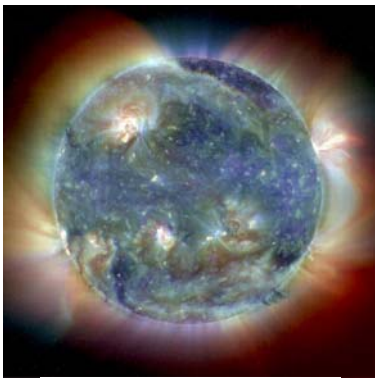
## Observing after the Meeting

Following the meeting, members and guests are welcome to tour through the Observatory. Weather-permitting, several of the telescopes will also be set up for viewing.

### Reminder

After the meeting, everyone is invited to join us at Plato's Diner in College Park. Plato's is located at 7150 Baltimore Ave. (US Rt. 1 at Calvert Rd.), just south of the university's campus. What if it's clear and you want to stick around and observe? No problem -- just come over when you're through. This is very informal, and we fully expect people to wander in and out.

### Top 10 SOHO Images Contest Results, 1<sup>st</sup> place (11,468 votes):



Courtesy ESA/NASA/SOHO

Did the free National Geographic Live tickets for the March 4<sup>th</sup> screening of "[Cosmos: A Spacetime Odyssey](#)" with Neil deGrasse Tyson disappear into a black hole?



<http://youtu.be/7e5-0t0pTF0>

### Our Dynamic Sun – continued from page 1



Holly Gilbert

University of Oslo in Norway. Prior to joining NASA, Dr. Gilbert was a Research Scientist at Rice University and an Associate Scientist at the High Altitude Observatory at the National Center for Atmospheric Research. As a solar physicist for over 13 years, Dr. Gilbert has extensive experience studying the solar atmosphere and phenomena associated with coronal mass

ejections (CMEs), such as prominences and global waves. In her research she has utilized both ground- and space-based data to gain a better understanding of solar dynamical processes. An ongoing primary focus of her research is determining the nature of prominence support, formation, and evolution and how this relates to CMEs. Her research in this area will lead to a greater understanding of the magnetic environment that controls solar eruptions (sometimes referred to as "solar storms").

## Cold Flow Evidence

Flowing into the Fireworks Galaxy (NGC 6946), a stream of hydrogen gas was discovered recently by astronomer D.J. Pisano (West Virginia University). There has been a standing question of what maintains consistent star formation rates in spiral galaxies such as NGC 6946. Some scientists believe that "cold flows," or hydrogen rivers, from intergalactic space, infuse the galaxies and provide the needed star fuel. The discovery of this hydrogen stream, using the Robert C. Byrd Green Bank telescope, may provide support for the cold flow theory.




A faint aura of hydrogen (in red) that appears to flow between galaxies

Photo Credit: D.J. Pisano (WVU); B. Saxton (NRAO/AUI/NSF); Palomar Observatory – Space Telescope Science Institute 2nd Digital Sky Survey (Caltech); Westerbork Synthesis Radio Telescope

Read more at: <https://public.nrao.edu/news/pressreleases/gbt-sees-river-of-hydrogen>



 Geremia  
(University of AZ)

The Green Bank radio telescope (West Virginia) can sense very faint radio sources and its surface characteristics also contribute to the timing accuracy of pulsars and the discovery of the nature of dark matter. The telescope is 485 feet tall, has a 100x110 meter dish and, at over 17 million pounds, is the largest, "fully-steerable" telescope in the world.

**National Air & Space Museum  
Exhibit:  
Spirit & Opportunity –  
10 Years Roving Across Mars**



Rover Opportunity at Tisdale 2 (Aug. 23, 2011: 2,695 sol), Courtesy NASA/JPL-Caltech

**Exhibit open until  
Sept. 14<sup>th</sup> 2014**

<http://airandspace.si.edu/exhibitions/mer/>

**Exploring the Sky  
will resume in April 2014!**

“Exploring the Sky” is an informal program that, for over 60 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!

**Sky Watchers**

**Winter Schedule**

**February**

3	6:00 pm – <b>Planets</b> , Northern Hemisphere. Features: <i>Uranus</i> (with the <i>Moon</i> at 3° N.)
11	1:00 am – <b>Planets</b> , Northern Hemisphere. Features: <i>Jupiter</i> (with the <i>Moon</i> at 5° S.)
14	6:53 pm – <b>Full Moon</b> , Global. Other Moon Names: <i>Full Snow Moon</i> , <i>Hunger Moon</i> , <i>Full Bony Moon</i> , <i>Moon of Ice</i> , <i>Budding Moon</i>
15	4:00 am – <b>Planets</b> , Northern Hemisphere. Features: <i>Venus</i> (brightest mag at -4.9)
16-28	Evening – <b>Zodiacal Light</b> , W. Sky, Northern Hemisphere.

All times EST

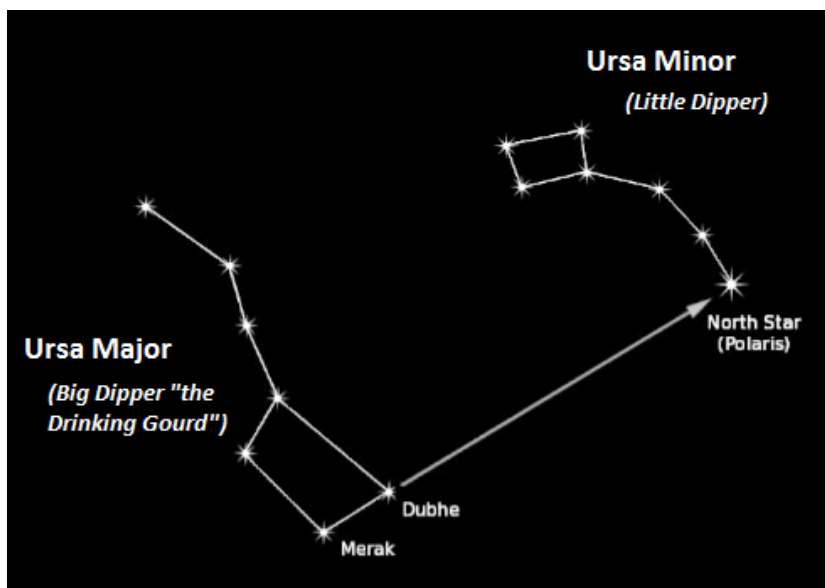
**The Drinking Gourd**

*“When the sun comes back and the first quail calls,  
follow the drinking gourd,  
for the old man is waiting for to carry you to freedom,  
if you follow the drinking gourd...”*

February is the month that the US celebrates African American history. Part of that history is a system of people, safe houses & routes from the far southeastern states of the US to Canada, collectively called “The Underground Railroad.” Enslaved Africans would make use of this system to stealthily escape the US borders into a land where slavery was prohibited. Beyond cryptic quilts with hidden directions to use the underground system, the railroad was also associated with celestial navigation. Polaris, the North Star, indicated the general direction that escaped slaves should travel to freedom. Locating Polaris was based on finding the Big Dipper (which was known by the Africans as “the Drinking Gourd”) in Ursa Major and viewing the alignment of the edge of the gourd (the stars, Merak & Dubhe) outward to the Little Dipper in Ursa Minor. This navigation system, along with other escape details, was immortalized in the the song, “Follow the Drinking Gourd” (attributed to a carpenter called “Peg-leg” Joe), in which escapees were charged to cross the Ohio River and move ever northward using the underground system.

*continued on page 4*

*The Drinking Gourd – continued from page 3*



*Use of the gourd to find Polaris – diagram based on Therese Josephson's The Story of: Follow the Drinking Gourd (Full Sail University)*

Although the Underground Railroad is an undisputed matter of historical record, there is a question of whether Joe really taught the song to enslaved Africans before the Civil War. Some do not believe so; others do. That being said, whether folklore or fact, the song continues to be inspiring and still stands as a representation of the courage, creativity and dedication of so many emancipators, supporters and slaves who risked everything for an idea, a belief and an unwavering moral compass...and they had pretty good celestial & geo-navigation skills all around.

### Other Resources

Some of the song verses and their meanings are listed on the NASA Quest educational site:  
<http://quest.arc.nasa.gov/ltc/special/mlk/gourd2.html>

Also, for a quick video of the song lyrics, See Therese Josephson's 6-minute history lesson: <http://youtu.be/IRGSqiTc7Jk>.

Finally, Montgomery College's Takoma Park Planetarium annually hosts a presentation called "African Skies." This year, it is being held on Saturday, February 15<sup>th</sup> at 7 pm:  
<http://www.montgomerycollege.edu/Departments/planet/>



Courtesy Michael Verlinden,  
<http://www.sgomusic.com/>

For a soulfully acoustic version of "Follow the Drinking Gourd," listen to multiple award-winning blues singer, Eric Bibb:  
<http://youtu.be/kjBZEMkmwYA>

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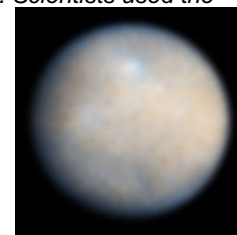
### **Please Get Star Dust Electronically**

• 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!**

### **Water on Ceres**

• Water vapor was detected on the dwarf  
 • planet, Ceres, located in the asteroid belt  
 • between Mars & Jupiter. This marks the first  
 • time an object in the belt has been identified  
 • as having water vapor. Scientists used the  
 • Herschel Space  
 • Observatory to make  
 • the claim. The  
 • spacecraft, Dawn,  
 • should reach Ceres  
 • in Spring 2015 to  
 • investigate the dwarf  
 • planet in more detail.



• Ceres via Hubble Space Telescope,  
 • Courtesy NASA, ESA, J. Parker (Southwest  
 • Research Institute), P. Thomas (Cornell  
 • University), and L. McFadden (University of  
 • Maryland, College Park)

## 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 Watts angle (WA) is given; it is aligned with the Moon's rotation axis and can be used to estimate where a star will reappear relative to lunar features. The selenographic latitude is WA -270. For example, WA 305 - 310 is near Mare Crisium.

## Mid-Atlantic Occultations

David Dunham

### Asteroidal and Planetary Occultations

2014	EST/						dur.	Ap.
Date	Day	EDT	Star	mag.	Asteroid	dmag	s	" Location
Feb 8	Sat	19:20	2UC39481875	12.3	Kirkwood	2.9	6	8 WV, nVA, DC, sMD, DE
Feb 10	Mon	1:13	2UC33556309	11.6C	Tercidina	0.3	15	9 MD, DE, sNJ, PA; DC?
Feb 17	Mon	6:14	SAO 118460	9.9	Itha	5.7	1	4 nVA, sOH; MD, DC?
Feb 26	Wed	5:30	2UC18934677	13.1	Pretoria	1.2	11	9 sOH, VA, NC; DC?
*** Dates and times above are EST, those below are EDT ***								
Mar 10	Mon	3:34	SAO 183623	10.4	Admete	5.5	12	5 eOH, WV, cVA, eNC

### Lunar Grazing Occultations

2014	EST/								
Date	Day	EDT	Star	Mag	% alt	CA	Location & Remarks		
Feb 10	Mon	2:47	ZC 904	7.1	81+	11	13N Woodstk, nStafrd, ChstntnHi I, VA		
Mar 3	Mon	18:55	SAO 109658	8.8	9+	22	61N Somerset, n. York, Medea, PA		
Mar 6	Thu	23:12	ZC 577	6.0	36+	9	10N LaceySpg, Madison, Thornburg, VA		
Mar 8	Sat	0:02	SAO 94119	7.8	46+	10	10N *Snbry, Kutztn, Lvtm, PA; TomR, NJ		
*** Dates and times above are EST, those below are EDT ***									
Mar 9	Sun	21:46	SAO 95623	8.6	64+	62	10N Pittsburgh&NewFreedom, PA; nDE		

Interactive detailed maps at <http://www.timerson.net/IOTA/>  
\*, no expedition planned from DC area

### Total Lunar Occultations

2014	EST/								
Date	Day	EDT	Ph Star	Mag	% alt	CA	Sp. Notes		
Feb 9	Sun	1:54	D 104 Tauri	4.9	73+	12	70S G4 Az. 284, ZC764, close dbl		
Feb 9	Sun	17:31	D ZC 871	6.7	79+	46	38S G8 Sun altitude 0		
Feb 9	Sun	17:46	D SAO 94839	7.5	79+	49	61S B9 Sun-2, mg2 10 close dbl?		
Feb 9	Sun	17:56	D SAO 94840	7.7	79+	50	76S F2 Sun -4, mg2 11 4", PA 20		
Feb 9	Sun	19:05	D SAO 94857	7.8	79+	62	36S K0 close double?		
Feb 10	Mon	19:08	D SAO 95913	7.6	86+	54	25N B8		
Feb 15	Sat	23:52	R 34 Sex	6.7	98-	51	72S F5 AA 267, ZC1564, close dbl		
Feb 19	Wed	2:15	R ZC 1886	5.6	83-	40	74S K3 close double??		
Feb 20	Thu	0:00	R SAO 158236	8.0	75-	14	77S G5 Azimuth 118 degrees		
Feb 21	Fri	1:03	R SAO 158831	7.9	65-	14	53N F0 Az. 123		
Feb 21	Fri	1:11	R SAO 158828	7.1	65-	15	84S K0 Az. 125		
Feb 22	Sat	3:46	R SAO 159520	7.6	53-	26	73N F2 close double??		
Feb 22	Sat	5:16	R SAO 159551	7.3	53-	32	74S G2		
Feb 24	Mon	4:26	R ZC 2561	7.6	31-	16	54S A3 mg2 10 sep 44" PA 188dg		
Feb 24	Mon	5:38	R SAO 160867	8.0	31-	24	69N G5		
Feb 24	Mon	5:44	R SAO 185874	8.0	31-	25	43S A0		
Feb 25	Tue	5:35	R ZC 2745	6.8	20-	18	57N K1 mg2 12 sep 16" PA 37deg		
Feb 25	Tue	5:47	R X 44940	8.1	20-	20	90S B9		
Mar 5	Wed	19:03	D SAO 93166	7.5	25+	44	73S M*		
Mar 5	Wed	20:14	D ZC 431	7.8	25+	31	62S A0		
Mar 6	Thu	19:53	D SAO 93608	8.0	35+	46	72S F2		
Mar 6	Thu	23:01	D SAO 93654	8.3	36+	11	49S K0 Azimuth 283 deg.		
Mar 7	Fri	18:09	D SZ Tauri	6.5	44+	69	23N F5 Sun alt. -1, ZC 697		
Mar 7	Fri	23:53	D SAO 94119	7.8	46+	11	34N K0 Az. 285		
Mar 8	Sat	19:52	D CE Tauri	4.3	54+	63	50S M2 ZC 832		
Mar 8	Sat	20:51	D 120 Tauri	5.7	55+	54	42S B2 ZC 836		
Mar 8	Sat	22:08	D SAO 94678	7.6	55+	40	70N K5 close double??		
*** Dates and times above are EST, those below are EDT ***									
Mar 9	Sun	22:57	D SAO 95703	7.5	65+	40	48N F5		

Explanations & more information is at <http://iota.jhuapl.edu/exped.htm>.  
David Dunham, dunham@starpower.net, phone 301-526-5590



NCA member, James Blau, posted an interesting link to an application developed by Cary & Michael Huang called "The Scale of the Universe" in which one can slide the scroll bar and get a perspective on the magnitude and/or distance of all manner of things, from earthworms to the Tarantula Nebula. There are 2 versions with which one can explore: <http://htwins.net/scale/> and <http://htwins.net/scale2/>

## 2013-2014 Officers

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- Harold Williams (2016)
- Benson Simon (2017)

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## Astronomie Haute Horlogerie

For those skywatchers who wear timepieces, Van Cleef & Arpels has a Poetic Astronomy series. During the promotion of the series, astrophysicist André Brahic stated that “astronomy is poetic by definition and by nature” and that both scientists and lovers of beauty are drawn to the field, which is connected to knowledge, philosophy and art. The newest edition to the series is the **Midnight Planétarium Poetic Complication™** watch, which was unveiled in Geneva at Salon International de la Haute Horlogerie (SIHH) last month.



Photo Credits: Van Cleef & Arpels



The watch is a mini solar system of 6 of the planets visible from earth revolving around a miniature sun in accurate time (e.g., Mercury in 88 days, Earth in 365 days, etc.) on aventurine disks. The planets are distinguished by different precious/semi-precious stones (Earth is turquoise) and the owner can set a special day during the year with a “lucky star.” The watch will be available later this year at the starting price of \$245,000 US for the alligator leather-strapped, 18K rose gold version (above).

## The Observing Campaigns have Begun!

**GLOBE AT NIGHT 2014**

January 20 to 29	July 16 to 25
February 19 to 28	August 15 to 24
March 21 to 30	September 15 to 24
April 20 to 29	October 14 to 23
May 19 to 28	November 12 to 21
June 17 to 26	December 11 to 20

**WWW.GLOBEATNIGHT.ORG**  
 Get Out and Observe the Night Sky!

<http://www.globeatnight.org/>



SKA Radio Dishes, Courtesy SKA Project Development Office and Swinburne Astronomy Productions

The Square Kilometre Array (SKA) is projected to become the largest radio telescope array in the world (3,000 dishes with the equivalent surface area of a square kilometer). Australia and South Africa will both host part of the telescope system.

<https://www.skatelescope.org/>

**The submission deadline for the March issue of Star Dust is February 23rd**

### Calendar of Events

- NCA Mirror- or Telescope-making Classes: Tuesdays and Fridays, from 6:30 to 9:45 pm at the Chevy Chase Community Center (intersection of McKinley Street and Connecticut Avenue, N.W.) Contact instructor Guy Brandenburg at 202-635-1860 or email him at [gfbrandenburg@yahoo.com](mailto:gfbrandenburg@yahoo.com).
- Open house talks and observing at the University of Maryland Observatory in College Park on the 5th and 20th of every month at 8:00 pm (Nov.-Apr.) or 9:00 pm (May-Oct.). Details: [www.astro.umd.edu/openhouse](http://www.astro.umd.edu/openhouse)
- Montgomery College, Takoma Park Planetarium: "African Skies," Sat. Feb. 15, at 7 pm. <http://www.montgomerycollege.edu/Departments/planet/>
- Mid-Atlantic Senior Physicists Group: "MESSENGER Views the Geology of Mercury," with Brett Denevi (JHU/APL), Wed. Feb. 19, at 1 pm at the American Center for Physics (1<sup>st</sup> floor conference room). <http://www.aps.org/units/maspg/>
- Owens Science Center Planetarium: "Sky Watchers of Africa," Fri. Feb. 21, at 7:30 pm; \$5/adult; \$3/students/senior/ teachers/military; children under 3 free. Doors open 7:00 for pre-show activities. [www1.pgcps.org/howardbowens](http://www1.pgcps.org/howardbowens)
- Space Exploration Alliance: "Legislative Blitz" in support of NASA & space exploration, Sun. Feb. 23 to Tues. Feb. 25, Washington, DC. Details: <http://www.spaceexplorationalliance.org/>
- Upcoming NCA Meetings at the University of Maryland Observatory:
  - 8 Mar: Elizabeth Hays (GSFC), *Cosmic Ray Protons from Supernova Remnants*
  - 12 Apr: Suvi Gezari (UMD), *Stars Shredded by Black Holes*
  - 10 May: Craig Markwardt (GSFC), *What NuSTAR Has Found So Far*

**Clear Skies!**

## 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.?

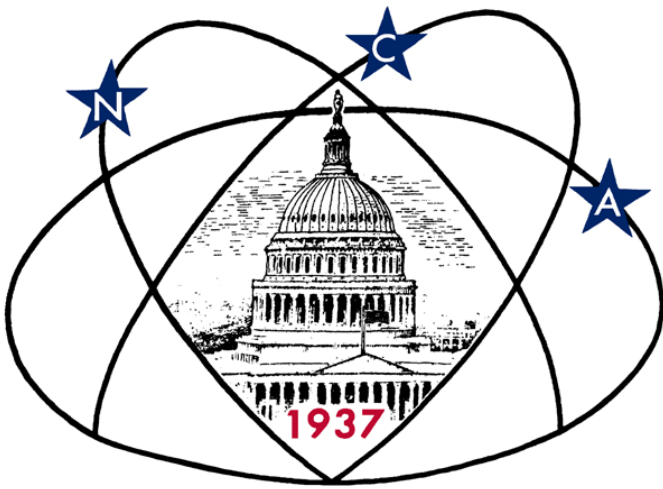
Are you interested in volunteering for: Telescope making, Exploring the Sky, Star Dust, NCA Officer, etc.?

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



*Next NCA Meeting:*

**2014 February 8<sup>th</sup>**

**7:30 pm**

**@ UMD Observatory**

**Dr. Holly Gilbert**

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