

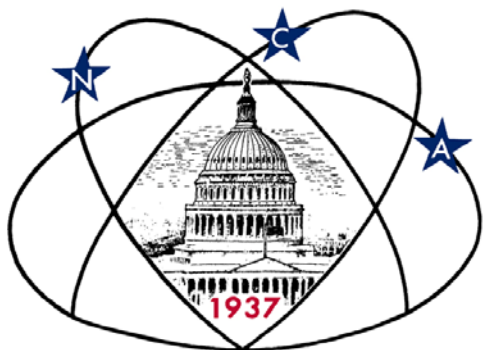
Star Dust

Newsletter of National Capital Astronomers, Inc.

capitalastronomers.org

December 2013

Volume 72, Issue 4



Next Meeting

When: Sat. Dec. 14th, 2013

Time: 7:30 pm

Where: UMD Observatory

Speaker: Douglas Hamilton

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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.

The Origin of Titan & Hyperion

Douglas P. Hamilton
University of Maryland

Abstract: Titan is arguably the Solar System's most unusual satellite. It is fifty times more massive than Saturn's other moons and is the only satellite with a substantial atmosphere. Titan shares a unique resonance with nearby Hyperion; but, otherwise, it sits in a particularly large gap between Rhea and Iapetus. Titan has the largest eccentricity of all Saturn's regular satellites and has a reasonably large



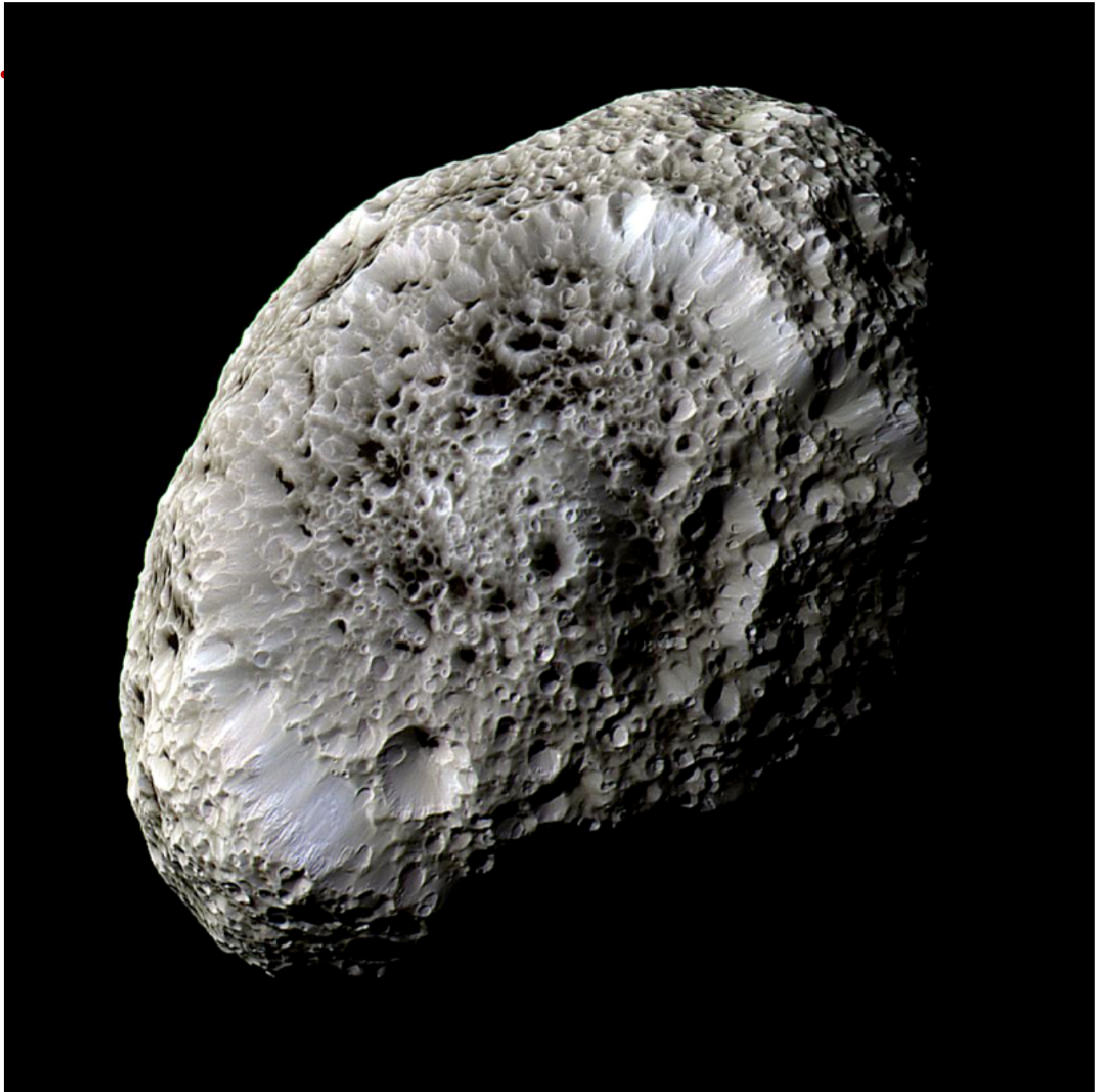
Saturn & Titan
Courtesy NASA/JPL-Caltech
Space Science Institute

orbital tilt; its distant neighbor, Iapetus, has an even more impressive 8° inclination. Hyperion itself is a mystery, with its extremely low density and its unique surface covered with bizarre craters. None of these peculiarities was even partially understood...until now!

[Image of Hyperion on page 2](#)

Biographical Sketch:

Douglas Hamilton is a Professor in the Department of Astronomy at the University of Maryland. He is known for his insights into how the individual planets and moons and asteroids in the Solar System formed, and how they eventually became as we see them today. He discovered Saturn's largest ring, and has solved several long-standing puzzles. Some of these puzzles include how it is possible for a pulsar to have planets (some do!), why Saturn is tilted, how Neptune captured Triton, the effects of intermediate-mass black holes in globular clusters, and, very likely, other intriguing puzzles that he will discuss in his talk. He is renowned for his clear and vivid explanations. He is also the lead author of the Astronomy Workshop (<http://janus.astro.umd.edu/>), a collection of interactive tools for use by Astronomy students and the general public.



Saturn's mysterious moon, Hyperion
Courtesy D. Hamilton

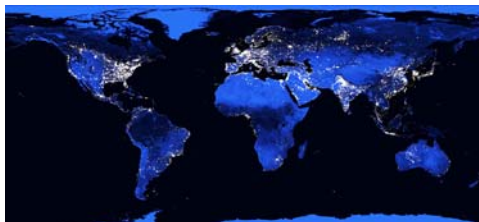
Observing after the Meeting

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.

Circadian Rhythms, LEDs & the Stars...



Courtesy NASA Earth Obs/NOAA
NGDC

Bob Parks, Director of the International Dark Sky Association, discusses **light pollution** on CBS.
<http://bit.ly/1elxmq>

Exploring the Sky
will resume in April 2014!

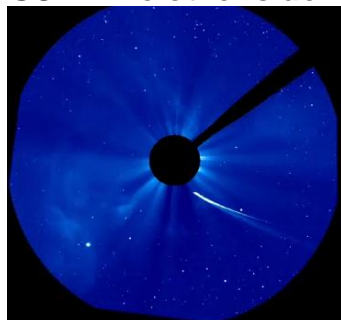
“Exploring the Sky” is an informal program that, for over 60 years, has offered monthly opportunities for anyone in the Washington area to see the stars and planets through telescopes from a location within



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!

ISON: The other side...



Courtesy NASA/SOHO
<http://youtu.be/kcROVqmF9SY>

Sky Watchers

Winter Schedule

December

6	5:30 pm – Planets , SW Sky, Northern Hemisphere. Features: <i>Venus (maximum mag: -4.9) & Phases of Venus (during December)</i>
13-14 (peak)	9-10:00 pm to early am – Geminid Meteor Shower , Global. solarsystem.nasa.gov/planets/geminids.cfm
17	4:28 am – Full Moon , Global. Other Moon Names: <i>Cold Moon, Long Night Moon, Moon before Yule</i>
21	12:11 pm – Winter Solstice , Northern Hemisphere.
25-28	10:08 pm – Moon & Planets , SE Sky, Northern Hemisphere. Features: <i>Moon, Mars & Saturn</i>

All times EST

Got Books?

Sally Bosken

Looking for an astronomy book? The US Naval Observatory (USNO) Library is happy to have visitors come to do research and use our collection. You can't "check books out," but you can use them on site and read past astronomy journals. We have them all in hard copy and online. Just email a week in advance to set up a date and we will be happy to help you.

Library Hours: 8 am – 4 pm, Monday – Friday

Location: 3450 Massachusetts Ave NW,
Washington DC 20392-5420
(free parking on the grounds)

Appointment set-up: email Sally Bosken, USNO Library
(sally.bosken@navy.mil)

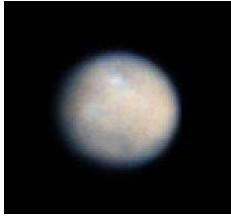


Plate 9: Ophiuchus, the serpent-bearer, from A. Jamieson's *Celestial Atlas* (1822 CE) – USNO Rare Book Collection

Ceres

David Dunham

On October 25th (only four nights after the Patroclus occultation), another occultation occurred across most of the east coast of the US, from southern Maine to Georgia. The occultation was important since it was the last chance to record an occultation of a star bright enough (11th magnitude or brighter) to be observed by 8th-magnitude Ceres before NASA's Dawn spacecraft will reach it in February 2015. It was clear in the Mid-Atlantic & New England regions; but, it was cloudy in the Carolinas and southernmost Virginia. The occultation of the



Ceres

10.0-mag. star in Virgo occurred at 5:40am EDT and, due to Ceres' fast motion, lasted about 22 seconds for observers in the Washington, DC area (which was near the center of this very wide path). Since Ceres was brighter, there was only a 0.3-magnitude drop when the occultation occurred, difficult to notice with visual observations but obvious in analysis of video recordings of the event.

The event occurred at an altitude of 15 degrees above the eastern horizon, posing challenges for finding a location with an unobstructed view. The view from my backyard in Greenbelt was blocked in that direction by a neighbor's house, but there was a view of such a low altitude between trees outside of a room on the top floor of our house. The figure to the right shows the 120mm refractor (with video equipment attached) set up in that room. I pre-pointed the telescope early in the evening before the event (I used a convenient pre-point opportunity of the 4th-mag. star, omicron Tauri). My wife Joan then took the picture and closed the window. Then, half an hour before the event, Joan got up, turned off the heat, and opened the window. By the time of the event, the air in the room stabilized to obtain a good recording of the occultation. In the meantime, I had driven south, to successfully record the occultation with two more 120mm refractors at locations north and south of Richmond, VA (at Varina and at Hanover High Schools). The occultation was also recorded from 4 other stations, in Maryland, northern Virginia, and New England; so, after we analyze the observations, we can contribute to characterization of Ceres before Dawn's arrival. The only other occultation by Ceres that has been observed from multiple stations was observed in November 1984.



Figure: An impromptu "observatory" set up in the "photo archive" room of our house to successfully record the Ceres occultation

Ceres image credit: NASA/ESA/J. Parker (Southwest Research Institute), P. Thomas (Cornell University), L. McFadden (University of Maryland, College Park), and M. Mutchler and Z. Levay (STScI).

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 • the document. If you can switch from paper
 • to digital, please contact Henry Bofinger, the
 • NCA Secretary-Treasurer, at
 • hbofinger@earthlink.net

Thank you!

Brrrrr...December too chilly?



Courtesy NASA JPL-Caltech

• A chthonian, hot Jupiter, like HD 149026b
 • (at about 3,700° F, according to the Spitzer
 • Telescope), soaking up almost all the energy
 • from its sun and glowing like a lump of coal,
 • may make you rethink a winter chill!

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

2013						dur. Ap.			
Date	Day	EST	Star	mag.	Asteroid	dmag	s "	Location	
Dec 15	Sun	2:08	2UC41323806	13.6	Latona	0.3	6 10	NJ,sPA,MD;DC?	
Dec 19	Thu	3:28	2UC39846820	13.2	Lumen	0.5	10 26	sDE,sMD,VA;DC?	
Dec 22	Sun	1:44	2UC34836511	12.2	Honorio	1.2	9 8	sNJ,MD,nVA;DC?	
Dec 29	Sun	2:29	2UC40637532	12.1	Ate	0.6	31 8	MD,sPA;DC,nVA?	
Dec 29	Sun	18:15	SAO 128055	9.2	Valborg	5.9	1 4	w&nVA,DC,MD,sNJ	
2014									
Jan 3	Fri	19:34	TYC24040617	9.7	Zvezdara	5.5	3 4	ePA,wMD,WV;nVA?	
Jan 9	Thu	22:19	TYC06621464	10.5	Branham	5.6	8 6	e&nVA,MD,DC,PA	
Jan 11	Sat	2:04	TYC49550550	12.2	Meriones	4.9	8 8	PA,MD,DE,NJ;DC?	

Lunar Grazing Occultations

2013									
Date	Day	EST	Star	Mag	% alt	CA	Location & Remarks		
Dec 26	Thu	2:14	ZC 1834	7.7	42- 14	2S	*Cntrvil&Burke,VA;Brndywin,MD		
Dec 27	Fri	6:09	Spica	1.0	34- 16	2S	Rostov &Kovrov,RU-Moscow time		
2014									
Jan 9	Thu	20:10	SAO 93030	8.0	69+ 65	0S	*Williamsburg &sPetersburg,VA		

Interactive detailed maps at <http://www.timerson.net/IOTA/>

Total Lunar Occultations

2013									
Date	Day	EST	Ph Star	Mag	% alt	CA	Sp.	Notes	
Dec 13	Fri	20:03	D sigma Ari	5.5	90+ 60	51S	B7	ZC 422	
Dec 14	Sat	19:50	D ZC 532	7.1	95+ 52	58S	G0	Maybe close double	
Dec 16	Mon	3:55	D ZC 718	6.0	99+ 27	30S	K4	Terminator Dist. 5"	
Dec 17	Tue	19:13	R ZC 943	6.6	99- 19	60S	B8	AA 273, TermDist 8"	
Dec 20	Fri	1:41	R ZC 1212	7.3	92- 65	84S	A5	close double??	
Dec 20	Fri	20:48	R 45 Cancri	5.6	88- 7	63N	A3	Az 79,ZC1309,close dbl?	
Dec 20	Fri	22:50	R 50 Cancri	5.9	87- 30	13S	A1	ZC 1318, Term.Dist. 17"	
Dec 21	Sat	0:56	R SAO 98146	7.7	87- 52	85S	F5	close double??	
Dec 21	Sat	5:46	R 60 Cancri	5.4	86- 45	65N	K5	ZC1332, close double??	
Dec 22	Sun	4:03	R SAO 117836	7.2	79- 59	66S	G5		
Dec 25	Wed	2:51	R ZC 1731	7.5	52- 31	49N	M*		
Dec 26	Thu	2:21	R ZC 1834	7.7	42- 15	13S	G5	Az.113,close double?	
Dec 26	Thu	3:56	R ZC 1843	7.0	41- 30	25N	F5		
Dec 27	Fri	5:15	R SAO 158105	7.5	31- 31	61S	F5	close double??	
Dec 27	Fri	7:34	R 86 Vir	5.5	30- 39	70S	G8	Sun +1, ZC 1971	
2014									
Jan 4	Sat	18:21	D SAO 145968	7.6	17+ 29	62S	B9		
Jan 4	Sat	18:38	D SAO 145963	7.5	17+ 26	46N	A2		
Jan 5	Sun	21:58	D ZC 3420	6.9	28+ 4	29S	K0	Azimuth 265 degrees	
Jan 6	Mon	17:10	D SAO 128524	7.6	37+ 54	59N	K2	Sun altitude -3 degrees	
Jan 6	Mon	19:48	D SAO 108995	7.9	38+ 39	65S	K2		
Jan 6	Mon	22:01	D ZC 14	8.0	38+ 16	89S	G5		
Jan 7	Tue	21:06	D ZC 131	7.9	49+ 37	84N	K0	close double??	
Jan 7	Tue	23:14	D SAO 109603	8.1	49+ 14	45N	G5	Azimuth 269 degrees	
Jan 7	Tue	23:25	D 70 Piscium	7.6	50+ 12	85N	G5	Az.271,ZC 142,Spec.Bin.	
Jan 7	Tue	23:46	D epsilon	4.3	50+ 8	72S	K0	Az.274,ZC 146,CloseDbl?	
Jan 9	Thu	19:51	D SAO 93030	8.0	69+ 65	26S	F8		
Jan 10	Fri	1:16	D SAO 93094	7.9	70+ 13	46N	A0	Azimuth 279 degrees	
Jan 10	Fri	20:11	D ZC 505	7.1	78+ 68	64S	A0		
Jan 11	Sat	18:04	D ZC 629	7.5	85+ 47	79S	G5	Sun -11, spec. binary	
Jan 11	Sat	20:30	D ZC 643	6.8	85+ 68	75S	F6		

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

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Mabel Sterns

CA Brooks



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As I finish the December issue of Star Dust, thinking about chthonian exoplanets, I realize that I finally have space to pay tribute to Ms. Sterns, the creator & first editor of this newsletter. When I accepted that very same role, I looked through the newsletter archives. The first Star Dust edition was October, 1943 (70 years before the first edition that I edited). At the time, there were 40 members, 4 officers, 4 trustees and \$229.14 in the treasury: all for the 7th year of an organization called the *Amateur Astronomers Association* (later to become National Capital Astronomers). In 1948, Ms. Sterns also became the first newsletter editor for the Astronomical League. In fact, in 1988, the league created a newsletter award for member organizations in honor of Ms. Sterns' service. The last Star Dust that she edited for NCA was in March, 1949 (Jewel Boling, who had been serving as assistant editor, then took over the editing duties). So, as we, fellow sky watchers of the DC area, continually aspire to share our love of the stars, let us take a moment to remember Mabel Sterns for her dedication that words still cannot adequately convey and for her creation that we shall continue to diligently maintain.

Yours in service, ~ CA

STAR DUST
 National Capital Astronomers
 Washington, D. C.

April 1949

Vol. 6, No. 8

MISS STERNS RESIGNS AS EDITOR OF STAR DUST

Since October 1943 Mabel Sterns has been Editor of STAR DUST. Only those who have performed a like service on a month in month out basis can appreciate the amount of effort that went into the preparation of this publication. With her it was a labor of love. It was her brain child and she nurtured it faithfully for more than five years.

It is a tribute to Miss Sterns and to NCA, by reflected glory, that time and again STAR DUST has carried scoops of astronomical news. SKY AND TELESCOPE as well as POPULAR ASTRONOMY have frequently carried items printed in STAR DUST first, and credited to STAR DUST in the articles published in these journals.

It is with regret that the trustees have accepted Miss Sterns' resignation as Editor of STAR DUST. Nothing that we can say would adequately express our sincere appreciation for a job well done.

Courtesy NCA – Star Dust Archive

Learn how to use your Telescope



Coming January 2014!

Submission deadline for the January issue of Star Dust is December 31st

Clear Skies!

Calendar of Events

- **NCA Mirror- or Telescope-making Classes:** Tuesdays Dec. 3, 10, 17, 31 and Fridays, Dec. 6, 13, 20, 27 (No class on Dec. 24) 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.
- **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
- **Owens Science Center Planetarium:** "Terrible Teddy" Fri. Dec. 13 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
- **NCA Pre-meeting Dinner:** Saturday, Dec. 14 at 5:30 pm, preceding the meeting, at [Mulligan's Grill and Pub](#) at the [University of Maryland Golf Course](#).
- **Mid-Atlantic Senior Physicists Group:** Habitable "Exoplanet Searches," with Paul Butler (DTM), Wed. Dec. 18 at 1 pm at the American Center for Physics (1st floor conference room). www.aps.org/units/maspg/
- **New Telescope Owner Workshops:** Wednesday, Jan. 22 or Saturday, Jan. 25, from 6:00 pm to 9:00 pm (30-minute time slots). Optional viewing afterwards. www.astro.umd.edu/openhouse/2programs/new-telescope-owners-nights.html
- **Upcoming NCA Meetings** at the University of Maryland Observatory:
 - 11 Jan: Dan Lathrop (UMD), *A Planetary Dynamo in the Laboratory* (meeting location to be announced!)
 - 08 Feb: Holly Gilbert (GSFC), *Results from the Solar Dynamics Observatory*
 - 08 Mar: Elizabeth Hays (GSFC), *Cosmic Ray Protons from Supernova Remnants*

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.?

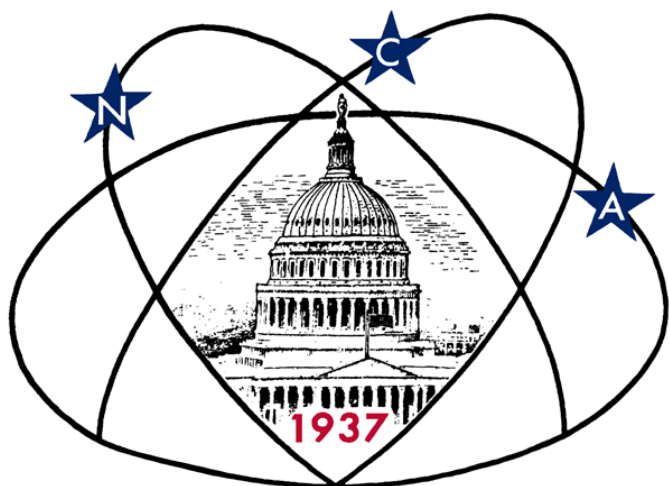
Are you interested in volunteering for: Telescope making, Exploring the Sky, Star Dust, NCA Officer, etc.?

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.

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First Class
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Next NCA Meeting:

2013 December 14th

7:30 pm

@ UMD Observatory

Dr. Douglas Hamilton

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