Star Dust

Newsletter of National Capital Astronomers, Inc.
capitalastronomers.org

April 2015 ***Volume 73, Issue 8***

Next Meeting

When: Sat. Apr.11th, 2015

Time: 7:30 pm

Where: UMD Observatory

Speaker: Timothy Rodigas

Table of Contents

Directions to Dinner/Meeting

Our time and location for dinner with the speaker before this meeting is 5:30 pm at "The Common," the restaurant in the UMD University College building located at 3501 University Blvd.

The meeting is held at the UMD Astronomy Observatory on Metzerott 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 @ observatory. Please try to let him know in advance by e-mail at rigel1@starpower.net.

Observing after the Meeting

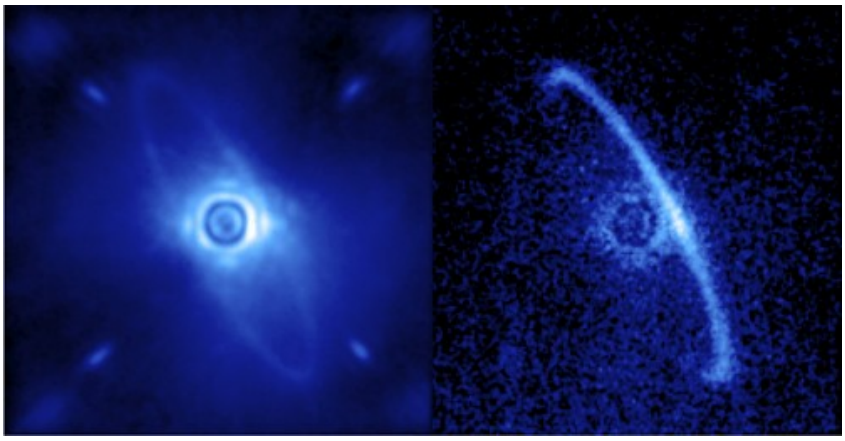
Following the meeting, members and guests are welcome to tour through the Observatory. Weather-permitting, several of the telescopes will also be set up for viewing.

High Resolution Views of Planets and Disks

Timothy J. Rodigas,
Carnegie Institution – Department of Terrestrial Magnetism (DTM)

Abstract: While still a young field, the study of exoplanets and disks is booming. Each new discovery changes the way we think about fundamental processes of planetary formation and evolution. Adaptive optics (AO) is a key tool in the discovery and characterization of these processes. This month's talk highlights the results of using the Large Binocular Telescope and Magellan AO systems to image nearby bright debris disks as well as the speaker's theoretical work on the dynamical relationship between planets and disks.

The debris disks are remnants of planet formation that are thought to continue to interact with nearby planets. Therefore, disk morphologies and chemical compositions can provide information about the planets that have yet to be detected. Also, since more massive planets create broader debris disks, this information can be used by future observers to place



Courtesy Marshall Perrin, Space Telescope Science Institute

Star HR 4796A (8 Myr) in Constellation Centaurus: Gemini Planet Imager's first light image of the light scattered by the star's orbiting disk of dust. Left image – light from the dust ring & residual, unpolarized star light affected by Earth's atmospheric turbulence (i.e., normal light) is visible. Right image – only scattered, polarized light is visible, revealing more dust ring detail (residual, unpolarized star light is removed).

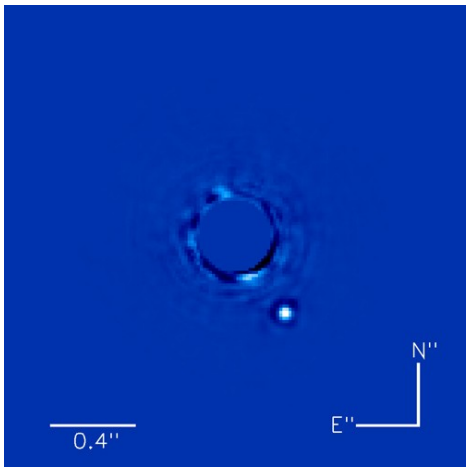
continued on page 2

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.

GPI & Exoplanets

The Gemini Planet Imager (GPI), located on the 8-meter Gemini South Telescope (Chile), is designed to capture images and probe the atmospheres of faint planets near bright stars. The imager uses adaptive optics to compensate for Earth's atmosphere and it detects infrared radiation from young, Jupiter-type planets in wide star orbits.



Courtesy Christian Marois, NRC Canada
GPI's first light image of the planet, Beta Pictoris b (Pictor Constellation) seen in the lower right of the image. The planet is aged at about 10 Myr with a radius 65% larger than Jupiter's. The near-infrared (1.5-1.8 microns) image shows light from heat released in the planet's formation.

GPI will also be helpful in studying planet-forming disks around young stars; and, future AO technology plans include the ability to see planets smaller than the size of Jupiter.

Planets and Disks – continued from page 1

dynamical upper limits on newly discovered planets' masses and to optimize target selection in future direct imaging surveys for young planets.

New high-resolution AO images of several iconic debris disks, from the visible to the infrared, will be presented. The discussion will also include current efforts to model the chemical compositions of disks' dust grains, with particular interest in water ice and organics—the key ingredients for Earth-like life. Additionally, images will be presented of an infant, forming planetary system based on data from an advanced AO instrument, the Gemini Planet Imager.

Biographical Sketch:

Timothy Rodigas grew up in New York City, went to high school near Boston, MA, and attended college at the University of Virginia. He attended the Astronomy graduate school at the University of Arizona and graduated with a PhD in 2013. After that, Dr. Rodigas started a Carnegie Postdoctoral Fellowship at the Carnegie Institution of Washington, DTM, in DC. Most of his work revolves around high-contrast imaging of exoplanets and debris disks. In particular, Dr. Rodigas is interested in deciphering the connection between planets and disks, specifically in what the disk shapes and morphologies can tell us about planets, and what the chemical compositions of the dust grains can tell us about the reservoir of life-essential ingredients such as water and organics.

The life of a postdoc often involves bouncing around from institution to institution every few years. This year, Dr. Rodigas was awarded a 2015 Hubble Fellowship, generally regarded as the most prestigious fellowship in astronomy. This will allow him to continue his research on planets and disks at Carnegie for another three years. Because Carnegie has unprecedented access to the best telescopes in the world, Dr. T.J. Rodigas states that "this is the best possible outcome for me!"

The New America Foundation, Arizona State University and Slate Magazine present:

Giant Leap: the Race to Mars and Back

Thursday, April 9, 2015 | 12:00 pm - 2:00 pm
At New America: 1899 L Street NW, Suite 400, Washington, DC 20036

See Agenda and RSVP:
http://www.newamerica.org/future-tense/giant-leap-the-race-to-mars-and-back/

"Can You See the Stars?"

April is…

Global Astronomy Month

presented by Astronomers Without Borders

http://astronomerswithoutborders.org/

Exploring the Sky Returns!

*"**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!

Hosted by: National Capital Astronomers, Inc and Rock Creek Park

Sky Watchers — *Spring Schedule*

April

10	Evening – **Planets**, N. Hemisphere. Venus 3º south of Pleiades
11	2:30 pm – **Messier Objects** (Online via Bellatrix Astronomical Observatory, Italy), Global. Features: *Messier Marathon Live: http://www.virtualtelescope.eu/webtv/*
12	Daytime – **Sun Day**, Global. Solar-viewing at the Haas Public Observatory (see newsletter Calendar on p. 7)
18	8:30 pm **– Exploring the Sky**, Local. Features: *Winter Constellations and Jupiter*
20- 29	Evening – **Globe at Night**, Global. Features: *Constellation Leo* (N. Hemisphere), *Constellation Crux* (S. Hemisphere)
22-23	Overnight **– Meteors**, N. Hemisphere. *Lyrids* (radiant point near Vega in the Lyra Constellation, look east at 1 am)

May

3	11:42 pm – **Full Moon**, Global. Other Moon Names: *Full Flower Moon (abundance of flowers), Full Corn-planting Moon, Full Milk Moon*

Times EDT

Should the NCA Continue to Judge at the Regional Science Fairs?

John Hornstein

Year after year, it has become ever more difficult for the NCA to find judges for the astronomy-related projects in the regional science fairs.It has reached the point where this year we will be judging only the Montgomery County Science Fair, and the Catholic Diocese's science fair in Arlington. The major fairs in Prince Georges County, DC, and Fairfax County will have no NCA judges this year.

As a result, it has been proposed that the NCA simply cease judging at the Regional Science Fairs.This will be brought to a vote by the NCA members at the June meeting (Of course, that meeting will also include the voting for the officers for the next year, and for one of the Board members).

continued on page 4

NCA at Regional Science Fairs – continued from page 3

Judging at the fair that is closest to you is not burdensome. It involves only part of one Saturday in March or April. At each fair, only a few projects are astronomy-related. Those projects are mostly at the Middle School level; however, because we are in the DC area, high school students can team up with scientists at Goddard and other government and private research labs. This can sometimes result in very high quality student projects.

We talk to the students at each project, which encourages them, and can be instructive for them, whether or not they receive an award from us. We also give certificates to the students whose projects showed independent thought and critical thinking, give them a one year subscription to Sky & Telescope, and provide one year of free membership in the National Capital Astronomers. We also invite them to speak at our June meeting.

One of the arguments that has been advanced for the NCA ceasing to judge at the science fairs is that some of our award winners have been visibly unimpressed. But every year a few other winners have been encouraged by winning, and become enthusiastic. They are eager to present their projects to us, and from the questions and suggestions they receive from the NCA audience, these students develop an appreciation for what science really is and how it is really done. Reaching those few students means that the NCA judging has made a difference. Given human diversity, reaching those few is a realistic aim. We should just shrug off those who are currently unreachable.

It would be a real shame to cease to make a difference to those who are receptive. It would be a disservice to the young people in our area and to our community. It would throw away an opportunity to have more future citizens who understand how to distinguish the plausible from the implausible. Frankly, that is much more important than inspiring a few young people to become scientists, as worthwhile as that is, because not having enough citizens who understand the importance of evidence in reaching decisions affects all of us.

Professional organizations far smaller than ours, such as the National Capital Section of the Optical Society of America, manage to judge at all of the local regional fairs, decade after decade. So it can be done.

If the vote turns out to favor the continuance of NCA judging at science fairs, at the end of the meeting, anyone who would be willing to judge next spring, at a science fair in their county or city, please come up to me, and I'll note down your name and contact info. Because the dates of next Spring's science fairs won't be known until early Spring, it is understood that your signing up for a particular science fair is provisional, and depends on you not having a schedule conflict with the date for that fair is finally announced.

continued on page 6

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

ISSN: 0898-7548

Editor: CA Brooks

Editorial Advisors:

- Michael Chesnes
- John D. Gaffey, Jr.
- Alex Klein
- Jeffrey Norman
- Elizabeth Warner
- Wayne Warren
- Marjorie Weissberg
- Harold Williams

PDF Distributor: Jay Miller

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

Thank you!

Planetarium Patty's Plaza

The plaza is a few special planetarium nights designed to take you deeper into specific astronomical topics of interest. These nights are geared toward anyone with an interest in astronomy and structured as lectures/Q&A sessions with some bonus night sky features!

April 24, 2015
Gamma-Rays and the Energetic Universe
Presenter: Bryce Carpenter
Howard B. Owens Science Center
7:30 pm (doors open at 7:15 pm)
$5/adult;
$3/students/senior/teachers/military

http://www1.pgcps.org/howardbowens/

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

2015

Date	Day	EDT	Star	Mag	Asteroid	dmag	dur. s	Ap. "	Location, Notes
Apr 14	Tue	20:53	2UC42216465	12.9	Leukothea	1.5	5	9	WV,VA;MD,DC,NC?
Apr 14	Tue	21:06	TYC18860370	11.3	Hedda	3.5	2	7	w&sPA,neMD,DE,NJ
May 5	Tue	2:51	2UC22726668	14.2	2003 LB7	8.7	7	12	TNO: NJ,PA,MD,DC

Lunar Grazing Occultations

2015

Date	Day	EDT	Star	Mag	% alt	CA	Location & Remarks
Apr 14	Tue	5:17	ZC 3169	6.1	25- 15	-2N	nWinchstr,VA;sColumbia,BWI,MD
Apr 22	Wed	21:56	SAO 94903	7.7	22+ 22	4N	Prlvl,DulTC,McL,VA;DC;NBch,MD
Apr 23	Thu	20:20	26 Gem	5.2	30+ 50	4N	Boyds,Fairland,Bowie,Riva, MD
Apr 23	Thu	21:27	SAO 96054	8.2	31+ 38	5N	*Warntn&Triangl,VA;sLenrdt,MD
Apr 26	Sun	20:12	SAO 98451	7.9	60+ 65	6N	*Jarat,sFrnkln,VA;Cmdn,Dck,NC
May 8	Fri	4:04	ZC 2687	6.6	82- 32	3S	*Strlg,VA;Potomc,SS,nBowie,MD

Interactive detailed maps at http://www.iota.timerson.net/.

Total Lunar Occultations

2015

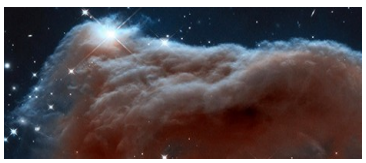
Date	Day	EDT	Ph	Star	Mag	%	alt	CA	Sp.	Notes
Apr 12	Sun	6:31	R	ZC 2889	6.9	47-	32	18S	M2	Sun alt. -2 deg.
Apr 13	Mon	4:52	R	SAO 163793	7.8	36-	17	64S	F0	mg2 11 sep 3",PA 227deg
Apr 14	Tue	5:20	R	ZC 3169	6.1	25-	16	5N	K0	
Apr 21	Tue	21:45	D	SAO 94187	7.2	13+	14	15S	F8	Az. 281, spec. binary
Apr 21	Tue	22:50	D	ZC 741	5.5	14+	2	65S	K1	Az. 290, close double?
Apr 22	Wed	19:54	D	130 Tauri	5.5	21+	45	60S	F0	Sun -2,ZC878,close dbl?
Apr 22	Wed	21:46	D	SAO 94922	8.1	22+	24	74N	F8	close double?
Apr 23	Thu	20:20	G	26 Gem	5.2	30+	50	5N	A2	Sun -6,ZC1029,closeDbl?
Apr 23	Thu	22:32	D	SAO 96102	7.7	31+	25	78S	B9	
Apr 23	Thu	22:50	D	SAO 96112	7.5	31+	22	45S	K2	
Apr 23	Thu	22:54	D	SAO 96108	7.5	31+	21	27S	F5	close double?
Apr 24	Fri	20:39	D	SAO 97074	8.3	40+	54	64N	G5	Sun -9, close double?
Apr 24	Fri	23:45	D	SAO 97150	7.8	41+	20	86S	K0	
Apr 25	Sat	1:02	D	SAO 97192	7.3	42+	5	38S	F0	Azimuth 285 degrees
Apr 26	Sun	0:49	D	ZC 1281	6.3	52+	15	88S	K0	Az. 275, close double?
Apr 26	Sun	23:07	D	SAO 98491	8.0	61+	41	44N	A2	mg2 11 sep. 1.2" PA 5dg
May 6	Wed	4:03	R	ZC 2390 *	6.7	95-	31	61N	B9	Axis Angle 290 degrees
May 7	Thu	5:57	R	ZC 2531	7.5	89-	25	64N	K0	Sun altitude -2 degrees
May 8	Fri	3:38	R	ZC 2680	5.6	82-	31	51N	K0	close double?
May 8	Fri	4:27	R	ZC 2685	6.8	82-	32	84S	K1	
May 8	Fri	5:07	R	SAO 161582	7.0	82-	32	64S	G3	Sun -10,mg2 10 69"PA262
May 9	Sat	0:34	R	rho 1 Sgr	3.9	74-	2	60S	F0	Az.115,ZC2826,closeDbl?
May 11	Mon	5:42	R	SAO 164359	8.0	50-	35	77S	B2	Sun altitude -4 degrees
May 12	Tue	6:13	R	rho Aqr *	5.4	39-	36	45N	B8	Sun alt. +2, ZC 3278

**The star is in the Kepler 2 exoplanet search program so lightcurves of the occultation are desired to check for close stellar duplicity.*

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

Celebrate the 25th Anniversary of the Hubble Telescope!

http://hubble25th.org/



Courtesy NASA, ESA, Hubble Heritage Team (STScI/AURA)
Horsehead Nebula (Orion)

2014-2015 Officers

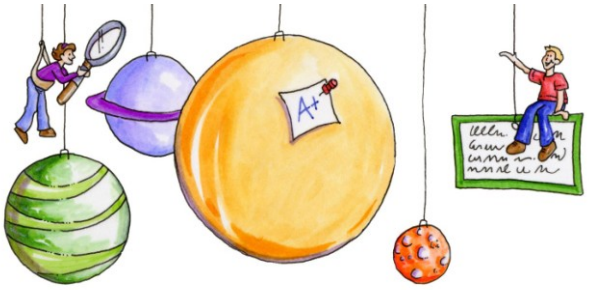
NCA at Regional Science Fairs – continued from page 4

Also in that case of a favorable vote, the NCA should designate a Science Fair Coordinator, whose responsibility would be to ensure that we field judges for as many of the fairs as possible, and who would collect the information about the award winners at all of the fairs. Initially, the Science Fair Coordinator could be appointed by the new President.

Note: Elizabeth Warner is willing to create a special science fair page as part of AstronomyinDC.org on which local fair information can be made available from schools to share with possible judges.

Montgomery County's NCA Science Fair Winners

John Hornstein



Montgomery County's fair was on March 14th. One of the science fair directors, Nuray Anahtar, noticed that NCA did not have judges present and graciously had some of the available judges (with appropriate backgrounds) select three astronomy-oriented projects for NCA.

The winners are:

1. Isaac & Elias Applebaum (Eastern Middle School),

   Mirror, Mirror: Solving the Turned-Down Edge Optical Defect in Parabolic Reflecting Telescopes (M726)

2. Kennedy Salamat (Bethesda Middle School),

   Effect of Solar Mass Loss on the Orbital Stability of Lagrangian Points L1, L2, L4 & L5 in Sun-Earth System (M746)

3. Shraeya Madhu (Poolesville High School)

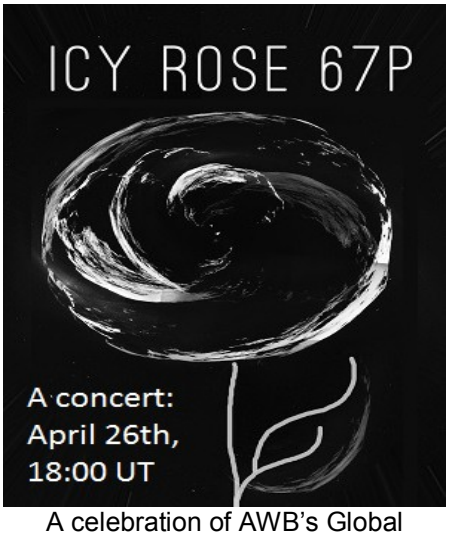
   Ferrying the Fluid (H708)

HOPEWELL OBSERVATORY

Open House

April 11, 2015
(at sunset)
Hopewell Observatory on Bull Run Mountain
(6 miles from Haymarket, VA - take I-66 from DC)

http://www.brmconservancy.org/



A celebration of AWB's Global Astronomy Month and UNESCO's International Year of Light

Watch the worldwide astro-concert live at Astronomers without Borders!

The submission deadline for the May issue of Star Dust is April 25th .

Clear Skies!

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.

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

Phoebe Waterman Haas Public Observatory at the National Air & Space Museum, Solar viewing, Wed. – Sun., 12 – 3 pm (weather permitting).

International Dark Sky Awareness Week: April 13 – 18. http://www.darksky.org/

Mid-Atlantic Senior Physicists Group: "Symmetries, Clusters & Synchronization Patterns in Complex Networks" with Thomas Murphy (UMCP), Fri. Apr. 17, at 1 pm at the American Center for Physics (1st floor conference room). http://www.aps.org/units/maspg/ ***note day and date****

Owens Science Center Planetarium: "Looking Over Our Shoulder," Fri. Apr. 17, 7:30 pm; $5/adult; $3/students/seniors/teachers/military; children under 3 free. www1.pgcps.org/howardbowens

The 2015 Global Star Party & "HangOut-a-Thon": Sat. Apr. 25, 15:00 UT – Mon, Apr. 27, 3:00 UT. www.astronomerswithoutborders.org

Upcoming NCA Meetings at the University of Maryland Observatory:
9 May: Brigette Hesman (UMD, GSFC), "A Giant Storm on Saturn."

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:

2015 April 11th

7:30 pm

@ UMD Observatory

Dr. Timothy Rodigas

Inside This Issue