Star Dust

Newsletter of National Capital Astronomers, Inc.

capitalastronomers.org

March 2018 ***Volume 76, Issue 7***

Celebrating 81 Years of Astronomy

Next Meeting

When: Sat. March 10th, 2018

Time: 7:30 pm

Where: UMD Observatory

Speaker: Dr. Ludmilla Kolokolova

Table of Contents

Directions to Dinner/Meeting

Our time and location for dinner with the speaker before this meeting is 5:30 pm at "Hunan Treasure" at 7537 Greenbelt Road, Greenbelt, MD 20770 in Greenway Center just east of where Greenbelt Road crosses over the Baltimore-Washington Parkway.

The National Capital Astronomers meeting is held at the UMD Astronomy Observatory on Metzerott Rd about halfway between Adelphi Rd and University Blvd.

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.

Why Send Spacecraft to Comets?

Ludmilla Kolokolova
University of Maryland

Abstract: Comets are small cosmic objects, which revolve around the Sun on elliptical orbits. When comets approach the Sun, they develop a huge atmosphere that often elongates in the anti-solar direction, forming the famous cometary tail. Although there are numerous small bodies in the Solar System – asteroids, Kuiper Belt objects, planetary satellites – comets have been visited by spacecraft more often than any other small body. Starting from 1986, when a set of spacecraft visited Comet Halley, there were 11 successful missions to comets (compared with 5 missions to asteroids, 3 missions to Venus, and 5 to all outer planets). What attracts scientists and space agencies to comets? The answer that scientists gave some years ago was "comets provide clues to the origin of the Solar System, and to the origin of life." Since the early missions to comets, this answer has broadened, when it became apparent that each comet is unique, and the differences among them are so huge that our understanding of comets changes dramatically after each space mission.

continued on page 2

Artistic impression of the Rosetta spacecraft launching the Philae module toward comet 67P/Churyumov-Gerasimenko. Image credit – European Space Agency

Star Dust © 2018. Star Dust may be reproduced with credit to National Capital Astronomers, Inc.

Recent Astronomy Highlights

A Change in a Comet's Rotation Rate

Astronomers discovered that between March and May of 2017, the rotation period of comet 41P/Tuttle-Giacobini-Kresak changed from 20 hours to more than 46 hours, due to outgassing. This is the largest change of rotation rate so far recorded for a comet. The astronomers published their results in Nature (DOI:10.1038/nature25150). The article can also be found at: https://arxiv.org/ftp/arxiv/papers/1801/1801.03870.pdf

Comet Has an Unusual Mix of Gases

In 2017, Scientists studying comet 45P/Honda-Mrkos-Pajdušáková, a Jovian-family comet, found that it contains more methane than carbon monoxide. Normally comets that are low in one of these gases are also low in the other due to depletion from outgassing. Researchers will study other Jovian-family comets while trying to figure out whether the 'missing' carbon monoxide went into reactions to create methanol. To read more, go to: https://www.sciencedaily.com/releases/2017/12/171205170252.htm

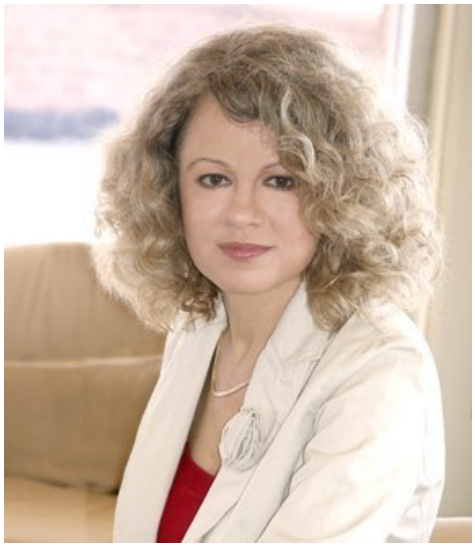
Ring of Gas Around a Supermassive Black Hole

A dusty ring of gas, 20 light years in radius, has been found surrounding the supermassive black hole at the center of the spiral galaxy M77. Theorized for decades, the structures and behaviors of such rings of gas in their interactions with the supermassive black hole they revolve around may help answer questions about the mysterious relationship between a galaxy's size and the size of its central black hole. More information can be found at: www.sciencedaily.com/releases/2018/02/180214093917.htm

continued on page 4

Why Send Spacecraft to Comets? – continued from page 1

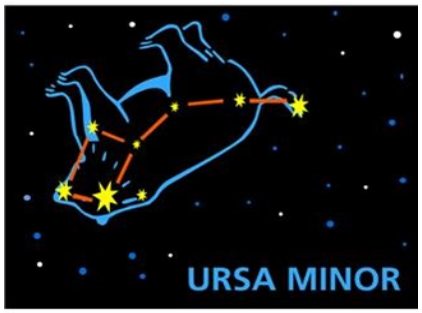
I will briefly characterize the comets studied by spacecraft, showing what new knowledge about comets we've gained from various space missions, and how those missions have changed our understanding of the formation and evolution of the Solar System. I will focus on the results of the Rosetta mission - the first spacecraft that spent a long period of time in a cometary environment, and whose module, Philae, accomplished the first landing on the cometary nucleus.



Biographical Sketch: Dr. Ludmilla Kolokolova is a Principal Research Scientist in the Department of Astronomy at the University of Maryland (UMCP). She received her PhD from the Main Astronomical Observatory of the Ukrainian Academy of Sciences (Kiev, Ukraine), and then continued there for several years studying the characteristics of asteroids by using theoretical and laboratory modeling of regolith surfaces. Later she was invited to work at the Max-Planck Institute for Solar System Research (Göttingen, Germany), where her research was focused on cometary dust. That activity included participation in designing a dust instrument for the Rosetta mission. In 1997, she was invited to join a team at the University of Florida (Gainesville) to design an instrument called the Planetary Aerosol Monitor/ Interplanetary Dust Analyzer (PAM/IDA). At the University of Florida, she returned to the lab modeling of light scattering by cometary dust, using the Microwave Analog-to-Light Scattering Facility. In 2004 she moved to the University of Maryland, where she became the manager of the Small Bodies Node of the NASA Planetary Data System (PDS), an archiving facility that preserves the data acquired by space missions and ground-based observations of comets, asteroids, and interplanetary dust. As a part of PDS, and as a scientist, she has participated in numerous space missions, among them Stardust, Deep Impact, EPOXI, Cassini, New Horizons, and Rosetta. She is the author of more than 200 papers, including books on cosmic dust and light scattering by particles and surfaces.

Star Dust © 2018. Star Dust may be reproduced with credit to National Capital Astronomers, Inc.

Exploring the Sky



*"**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

With the winter months, the Exploring the Sky program will take a hiatus until April 2018.

2018 Exploring the Sky Sessions

7 April	8:30 p.m. - Orion Nebula, Beehive Cluster
5 May	9:00 p.m. – Jupiter, Beehive Cluster
2 June	9:00 p.m. – Jupiter, M13
14 July	9:00 p.m. – Jupiter, Saturn, M13
11 Aug.	8:30 p.m. – Jupiter, Saturn, M13
1 Sep.	8:00 p.m. – Jupiter, Saturn, Mars
6 Oct.	7:30 p.m. – Saturn, Mars
17 Nov.	7:00 p.m. – Saturn, Mars, Uranus, Moon

More information can be found at NCA's web site, www.capitalastronomers.org or the Rock Creek Park web site, 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

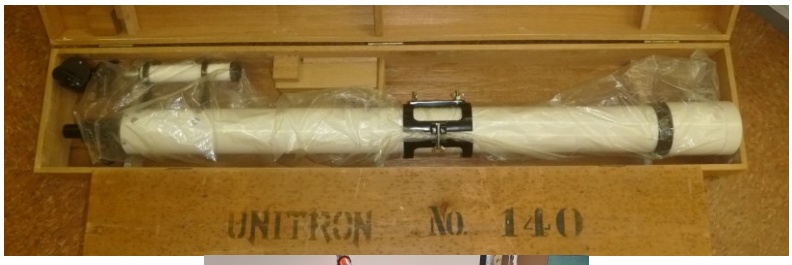
A Gift from Joe Morris

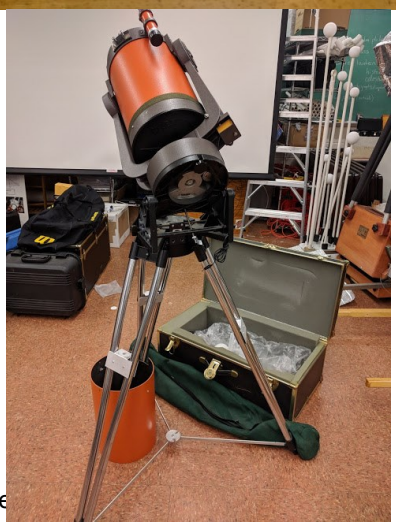
As many of you know, Joe Morris served the National Capital Astronomers in many roles, including as President for several years and with the Exploring the Sky program, before his passing last summer (see capitalastronomers.org/SD_year/2017/StarDust_2017_09.pdf). Recently his nephew, John Williamson, contacted the NCA, since it was Joe's wish that his telescopes and astronomical equipment be donated to the organization.

The equipment was received and moved to the University of Maryland Observatory on February 3rd. Since then Guy Brandenburg and Elizabeth Warner have inventoried and photographed the various telescopes and many accessories. That inventory includes a Celestron 8" SCT with a mount and drives, a Celestron 11" SCT with a Losmandy mount and tripod, as well as drives, a Celestron 5" SCT, and a Unitron Refractor. Pictures of the Unitron Refractor and the Celestron 8" SCT are below. In addition, there is a pair of 20x80 binoculars, numerous eyepieces and a number of other pieces of astronomical equipment. Guy has put an extensive photographic inventory of the equipment at: www.dropbox.com/home/Telescopes%20etc%20from%20Joe%20Morris

At the February 10th meeting of the NCA, there was an initial discussion of whether to keep the equipment for NCA use or to sell it, with the proceeds going to help in the funding of the organization. The discussion was tabled for future meetings, although the suggestion was made to possibly keep one of the telescopes, a Unitron refractor, for use with such events as Exploring the Sky while selling the other equipment.

If anyone is interested in being the guardian of one of the telescopes for possible use at NCA outreach events, please contact Guy Brandenburg at: gfbrandenburg@yahoo.com.





Star Dust © 2018. Star Dust may be reproduced with cre Inc.

A Tribute to Joe Morris

Sarah Brown, UMD Amateur Radio Astronomy Team

The loss of this kind and compassionate man leaves us with sweet memories and a brief moment at the beginning of each National Capital Astronomers meeting where you just expect him to be there (and he may be there for all I know).

His private support for our Amateur Radio Astronomy team was always demonstrated by a quiet visit to our corner of the observatory to see what we were doing... what we had achieved. And he'd privately nod a little nod of approval for each little success. We dearly miss his support! We are very grateful to have had the benefit of Mr. Morris's wisdom, suggestions, and kindness.

AAS Meeting

On January 8th through the 12th, the American Astronomical Society held its 231st meeting at the Gaylord National Resort and Convention Center in National Harbor, MD. NCA members were in attendance, including Guy Brandenburg, who presented the following collage highlighting NCA and NOVAC (the Northern Virginia Astronomy Club), as well as Isaac Newton getting a chance to look through a telescope, just as he did at January's NCA meeting (see Page 8 of the February issue of Star Dust).

For those who were not able to attend, press conferences with presentations about much of the latest research, with titles such as "From Comets to Galaxies" and "It's Amazing What You Can Do With Space Telescopes", are available at the following webpage. aas.org/media-press/archived-aas-press-conference-webcasts
Press Conferences from previous AAS meetings are also available at the webpage. In addition, a summary of many of the presentations made each day at the meeting can be found starting at the following webpage - aasnova.org/2018/01/08/aas-231-welcome/ .

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

ISSN: 0898-7548

Editor: Todd Supple

Editorial Advisors:

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

Electronic 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!

Recent Astronomy Highlights – continued from page 2

Amateur Astronomer Photographs Supernova Explosion

On September 20, 2016, amateur astronomer Victor Buso of Argentina, was testing a new camera on his 16-inch telescope. During that test, he captured the 'first optical light' of a supernova in NGC 613, a spiral galaxy 80 million light years from Earth. Nobody has ever captured such light before. Other astronomers were able to determine that the event was a Type IIb supernova, the explosion of a star that has previously lost most of its hydrogen, possibly to a companion star. Astronomers theorize that the star might have originally been 20 solar masses, but had slimmed down to 5 times the mass of the Sun before the explosion. More information can be found at: www.sciencedaily.com/releases/2018/02/180221131839.htm

Star Dust © 2018. Star Dust may be reproduced with credit to National Capital Astronomers, Inc.

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

Asteroidal Occultations

Date	Day	EDT	Star	mag.	Asteroid	dmag	dur. s	Ap. "	Location, Notes
2018									
Mar 13	Tue	3:29	4UC47004656	12.3	Pickeringia	1.2	8	8	nMD,sPA;DC,nVA?
Mar 14	Wed	0:43	TYC02511227	11.5	Nemausa	0.3	16	7	NJ,nDE,ePA,wNY
Mar 19	Mon	3:15	SAO 62357	9.2	Tauris	5.2	8	4	nSC,swNC,e&nTN
Mar 22	Thu	0:29	4UC59934162	12.4	Antwerpia	3.2	3	8	swOH,scVA,neNC
Mar 25	Sun	0:08	4UC60841315	13.3	Joensuu	3.4	5	11	ePA,cMD,DC,eVA
Mar 27	Tue	22:17	4UC54927417	13.0	Kassandra	0.8	6	10	nKY,sWV,cVA;sMD?
Mar 28	Tue	23:47	4UC54927742	13.5	Kassandra	0.5	5	11	nKY,sWV,sVA,neNC
Mar 30	Fri	5:41	2UC24402018	10.9	May	4.1	10	6	sOH,WV,c&seVA
Mar 31	Sat	0:39	4UC55824618	13.1	Chicago	1.6	10	11	sON,sNY,nPA,nNJ
Mar 31	Sat	23:30	4UC60527186	13.2	Katja	1.7	2	11	wNY,ePA,NJ;neMD?
Apr 6	Fri	0:34	SAO 119731	8.4	WilliamsBay	7.6	2	2	sNE,NY,sON;nPA?
Apr 10	Tue	1:59	2UC32376640	10.5	Gratia	3.3	6	6	sMD,nVA,OH;DC?
Apr 10	Tue	4:23	2UC21880338	11.5	Demophon	6.9	3	7	wVA,NC;sMD?
Apr 14	Sat	3:19	TYC62533572	11.1	Amalthea	1.5	9	7	w&ecNY,sNH,sME
Apr 16	Mon	5:33	2UC30033315	12.1	Chaldaea	0.8	11	8	e&nVA,w&cMD,DC

* before the asteroid name indicates an event in the list of high-interest asteroidal occultations of the ESO Large Programme.

Lunar Grazing Occultations

Date	Day	EDT	Star	Mag	% alt	CA	Location & Remarks
2018							
Mar 22	Thu	19:25	Aldebaran	0.9	31+ 38	3S	FtMackenzie,Nain, Labrador
Mar 22	Thu	21:52	ZC 705	7.9	32+ 33	0N	Poindexters,Ashcake,VA
Mar 23	Fri	23:12	SAO94770	8.5	43+ 29	2N	sCarson,Suffolk,Hickory,VA

* No expedition from the DC region expected
Interactive detailed maps at http://www.iota.timerson.net/

Total Lunar Occultations

Date	Day	EDT	Ph	Star	Mag	%	alt	CA	Sp.	Notes
2018										
Mar 20	Tue	19:23	D	mu Ceti	4.3	13+	36	70S	F1	Sun -2,ZC405,close dbl?
Mar 22	Thu	20:58	D	SAO 94047*	7.9	32+	43	24N	F0	
Mar 22	Thu	22:13	D	SAO 94070*	8.4	32+	29	50N	A2	
Mar 22	Thu	22:45	D	ZC 711	8.2	32+	23	81N	K5	
Mar 23	Fri	19:59	D	SAO 94694	7.8	42+	64	51S	K0	Sun altitude -8 deg.
Mar 23	Fri	22:49	D	SAO 94767	8.2	43+	34	39N	A0	
Mar 23	Fri	23:04	D	ZC 862	7.3	43+	31	54S	K0	
Mar 23	Fri	23:16	D	127 Tauri	6.7	44+	29	53S	B9	ZC 863
Mar 24	Fri	20:04	D	SAO 95908*	9.2	54+	70	77N	A0	Sun altitude -9 deg.
Mar 24	Sat	21:39	D	ZC 1025	7.3	54+	58	41S	K0	
Mar 24	Sat	22:09	D	SAO 78639	8.2	55+	53	62N	A0	
Mar 25	Sun	0:07	D	ZC 1034	8.1	55+	30	39S	F0	close double?
Mar 26	Mon	20:09	D	SAO 98005*	8.2	76+	62	84S	F8	
Mar 26	Mon	22:24	D	SAO 98061*	8.8	77+	66	52S	F2	
Mar 27	Tue	20:21	D	11 Leonis	6.6	85+	53	37S	F2	Sun alt. -11,ZC 1420
Mar 27	Tue	23:32	D	psi Leonis	5.4	86+	62	78S	M2	ZC 1434
Mar 28	Wed	2:08	D	SAO 98773	7.5	87+	36	52S	K0	
Mar 30	Fri	3:11	D	ZC 1693*	7.5	98+	38	31N	F5	
Mar 30	Fri	4:06	D	SAO119000*	7.3	98+	28	75N	G0	
Apr 2	Mon	5:26	R	ZC 2047	6.6	96-	29	23N	K0	AA 327, TermDist 12"
Apr 4	Wed	4:19	R	ZC 2280	6.5	84-	35	25N	M1	
Apr 5	Thu	2:02	R	SAO 160069	7.5	77-	19	73S	K2	
Apr 7	Sat	4:20	R	ZC 2679	7.6	59-	22	65N	A0	
Apr 8	Sun	5:23	R	ZC 2829	6.7	49-	24	35N	K2	
Apr 10	Tue	5:23	R	SAO 164100	7.4	30-	15	24N	K0	Azimuth 128 deg.

*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

Star Dust © 2018. Star Dust may be reproduced with credit to National Capital Astronomers, Inc.

2017-2018 Officers

President:
Harold Williams
haroldwilliams@me.com or Harold.Williams@montgomerycollege.edu

Vice-President:
John Hornstein
jshgwave@yahoo.com
301-593-1095 (h)

Secretary-Treasurer:
Henry Bofinger
hbofinger@earthlink.net
202-675-1075

Asst. Secretary-Treasurer:
Jeffrey B. Norman
jeffreynorman@comcast.net

Trustees:
- Benson Simon (2017)
- Michael Brabanski (2018)
- Wayne Warren (2019)
- Jack Gaffey (2020)

Appointed Officers and Committee Heads:

Exploring the Sky
Jay Miller
jhmiller@me.com

Telescope Making
Guy Brandenburg
gfbrandenburg@yahoo.com
202-635-1860

NCA Webmaster
Elizabeth Warner
warnerem@astro.umd.edu
301-405-6555

Star Dust Editor
Todd Supple
NCAStardust@gmail.com
301-595-2482 (h)

Social Media
Liz Dervy
Twitter: @NatCapAstro

Sky Watchers

February/March

Mercury and Venus continue to dominate the evening sky. Jupiter rises before midnight. Saturn rises about three hours after Jupiter. Mars continues to move away from Jupiter and closer to Saturn on the way toward the conjunction listed below.	
3/15	Mercury at greatest eastern elongation – 18.4° from the Sun and the highest in the evening sky. Venus will be within 4 degrees of Mercury.
3/31	Full Moon – The second and last Blue Moon of 2018. 8:37 p.m.
4/2	Conjunction – Mars will be 1° 13' south of Saturn. 7:53 a.m.

Times - Eastern Daylight Savings Time

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 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 can be found at: www.astro.umd.edu/openhouse

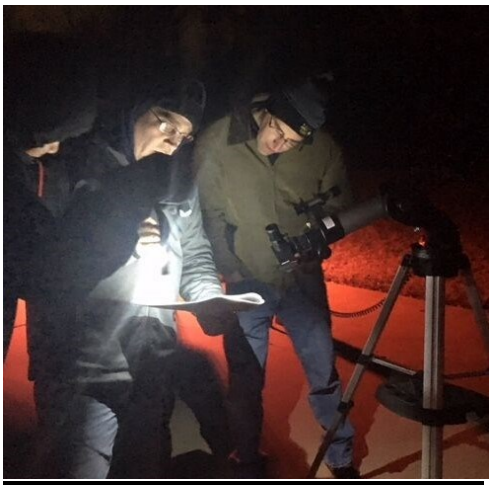
Upcoming NCA Meeting at the University of Maryland Observatory: 14 April 7:30 p.m.: Jonathan Gagné (Carnegie DTM), *Planets without Stars*

UMD Amateur Radio Astronomy Team Meetings: Wednesdays and Saturdays 2:00 p.m. to 5:00 p.m. (and other times when interesting phenomena occur) at the University of Maryland Observatory. For more information, contact Sarah Brown - Sarah.E.Brown@verizon.net

Montgomery College's Planetarium: "The Vernal Equinox, the First Day of Spring" Tuesday, March 20th at 7:00 p.m. For directions and information, go to the following website: www2.montgomerycollege.edu/departments/planet/

Details of upcoming meetings and presentations of the **APS Mid Atlantic Senior Physicists Group** at 1 Physics Ellipse, College Park, MD-- off River Rd., between Kenilworth Ave. and Paint Branch Parkway, can be found at the following link: www.aps.org/units/maspg/

Star Dust © 2018. Star Dust may be reproduced with credit to National Capital Astronomers, Inc.



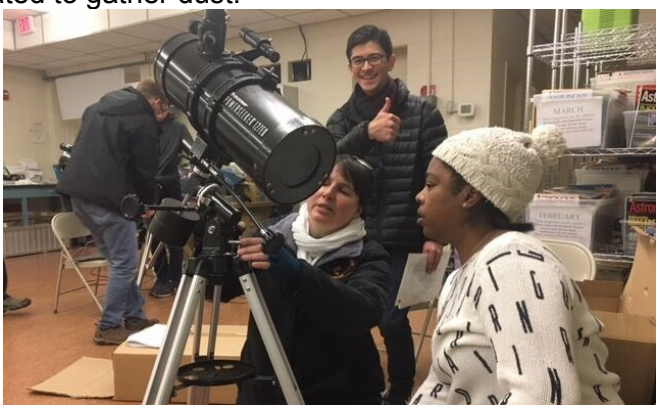
Reading the instruction manual is always a good idea, even in the dark. (*Pictures by Observatory Volunteer Valentina Petroni*)

Do you have an astronomy story to share with your fellow NCA members? The submission deadline for April's Star Dust, is Mar. 21st.

Clear Skies!

New Telescope Owners Night 2018

In an attempt to keep new telescopes from becoming expensive clothes hangers or dust gatherers in the corner of someone's bedroom, Elizabeth Warner, Director for the University of Maryland Observatory, has in recent years organized two nights early in the new year (after said telescopes are often given as gifts) to train new owners in how to use and maintain them. This year those nights were January 31st and February 3rd. Helping Elizabeth were NCA members Jim Simpson and Todd Supple as well as Rudy Casper, Tom Stickles and Greg Bishop. New owners came with questions about everything from how to aim a telescope to how to collimate one. Hopefully through these sessions, some new owners will see many of the wonders of the Universe… and some telescopes will no longer be fated to gather dust.



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 81 Years of Astronomy

Next NCA Meeting:

2018 March 10th

7:30 pm

@ UMD Observatory

Dr. Ludmilla Kolokolova

Inside This Issue

Table of Contents