Star Dust

National Capital Astronomers, Inc.

September 2013

Volume 71, Issue 1

capitalastronomers.org

Next Meeting

When: Sat. Sep. 14, 2013

Time: 7:30 pm

Where: UMD Observatory

Speaker: Tilak Hewagama, GSFC

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Directions to Dinner/Meeting

Our new location for dinner with the speaker before each meeting is 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 Metzerott Rd about halfway between Adelphi Rd and University Blvd.

Need a Ride?

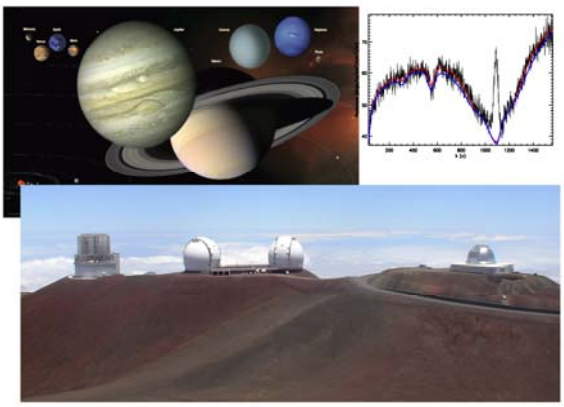
Please contact Jay Miller, 240-401-8693, if you need a ride from the metro to dinner or to the meeting at the observatory. Please try to let him know in advance by e-mail at rigel1@starpower.net.

Sep. 2013: Dr. Tilak Hewagama
UMBC, UMCP, GSFC

Exploring Planetary Atmospheres: Follow the Trace Constituents

Abstract: Trace quantities of certain infrared active molecular species can have a marked impact on the atmosphere of a planet. Fascinating relationships are seen between such gases and the global physics and chemistry of the atmosphere. Ground- and spacecraft-based observations of solar system planets and satellites have provided a wealth of data that help refine our understanding of these atmospheres. High spectral resolution measurements of molecular line shapes permit the retrieval of the composition and dynamics of the atmospherics. We will discuss examples and techniques for studying atmospheric phenomena. The plethora of recent exoplanet discoveries has infused new life into the study of comparative atmospheres.

Biography: Dr. Tilak Hewagama is a scientist with the University of Maryland Baltimore County, University of Maryland College Park and NASA/Goddard Space Flight Center, Greenbelt, MD. Tilak received a BSc from the University of Colombo, Sri Lanka, and a PhD from the University of Maryland, College Park. His graduate research focused on the use of an infrared polarimeter and a high-resolution Fourier transform spectrometer to study magnetic fields in solar active regions. His recent research concerns the thermal structure, trace gases, and dynamics of Earth and planetary atmospheres. He has participated in the Cosmic Background Explorer and EPOXI missions, and he is currently involved with the Soumi NPP Cross-Track Infrared Sounder. As an observer, Tilak has enjoyed freezing himself at the Mauna Kea telescopes in Hawaii -- and been treated to spectacular sunrises.



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.

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

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Editor: Elizabeth Warner

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) and also save some trees. If you can switch from paper to digital, please contact Manjunath Rao, the NCA Secretary, at kurchi@hotmail.com.

Thank you!

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.

Come See the Stars!

Exploring the Sky

2013 Schedule

Date	Time	Things of interest in the month:
5/4	9:00pm	Saturn rising in the east; the Beehive in Cancer
6/1	9:00pm	Solstice 6/21; Mercury at Castor's feet
7/13	9:00pm	Summer Triangle; 5-day-old Moon near Virgo
8/10	8:30pm	Andromeda rising; Perseid meteor shower
9/7	8:00pm	Andromeda Galaxy rising; equinox 9/22
10/5	7:30pm	Astronomy Day 10/12; Orionid meteor shower
11/2	7:00pm	Pleiades and Winter constellations appear

Exploring the Sky is an informal program that for over sixty 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.

Sessions are held in Rock Creek Park once each month on a Saturday night from April through November, starting shortly after sunset. We meet in the field just south of the intersection of Military and Glover Roads NW, near the Nature Center. A parking lot is located next to the field.

Beginners (including children) and experienced stargazers are all welcome—and it's free!

Questions? Call the Nature Center at (202) 895-6070 or check the Internet sites:

www.nps.gov/rocr/planyourvisit/expsky.htm

www.capitalastronomers.org

A presentation of the National Park Service and National Capital Astronomers

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It's Dues Time

The scheduling for renewing your NCA membership has been *simplified*.

September is dues-month for everyone!

Please bring your dues to the meeting, or mail them to:

Henry Bofinger,
727 Massachusetts Ave. NE
Washington, DC 20002-6007

hbofinger@earthlink.net

Remembering Craig Levin

Michael Chesnes

This May NCA lost a rising star in the local amateur astronomy community when Craig Levin died at 42. Craig and his wife Elizabeth were good friends of mine over the past seven years, first when I worked with Craig at the NASA Headquarters Library, and then when I volunteered and observed with them at local star parties and public outreach events. The Levins worked together as a team when explaining to families what they were seeing when they looked through a telescope, and happily shared the binoculars and Edmund Astroscan reflector which they won as raffle prizes at the Mason Dixon Star Party. This minimalist low-budget approach to observing went a long way in spite of Maryland's light-polluted skies. They were a close couple who were well read with overlapping interests. The long conversations we had afterwards at Plato's and other diners were an integral part of our evenings, weaving astronomy into many topics from the arts and humanities.

Craig was a devoted supporter of the Owens Science Center Planetarium in Lanham, MD and the David M. Brown Planetarium in Arlington, VA. At the Owens, Craig wrote and delivered planetarium presentations on Egyptians, Mound Builders, William Herschel, Polynesians, and Tycho Brahe. The Levins volunteered at most of the other Owens planetarium shows in recent years, sometimes appearing in costume to take part in skits. They also participated in the campaign to save and remodel the Brown Planetarium, volunteering at fundraising and outreach events, while Craig was a regular commenter on the campaign's Facebook site.

At all these events Craig made educating children and families a priority. He took pride in his role as a science fair judge for his wife's elementary school students, and when the Owens was threatened by major budget cuts, he delivered an eloquent speech at a Prince George's County Board of Education meeting about the role of a scientifically literate public in society.

Craig was enthusiastic about communicating science through the written word, participating in the D.C. Science Writers Association, writing essays to accompany bibliographies on the NASA Headquarters Library's website, and serving as Editor for *The Meteor*, the Astronomical Society of Greenbelt's newsletter. His interest in astronomy had an historical streak, taking in medieval and Renaissance navigational instruments, 18th and 19th century telescopes, and early 20th century rocketry. Craig saw astronomy as a gateway between science and the humanities, and he had strong interests in related subjects such as science fiction, futuristic technology, and human space flight. Finally he was very proud of NASA, and often encouraged people, especially tourist families, to visit his workplace and ask for his help on school projects.

Craig had a lot of potential when he died. His skills as a writer and presenter were growing, and there was every reason to believe he could have done much more as a science communicator. Craig accomplished a lot in his short life, and he made a strong impression on the many people who were fortunate to have known him.

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 and Expeditions

Dr. David Dunham

2013 Date	Day	EDT	Star	mag.	Asteroid	dmag	dur. s	Ap. "	Location or Dist.s.of DC, km
Sep 13	Fri	4:05	TYC13351275	11.5	Adrastea	3.9	1.4	7	sWV,cVA,seMD;DC?
Sep 20	Sat	21:08	TYC05750908	11.4	Orosz	4.2	3	6	PA,wMD,VA,WV;DC?
Sep 22	Sun	4:04	SAO 112739	9.1	Morabito	6.3	2	4	sKY,sVA,nNC
Sep 28	Sat	4:15	SAO 94720	8.8	Dorothea	5.9	4	3	OH,nWV,nVA,DC,MD
Oct 5	Sat	22:52	TYC00300604	10.6	Nike	3.2	6	6	ON,sMI,IL
Oct 6	Sun	21:46	2UC40791605	12.1C	Cheruskia	1.1	8	8	ePA,MD,DC,VA,cNC
Oct 7	Mon	22:01	TYC62481005	11.7	Lanzia	3.1	4	8	WV,MD,nVA,DC-low
Oct 11	Fri	4:10	30 Piscium	4.4	Henan	10.6	2	1	NC,nwSC,nGA,nAL
Oct 21	Mon	2:43	TYC06460730	9.6	Patroclus	5.1	9	4	NC,VA,TN,KY;sWV?

Lunar Grazing Occultations

2013 Date	Day	EDT	Star	Mag	%	alt	CA	Location & Remarks
Sep 23	Mon	6:02	ZC 450	6.4	84-	57	14S	*Henderson,Halifax,&Moyock,NC
Sep 27	Fri	3:06	ZC 985	6.8	48-	34	3N	*Chrltv&Frdrkbg,VA;Waldorf,MD
Sep 29	Sun	5:09	SAO 97580	7.8	29-	38	1S	*Roanoke, Chester, &Toano, VA
Sep 29	Sun	6:23	SAO 97609	9.0	29-	50	1S	*Damascus,ElicotC,&Dundalk,MD

(there are no observable grazes in early October)

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

Total Lunar Occultations

2013 Date	Day	EDT	Ph	Star	Mag	%	alt	CA	Sp.	Notes
Sep 14	Sat	0:03	D	ZC 2715	6.3	66+	12	73S	M4	Az. 233, close dbl?
Sep 16	Mon	0:06	D	ZC 3021	7.3	86+	31	56N	K0	Maybe close double?
Sep 18	Wed	2:59	D	Situla	5.0	98+	30	48N	K2	ZC3320=kappaAqr, dbl?
Sep 20	Fri	21:33	R	ZC 162	6.9	97-	21	35N	F0	AA 324
Sep 22	Sun	22:22	R	sigma Ari	5.5	85-	15	83N	B7	Azimuth 83, ZC 422
Sep 23	Mon	6:24	R	ZC 450	6.4	83-	52	36S	K3	Sun -7; Carolinas graze
Sep 24	Tue	1:54	R	SAO 93630	7.5	76-	47	27S	G0	
Sep 24	Tue	23:38	R	SZ Tauri	6.5	68-	13	62S	F5	Azimuth 77, ZC 697
Sep 25	Wed	2:33	R	ZC 710	7.1	67-	46	39S	G5	mg2 10,sep.100",PA 102d
Sep 25	Wed	4:30	R	SAO 94110	7.5	67-	65	19S	K0	
Sep 26	Thu	1:49	R	SAO 94634	7.5	58-	29	89N	F7	
Sep 27	Fri	5:09	R	SAO 95715	7.7	48-	57	83S	G5	
Sep 28	Sat	1:32	R	ZC 1091	6.5	39-	7	73S	K5	Az. 74, close double??
Sep 29	Sun	2:27	R	ZC 1212	7.3	30-	7	47N	A5	Az. 77, close double??
Sep 29	Sun	5:28	R	SAO 97580	7.8	29-	41	27S	K0	
Sep 29	Sun	7:18	R	ZC 1234	6.2	29-	59	27N	A1	Sun +3, close double?
Sep 30	Mon	5:24	R	60 Cancri	5.4	21-	30	83N	K5	ZC1332, close double??
Oct 1	Tue	5:23	R	SAO 117874	8.0	13-	19	69S	G0	
Oct 10	Thu	19:26	D	X 43762	8.2	39+	29	84N	K0	Sun-11, close double
Oct 10	Thu	20:16	D	X 43805	8.0	39+	24	82N	F0	mg2 10,sep. 2.8",PA 349
Oct 10	Thu	21:55	D	SAO 161426	8.0	39+	12	80S	A0	Az.233, dbl 0
Oct 10	Thu	21:57	D	SAO 161424	7.7	39+	12	60N	K5	Azimuth 233 degrees
Oct 11	Fri	20:45	D	rho1 Sgr	3.9	50+	29	84S	F0	ZC2826, close double?
Oct 11	Fri	21:44	D	SAO 162545	8.0	51+	23	49N	B9	
Oct 11	Fri	21:54	D	SAO 162557	8.2	51+	21	47S	G5	
Oct 12	Sat	18:47	D	ZC 2958	7.7	61+	34	87N	K1	Sun altitude -4 deg.
Oct 12	Sat	21:23	D	DabihMinor	6.1	62+	33	79N	B9	ZC 2968 =beta1 Cap, close companion mag. 9.1, separation 0.7" in PA 75, HIP discovery
Oct 12	Sat	21:31	D	DabihMajor	3.1	62+	33	83N	A5	ZC 2969 = beta2 Cap, probably a close double, primary a spectroscopic binary
Oct 12	Sat	23:31	D	ZC 2972	6.8	63+	18	14N	B3	

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

Timing equipment and even telescopes can be loaned for most expeditions that we actually undertake; we are always shortest of observers who can fit these events in their schedule, so we hope that you might be able to.

Information on timing occultations is at http://iota.jhuapl.edu/timng920.htm. Good luck with your observations.

NCA Newsletters

- CA Brooks will be the newsletter editor for the remainder of the year. You may send content to her at crealm_9@hotmail.com

- We need a decision on whether or not to continue using volume numbers on the newsletters. I've got a listing of issues and technically, this issue is volume 71 issue 1. However, because of a mistake in the far past (1989), some of the editorial board feels that we should continue with the (incorrect) labeling so that this issue is then volume 72 issue 1. I personally think we should do away with volume numbers entirely. We do not organize the newsletters on the website by volume primarily because of numerous discrepancies. **What do you think?**

  a) Keep volume numbers but fix for what it should be.
  b) Keep volume numbers but continue the pattern that has been in place since the last mistake.
  c) Drop the volume number.

You can see the past newsletters archived on the NCA website at capitalastronomers.org/StarDust_Archive.html, one of the options is to see a "cheat sheet guide to issues".

Mid-Atlantic Senior Physicists Group
www.aps.org/units/maspg

The Atmosphere of the Sun and What Happens in It
September 18, 2013
American Center for Physics, College Park, MD

Speaker: **George A. Doschek, , Space Science Division, Naval Research Laboratory**

Topic: **The Atmosphere of the Sun and What Happens in It**

Time and Location: 1:00 PM, with Q&A to follow; in a 1st floor conference room at the American Center for Physics (www.acp.org), 1 Physics Ellipse, College Park, MD-- off River Rd., between Kenilworth Ave. and Paint Branch Parkway.

Abstract: The Sun's atmosphere has been a mystery since it was discovered in the early 1940s that the unidentified coronal emission lines seen during solar eclipses were due to highly ionized atoms, implying a high coronal temperature on the order of a million degrees. No one knows even now what exactly causes the high temperatures. Later, the solar wind was predicted and discovered and the atmosphere of the Sun is now known to extend out to the outer boundaries of the solar system. Within the atmosphere extraordinary violent plasma events occur such as solar flares and coronal mass ejections that can produce temperatures up to about 25 million degrees and multi-MeV particles.

Because of our increasing electronic dependence on near-Earth spacecraft and ground power sources, and the propagation of radiation and highly energetic particles from the Sun to the Earth, the Sun is a potential source of a major electronic disaster. Studying and mitigating the effects of the Sun's atmosphere on the Earth is the subject of Space Weather. In this talk I will focus on what we have learned about the solar atmosphere from space, particularly observations in the extreme-ultraviolet and X-ray regions, and discuss some of the possible causes of coronal heating and the production of flares and coronal mass ejections. All of the material I will discuss comes from currently orbiting state-of-the-art solar observatories.

Biography: George Doschek is currently a Research Physicist in the Space Science Division of the Naval Research Laboratory (NRL). He received a B.S. in Physics in 1963 from the University of Pittsburgh and a Ph.D. in physics in 1968 from the University of Pittsburgh. He was Branch Head of the Solar-Terrestrial Relationships Branch in the Space Science Division at NRL from 1979 until January 2011. Between 1970 and 1979 he was a Research Astrophysicist at NRL, and between 1968 and 1970 he was an E.O. Hulburt Fellow at NRL.

He is a member of the American Astronomical Society, the American Geophysical Union, the International Astronomical Union, and is a Fellow of the Optical Society of America. He is an author of over 300 research papers on solar physics and X-ray and extreme-ultraviolet spectroscopy. His research areas are solar physics, atomic physics, and solar physics spectroscopic space instrumentation. He has analyzed data from many astrophysical space missions and has been a key player in the design and construction of solar space experiments. He is currently the Principal Investigator to NASA for the multi-national United Kingdom Extreme-ultraviolet Imaging Spectrometer on *Hinode*.

UMD Observatory

The UMD Observatory continued making a number of updates/upgrades over the summer. New parking lot lights were installed late in the spring. And we are moving forward with getting campus internet.

In addition, our student staff Carol, Erin, and Tyler have all graduated and moved on and we have new students who will be operating the telescopes at the Open Houses and other events. At some point, they will also be assisting at NCA meetings.

Calendar of Events

NCA Mirror- and Telescope-making Classes: Tuesdays Sep. 3, 10, 17, 24 and Fridays, Sep. 6, 13, 20, 27, 6:30 to 9:30 pm at the Chevy Chase Community Center, at the northeast corner of the intersection of McKinley Street and Connecticut Avenue, N.W. Contact instructor Guy Brandenburg at 202-635-1860 or email him at gfbrandenburg@yahoo.com. In case there is snow, call 202-282-2204 to see if the CCCC is open.

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

NCA Pre-meeting Dinner: Saturday, Sep 14 at 5:30 pm, preceding the meeting, at Mulligan's Grill and Pub at the University of Maryland Golf Course.

Owens Science Center Planetarium: "Be Careful What You Summon (a Kane Chronicles Adventure)" Fri. Sep 20 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

MASPG: 18 Sep, **George A. Doschek,** *The Atmosphere of the Sun and What Happens in It*

Upcoming NCA Meetings at the University of Maryland Observatory:
14 Sep Tilak Hewagama (GSFC), *Exploring Planetary Atmospheres: Follow the Trace Constituents*

12 Oct Sarah E. Brown (NCA), *Large-Scale Computer-Aided Searches in Astronomy*

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
Dated Material

Next NCA Mtg:

2013 September 14
7:30 pm
@ UMD Observatory

Dr. Tilak Hewagama

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