

Star Dust

National Capital Astronomers, Inc.

February 2010

Volume 68, Issue 6

<http://capitlastronomers.org>

Next Meeting

When: Sat. Feb. 13, 2010
Time: 7:30 pm
Where: UM Observatory
Speaker: Scott Sheppard, DTM

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Directions to Dinner/Meeting

Members and guests are invited to join us for dinner at the Garden Restaurant located in the UMUC Inn & Conference Center, 3501 University Blvd E. The meeting is held at the UM 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.

Observing after the Meeting

Following the meeting, members and guests are welcome to tour through

February 2010: Dr. Scott Sheppard Department of Terrestrial Magnetism Carnegie Institution of Washington Completing the Inventory of the Outer Solar System

Abstract: The dynamical and physical properties of asteroids offer us a glimpse at the processes operating in the Solar System, and allow us to understand planet formation and evolution. The recent advent of sensitive, wide-field CCD detectors is allowing us to complete the inventory of our Solar System and obtain detailed knowledge about the small bodies it contains. I will discuss the recent dynamical and physical results, with a focus on minor planets in stable reservoirs such as the Neptune Trojans, Trans-Neptunian objects and outer satellites of the giant planets.

Biography: Scott S. Sheppard is a research scientist at the Carnegie Institution of Washington's Department of Terrestrial Magnetism (DTM) in Washington, D.C. He obtained his Ph.D. in astronomy from the University of Hawaii, where he learned the art of discovering asteroids, satellites and Kuiper Belt objects. Scott's research interests are in the origin and evolution of planetary systems. To this end Scott studies small bodies in our solar system in order to understand how the planets formed and migrated, and he observes young stellar objects and brown dwarfs to see how other stellar systems may form.



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).

ISSN: 0898-7548

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Thank you!

215th Meeting of the American Astronomical Society

Jay Miller

NCA Members Jay Miller and Guy Brandenburg volunteered at the 215th meeting of the American Astronomical Society, held January 3-10 in Washington. In return for volunteering, Jay and Guy were able to attend the meeting for free, and here are some of Jay's reflections on the talks he heard. In addition to the two talks profiled below, Jay noted that Kevin Krisciunas of Texas A&M University spoke on using a Jacobs Staff to find the variation of the moon's diameter and its orbital eccentricity. This could have been done prior to the invention of the telescope and would be an interesting exercise for high school students.

Tuesday, 5 January, talk by Dr. Maria Zuber (MIT) The Evolving View of Water on Mars

The global dust storms originate off the southern polar cap in its summer. I think she said that conditions on Mars have been amenable for liquid water for only about one million years. Not sure of this. There must have been rain at some point because conditions on hilltops can have happened only if there was rain. There are also what appear to be meandering stream beds. This implies flowing water for enough time for the streams to meander. The source of the water was probably degassing from volcanoes, as it is on Earth. Hawaiian-like lavas (viscous) also appear to be present. Degassing from the Tharsis Rise could have yielded a 1.5 bar atmosphere and water 120 meters deep over Mars' surface. However, since the land slopes over the planet from south to north, there would have been a deeper ocean at the north pole. Since water plus carbon dioxide yields carbonic acid this should be present on the surface, but is not. However, the presence of iron salts, which form in more acidic conditions, indicates more acidic conditions. If both present polar caps consisted of only water they would be ~85% of the Greenland ice. At their greatest point the polar caps are about three kilometers thick. It appears that recent impacts have sublimated water ice. Also, there could be liquid water presently if the salt concentration is high. Orbiting satellites have indicated the presence of methane in the atmosphere. There are two possible sources, volcanic or biogenic. Much of the atmosphere has been blown off by large impacts. Also, she did not mention that Mars' smaller gravity would allow more of the atmosphere to go off into space. Lastly, an indication of recent water flow is the fact that gullies are seen to cut across dunes and dunes are active formations.

Page 3 Top: Summer and winter distribution of water ice on northern hemisphere of Mars, as measured by Mars Odyssey spacecraft.
<http://svs.gsfc.nasa.gov/vis/a000000/a002700/a002779/>

Page 3 Bottom: Bighorn Medicine Wheel, Wyoming.
<http://commons.wikimedia.org/wiki/File:MedicineWheel.jpg#filehistory>

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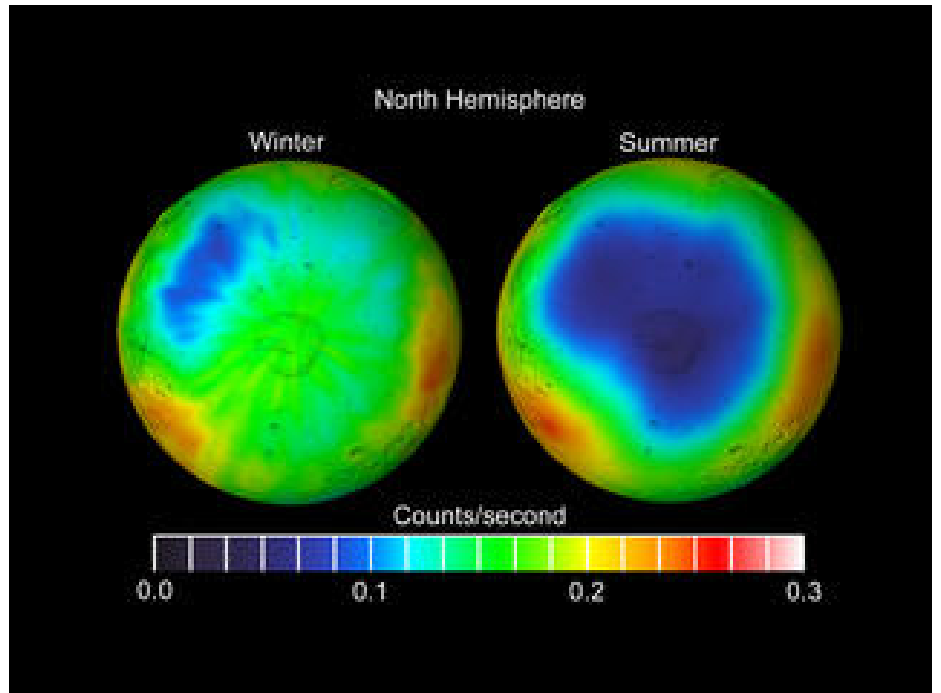
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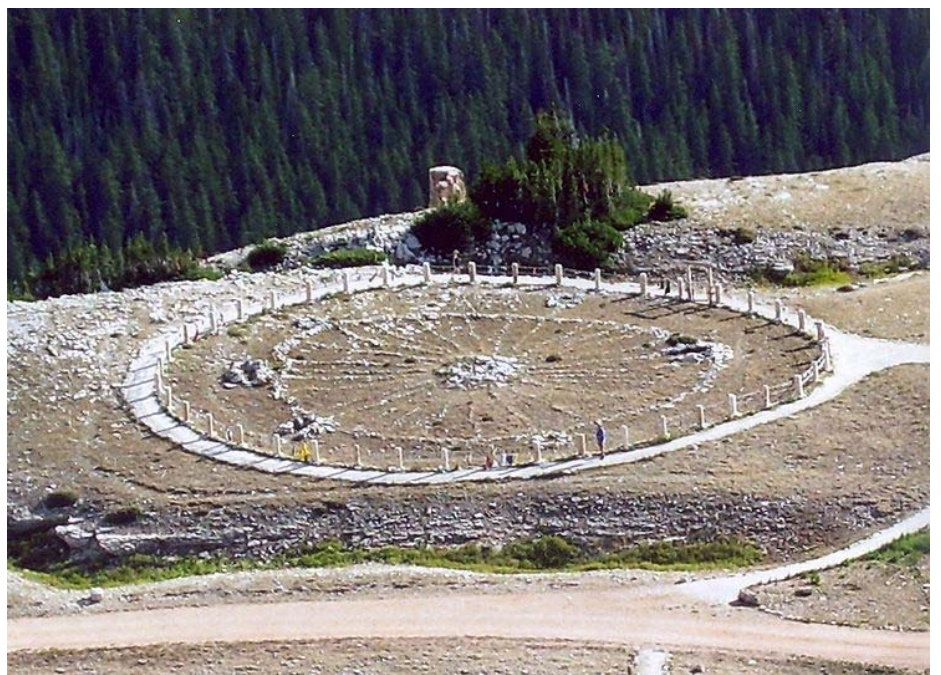
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Carol Ambruster, (Villanova U)

Criteria for the Attribution of Intent to Archaeoastronomical Alignments: An Example in Chaco Canyon, NM

This talk was from one of the History of Astronomy sessions, and refers to constructions such as Stonehenge. There are a number of formations in Chaco Canyon which might have astronomical significance. However, to prove cultural significance one needs at least three points in a line on the artifact. There is a formation called the Bighorn Medicine Wheel which has 28 points around a circle, but the only possible preferential time indicated might be the summer solstice.



How to Make \$1000 with Your Telescope February, 2010

*By Tom Koonce
Antelope Valley Astronomy Club, Inc.
Lancaster, California*

So...You've observed the Moon and the planets in detail. You've awed your family with close-up views of craters, rings, and subtle hues of color. You've used your observational successes to justify "investment" in the purchase of a bigger, better telescope and sharper eyepieces with wider fields of view so that you can observe deep-sky objects such as remote galaxies and faint nebulae. You know what a SCT is and know and understand cool down times, stellar magnitude, seeing, and why every serious amateur needs a Telrad. Perhaps you invested in imaging equipment and are starting to produce night sky pictures like those in the magazines. Does this fit you?

Now you're asking yourself, "How can I make some money with my telescope to recoup my investment? ...How can I make \$1000 with my telescope?"

The weather will be warming up soon, and the opportunity to feel that sense of sustained excitement you always get as you head back out under the stars. More importantly, you'll soon have opportunities to interact with others who don't have your knowledge of astronomy, and certainly don't have the kind of telescope equipment you've put together! Sharing nighttime views with others is the key to getting a big payoff from your telescope. No, not by charging people to view through your eyepiece, but instead by getting a charge out of someone's first spectacular view through your telescope!

How can you make \$1000 from your telescope? If you want fast cash, I suggest that you start out with a telescope worth \$2500 and offer it for sale on AstroMart.com. But by offering views of the night sky to people who have never had the opportunity, you'll easily get \$1000 of value for every adult who gasps in astonishment when seeing the Ring Nebula or a distant galaxy, comprehending their physical significance. You'll get a million dollars of satisfaction each child that sees the craters on the Moon and the rings of Saturn for the first time and cries out with joy.

How can you make money in amateur astronomy? The truth is, if you're involved in this hobby to make cash, you can either sell your amazing astrophotos, meteorites that you found, or maybe invent the next Telrad. But if you want the real payoff, then share your love of astronomy with others as the weather turns warmer. You will provide them inspiration and enrichment worth \$1000 and more.

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

Asteroidal Occultations

Date	Day	EDT	Star	Mag.	Asteroid	mag	dur. s	Ap. " "	Location
Feb 10	Wed	1:27	TYC24640398	10.1	Kiyose	6.3	2 3	SMD,nVA,DC?	rnk8
Feb 10	Wed	21:38	2UC33168004	12.5	Lillianna	3.4	6 9	WV,PA;MD,nVA?	
Feb 13	Sat	4:23	SAO 101423	6.9	2003 AA10	11.5	0.4 2	wNC,VA,MD,NJ;PA?	
Feb 17	Wed	4:36	2UC17283308	11.9C	Interamnia	0.4	30 10	OH,WV,VA,NC,SC	
Mar 1	Mon	0:32	2UC33578598	12.3	Nyanza	2.7	6 8	DE,MD,swPA;nVA?	
Mar 1	Mon	5:04	2UC25397667	12.2C	Doris	1.0	7 8	WV,VA,NC;MD,DE?	
Mar 1	Mon	19:39	SAO 109337	8.5	Thisbe	3.9	4 3	nOH,PA,sNY,NJ,CT	
Mar 3	Wed	19:54	2UC45147850	13.2	Bouzareah	2.0	7 9	w&sPA,MD,DE;nVA?	
Mar 8	Mon	20:08	SAO 93050	9.1	Octavia	5.2	2 4	cOH,sPA,NJ;nMD?	
Mar 9	Tue	5:49	TYC14450444	11.0	Juliana	3.4	5 7	eNC,eVA,wMD,wPA	

Lunar Grazing Occultations (*, Dunham plans no expedition)

Date	Day	EDT	Star	Mag.	% alt	CA	Location
Feb 20	Sat	19:54	SAO 75704	8.1	39+ 51	5N	Noksvl&Woodbrdg,VA;StChrls,MD
*** Dates and times above are EST, those below are EDT ***							
Mar 17	Wed	19:45	SAO 92274	9.4	4+ 6	16N	Manassas & Mt. Vernon, VA
Mar 20	Sat	19:11	Merope	4.1	24+ 52	10N	Estes, TX Sun alt. -8 deg.
Mar 20	Sat	22:54	ZC 564	6.2	25+ 16	14N	Cleveland;Pitsbrg;Columbia,MD

Total Lunar Occultations

DATE	Day	EDT	Ph	Star	Mag.	% alt	CA	Sp.	Notes
Feb 8	Mon	5:33	R	BF Oph	7.5	26- 16	66S	G0	SAO 185020, spec. bin.
Feb 8	Mon	6:06	R	ZC 2458	6.3	26- 19	89S	B8	
Feb 16	Tue	17:13	D	TX Piscium	5.0	7+ 35	90S	N0	ZC 3501=19 Psc; Sun +5
Feb 20	Sat	19:06	D	SAO 75705	7.8	39+ 59	52S	K0	
Feb 20	Sat	23:00	D	SAO 75764	7.6	40+ 16	32S	F0	close double
Feb 20	Sat	23:08	D	ZC 461	7.2	40+ 15	67S	K0	Azimuth 287 deg.
Feb 20	Sat	23:39	D	SAO 75777	7.6	40+ 9	48N	B9	Azimuth 291 deg.
Feb 21	Sun	18:05	D	SAO 76358	7.2	49+ 75	69S	B9	Sun alt. -4 deg.
Feb 21	Sun	21:44	D	36 Tauri	5.5	50+ 42	41S	G0	ZC 598,double,sep. 0.1"
Feb 21	Sun	0:13	D	SAO 76480	7.4	51+ 14	36S	A3	Azimuth 290 deg.
Feb 22	Mon	19:27	D	SAO 76883	8.0	61+ 75	25S	G2	
Feb 23	Tue	22:55	D	SAO 78038	7.4	72+ 51	38S	G0	mg2 9.1 sep. 31",PA 189
Feb 23	Tue	23:50	D	5 Gem	5.8	73+ 40	68S	K0	ZC 936, spect. binary
Feb 24	Wed	2:05	D	8 Gem	6.1	74+ 15	32S	G8	Az289, ZC954,maybe dbl.
Feb 24	Wed	18:55	D	44 Gem	6.0	81+ 60	47S	B8	ZC 1078
Feb 24	Wed	19:50	D	R Gem	7.5	82+ 69	84S	S3	SAO79070,MiraVarMg.6-14
Feb 24	Wed	21:26	D	SAO 79126	7.6	82+ 72	49S	K2	
Feb 25	Thu	0:25	D	ZC 1102	7.0	83+ 44	75S	K5	
Feb 25	Thu	19:11	D	ZC 1227	7.6	90+ 50	53N	F8	
Feb 26	Fri	3:58	D	ZC 1260	7.1	92+ 13	87N	F5	Azimuth 282 deg.
Feb 26	Fri	4:24	D	25 Cancri	6.1	92+ 8	88S	F6	ZC1262,Az.286,double??
Mar 2	Tue	5:24	R	II Vir	6.6	95- 20	17S	A0	ZC1752,WA210,Term.d.8"
Mar 2	Tue	22:31	R	ZC 1852	6.0	91- 17	74N	A2	double, sep. 0.1"
Mar 2	Tue	23:47	R	SAO 157613	7.4	90- 28	58N	K5	double, sep. 0.1"
Mar 3	Wed	0:10	R	ZC 1858	6.3	90- 31	67N	K5	
Mar 5	Fri	0:01	R	ZC 2109	6.1	74- 7	70N	K4	Azimuth 125 deg.
Mar 6	Sat	5:41	R	SAO 183883	8.0	62- 26	77S	M1	Sun alt. -11 deg.
Mar 11	Thu	6:18	R	sigma Cap	5.3	16- 19	76N	K2	ZC 2963, Sun-2 deg.

Explanations & more information are 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 into their schedules, 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.

Science News

Thank you Nancy Grace Roman for finding this article.

Scientists Taking Suggestions on Where to Image the Red Planet Using NASA Satellite

From NASA News, Jan. 20, 2010
Dwayne Brown, Guy Webster,
Daniel Stolte

The HiRISE team is pleased to give the public this opportunity to propose imaging targets using the most powerful camera aboard a NASA spacecraft orbiting Mars. Share the excitement of seeing your favorite spot on Mars at people-scale resolution.

Students, researchers and others can view Mars maps using a new online tool to see where images have been taken, check which targets already have been suggested and make new suggestions.

In addition to identifying the location on a map, anyone nominating a target will be asked to give the observation a title, explain the potential scientific benefit of photographing the site and put the suggestion into one of the camera team's 18 science themes. The themes include categories such as impact processes, seasonal processes and volcanic processes.

To make camera suggestions, visit: <http://uahirise.org/suggest/>

For more information about the MRO mission, visit: <http://www.nasa.gov/mro>

Forest Heights Science Fair

Anyone interested in being a judge for a K-6 STEM (Science, Technology, Engineering, Math) fair February 24 in Forest Heights, MD for a high needs school should contact Elizabeth Levin at elizabeth.levin@pgcps.org.

The High Resolution Imaging Science Experiment (HiRISE) is an instrument from the University of Arizona onboard the Jet Propulsion Laboratory's Mars Reconnaissance Orbiter spacecraft. <http://www.uahirise.org/>



The images of Mars on this page are from the HiRISE instrument. The top image http://www.uahirise.org/ESP_015942_1980 shows a geologically complex area that is a possible landing site for future spacecraft. This area is one small part of Syrtis Major, a large volcanic region that sometimes appears as a dark smudge when viewing Mars through a telescope. The image below http://www.uahirise.org/PSP_010200_1805 shows a cluster of small recently formed craters.



Star Dust Speaker Reviews

By Michael Chesnes

I warmly encourage NCA members to write reviews for the talks at our meetings, so that they can be published in Star Dust. We have an excellent lineup of speakers every year, and our reviews are both a valuable historical record of our activities and a way to recognize our speakers.

Reminder

After the meeting, everyone is invited to join us at Plato's Diner in College Park. Plato's is 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.

Calendar of Events

NCA Mirror- and Telescope-making Classes: Tuesdays Feb. 2, 9, 16, 23 and Fridays, Feb. 5, 12, 19, 26, 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 gbrandenburg@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). There is telescope viewing afterward if the sky is clear.

Dinner: Saturday, Feb. 13 at 5:30 pm, preceding the meeting, at the [Garden Restaurant](#) in the University of Maryland University College Inn and Conference Center.

The Marilyn J. Praisner Safe and Earth-Friendly Roadway Act: Hearing on Maryland Delegate Al Carr's bill Tuesday, February 9 at 1 PM before the House Environmental Matters Committee.

Forest Heights Science Fair: February 24, contact elizabeth.levin@pgcps.org

Upcoming NCA Meetings at the University of Maryland Observatory

Feb 13, 2010

Scott Sheppard (DTM) *Completing the Inventory of the Outer Solar System*

Mar. 13, 2010

Chris Reynolds (U. MD) *X-rays from the Nuclei of Galaxies*

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All members receive Star Dust, the monthly newsletter announcing NCA activities. The basic dues cover an electronic copy of Star Dust; paper copies are \$10 extra. You may also choose to get Sky & Telescope magazine at the discounted rate of \$33.

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Paper copy of Star Dust.....	\$10
Sky & Telescope	\$33
Total.....	_____

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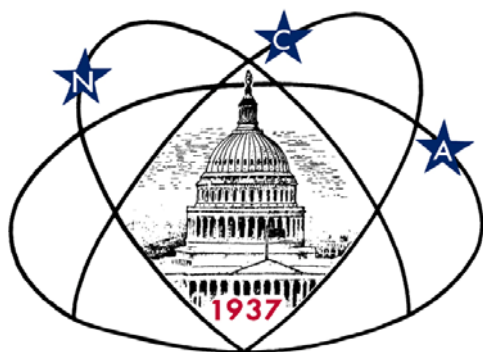
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Feb. 13

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@ UM Obs

Dr. Scott Sheppard

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