Star Dust

National Capital Astronomers, Inc.

June 2012

Volume 70, Issue 10

http://capitalastronomers.org

Next Meeting

When: Sat. June 9, 2012

Time: 7:30 pm

Where: UMD Observatory

Speaker: Science Fair winners and Election

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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 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.

Observing after the Meeting

Following the meeting, members and guests are welcome to tour through the Observatory. Weather-permitting,

June 2012

Science Fair Winners

Joe Morris

The June meeting will feature presentations by two winners of the NCA award for notable science fair projects:

Huy Lam (Poolesville High School) will speak on his project "A Multi-Satellite Study of Auroral Kilometric Radiation Using the Virtual Wave Observatory"

James Waychoff (Parklane Middle School) will present "Variation of the Number of Cosmic Rays Bombarding the Earth at Day and Night: Cosmic Ray Detection and Analysis Using a Cloud Chamber"

This year the June pre-meeting dinner, to which the winners and their parents are invited, will be held at Three Brothers Pizza in Beltsville, MD. The address is 10961 Baltimore Avenue (aka Route 1), just south of Powder Mill Road. We've reserved some tables; everyone is welcome (no additional reservations are required) so please plan to arrive before about 5:30.

2012 Transit of Venus

NCA members are invited to observe the upcoming transit of Venus at the following events. Stay tuned to the NCA listserv, since Guy Brandenburg may also be observing from McKinley High School in Washington, D.C...

Exploring the Sky:
(See Page 3) Observers will be set up at the usual location near the Rock Creek Park Nature Center. Come before 6:00 pm if you can, so you have time to get ready for the transit. Don't forget regularly scheduled June 16 session.

University of Maryland Observatory:
Roof of Stadium Dr. Garage from 5:00 to 10:30 pm. In lieu of regularly scheduled open house. Night sky observing if clear afterwards.
www.astro.umd.edu/openhouse/2programs/special/20120605_Venus.html

Montgomery College Planetarium:
7621 Fenton Street, Takoma Park, MD (240) 567-1463.
Tuesday, June 5 at 5 pm. Transit of Venus across the disk of the Sun from the roof of the King Street Parking Garage. If it is hopelessly cloudy and predicted to continue that way well past the event then we will have a show in the planetarium watching web cams of this event. The real thing is better!
www.montgomerycollege.edu/Departments/planet/planet/VenusTransit.html

several of the telescopes will also be set up for viewing.

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Thank you!

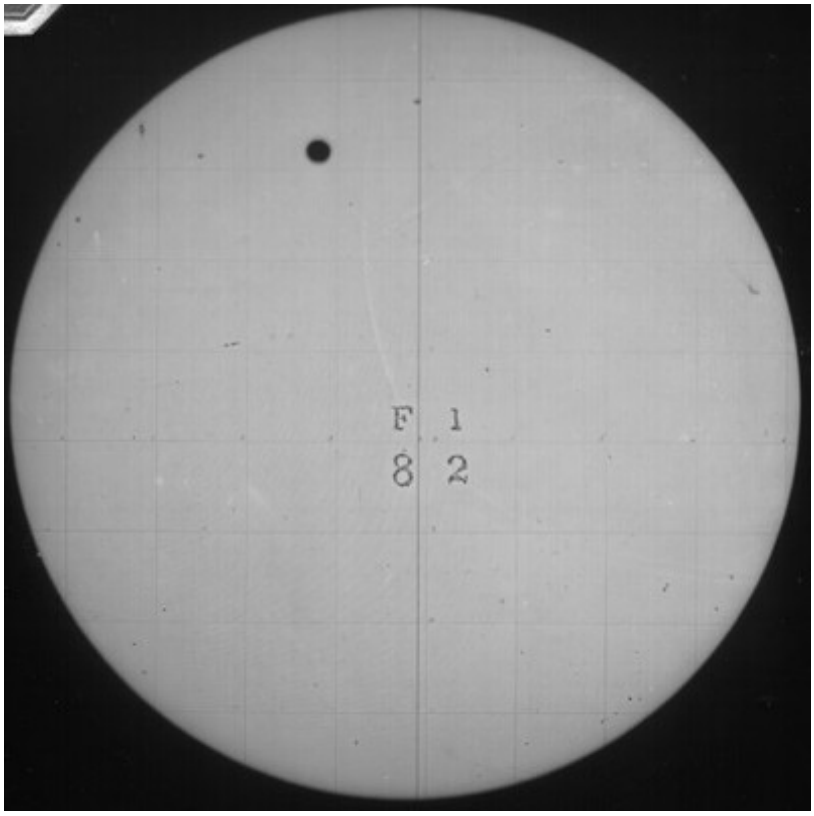
Reminder

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.

Transit of Venus Gallery

Here are some images of previous Venus transits.

1882 (Courtesy USNO Library)
www.usno.navy.mil/USNO/astronomical-applications/images_aa/venustran1882_glass11.jpg/view



Jeremiah Horrocks Observing 1639 Transit
en.wikipedia.org/wiki/File:Horrocks_observing_the_1639_transit_of_Venus_by_Eyre_Crowe.jpg

Exploring the Sky

6/05	**6:00 PM**	Transit of Venus (solar observing)
6/16	9:00 PM	Solstice 6/20; Mars and Saturn
7/21	9:00 PM	Summer Triangle; Moon passing near Regulus
8/18	8:30 PM	Mars and Saturn near Spica; Andromeda rising
9/15	8:00 PM	Cassiopeia level with Polaris; equinox next week
10/20	7:30 PM	Astronomy Day; Orionid meteor shower
11/03	7:00 PM	Pleiades and Winter constellations appear

Questions? Call the Nature Center at (202) 895-6070 or check:
http://www.nps.gov/rocr/planyourvisit/expsky.htm
http://www.capitalastronomers.org

A presentation of the National Park Service and National Capital Astronomers

Mighty Mini Lessons Learned in Khabarovsk

David Dunham

Scotty Degenhardt's design of small "mighty mini" video systems, and the larger "midi's" and "maxi's", have revolutionized multiple-station deployments and have greatly increased the number of chords, and scientific results, from many relatively bright asteroidal occultations since these systems were developed almost four years ago. But only a few of us have made multiple deployments; using these "minimalist" systems, necessarily made as small as possible to allow air transport that's not prohibitively expensive, is as much an art as a science by those of us who use them frequently, with stellar pattern recognition and "star hopping" being crucial skills.

Although tiring, it can be an extreme sport of endurance; those of us with an array of mighty mini's relish early morning occultations, where several hours can be used to deploy the systems across a whole occultation path at times when most people are fast asleep. But many good events occur in the evening, not very long after sunset, where the available dark time before the occultation is too short to deploy more than one or two systems. For them, a few attempts have been made to enlist the help of local observers to deploy mighty mini systems across a path to give reasonable coverage. Paul Maley has enlisted the aid of others to turn on the camcorders to record the occultation for some of his deployments, but as far as I know, he has done the crucial pre-pointing of all of the mini's (or in some cases, midi's). That's all right for events with enough dark time for the purpose, but that can't be done for most events when the sky is dark enough for only an hour or two before the occultation, especially to deploy stations across a whole predicted path and some of its uncertainty zone. In these cases, the local observers need to learn how to point the mini's (or midi's).

Crucial for such efforts is a local amateur astronomer who can take charge, to obtain help from enough other observers and organize them to spread across the area that needs to be covered, typically more than 100 km wide. Fortunately, for the three occultations where I've tried to train others to use the mini's, including pointing them, I have had good support from a local observer who did the necessary local organizing.

Continued on Page 5

One recent opportunity to teach others to use mighty mini's came on May 11 this year, when the asteroid (28) Bellona, expected to be about 130 km in diameter, would occult the 6.5-mag. star SAO 140947 = HIP 78870 in Ophiuchus, which happened to be only about 4 degrees from delta Ophiuchi, the star occulted by Roma in July 2010. The predicted path crossed the Russian Far East, passing over the cities of Blagoveschensk and Khabarovsk. Khabarovsk is the largest city in the Russian Far East (population over 600,000) with highways leading northeast and south from the city, covering the predicted path and its uncertainly zone, so it was a logical place from which to try to observe this event.

I was working at the Moscow Institute of Electronics and Mathematics (MIEM) at the time, and am thankful to them for supporting my travel, and that of MIEM's Olga Erokhina, to travel 7 time zones east from Moscow to Khabarovsk, using funds from our megagrant to study asteroids, and develop orbital plans to defend Earth from potentially hazardous ones. Olga and I searched the Russian amateur astronomy forum to find Igor in Khabarovsk; Igor understood how we wanted to spread observers across the path, and made field trips to find suitable sites before Olga and I arrived in Khabarovsk early the morning of May 10. Igor recruited four other observers in Khabarovsk to make the observations (so that with him and me, we could use all six available systems), and we all met at a conference room at Igor's employer right after normal working hours. We assembled all of the mini's and midi's, and pointed them out the window to image distant buildings, and verify that they all worked.

The sky was beautifully clear, and the observers left to their appointed stations; with rush-hour traffic (Russians now have a lot more cars than in Soviet times, but the road infrastructure has not kept up, a familiar problem in many countries, including many areas of the US), there was just time for the observers going to the farthest stations to reach them.

Mid-Atlantic Occultations and Expeditions

David Dunham

Asteroidal and Planetary Occultations

Date	Day	EDT	Star	Mag.	Asteroid	dmag	dur. s	Ap. "	Location
Jun 9	Sat	4:56	2UC27870726	11.3	Tauntonia	3.1	4	7	MD,nVA,WV;sPA?
Jun 10	Sun	4:54	TYC58030981	10.2	Eleonora	1.7	22	5	sWV,w&sVA,neNC
Jun 23	Sat	0:51	2UC22082298	12.3C	Hamburga	1.1	6	8	NJ,DE,MD,DC,nVA
Jul 4	Wed	0:45	TYC73681110	11.3	Alauda	1.2	17	8	PA to eNC;alt.13
Jul 22	Sun	0:00	TYC52301175	10.2	Tarkovskij	5.9	2	5	VA,WV;DC,seMD?
Aug 4	Sat	3:43	TYC23880226	10.1	Ambrosia	3.9	1	5	wNC,wVA,wMD,ePA
Aug 7	Tue	4:14	2UC27404901	11.7	Pittsburghia	2.2	4	7	wPA,WV,swVA,wNC
Aug 15	Wed	21:11	SAO 128155	7.7	Strattonia	6.9	4	2	PA,nNJ,NYC,sNE
Sep 9	Sun	20:43	SAO 187062	9.9	Utra	6.2	3	4	seSC,eNC,seVA

Lunar Grazing Occultations (*, Dunham plans no expedition)

Date	Day	EDT	Star	Mag.	%	alt	CA	Location
Jun 16	Sat	5:08	SAO 93319	7.6	9- 17		3N	*Sheperdstown,WV; N.York,PA
Jul 8	Sun	5:16	ZC 3371	6.4	76- 47		7N	Frostburg, MD; Lewisburg, PA
Jul 16	Mon	4:33	X 6971	9.3	7- 8		1S	*Pea Island, NC
Aug 14	Tue	5:18	SAO 96283	8.1	11- 21		2S	*Restn,VA;Potomac&Brtnsvl,MD
Sep 9	Sun	5:44	SAO 77515	8.2	42- 60		1S	*Skiprs,Sufolk,&Chesapeak,VA

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

Total Lunar Occultations

DATE	Day	EDT	Ph	Star	Mag.	%	alt	CA	Sp.	Notes
Jun 10	Sun	3:17	R	ZC 3290	7.3	61- 29		39S	F0	close double?
Jun 14	Thu	5:21	R	100Piscium	7.3	23- 33		50S	A3	Sun-4,ZC230,mg2 8,16"
Jun 21	Thu	21:16	D	1 Cancri	5.8	6+ 7		60N	K3	Sun -7, Az.285, ZC1197
Jun 22	Fri	21:10	D	50 Cancri	5.9	11+ 15		75S	A1	Sun -6, Az.274, ZC1318
Jun 23	Sat	22:06	D	SAO 117819	7.4	19+ 10		67S	A2	Az.271,mg2 13,2",PA164
Jun 24	Sun	22:04	D	SAO 118319	7.8	28+ 17		48N	A0	
Jun 26	Tue	20:55	D	RW Vir	7.1	49+ 36		52S	M5	Sun alt. -4, ZC 1745
Jun 29	Fri	1:06	D	ZC 2018	6.6	73+ 7		82N	A1	Azimuth 242 degrees
Jul 2	Mon	23:56	D	14 Sgr	5.5	99+ 29		63N	K2	ZC 2635, Term.Dist.8"
Jul 4	Wed	4:05	R	ZC 2825	6.3	100- 23		82S	B5	AA 238, Term.Dist. 7"
Jul 8	Sun	5:36	R	ZC 3371	6.4	76- 49		32N	F0	Sun alt. -3 deg.
Jul 9	Mon	2:05	R	SAO 128329	7.5	67- 29		67N	K2	
Jul 13	Fri	1:52	R	pi Arietis	5.3	29- 4		40N	B6	Az70,ZC416,mg2 8 3",121
Jul 13	Fri	4:57	R	44 Arietis	7.0	28- 38		89S	A3	Sun alt. -10, ZC 429
Jul 13	Fri	5:58	R	rho Arietis	5.6	28- 50		58N	F6	Sun alt. 0, ZC 433
Jul 14	Sat	3:44	R	13 Tauri	5.7	21- 17		69N	B9	ZC 531, spec. binary
Jul 14	Sat	4:27	R	14 Tauri	6.1	20- 25		81S	G8	ZC 533
Jul 22	Sun	20:31	D	62 Leonis	6.0	16+ 18		35N	K3	Sun alt. -2, ZC 1605
Jul 24	Tue	22:49	D	ZC 1845	6.5	36+ 4		55N	G8	Az 253,mg2 9,30",PA300
Jul 25	Wed	22:00	D	SAO 158128	7.5	46+ 18		89S	K5	
Jul 25	Wed	22:24	D	SAO 158141	7.7	47+ 15		81N	M1	Azimuth 237 deg.
Jul 27	Fri	20:08	D	ZC 2228	5.8	69+ 30		57S	K0	Sun alt. +2 deg.
Jul 28	Sat	22:31	D	SAO 184593	7.6	80+ 27		46S	B9	
Jul 29	Sun	20:45	D	ZC 2549	6.6	88+ 25		78N	F0	Sun -5, spec. binary
Jul 30	Mon	20:27	D	ZC 2720	6.4	94+ 18		40S	F5	Sun alt. -2 deg.
Jul 30	Mon	23:55	D	SAO 187349	6.8	95+ 30		22N	G0	Term.D. 15", spec. bin.
Aug 3	Fri	3:14	R	46 Cap	5.1	98- 39		52S	G8	Axis Ang. 215, ZC 3185
Aug 3	Fri	3:20	R	ZC 3184	7.0	98- 39		65S	K0	AA 228, close double?
Aug 5	Sun	1:59	R	ZC 3444	6.3	89- 46		37S	K2	mag.2 10, 39", PA 149
Aug 5	Sun	5:22	R	kappa Psc	5.0	88- 46		53N	A0	ZC3453,mg2 10,177",P343
Aug 5	Sun	5:31	R	9 Piscium	6.3	88- 44		90S	G7	Sun -8,ZC3455,spec.bin.
Aug 10	Fri	3:52	R	ZC 497	6.5	45- 41		19S	A3	close double?
Aug 11	Sat	4:15	R	omega2 Tau	4.9	35- 38		66N	A3	ZC 628, close double?
Aug 13	Mon	5:28	R	SAO 77889	6.9	18- 33		88N	G5	Sun altitude -10 deg.
Aug 13	Mon	16:41	D	Venus	-4.4	15- 5	-71N			Sun +38, Az. 292, AA 69
Aug 23	Thu	21:59	D	ZC 2207	7.0	44+ 13		45N	A4	Azimuth 231 degrees
Aug 27	Mon	1:13	D	ZC 2697	6.5	78+ 9		65S	F0	Azimuth 234 degrees
Sep 2	Sun	0:44	R	22 Piscium	5.6	97- 49		24S	K4	AA194,ZC3512,Term.D. 9"
Sep 6	Thu	2:53	R	UW Arietis	6.1	71- 53		75S	B1	ZC 455, close double?
Sep 7	Fri	5:16	R	ZC 595	6.8	61- 69		35N	K1	Close double?
Sep 9	Sun	1:28	R	SAO 77323	7.7	43- 12		56N	G4	Azimuth 73 degrees
Sep 9	Sun	4:07	R	Ceres	8.8	42- 42		17S		pred. dur. 1.8 sec.
Sep 9	Sun	6:35	R	Y Tauri	6.9	41- 67		85S	M5	Sun -2,SAO 77516,min. 9

Explanations & more information is at http://iota.jhuapl.edu/exped.htm .
David Dunham, dunham@starpower.net, phone 301-526-5590 or +7-916-0929487

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Although we failed to determine the outline of Bellona, the observations provide a valuable astrometric result, with an accuracy of about 0.15 path-width or about 0.015". Also, analysis of the video recording will determine whether or not the spectral type K0 star is a close double (our quick visual inspection of the tape shows nothing unusual, but analysis could show quick step events that might be due to a companion), or a gradual drop might be evidence of the star's angular diameter (expected to be about 0.0007").

Like the interaction of IOTA members and other amateur astronomers at the IOTA booth at the North-East Astronomy Forum in New York in April, both the local observers in Khabarovsk and I learned much from the effort to observe the Bellona occultation. The observers in Khabarovsk, who had only a vague knowledge of occultations before, now realize that making observations of occultations with mobile equipment is an interesting activity that can result in valuable contributions to astronomy.

You can see the charts that were provided to observers, mostly translated into Russian, in the Bellona occultation area "Charts (PPT)" at the top-left part of http://www.asteroidoccultation.com/observations/NA/ .

I've sent the English-language version to Brad to post there, also, when he gets a chance to do that; it includes a map showing the plan of stations across the area.

Besides Olga and all those in Khabarovsk who participated in this effort, I also thank Andrew Cool in Australia; he set up a special page covering the Khabarovsk region on his excellent cloud-cover prediction Web site, www.skippysky.com.au to support our effort during the days before the occultation.

Thank you Nancy Grace Roman for finding this article.

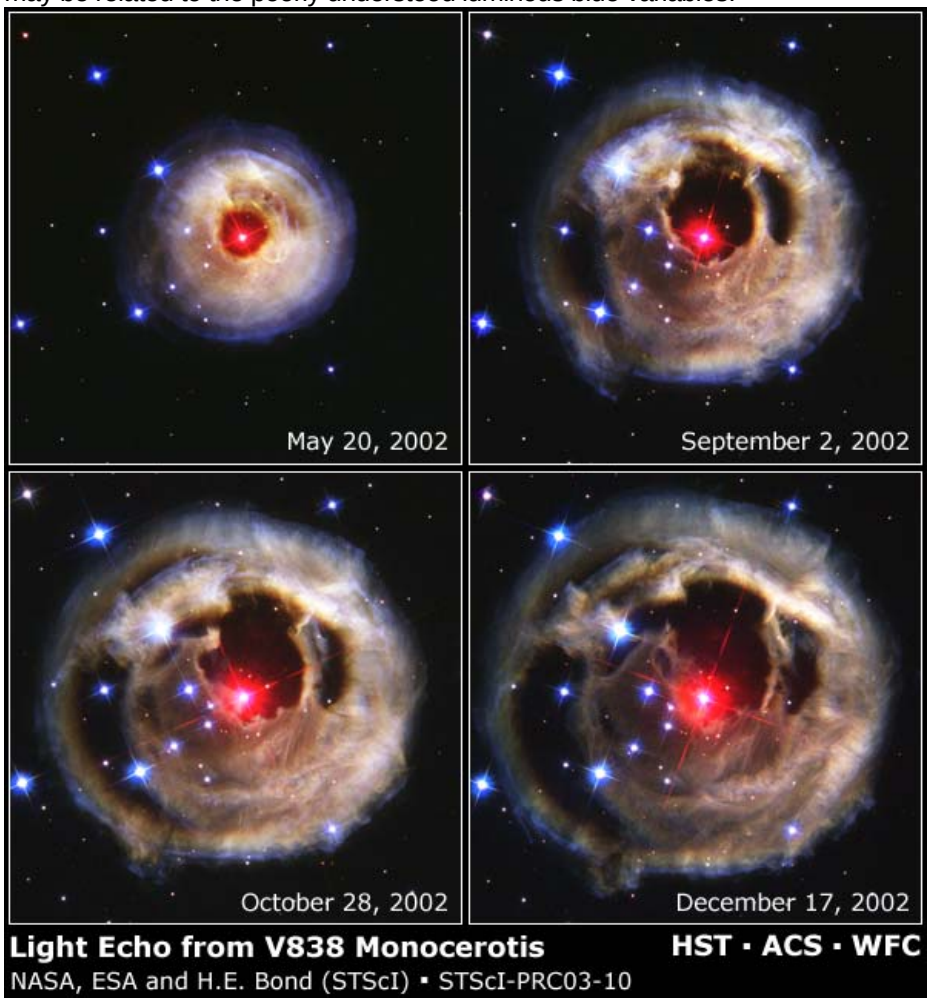
Between Novae and Supernovae

Based on article by
Howard E. Bond in the STScI Newsletter Vol. 28, No. 2, 2011

Until recently there has been a large gap in maximum luminosity between novae and supernovae. In the past several years, transient brightenings have been found that populate this gap. Because these are quite red, they are called Intermediate-Luminosity Red Transients (ILRTs).

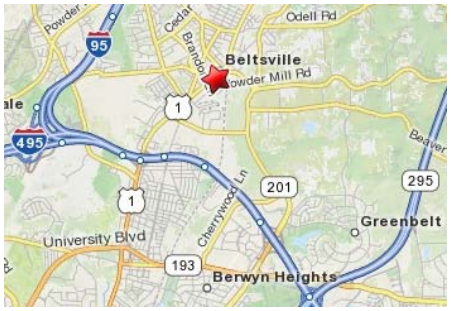
There are two types of these transients. One of the best known of the first type is V838 Mon. Several groups had argued that these resulted from the merger of the components of a close binary. A confirmation has come from observations of V1309 Sco in a field that had been monitored for several years by the OGLE project. The progenitor was found to have been a short period contact binary. It was even possible to detect the shortening of the orbital period over the course of several years before the outburst. Mergers are now the leading contender to account for ILRTs that occur in old populations.

There is another class of ILRTs that is about two magnitudes brighter than the merger candidates. Two occurred in 2008 in nearby galaxies. The spiral arm field of NCG 300 was the site of the transient NGC 300 OT-2008. The progenitor did not appear in optical images of this field down to magnitude 28.5. However the Spitzer Space Telescope showed a heavily dust-enshrouded source in the mid infra-red in the location of the future outburst. In the mid infrared it is one of the brightest sources in NGC 300. The origin of these sources is unknown but they may be related to the poorly understood luminous blue variables.



Maps and Directions for Three Brothers Restaurant in Beltsville, MD

Three Brothers is located at 10961 Baltimore Avenue (Route 1), just south of its intersection with Powder Mill road (Route 201).



Calendar of Events

NCA Mirror- and Telescope-making Classes: Tuesdays June 4, 11, 18, 25, and Fridays, June 1, 8, 15, 22, 29, 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

Dinner: Saturday, June 9 at 5:30 pm, preceding the meeting, at Three Brothers restaurant. (See map on left column of Page 7.)

Montgomery College Planetarium:
7621 Fenton Street, Takoma Park, MD (240) 567-1463.
Saturday, 22 September 2012 at 7pm. Mayan Calendars. In the Planetarium.
http://www.mc.cc.md.us/Departments/planet/planet/MayanAstronomy.html

Upcoming NCA Meetings at the University of Maryland Observatory

June 9, 2012 **Science Fair winners** and Election

National Capital Astronomers Membership Form

Name: _____ **Date:** ____/____/____

Address: _____ **ZIP Code:** _____

Home Phone: ____-____-____ **E-mail:** _____ **Age:** _____

Present or Former Occupation (Or, if Student, Field of Study): _____

Academic Degrees: _____ **Field(s) of Specialization:** _____

Employer or Educational Institution: _____

Student Membership: ..... **$ 5**

Standard Individual or Family Membership: **$10**

Optional additional contribution to NCA: ..... **$**_____

Total Payment (circle applicable membership category above): ..... **$**_____

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Michael L. Brabanski, NCA Treasurer; 10610 Bucknell Drive; Silver Spring, MD 20902

National Capital Astronomers, Inc.

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First Class
Dated Material

Next NCA Mtg:

June 9

7:30 pm

@ UM Obs

Science Fair Winners and Elections

Inside This Issue