Star Dust

National Capital Astronomers, Inc.

October 2009

Volume 68, Issue 2

http://capitalastronomers.org

Next Meeting

When: Sat. Oct. 10, 2009

Time: 7:30 pm

Where: UM Observatory

Speaker: Robert Olling, UM

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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 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.

October 2009: Dr. Robert Olling
University of Maryland
Proper Motions within Andromeda

Abstract: Distances to astronomical objects, while not intrinsic properties, play a fundamental role in astrophysics. For example, in antiquity, the heliocentric model was rejected because the predicted stellar annual parallax was not observed.

In recent history "astronomical accuracy" meant "to within a factor of two, or so." However, as the quality of astronomical data has steadily increased, so has the need for accurate distances. For example, distances to stars can be particularly helpful in double-checking the predictions of the age of the universe and the value of the Hubble constant based on recent cosmological data sets.

There are basically two classes of distance measures: 1) geometric methods (e.g., annual parallax) and 2) "intrinsic property" methods (e.g., the Cepheid Period-Luminosity relation). The results of the former method depends on how accurately we can determine the small parallax angle, which is mostly limited by our technological capabilities. The second method depends on some intrinsic property of stars, and is mostly limited by how well-behaved the star is. In this talk, I will focus on the geometric methods, and in particular on the "Rotational Parallax" method. With data from the proposed SIM-Lite mission, the Rotational Parallax method can deliver a distance to the Andromeda galaxy with an error of 1%, roughly 5-10 times better than other proposed methods.

Biography: Rob Olling has been at the University of Maryland since 2006, where he worked on analysis of the 2MASS catalog and on various aspects of the proposed SIM-Lite astrometric. In particular, he has worked on the Rotational Parallax method, and also on the detection of long-period extra-solar planets. Before that, he worked at the US Naval Observatory at various proposed astrometric missions (FAME/AMEX/OBSS). In the late 1990's he worked (in Southampton, UK) on the size and shape of the Milky Way. In graduate school in the early nineties at Columbia University (NY), he worked on high-resolution neutral hydrogen observations (from the VLA) to determine the shape of dark matter halos. A native of the province of Frisia in the Netherlands, Dr. Olling is one of the few people on this side of the pond who completed the world-famous 120 mi Eleven-City speedskating race.

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.

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Thank you!

Come to the Annual Fall Open House at Hopewell Observatory on Saturday, November 7

(Cloudy or not!)

Guy Brandenburg

All members of National Capital Astronomers (and their friends and relatives) are invited to come see the skies at a small, private, member-built and member-owned observatory in the foothills of Northern Virginia on the evening of Saturday, November 7, 2009. If the skies are overcast or rainy, then the Open House will consist instead of a tour of our facilities.

The Hopewell Observatory is located on a small mountainous ridge called the Bull Run Mountains, about 4 ¾ miles northwest, measured in a straight line, from the intersection of I-66 and US-15 at the small town of Haymarket, VA. It is about 36 miles due west of the US Capitol building, and is probably located on the highest and darkest location anywhere that close to the Capital Beltway. It is surrounded by wooded areas, and the observatory's telescopes are located just about at the level of the local tree-tops. Thanks to the activities of some of our members (especially Bruce Roemmelt), the local subdivisions and shopping centers have been diligent in installing full-cut-off lighting, so the light pollution is not too bad, considering everything. When the moon is down and the skies are clear, it's fairly easy to see the Milky Way.

Our Telescopes

We currently have two telescope piers, in two separate observing rooms, under a roll-off roof, rather than a dome. One pier houses a massive, research-grade mount manufactured by Ealing, which guides a Celestron 14-inch Schmidt-Cassegrain telescope, a 6-inch f/15 refractor made by Jaegers, and a variety of guide scopes. The other pier houses an unusual 12-inch diameter Wright-Newtonian catadioptric telescope entirely made by one of our senior members Bob Bolster – and that includes the optics.

Some of our members own (or have built) their own telescopes, and will have them set up in the cleared, grassy area around the observatory building. If you would like to bring your own, feel free to do so. We even have outdoor electrical outlets and a small level concrete area if you need them.

Research

Recently the C-14 has been used by one of our members (Paul Hueper) to detect and confirm (or not) the existence of some extra-solar planets. He does this by using a CCD camera mounted on the telescope and taking very careful measurements of the relative brightness of "candidate" stars compared to other local stars, for many hours at a stretch. If the "candidate" star dims, remains dim, and goes back to its normal brightness again at the theoretically predicted times, then one can confirm that the theoretically proposed (but as-yet unseen) extra-solar planet has probably passed between us on Earth and its star. This is not an easy task, however; the dimming is on the order of a hundredth of a magnitude, or sometimes less.

Conditions and Predictions

The weather will most likely be rather chilly, so dress warmly, using layers. The Observatory is in the woods, and is at a higher altitude (1178 feet) than most other places inside the Beltway. We will have hot cocoa available in our 'operations' building. If you would like a detailed astronomical weather forecast for the location, do a Google search for "Hopewell Observatory Clear Sky Chart" or go directly to http://www.cleardarksky.com/c/HpwllObVAkey.html?1 or http://tinyurl.com/HAS2009.

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2009-20010 Officers

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The US Naval Observatory predicts that sunset will take place at 5:01 PM, and that civil twilight will end at 5:29 PM. The Moon will rise at about 9:37 PM, in a 72% illuminated waning gibbous phase. If you feel like staying up all night, the Moon will transit at 5:05 AM, and morning civil twilight will start the next morning at 6:15 AM. Jupiter will transit shortly after the end of twilight, and will set around midnight. Uranus and Neptune will not be too far away from Jupiter in the sky. Betelgeuse will rise around 8:15 PM, Sirius and Mars both rise about 10:30 PM, and Saturn rises about 2:45 AM on the 8th. The Pleiades will transit around 12:45 AM. [An object in the sky "transits" when it crosses an imaginary north-south line drawn on the sky.] The moons of Jupiter are always doing something interesting – and continue to do so this year, 400 years after Galileo first saw them and told everybody else about what he had seen.

The event will be held no matter what the weather is like. If the weather is very bad, we won't open up the roof of the observatory, but you can look around the facilities, and talk to members.

Our Facilities

If you bring a flashlight, and it's not already a red one, then try to find some translucent red plastic to tape over the front of the white light. This will allow you to see your way around, but will also preserve the visual purple in your eyes and allow you to continue to see in the dark. If you don't have a red cover for your flashlight, we will have some red plastic and some masking tape in the operations building. Both buildings have red lights to help preserve your night vision. It only takes a moment's exposure to white light to make you night-blind, and it takes 10 to 20 minutes for it to come back. The A-frame building serves as an operations center and a place to get warm and to heat up hot water for tea, hot chocolate, and so on.

In the observatory itself, you will need to climb some stairs to look through the eyepieces.

Sanitation is primitive. We have a simple composting toilet (with directions) in a red-lit outhouse behind the operations building, but we have no running water. We have some bottled drinking water and some non-potable water good enough for rinsing your hands. We also have paper towels, toilet paper, and hand sanitizers. We also have lots of bushes if you prefer roughing it.

If you get lost, you can call the observatory directly at 703-754-2317.

Membership in the Observatory

The Hopewell Observatory was built by its founding members, with the largest amounts of the labor given by Bob Bolster, the late Bob McCracken, and Jerry Schnall. All of the members are, or were, local professional or amateur scientists and/or astronomers. It is a nominally profit-making, share-issuing, privately-held corporation devoted to observation, research and investigation. Each prospective member must purchase a certain number of shares. Each member must pay a pro-rated fee towards annual expenses (electricity, property taxes, maintenance, etc.) Members are allowed essentially unlimited observing time, but are also expected to help work on maintaining the existing observatory, or helping to create new ones. Maintenance work is reimbursed at a per-hour basis against annual dues, but new construction is rewarded by additional voting shares of stock.

If you have a serious interest in astronomy, would like to have a very sturdy and solidly-tracking mount or two at your disposal, and if you don't mind getting your hands dirty and putting in an initial investment, then talk to one of the current members about possibly joining.

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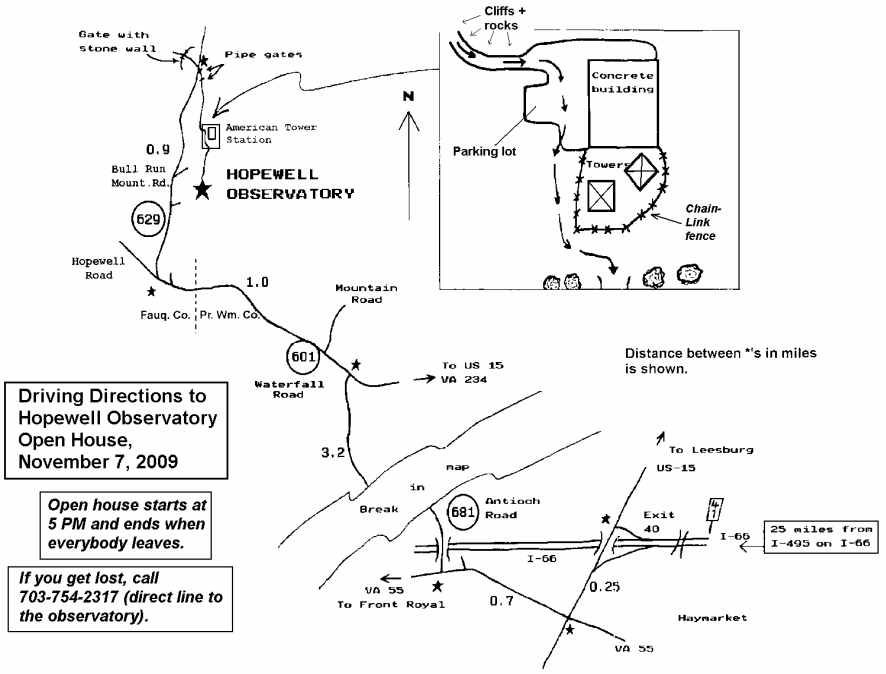
Directions and Parking

Let's assume you are on Interstate-66 in Virginia, heading west, away from DC. If you are heading east on I-66, the only difference is that you turn right (south) onto US route 15 almost immediately, rather than after 0.25 miles.

1. Consider car-pooling, as parking is very limited.
2. Exit at exit 40, Haymarket, go to end of ramp.
3. Turn left (south) at the end of the ramp (traffic light) and go about 0.2 miles on US route 15.
4. Turn right (at a light) onto US route 55, heading west.
5. Go about 0.8 miles to Antioch Road (VA 681; no light, no stop sign) and turn right (north).
6. Go about 3.2 miles on Antioch Road until it dead-ends on Waterfall Road (VA 601). Turn left (west).
7. Go about 1.0 of a mile; you will cross into Fauquier County, whereupon it changes its name to Hopewell Road. Do NOT turn on Mountain Road; wait until you see Bull Run Mountain Road (VA 629).
8. Make a diagonal right (north) onto Bull Run Mountain Road. This soon becomes a gravel road that gains elevation. Proceed about 0.9 miles until you see a large, well-made, locked stone-and-metal gate on the left and a much simpler, open metal gate (rusty orange) on the right, that consists of a single long bar, followed by another, similar, open gate.
9. Make a very sharp right turn right, uphill, through this gate. You will be heading south. This will be an unmarked and somewhat poorly-paved road, but your car should be able to handle it unless you have a very low suspension. If you are afraid of your undercarriage dragging on the road, then try to navigate so that your tires stay on the high spots and don't go down into the potholes. You will be gaining more elevation.
10. After about 0.3 miles the road ascends and turns left around a small but massive rocky cliff. You will see a concrete building attached to a radio tower, and a small parking lot. THIS IS NOT THE OBSERVATORY, but you can park in the lot here if the closer parking spots are all full, or if you don't want to drive on an unimproved dirt road.
11. Take a sharp RIGHT in front of the concrete building and follow a not-very-clearly-marked dirt road that goes about 1/3 of the way around the radio tower.
12. Then make a right onto a dirt road through some trees and brush, bypassing a white closed metal gate that doesn't open any more. Do NOT drive down the power-line right-of-way.
13. About 250 meters/yards (~0.15 mi) further on (south) you will come to a few rough parking spots to the left and to the right of the road that have been made by clearing and cutting down the brush and trees; if these spaces are still available, park there. If they are all full, you will need to turn around carefully, drive back to the radio tower, and walk from there.
14. Please do not park in the space around the observatory itself unless you are bringing your own telescope to set up near the observatory.
15. The first building you will see is the Operations Building, which is an A-frame building made of concrete block and roofed with gray shingles. Feel free to 'check in' there and get some red tape for your flashlight, if needed, and some self-serve hot cocoa or tea if you like.
16. The observatory itself is about 40 meters (or yards) to the south of the Operations Building. It is made of white-painted concrete block with a metal roll-off roof, and has a single door in the north side. The roll-off roof gives the impression of being a big porch roof, but it's not.



Mid-Atlantic Occultations and Expeditions

Dr. David Dunham

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.

Grazing Occultation In Laurel Sep. 15

Michael Chesnes

Before dawn on a Tuesday morning I helped David Dunham set up an occultation station to observe the star SAO 97955 graze the mountains near the south pole of the Moon. I used a 5 inch Schmidt-Cassegrain telescope, which I guided by hand using slow motion controls, and a small video camera, to record a couple of the star's reappearances from behind lunar mountains. The experience taught me the importance of making sure that glare from the Moon does not overwhelm the grazing star. Nevertheless, SAO97955 is visible as a glow to the left of the furthest detached mountain in this still from the video I took. Both setting up the equipment in time and making the observation were exciting, and I recommend observing a lunar graze when there is one in our region.

Mid-Atlantic Occultations and Expeditions

Dr. David Dunham

Asteroidal Occultations

Date	Day	EDT	Star	Mag.	Asteroid	dmag	dur. s	Ap. "	Location
Oct 6	Tue	21:04	2UC 33483517	11.6C	Ekard	0.4	8	9	PA,NJ;MD,DE?
Oct 9	Fri	6:30	2UC 41650964	13.1	2002 TX300	6.4	32	9	TNO Arctic;USA?
Oct 10	Sat	21:32	2UC 28838190	11.8C	Cybele	0.3	33	9	NY,PA,OH;MD,VA?
Oct 10	Sat	22:46	TYC 56983992	10.0	Keck	6.9	0.3	5	WV,VA;MD,DC,DE?
Oct 12	Mon	0:18	SAO 165541	8.0	Stropek	8.0	1.5	3	NJ,sePA,MD,nVA
Oct 19	Mon	4:10	ZC 504	7.4	Mieke	8.5	3	2	CT,sNY,nPA,nOH
Oct 21	Wed	20:10	2UC 21436676	12.6C	Happelia	1.1	4	8	NC,VA,MD,ePA,NJ
Oct 22	Thu	2:11	TYC 19341003	11.7	Erida	4.0	4	7	w&nVA,WV,MD,NJ
Oct 24	Sat	3:36	SAO 193534	7.2	Eva	3.8	10	2	MS,eMO,eIA,wWI
Oct 26	Mon	23:51	2UC 30937573	12.0C	Athor	0.3	9	9	e&nVA,nWV,OH;MD?
Oct 27	Tue	0:38	SAO 126906	9.6	Eros	3.3	6	4	sKY,swVA,neNC
Oct 29	Thu	22:52	TYC 06360358	9.8	Decabrina	5.6	1	4	NJ,sePA,MD,nVA

*** Dates and times above are EDT, those below are EST ***

Date	Day	EST	Star	Mag.	Asteroid	dmag	dur. s	Ap. "	Location
Nov 8	Sun	17:47	TYC 05280946	10.5	Ekard	2.3	5	6	sNY,nPA,CT,RI,MA

Lunar Grazing Occultations (*, Dunham plans no expedition)

Date	Day	EDT	Star	Mag.	%	alt	CA	Location
Oct 24	Sat	19:28	SAO 188135	8.0	40+	23	16S	* Somerset, PA; Utica, NY

*** Dates and times above are EDT, those below are EST ***

Date	Day	EST	Star	Mag.	%	alt	CA	Location
Nov 10	Tue	4:42	ZC 1458	5.9	41-	52	13S	Salisbury & Fayetteville, NC
Nov 11	Wed	2:58	SAO 118471	7.1	31-	19	8S	Hrndn,VA;Bthsda,TakP,Bowie,MD
Nov 11	Wed	6:21	SAO 118521	8.4	30-	49	11S	Sun-6;Millrsbg,PA;Wilmngtn,DE
Nov 13	Fri	3:59	SAO 138786	7.9	13-	5	12S	Richmnd,Wilmsbrg,Cheapside,VA

Total Lunar Occultations

DATE	Day	EDT	Ph	Star	Mag.	%	alt	CA	Sp.	Notes
Oct 7	Wed	23:49	R	36 Tauri	5.5	83-	35	34S	G0	ZC 598, close double
Oct 10	Sat	3:18	R	ZC 949	7.3	62-	52	23N	K5	May be close double
Oct 10	Sat	6:13	R	SAO 78231	7.4	61-	76	83N	K2	mg2 9.9,sep. 21",PA 243
Oct 10	Sat	6:21	R	ZC 966	7.1	61-	76	36N	B9	Sun-11,mg2 9,57",PA 265
Oct 21	Wed	18:59	D	ZC 2409	7.0	15+	11	58S	B9	Sun alt. -8, Az. 222
Oct 25	Sun	18:44	D	ZC 2955	7.9	49+	31	67S	A3	Sun alt. -6 deg.
Oct 25	Sun	19:39	D	SAO 189104	7.9	49+	31	47S	K0	
Oct 27	Tue	22:05	D	ZC 3205	6.9	69+	36	89N	K0	May be close double
Oct 27	Tue	22:47	D	ZC 3208	6.5	69+	32	63N	B9	Close triple star
Oct 29	Thu	22:48	D	ZC 3444	6.3	85+	50	61N	K2	
Oct 30	Fri	2:10	D	9 Piscium	6.3	86+	22	19N	G7	ZC 3455, spect. Binary

*** Dates and times above are EDT, those below are EST ***

DATE	Day	EST	Ph	Star	Mag.	%	alt	CA	Sp.	Notes
Nov 2	Mon	21:51	R	mu Arietis	5.7	100-	45	68N	A0	WA245,ZC399,dbl,TrmDt4"
Nov 3	Tue	6:22	R	epsilon Ari	4.7	99-	12	65N	A2	Sun-4,WA268,ZC440,db,T9
Nov 3	Tue	23:31	R	Merope	4.1	97-	66	27N	B6	WA323,ZC545,TermDist10"
Nov 4	Wed	1:10	R	26 Tauri	6.5	97-	75	90N	F0	WA 260,ZC 559,CloseDbl.
Nov 4	Wed	1:12	R	Pleione	5.1	97-	75	28N	B7	WA 322,ZC 561,TermD 12"
Nov 4	Wed	1:12	R	ZC 564	6.2	97-	75	43S	B8	WA 213
Nov 4	Wed	1:19	R	Atlas	3.6	97-	75	50N	B8	WA 299,ZC 560,27 Tauri
Nov 6	Fri	22:02	R	ZC 1050	5.7	77-	16	63N	K5	
Nov 7	Sat	2:05	R	SAO 78963	7.2	76-	61	59N	A0	
Nov 7	Sat	6:04	R	R Gem	7.5	74-	61	62S	S3	Sun-8,SAO79070,Var.8-14
Nov 7	Sat	23:25	R	85 Gem	5.4	66-	18	32S	A0	ZC 1193
Nov 8	Sun	2:06	R	ZC 1205	6.3	65-	48	84S	K1	
Nov 8	Sun	2:49	R	SAO 97491	7.7	65-	56	87S	B9	
Nov 9	Mon	1:45	R	omicron1Cnc	5.2	54-	32	75N	A5	ZC 1336
Nov 10	Tue	5:05	R	ZC 1458	5.9	41-	53	55S	K2	
Nov 13	Fri	4:45	R	ZC 1788	6.8	12-	13	75N	G0	Az. 113
Nov 14	Sat	6:31	R	ZC 1918	6.8	6-	19	48N	K5	Sun alt. -4 deg.

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

Member Astrophotos

Jeff Guerber: (Top) Veil and North American Nebulae in Cygnus; (Middle) Moon, Venus, Pleiades, and Hyades. Both with 50mm lens and Elite Chrome 200 slide film.

David Dunham: (Bottom) The International Space Station passes near a bright star. 50mm "mighty mini" video lens system.

Ten Commandments for Amateur Astronomers

Thank you Jeff Guerber for bringing these to my attention. They were distributed to attendees at Blackwater Falls Astronomy Weekend.

1. Thou shalt have no white light before thee, behind thee, or to the side of thee whilst sharing the night sky with the fellow stargazers.

2. Thou shalt not love thy telescope more than thy spouse or thy children; as much as, maybe, but not more.

3. Thou shalt not covet thy neighbor's telescope, unless it exceeds in aperture or electronics twice that of thy wildest dreams.

4. Thou shalt not read "Astronomy" or "Sky & Telescope" on company time, for thine employer makes it possible to continue thine astronomical hobby.

5. Thou shalt have at least two telescopes so as to keep thy spouse interested when the same accompanies thee under the night sky or on eclipse expeditions to strange lands where exotic wild animals doth roam freely.

6. Thou shalt not allow either thy sons or thy daughters to get married during the Holy Days of STAR QUEST or ASTRONOMY WEEKEND!

7. Thou shalt not reveal to thy spouse the true cost of thy telescope collection; only the individual components, ant that shall be done with great infrequency.

8. Thou shalt not buy thy spouse any lenses, filters, dew shields, maps, charts, or any other necessities for Christmas, anniversaries, or birthdays, unless thy spouse needs them for their own telescope.

9. Thou shalt not deceive thy spouse into thinking that ye are taking them for a romantic Saturday night drive when indeed thou art heading for a dark sky site.

10. Thou shalt not store thy telescope in thy living room, dining room, or bedroom, lest thou be sleeping with it full time.

Addenda:

11. Verily, observe not through thy neighbor's AP or Tak, lest thee be utterly consumed by the lust of apo-fever, and thy brain and thy bank account shall shrivel and wither like branches in a flame.

12. Verily, observe not through thy neighbor's Dob of Goliath, lest thee be lain bare to the fires of aperture-fever, and thy sanity, thy sacroiliac, and thy life savings be crushed as ye grapes of wrath.

Volunteer Outreach Opportunities

As posted on the NCA listserv, there are a couple of upcoming events which need volunteers who are willing to let the public observe through their telescopes.

The Department of Terrestrial Magnetism, part of the Carnegie Institution of Washington, is sponsoring Galilean Nights on Friday, October 23 as part of the International Year of Astronomy. Please contact Alycia Weinberger alycia@dtm.ciw.edu from DTM if you are interested in volunteering.

On Saturday, November 21, there is a 4-H Adventures in Science Astronomy Night Session at the Agricultural History Farm Park in Deerwood, MD. Please contact Andrew Martin sellallyouown@yahoo.com if you would like to participate.

Calendar of Events

NCA Mirror- and Telescope-making Classes: Fridays, Oct. 2, 9, 16, 23, and 30, 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). There is telescope viewing afterward if the sky is clear.

Dinner: Saturday, Oct. 10 at 5:30 pm, preceding the meeting, at the *Garden Restaurant* in the University of Maryland University College Inn and Conference Center.

Upcoming NCA Meetings at the University of Maryland Observatory

Oct. 10, 2009
Robert Olling (UM)
Proper Motions within Andromeda
The IYA theme of the month is Andromeda.

Nov. 14, 2009
Alice Harding (GSFC)
A Gamma-ray Pulsar
The IYA theme of the month is the Crab Nebula.

Yes, I'd like to join NATIONAL CAPITAL ASTRONOMERS!

Name: ..... Date: _____/_____/_____

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City/State/ZIP: .....

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MEMBERSHIP CATEGORIES AND ANNUAL DUES RATES

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.

Student Membership	$ 5
Paper copy of Star Dust	$10
Sky & Telescope	$33
Total	_____

Individual/Family Membership	$10
Paper copy of Star Dust	$10
Sky & Telescope	$33
Total	_____

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Dated Material

Next NCA Mtg:

Oct. 10

7:30 pm

@ UM Obs

Dr. Robert Olling

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