Star Dust

National Capital Astronomers, Inc. **http://capitalastronomers.org**

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The President's Corner

There are two items that I want to tell you about. The first thing is, as you can see, NCA is making a big change in its meeting location, something we have been discussing recently. We have met at a number of sites over the approximately 40 years I have been a member. In the beginning we met in Washington, but we have moved out of the city in recent years, most recently to Bethesda. Until we were forced to leave NIH, we met in the evening. At the Bethesda-Chevy Chase Services Center, we have had to meet at 3 P.M. on Saturday. Because of this, we have lost members. In our search for an evening site, Elizabeth Warner, director of the University of Maryland Observatory, has offered the use of her facility. Not only can we return to our evening time, but we will be associated with one of the major universities in the area. I think this will be a plus for NCA. As for the restaurant for the pre-meeting dinner, I chose the Garden Restaurant in the University College Center because of its convenient location. At later meetings, we can try other restaurants.

"Change in Time and Place for January, February, and March Meetings"

Some members travel to our meetings by public transportation. The campus and College Park are served by not only the Green Line of the subway system, but also the C2, C8, and F6 metro buses. If you are coming by bus, we can pick you up at the Student Union on campus. For January, call me at 301-530-7942 or email me at jhmiller@os2bbs.com if you need a ride or if you can pick up people. At the meeting, I would like a volunteer to serve as ride coordinator.

See driving directions on Page 6. For those coming from the subway, turn left when coming out of the subway. This is where the bus stops are, and there is a parking lot where we can pick up people. We will have drivers at the College Park Metro stop at 4:30 P.M. for the dinner and 6:30 and 7:00 P.M. for the meeting.

The second item concerns NCA's 14" Ce-

(Continued on page 2)

December Speaker: Dr. Michael F. Corcoran, "X-raying a Stellar Monster"

Submitted by Jeff Guerber

Dr. Michael F. Corcoran will present the featured talk "X-raying a Stellar Monster" at the January 3 meeting of the National Capital Astronomers.

The meeting will be held at 7:00 P.M. in the University of Maryland Astronomy Observatory on Metzerott Road in College Park, MD.

Abstract
Supermassive stars are extremely rare astrophysical objects, yet these stellar monsters produce a wide range of important phenomena: they seed the cosmos with important life-giving elements, they explode as supernovae or "hypernovae," and they produce massive black holes.

Though these objects are rare, there is one near the earth, a star known as Eta Carinae. Eta Carinae is violently unstable and very variable, and it just underwent a mysterious, anticipated event this past summer when the material around the star changed dramatically, along with a sharp decrease in the star's X-ray brightness. This event was observed in nearly every available region of the spectrum by almost every space based observatory (including HST, the Chandra X-ray Observatory and the INTEGRAL Gamma-Ray observatory) and by numerous dedicated programs from ground, including both professional and non-professional astronomers. The results have been both reassuring and surprising, clarifying some mysteries, but deepening some others.

In my talk, I'll present some early results of this observing campaign, concentrating

(Continued on page 3)

NCA Events This Month

The Public is Welcome!

NCA Home Page: http://capitalastronomers.org

Fridays, January 2, 9, 16, 23, and 30, 6:30 to 9:30 P.M. NCA mirror- and telescope-making classes 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. For more information, see the article on the next page.

Fridays, January 2, 16, 23, and 30, at 8:30 P.M. Open nights with NCA's 14-inch telescope at Ridgeview Observatory near Alexandria, Virginia. For more information, see the article on the next page.

To join the National Capital Astronomers, use the membership application on Page 7.

Saturday, January 3 at 7:00 P.M. NCA meeting at the University of Maryland Astronomy Observatory on Metzerott Road in College Park, MD.

Dr. Michael F. Corcoran will present the featured talk, "X-raying a Stellar Monster" See directions on Page 6

Saturday, January 3, preceding the meeting, dinner with the speaker and NCA members will at 5:00 p.m. at the Garden Restaurant at the UMD University College Inn and Conference Center, See directions on Page 6

Meetings in February and March will be at the U. of MD Observatory at 7:00 - 9:00 P.M., February 7: Larry Nittler (DTM): "Interstellar Grains"; March 6: Al Holm (STScI)): "The AAVSO"

The President's Corner

(Continued from page 1)

lestron, which is presently at Bob Bolster's house in Alexandria. There are several problems. One, recently, no members have been going to his house for Friday viewing sessions. Two, Bob is no longer able to bring the telescope to Exploring the Sky in Rock Creek Park, because of its weight and bulkiness. Bob has said that if he can get assistance from someone, the 14" could be taken to Exploring the Sky. Alternatively, are there any members who would be interested in storing the telescope at home for Friday night viewing, and bringing it to Rock Creek Park once a month between April and November? If no one is willing to do this, we may have to find a place to store it, such as the UM Observatory, where it would be less available to the membership and to Exploring the Sky. Again, contact me on this issue.

Jay Miller, President NCA

Star Dust is Now Available Electronically

Any member wishing to receive *Star Dust*, the newsletter of the National Capital Astronomers, via e-mail as a PDF file attachment, instead of hardcopy via U.S. Mail, should contact Nancy Grace Roman, the NCA Secretary, at nancy.roman6@verizon.net or 301-656-6092 (home).

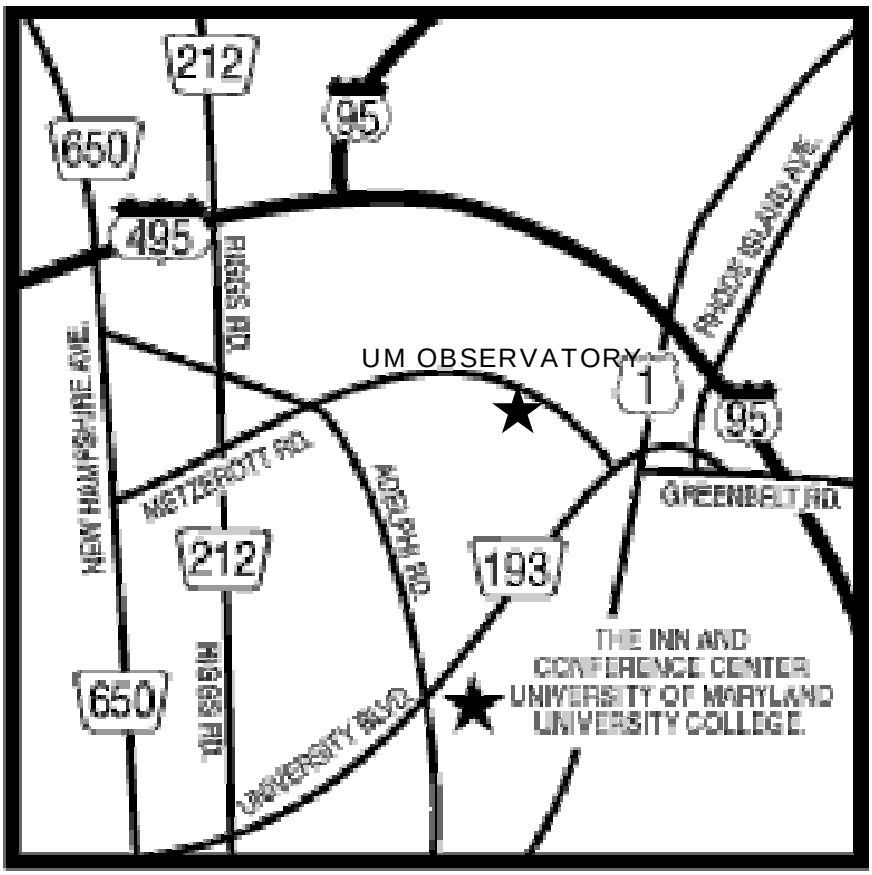
Membership Cards
By Nancy Grace Roman

There was a delay in obtaining new membership cards. In the meantime, I have issued cards I made by my computer. If anyone who received one of these cards wishes to have a "standard" card, please contact me.

Nancy Grace Roman

nancy.roman6@verizon.net

301-656-6092



See written directions on Page 6.

Observing with the NCA C-14

Bob Bolster

All at 8:30 p.m.	**Prime Objects**
Friday, January 2	Gibbous Moon, Saturn (after 10:00)
Friday, January 16, 23	Saturn, M31, M42, Double Cluster
Friday, January 30	Gibbous Moon, Saturn

At Ridgeview Observatory in Bob Bolster's backyard, 6007 Ridge View Drive, Franconia, Virginia (off Franconia Rd. between Telegraph Rd. and Rose Hill Dr.). Call Bob at 703-960-9126 to let him know you are coming.

The NCA Mirror-Making Group Continues

Guy Brandenburg

Several people have started projects in the past month. With a good deal of help from both Jerry Schnall and Guy Brandenburg, Steve Strouse has at long last completed a Pyrex 4.25" f/8.5 mirror. It is even somewhat parabolized, and the turned edge is gone. Thanks to a cardboard sonotube tube generously donated by Michael McChesnes and other parts and paint scrounged by Guy, Steve's mount is nearly completed, as well. It took quite a bit of work by both Jerry and Guy to eliminate all of the various errors in the figure; the lap had to be re-cast several times.

Steve is now trying to make a small optical flat by grinding and polishing three pieces of glass against each other. This experiment has been inspired by the work of David Gordon. We are using some glass that had been donated to us by 10th-grader Wade Duvall, who had been given it for a project that has been mentioned before. This glass was supposed to be a really high-quality front-surface flat, but tests that we and David Gordon carried out using some double-sided optical reference flats and a monochromatic light box made by Guy, established that it was not flat at all, anywhere, on either side. (Before testing it, we had to first strip off all of the aluminum coating using muriatic acid. If you do this at home, use goggles and gloves!)

We have noticed recently that the mirror kits provided by Newport Glass tend to make a very large jump from 9-micron aluminum oxide abrasive to cerium oxide, which is somewhere around 1 to 2 microns in size. Those who have made mirrors using that progression have found that it is nearly impossible to get rid of all of the small pits from the 9-micron abrasive when polishing, no matter how many hours they try to polish them out. Even the polishing pads used by eyeglass manufacturers didn't seem to help. The only thing that did help is to go back to fine grinding with what the (now-defunct) American Optical Company labeled M302 (~22 micron), M302 1/2 (18 micron), M303 (15 micron), M303 1/2 (11 micron), M304 (8 micron), M305 (5 micron), and then to proceed to pouring a pitch lap and polishing with CeO and then rouge.

A big, belated thank-you is owed to Jean-Paul Richard, retired from the University of Maryland, for donating super-low-pressure gauges that have helped us to make the aluminizer more effective.

During January, classes will be held at the usual location at the Chevy Chase Community Center, from 6:30 to 9:30 P.M., at the northeastern corner of McKinley Street and Connecticut Avenue, on the following Fridays: January 2, 9, 16, 23, and 30, 2004. For more information, you can email Guy Brandenburg at gfbrandenburg@yahoo.com, or call him at 202-262-4274, or see his website at http://home.earthlink.net/~gfbranden/GFB_Home_Page.html.

The deadline for the February Star Dust is January 15. Please send your material to Elliott Fein by that date to ensure inclusion.

Send submissions to Elliott Fein at elliott.fein@erols.com.

Text must be in ASCII, MS Word (97 or earlier), or WordPerfect.

All articles submitted may be edited to fit the space available.

Dr. Michael F. Corcoran to Speak

(Continued from page 1)

on X-ray variations as seen by the Rossi X-ray Timing Explorer, and the Chandra and XMM-Newton X-ray observatories. I'll discuss how all this impacts our understanding of the formation and evolution of these extremely massive stellar monsters.

Bio

Dr. Michael Corcoran is an astrophysicist with the Universities Space Research Association. He works at the Laboratory for High Energy Astrophysics at the Goddard Space Flight Center.

Mike is a native of Queens, N.Y. and received his Ph.D. from the University of Pennsylvania in 1988. In 1989, he joined the X-ray group at Goddard, first as a post-doc working on the Astro-1 mission, then as part of the ROSAT X-ray Observatory support center.

He currently is an archive scientist and calibration specialist with the High Energy Astrophysics Science Archive Research Center. Mike's research involves the formation, life, and death of massive stars, and he coordinates a group of astrophysicists with similar interests. In his spare time, Mike helps chase his six-year-old son Jack around, and when possible, plays golf, badly.

Mid-Atlantic Occultations and Expeditions

by David Dunham

Asteroidal Occultations

Date	Day	EST	Star	Mag	Asteroid	dmag	dur. s	Ap. in.	Location
Jan 9	Fri	5:25	TYC08681093	12.7	Yrsa	1.0	5	10	DC, MD, nVA
Jan 10	Sat	6:15	TYC02361330	9.9	Union	4.7	5	6	N. Carolina
Jan 15	Thu	0:12	SAO 58619	7.2	Charlois	7.3	3	2	s. Florida?
Jan 25	Sun	2:04	SAO 59239	7.3	Brabantia	6.8	1	2	s. Virginia
Jan 25	Sun	3:16	SAO 114649	9.1	Gunila	5.5	5	3	s. S.Carolina
Jan 26	Mon	23:47	TYC13431401	11.6	Hygeia	0.3	22	8	n. New York
Jan 28	Wed	18:27	TYC06361110	12.3	Vera	1.1	4	9	s.cen. Penn.
Jan 31	Sat	4:51	TYC08400977	11.6	Penthesilea	2.9	8	5	n. Maine
Jan 31	Sat	20:53	TAC+39 3539	10.8	Dudu	4.9	3	7	Florida?
Feb 6	Fri	21:48	TYC18952225	9.5	Hilaritas	5.5	4	4	s. Quebec?
Feb 6	Fri	22:42	TYC18640315	10.8	Megaira	3.4	16	7	Florida?
Feb 7	Sat	4:53	SAO 160289	7.6	2000 AG55	12.0	1	2	s. Virginia

Grazing Occultations

DATE	Day	EST	Star	Mag	% alt	CA	Location
Jan 10	Sat	23:53	42 Leonis	6.2	88- 40	8S	Harrisburg, PA
Jan 13	Tue	0:41	7 Virginis	5.4	71- 25	9S	Halifax, PA
Jan 15	Thu	6:45	X36861	9.6	47- 40	16S	White Marsh, MD; Sun -8 deg.
Jan 17	Sat	5:43	SAO 183595	8.8	26- 22	17S	Havre de Grace, MD
Jan 17	Sat	6:52	SAO 183625	8.8	25- 27	17S	Bredshaw, MD Sun alt. -7
Jan 29	Thu	17:56	SAO 93219	9.3	57+ 66	18S	Timonium, MD Sun alt. -7
Jan 31	Sat	22:06	SAO 76717	7.2	75+ 61	5S	Nanjemoy, MD

Total Lunar Occultations

DATE	Day	EST	Ph	Star	Mag	%	alt	CA	Sp.	Notes
Jan 3	Sat	2:30	D	ZC 0497	6.5	83+	15	29S	A3	Az. 283; double?
Jan 3	Sat	19:50	D	39 Tauri	5.9	89+	64	14N	G5	ZC 0601; 17" to term.
Jan 4	Sun	0:42	D	ZC 0621	6.1	89+	45	83N	B9	spectroscopic binary
Jan 4	Sun	1:42	D	ZC 0625	7.1	90+	34	89S	F5	
Jan 4	Sun	19:17	D	ZC 0740	6.3	94+	51	68N	F0	
Jan 7	Wed	23:59	R	76 Gem	5.3	100-	74	49N	K5	ZC 1169
Jan 11	Sun	0:30	R	SAO 99091	7.3	87-	48	47N	G5	Close dbl.,2nd mag.7.3
Jan 11	Sun	5:14	R	ZC 1535	6.9	86-	54	58N	K0	
Jan 11	Sun	22:12	R	ZC 1612	7.3	80-	10	60S	F5	Azimuth 85 deg.
Jan 13	Tue	1:47	R	SAO 119169	7.8	70-	37	68S	F5	
Jan 14	Wed	4:58	R	SAO 139044	7.7	58-	46	75N	F5	
Jan 15	Thu	2:46	R	82 Vir	5.0	48-	23	29N	M2	ZC 1962
Jan 15	Thu	6:33	R	ZC 1973	6.0	47-	41	16N	K5	2nd* mg.7.6,".4,PA249d
Jan 17	Sat	3:59	R	ZC 2214	6.3	26-	9	64N	A5	Az125;2nd*mg9.0,11",281
Jan 28	Wed	19:23	D	V Arietis	8.5	47+	56	85N		SAO 92853, mag.range 1.0
Jan 28	Wed	22:48	D	ZC 0340	6.9	48+	21	22N	G5	
Jan 31	Sat	0:52	D	ZC 0586	6.8	68+	19	49S	K0	
Jan 31	Sat	21:53	D	SAO 76717	7.2	75+	63	20S	F5	Graze at Nanjemoy, MD
Jan 31	Sat	22:32	D	95 Tauri	6.2	76+	56	35S	F7	ZC 0714
Feb 2	Mon	3:30	D	ZC 0869	7.3	84+	12	38N	B9	2nd* mg.8.3,0.4",PA 24d
Feb 2	Mon	21:23	D	ZC 0994	6.6	90+	77	76N	F5	2nd* mg.7.7,.003",269d
Feb 4	Wed	23:06	D	lambda Cnc	5.9	98+	74	26S	B9	ZC 1251; 6" to term.

David Dunham, e-mail dunham@erols.com, Web http://iota.jhuapl.edu
Phone home 301-474-4722; office 240-228-5609; car 301-526-5591

Investigation of Lorton/Laurel Hill as a possible Dark-Sky Site

Guy Brandenburg

On Monday, November 24, in an effort to find an additional dark-sky viewing site for NCA members, Eric Kearsley and Guy Brandenburg got a very wet tour of the former Lorton Prison grounds.

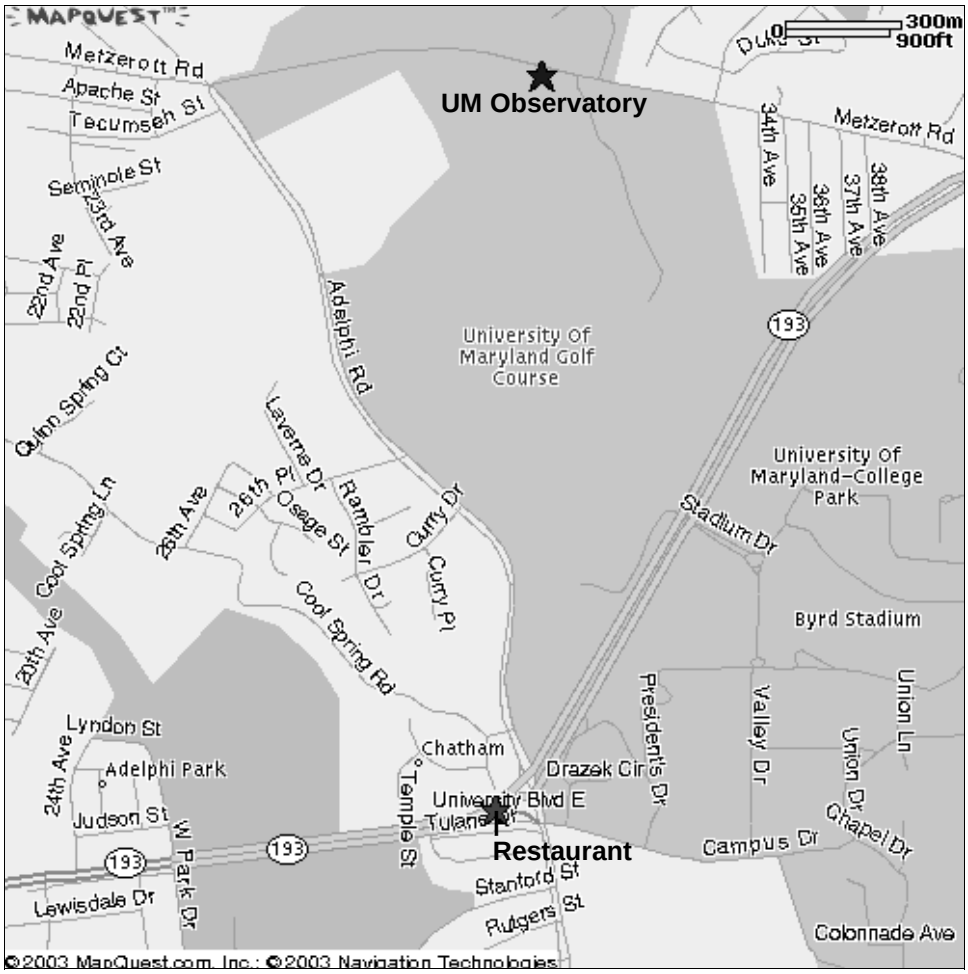
We drove south during the usual horrible evening rush hour on I-95 and got a guided tour of 'Laurel Hill', as the former Lorton prison complex is known. At first, it was merely warm and overcast, but soon the weather changed to a driving rain. The weather made it seem like a rather spooky place - the minimum and maximum security facilities are all now completely deserted and rusting away. Some of the buildings are over 100 years old, but some are nearly brand-new. The site is now sometimes rented by movie producers in order to film prison scenes. One of the baseball fields near the Central/Max (central and maximum security prison areas) seemed at first to have some potential, in that you can't see much in the way of lights at this time, but lots of buildings of all kinds are being constructed all around, including a school and lots of houses, many of which are already occupied, and the field is only a very short distance from what will soon be a major thoroughfare. Our guide, Officer Johnson of Wackenhut, told us that there are plans to turn parts of the prison into shopping malls, museums, and so on. (One might harbor doubts as to whether the attempt will be financially successful!)

My personal opinion is that using this site for dark-sky observing is not worth pursuing any further, since it is going to become so commercialized and surrounded by lights in such a short amount of time. However, I must thank John Pitts of the Fairfax County Park Authority for allowing us to investigate this often-discussed but little-seen piece of our local history and real estate.

Perhaps Fort Meade might be better?

Getting to the NCA Monthly Meeting

See next page for written directions.



Meteor Showers

December Radiants

Full Moon: December 8

Major Activity

Radiant	Duration	Maximum
Geminids (GEM)	Dec. 6 - 19	Dec. 14 at 15:10 UT

Moderate Activity

Radiant	Duration	Maximum
Ursids (URS)	Dec. 17 - 25	Dec. 22 @ 23:30 UT

Minor Activity

Radiant	Duration	Maximum
Delta Arietids	Dec. 8 - Jan. 2	Dec. 8/9
11 Canis Minorids	Dec. 4 - 15	Dec. 10/11
Coma Berenicids (COM)	Dec. 8 - Jan. 23	Dec. 18-Jan. 6
Sigma Hydrids (HYD)	Dec. 4 - 15	Dec. 11/12
December Monocerotids (MON)	Nov. 9 - Dec. 18	Dec. 11/12
Northern Chi Orionids (XOR)	Nov. 16 - Dec. 16	Dec. 10/11
Southern Chi Orionids (XOR)	Dec. 2 - 18	Dec. 10/11
Phoenicids (PHO)	Nov. 29 - Dec. 9	Dec. 5/6
Alpha Puppids (PUP)	Nov. 17 - Dec. 9	Dec. 2-5

Source:http://comets.amsmeteors.org/meteors

Getting to the NCA Monthly Meeting

The Meeting

You may join us for dinner with the speaker and NCA members at 5:00 p.m. at the restaurant, attend the NCA Meeting at 7 P.M., or do both.

The Directions

Directions and maps compliments of Elizabeth Warner. The maps are on the proceeding page and Page 2.

Directions to the Restaurant

Garden Restaurant at the Inn & Conference Center (ICC), lobby level.
University of Maryland University. College
3501 University Blvd. East
Adelphi, Maryland 20783
The directions below guide folks into a garage at UMUC/ICC.

From Washington D.C.

Take New Hampshire Avenue (Route 650) north toward College Park. Turn right onto Route 193 East (University Boulevard). At the sixth traffic light*, cross Adelphi Road and turn right into the parking garage (not free) or continue around building(s) to Lot 1 (free).
*Lot 1 can also be accessed by crossing Adelphi to Campus Drive and turning left into the lot.

From Montgomery County and Points West

Take the Capital Beltway (I-495) toward College Park. Exit at New Hampshire Avenue/Takoma Park (MD Route 650 South). At the second light, turn left onto Adelphi Road. At the third light**, make a left onto Route 193 East (University Boulevard) and turn right into the parking garage (not free) or continue around building(s) to Lot 1 (free).
**Lot 1 can also be accessed by turning left onto Campus Drive and turning left into the lot.

From Alexandria, VA and Points South of Washington

Take I-295 north toward Baltimore. I-295 becomes the Baltimore-Washington Pkwy. (MD Route 295). Exit onto Riverdale Road west toward Hyattsville/ New Carrollton. Riverdale Road becomes East-West Highway (MD Route 410). Turn right onto Adelphi Road. At fourth light***, turn right onto University Boulevard (MD Route 193) and take the first right into the parking garage (not free) or continue around buildings to Lot 1 (free).
***Lot 1 can also be accessed by turning right onto Campus Drive and turning left into the lot.

From Baltimore

Take I-95 south to the Capital Beltway (I-495) toward College Park. Take Exit 25 (US Route 1 South). Proceed about 1 mile south on US Route 1. Turn right onto MD Route 193 West (University Boulevard). At the third traffic light (Adelphi Road), make a U-turn and turn right into the parking garage.

From Annapolis and Points East

Take Route 50 to the Capital Beltway (I-495) toward College Park. Take Exit 25 (U. S. Route 1 South). Proceed approximately 1 mile south on U.S. Route 1. Turn right onto Route 193 West (University Boulevard). At the third traffic light (Adelphi Road), make a U-turn and turn right into the parking garage.

Directions to the Meeting Place

The meeting will be held at the University of Maryland Astronomy Observatory located on Metzerott Rd.

From the Beltway

The Observatory is located on Metzerott Road between Adelphi Road and University Blvd. in College Park. From the beltway (I-495) take the College Park/Route 1 exit. You will head south on Route 1 for about a mile until you see a sign for 193 West. You want to get on 193 West. The first light you come to will be Metzerott Road. Take a right onto Metzerott Road. Once on Metzerott, you will go through a stop light and the observatory is about a quarter of a mile on the left side of the road after the stop light. Our entrance is slightly hidden, but you should slow down to turn left as soon as you pass a large "System Administration" sign. We are almost directly across the street from the UM System Administration (3300 Metzerott Rd.).

Parking

Our lot has only twenty parking spaces. There is an overflow lot across the street at the University System of Maryland Administration Building. Parking is free in both lots. Please follow the directions of our volunteers in the parking lot and they will assist you. Please be extremely careful crossing the street.

From the Garden Restaurant

Exit onto University Blvd. (Rt. 193, heading east). At the second light, turn left onto Metzerott. Once on Metzerott, you will go through a stop light and the observatory is about a quarter of a mile on the left side of the road after the stop light. Our entrance is slightly hidden, but you should slow down to turn left as soon as you pass a large "System Administration" sign. We are almost directly across the street from the UM System Administration (3300 Metzerott Rd.).

Alternatively, if you exit onto Adelphi heading north, you'll turn right onto Metzerott and go about a mile and turn right into the observatory lot. UM System Admin. will be after the observatory from this direction.

Basically, University Blvd, Adelphi and Metzerott form a triangle. The restaurant is located at the intersection of Adelphi and University Blvd. while the Observatory is on Metzerott Road.

I've attached one graphic (see Page 5). The star near the bottom is the location of the restaurant and the star at the top of the map is the Observatory

What We Will Do after the Meeting

Members are invited to stay and observe (weather permitting) through the Observatory telescopes. Be sure to dress warmly!!!

Public Transportation

Please contact Elizabeth Warner 703-587-0181 (cell), if you need a ride from the metro to dinner or to the meeting at the observatory. (Please try to let me know in advance by email at warnerem@astro.umd.edu or calling at 301-405-6555 so that I know who to expect.)

Star Dust is published ten times yearly, September through June, by the National Capital Astronomers, Inc. (NCA).
Editor: Elliott Fein, Co-editor: Adele Fein, Editorial Advisor: Nancy Byrd. Consultant: Jeffrey Norman

National Capital Astronomers, Inc.

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Appointed Officers and Committee Heads: Exploring the Sky - Joseph C. Morris; Meeting Facilities - Jay H. Miller; Observing - Robert N. Bolster; Telescope Making - Guy Brandenburg; Travel Director - Sue Bassett; *Star Dust* Editor - Elliott Fein

SERVING SCIENCE & SOCIETY SINCE 1937

NCA is a nonprofit, membership-supported, volunteer-run, public-service corporation dedicated to advancing astronomy, space technology, and related sciences through information, participation, and inspiration, via research, lectures, presentations, publications, expeditions, tours, public interpretation, and education. NCA is the astronomy affiliate of the Washington Academy of Sciences. All are welcome to join NCA.

SERVICES & ACTIVITIES:

Monthly Meetings feature presentations of current work by researchers at the horizons of their fields. All are welcome; there is no charge. *See* monthly *Star Dust* for time and location.

NCA Volunteers serve in a number of capacities. Many members serve as teachers, clinicians, and science fair judges. Some members observe total or graze occultations of stars occulted by the Moon or asteroids. Most of these NCA members are also members of the International Occultation Timing Association (IOTA).

Publications received by members include the monthly newsletter of NCA, *Star Dust*, and an optional discount subscription to *Sky & Telescope* magazine.

Consumer Clinics: Some members serve as clinicians and provide advice for the selection, use, and care of binoculars and telescopes and their accessories. One such clinic is the semiannual event held at the Smithsonian Institution National Air and Space Museum.

Fighting Light Pollution: NCA is concerned about light pollution and is interested in the technology for reducing or eliminating it. To that purpose, NCA is an Organization Member of the International Dark Sky Association (IDA). Some NCA members are also individual members of IDA.

Classes: Some NCA members are available for educational programs for schools and other organizations. The instruction settings include star parties, classroom instruction, and schoolteacher training programs that provide techniques for teaching astronomy. NCA sponsors a telescope-making class, which is described in the *Star Dust* "Calendar of Monthly Events."

Tours: On several occasions, NCA has sponsored tours of astronomical interest, mainly to observatories (such as the National Radio Astronomy Observatory) and to the solar eclipses of 1998 and 1999. Contact: Sue Bassett wb3enm@amsat.org

Discounts are available to members on many publications, products, and services, including *Sky & Telescope* magazine.

Public Sky Viewing Programs are offered jointly with the National Park Service, and others. Contact: Joe Morris, joemorris@erols.com or (703) 620-0996.

Members-Only Viewing Programs periodically, at a dark-sky site.

NCA Juniors Program fosters children's and young adults' interest in astronomy, space technology, and related sciences through discounted memberships, mentoring from dedicated members, and NCA's annual Science Fair Awards.

Fine Quality Telescope, 14-inch aperture, see "Calendar of Monthly Events."

✂

Yes! I'd like to join the NATIONAL CAPITAL ASTRONOMERS **Date:**

Name(s): _____
Address: _____
_____
Telephone: _____ E-mail: _____
Other family members who should receive a membership card: _____
_____ I prefer to receive *Star Dust* by e-mail
Dues:
___ $60 With *Star Dust* and a discount subscription to *Sky & Telescope*.
___ $27 With *Star Dust* ONLY.
___ $45 Junior membership with *Star Dust* and a discount subscription to *Sky & Telescope*.
___ $15 Junior membership with *Star Dust* ONLY.
___ $100 Contributing member (with *Sky & Telescope*) ($40 tax-deductible).
___ $150 Sustaining member (with *Sky & Telescope*) ($90 tax-deductible).

Junior members only: Date of Birth: _____ Only members under the age of 18 may join as juniors.

Tax deductible contribution: ____ Thank You.

.
Please send this form, with your check payable to National Capital Astronomers, Inc., to:
Mr. Jeffrey Norman, NCA Treasurer, 5410 Connecticut Ave NW #717, Washington DC 20015-2837

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Change in Time and Place for January, February, and March Meetings! See Page 1.

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