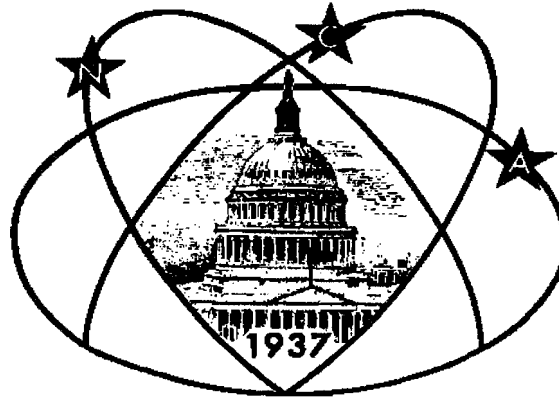


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# Star



# Dust

National Capital Astronomers, Inc.

<http://capitalastronomers.org>

Volume 62, Number 8

April 2004

ISSN 0898-7548

## The President's Corner

Amateur astronomy doesn't exist in a vacuum. It is intimately associated with the professional astronomy community and that includes NASA. As I mentioned previously, I have signed up NCA with the Night Sky Network. This is a joint NASA/Astronomical Society of the Pacific venture. I've just received their packet of materials. Its purpose is to use NASA projects to teach astronomy to the public through presentations containing videos and simple materials so that the public has a better understanding of not

only astronomy in general, but also the what and why of NASA's projects. It is important that we keep interest up in NASA projects.

I'm bringing the manual to the meeting and I hope you will look through it so that we can use these when we give presentations to various groups. I'm planning on using it at the Astronomy Day presentation I'll be giving at Black Hill Regional Park in Montgomery County on April 24 and I think we can use parts of

it at Exploring the Sky. The first set emphasizes the search for extra-solar planets, the Terrestrial Planet Finder, and the Space Interferometry Mission. In order to stay in the program, we have to use it five times during the year. As an incentive, we become eligible for prizes when we use it and report back to them. As I've said before, you don't have to be a Ph.D. astronomer to participate.

*Jay Miller, President NCA*

## April Speaker: Fred Espenak, "Transit of Venus"

*Submitted by Jeff Guerber*

Fred Espenak will present the featured talk: "Transit of Venus" at the April 3 meeting of the National Capital Astronomers.

The meeting will be held at 7:30 P.M. in the University of Maryland Astronomy Observatory on Metzert Road in College Park, MD.

### Abstract

A transit of Venus across the face of the Sun is among the rarest of eclipses. Only six such transits have occurred since the invention of the telescope (1610). In 1716, Edmond Halley recognized the value of transits in measuring Earth's distance from the Sun and the ultimate scale of the solar system. His work inspired astronomers of the next two centuries to organize transit expeditions to the farthest corners of the Earth. The first transit in 121 years occurs on June 8, 2004. The presentation will conclude with a preview of this remarkable event.

### Bio

Fred Espenak is an astrophysicist at NASA's Goddard Space Flight Center in Greenbelt, Maryland, where he uses state-of-the-art infrared spectrometers to probe the atmospheres of the planets. This work frequently takes him to the world's highest observatories atop the Hawaiian volcano Mauna Kea. He has participated in a number of research projects including the monitoring of ozone in Mars' atmosphere, the detection of winds on Venus, Mars, and Titan, and the measurement of hydrocarbons in the stratospheres of Jupiter, Saturn, Uranus, and Neptune.

Espenak is perhaps best known for his predictions of eclipses. His two books, "Fifty Year Canon of Solar Eclipses: 1986 - 2035" and "Fifty Year Canon of Lunar Eclipses: 1986 - 2035" have become standard references on the subject. Espenak also publishes special NASA

bulletins for each major solar eclipse which provide detailed predictions and maps. He is co-author of the popular book "Totality: Eclipses of the Sun" with Mark Littmann and Ken Willcox. Espenak's interest in eclipses was first sparked after witnessing the total solar eclipse of March 1970. Since then, he has participated in over twenty eclipse expeditions around the world and has made predictions on thousands of eclipses. His astronomical photographs have appeared in both national and international publications, and he has lectured extensively to the general public on the Sun, eclipses and photography. He is the webmaster of NASA's official eclipse web site ([sunearth.gsfc.nasa.gov/eclipse/](http://sunearth.gsfc.nasa.gov/eclipse/)) as well a personal web site on eclipse photography ([www.MrEclipse.com](http://www.MrEclipse.com)). In 2003, the International Astronomical Union honored Espenak and his work on eclipses by naming asteroid 14120 after him.

## NCA Events This Month

**The Public is Welcome!**

NCA Home Page: <http://capitalastronomers.org>

**Fridays, April 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 [gbrandenburg@yahoo.com](mailto:gbrandenburg@yahoo.com). For more information, see the article on the Page 5.

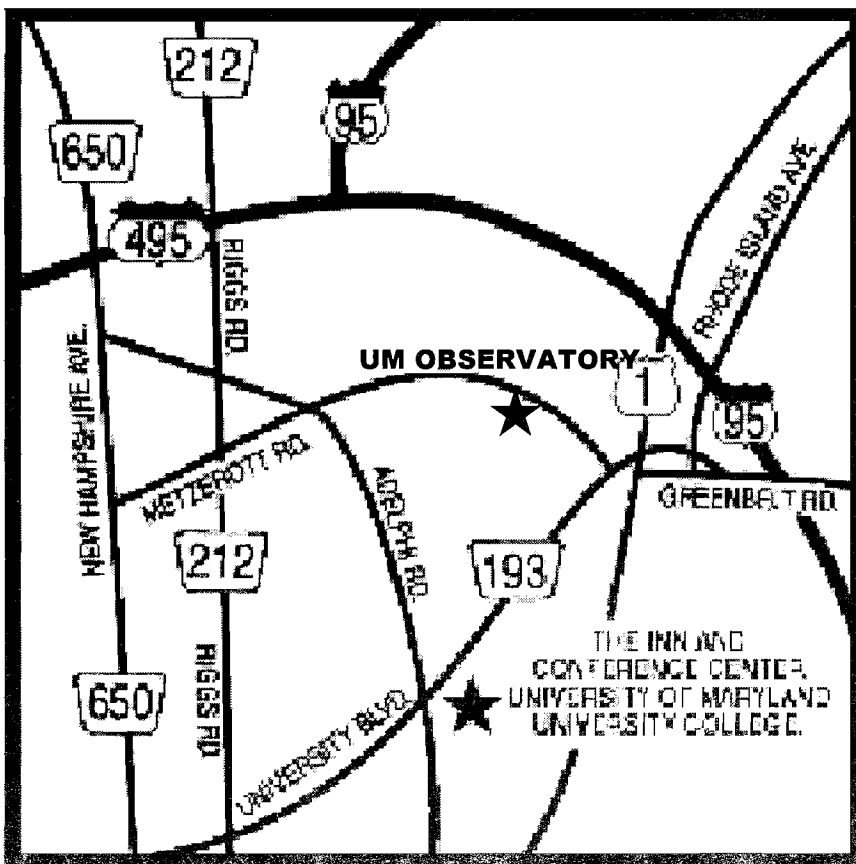
**Sunday, April 4, and Saturdays, April 10, 17, & 24, at 8:30 P.M.** Observing with NCA's 14-inch telescope in Chevy Chase, MD. For more information, see article this page.

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

**Saturday, April 3 at 7:30 P.M.** NCA meeting at the University of Maryland Astronomy Observatory on Metzert Road in College Park, MD.

Fred Espenak will present the featured talk "Transit of Venus." See maps below and on Page 7 and directions on Page 8

**Saturday, April 3, preceding the meeting,** dinner with the speaker and NCA members will be at 5:30 p.m. at the Garden Restaurant at the UMD University College Inn and Conference Center. See maps below and on Page 5 and directions on Page 6.



See written directions on Page 8.

## Reserve your Ride and/or Restaurant Seat *Jay Miller*

If you are planning to come to the dinner before the meeting, please tell Benson J. Simon, telephone: 301-776-6721, e-mail [st88@ioip.com](mailto:st88@ioip.com), so that we can make reservations for the right number of people.

Please contact me at 301-530-7942, 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: [jhmiller@os2bbs.com](mailto:jhmiller@os2bbs.com) or calling at 301-405-6555 so that I will know who to expect.)

## From the NCA Secretary

***Nancy Grace Roman***

Please return the renewal form, even if you pay with on-line banking. We need it for our records.

## Observing with the NCA C-14

***Mike McNeal***

<u>All at 8:30 p.m.</u>	<u>Prime Objects</u>
Sunday, April 4	TBD
Saturday, April 10	TBD
Saturday, April 17	TBD
Saturday, April 24	TBD

In Mike McNeal's backyard, 5410 Grove St, Chevy Chase, MD, (Friendship Heights Metro). Call Mike at 301.907.9449 or email [mcnealmi@verizon.net](mailto:mcnealmi@verizon.net) to let him know you are coming.

## 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](mailto:nancy.roman6@verizon.net) or 301-656-6092 (home).

# Support the IDA

Join the International  
Dark-Sky Association  
3225 N. First Avenue  
Tucson, AZ 85719-2103

[www.darksky.org](http://www.darksky.org)

*The deadline for the  
May Star Dust is  
April 15.*

*Please send your  
material to Elliott Fein  
by that date to  
ensure inclusion.*

*Send submissions to  
Elliott Fein at  
[elliott.fein@erols.com](mailto:elliott.fein@erols.com).*

*Text must be in ASCII,  
MS Word (97 or ear-  
lier), or WordPerfect.*

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

## Come See the Stars! by Joe Morris

### Exploring the Sky 2004-2005 Schedule

Date	Time	Notes
4/17	8:30 P.M.	Astronomy day 4/24
5/15	9:00 P.M.	
6/19	9:00 P.M.	Summer Solstice 6/21
7/24	9:00 P.M.	Moon at first quarter
8/7	8:30 P.M.	Perseid meteor shower 7/17-8/24
9/18	8:00 P.M.	Equinox 9/22
10/16	7:30 P.M.	Orionid meteor shower 10/2-11/7
11/13	7:00 P.M.	Leonid meteor shower 11/14-11/21

*Exploring the Sky* is an informal program that for nearly fifty 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 immediately 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:  
<http://www.nps.gov/rocr/planetarium>  
or  
<http://www.capitalastronomers.org>

## Meteor Showers April Radiants

Full Moon: April 5

### Major Activity

Radiant	Duration	Maximum
Lyrids (LYR)	April 16-25	April 22@ 02:45 UT

### Minor Activity

Radiant	Duration	Maximum
Tau Draconids	March 13-April 17	March 31-April 2
Librids	March 11-May 5	April 17/18
Delta Pavonids	March 21-April 8	April 5/6
Pi Puppids (PPU)	April 18-25	April 23/24
April Ursids	March 18-May 9	April 19/20
Alpha Virginids	March 10-May 6	April 7-18
April Virginids	April 1-16	April 7/8
Gamma Virginids	April 5-21	April 14/15

### Daylight Activity

Radiant	Duration	Maximum
April Piscids	April 8-29	Apr. 20/21

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

# Mid-Atlantic Occultations and Expeditions

by David Dunham

## Asteroidal Occultations

Date	Day	EST	Star	Mag	Asteroid	dmag	s	in.	Location	dur. Ap.
Apr 8	Thu	2:55	ZC 1994 A	6.7	Brest	9.4	1	2	New York City	
Apr 12	Mon	21:58	TYC61320446	10.1	Wallia	4.3	3	5	Maine	
Apr 14	Wed	4:28	TYC62902319	11.2	Helio	3.4	13	7	Bermuda?	
Apr 15	Thu	22:09	TYC18711473	12.0	Irene	0.5	5	8	Virginia	
Apr 18	Sun	3:08	TYC15510423	9.3	Olympia	5.0	4	2	Newfoundland?	
Apr 21	Wed	3:23	TAC+16 6935	11.5	Thetis	0.7	13	8	N.Y., s.Main	
Apr 22	Thu	23:13	TYC49710583	11.0	Roberta	1.2	10	7	North Carolina	
May 1	Sat	23:16	TYC14041681	11.5	Eurydike	3.6	5	8	Conn., Long Is.	

## Grazing Occultations

DATE	Day	EST	Star	Mag	% alt	CA	Location
Apr 21	Wed	20:45	X67157	10.1	5+ 14	5N	Sun-11 Union Mills & Perry Hall MD
Apr 23	Fri	22:44	SAO 77229	7.8	17+ 14	8N	Ladysmith, VA

## Total Lunar Occultations

DATE	Day	EST	Ph	Star	Mag	% alt	CA	Sp.	Notes
Apr 2	Fri	1:47	D	42 Leonis	6.2	88+ 32	15N	A1	ZC1514; graze, Baltimore
Apr 3	Sat	22:59	D	ZC 1728	6.7	98+ 54	79S	M4	
*** Dates and times above are EST, those below are EDT ***									
Apr 7	Wed	23:25	R	ZC 2212	6.2	90- 7	69N	A3	Azimuth 124 deg.
Apr 10	Sat	3:04	R	ZC 2545	6.4	70- 15	85N	F0	prob. close double
Apr 10	Sat	4:52	R	X Sgr	4.5	70- 22	20N	F7	ZC 2554; del Cep var.
Apr 12	Mon	4:19	R	SAO 188688	7.7	47- 10	47N	G8	Azimuth 136 deg.
Apr 13	Tue	5:55	R	SAO 189868	7.6	36- 17	43S	F3	Sun alt. -8 deg.
Apr 14	Wed	5:46	R	SAO 164703	7.7	26- 12	32S	K4	Sun alt. -9 deg.
Apr 21	Wed	21:28	D	SAO 76212	8.0	5+ 7	85S	A5	Azimuth 292 deg.
Apr 21	Wed	21:50	D	SAO 76227	8.1	6+ 3	81S	F5	Azimuth 295 deg.
Apr 24	Sat	21:14	D	SAO 78300	8.3	25+ 40	68N	B9	
Apr 24	Sat	21:29	D	SAO 78309	7.4	25+ 37	53S	A0	mg2 10.9 1.0", PA 0
Apr 24	Sat	22:49	D	SAO 78361	8.6	25+ 22	53S		
Apr 24	Sat	23:19	D	X33814	10.2	26+ 17	62S		
Apr 25	Sun	0:01	D	ZC 994	6.6	26+ 10	66S	F5	very close dbl, 3 mas
Apr 25	Sun	0:03	D	SAO 78422	8.6	26+ 9	77S	K2	
Apr 25	Sun	21:18	D	ZC 1105	6.5	34+ 48	67S	G7	mg2 7.0, ".1, PA 247 dg
Apr 25	Sun	22:49	D	ZC 1108	7.0	34+ 31	33N	G8	prob. close double
Apr 25	Sun	23:19	D	SAO 79304	8.1	34+ 26	69N	K2	
Apr 25	Sun	23:29	D	SAO 79311	8.3	34+ 24	86S	A0	
Apr 26	Mon	21:08	D	SAO 79980	7.3	43+ 59	22S	G8	/RX Cancri = ZC 1244
Apr 26	Mon	23:46	D	RX Cancri	8.6	44+ 29	57N	M8	dbl? SRBvar. range 2 mgs
Apr 27	Tue	1:51	D	SAO 80089	7.2	45+ 7	81S	G5	az. 296 deg.
Apr 30	Fri	2:24	D	ZC 1578	6.9	74+ 19	70N	K0	maybe close double
May 1	Sat	0:19	D	ZC 1684	6.8	83+ 46	78S	K0	
May 1	Sat	0:44	D	SAO 118952	7.1	83+ 42	38N	A2	
May 2	Sun	0:04	D	SAO 138774	7.7	90+ 47	66S	G5	maybe close double

David Dunham, e-mail [dunham@erols.com](mailto:dunham@erols.com). My Web site, <http://iota.jhuapl.edu> has data for many other late April events - crescent Moon in Milky Way. Phone home 301-474-4722; office 240-228-5609; car 301-526-5590

# The NCA Mirror-Making Group Continues

## Guy Brandenburg

We continue to have six to a dozen people every Friday evening working on their mirrors, or just visiting and watching what the rest of us are up to.

If you think you might want to make a mirror and a telescope, you can start or finish a project at any time. We meet from 6:30 to 9:30 P.M. on Friday evenings at the Chevy Chase Community Center at the northeast corner of the intersection of McKinley Street and Connecticut Avenue, N.W., in the woodshop in the basement. We only charge for materials. Thus, a 6" mirror blank and all of the needed grinding and polishing materials costs \$70, and an 8" blank kit costs \$110. Aluminizing costs \$15 more for the 6-inch kit, and \$20 more for the 8-inch. We have all the materials on hand up through 12 inches, but we can special order larger sizes if you want. (But it is STRONGLY advised to make a smaller mirror first before trying anything 10

inches or larger!) Instruction is free.

Responding to a request for technical assistance made to NCA, I assembled and checked out a telescope that was purchased for the Ben W. Murch Elementary School (DCPS) annual auction, to be auctioned off at an event whose theme was 'Reach for the Stars' and was held at the Carnegie Institution at 16th and P, N.W. in Washington, D.C. The telescope was a 6" f/8 Orion Dobsonian-mount Newtonian reflector that is ready to accept digital setting circles. It originally cost just about \$300, and was purchased from Company 7 in Laurel. The alignment was surprisingly good, and I didn't feel the need to adjust anything. The optics, as shown by a quick star test, are not perfect, but will probably perform fairly well anyway, given that it has a fairly large focal ratio. The telescope includes two decent Ploessl eyepieces, a Barlow, and a finder. I had recommended this tele-

scope for purchase based on its ease of use for a beginner and relatively high aperture - to - dollar ratio.

I just heard that the telescope "package" was auctioned off for \$700.00! The price includes one evening of introduction to using the telescope, and viewing of various objects in the night sky, that I will host at some dark-sky site later on during the year. All of the items auctioned at the event probably raised several tens of thousands of dollars for the school, which feeds into the junior high school where I teach. For more information, contact Guy Brandenburg at 202-262-4274 or visit his website at [http://home.earthlink.net/~gfbranden/GFB\\_Home\\_Page.html](http://home.earthlink.net/~gfbranden/GFB_Home_Page.html).

## Transits of Venus Exhibition

### Peggy Dickie

An exhibition entitled "Chasing Venus: Observing the Transits of Venus, 1631-2004" was launched at the Museum of American History (first floor, west wing) on March 24 and will be on display until early April 2005. Sponsored by the Smithsonian Libraries, it contains objects borrowed from the collections at the U.S. Naval Observatory as well as items from the Smithsonian Libraries and objects from the collections at the Museum of American History.

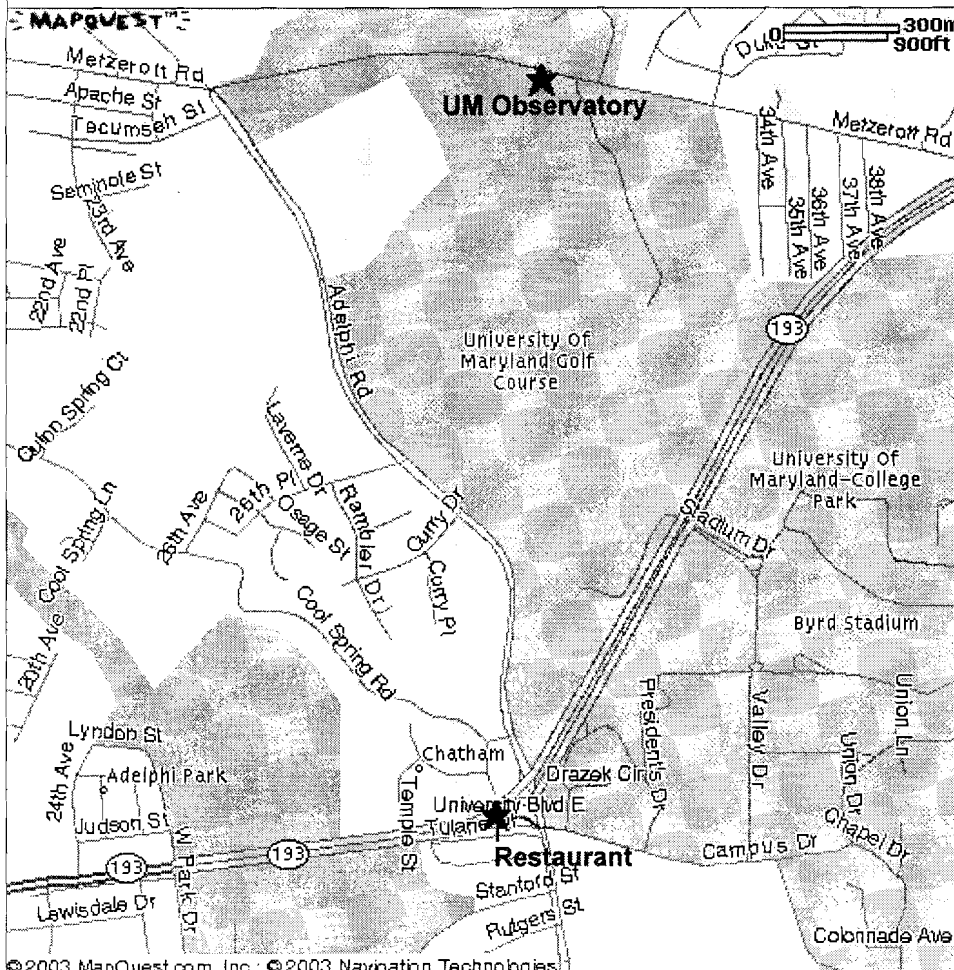
Also, there will be a "Chasing Venus" lecture series, on Thursdays, at 12 Noon, on April 8 & 22, May 6 & 20, and June 3 at Noon in the Leonard Carmichael Auditorium at the National Museum of American History, Behring Center. The first lecture will be "The First Observation of a Transit of Venus: Jeremiah Horrocks and the New Astronomy" by Wilbur Applebaum, Professor Emeritus, Humanities Dept., Illinois Institute of Technology. More information about the lectures can be found at <http://www.sil.si.edu/>.

For further information on the exhibition, one can contact its curator, Ron Brashear or his assistant Kirsten at the U.S. Naval Observatory at (202) 633-3870.

For further information on the Smithsonian Libraries and their public programs, one can contact Gwen Leighty at Smithsonian Libraries Public Information at (202) 786-2875.

## Getting to the NCA Monthly Meeting

See next page for written directions.



# Getting to the NCA Monthly Meeting

## The Meeting

You may join us for dinner with the speaker and NCA members at 5:30 p.m. at the restaurant, attend the NCA Meeting at 7:30 P.M., or do both.

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

The MD Observatory 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.

We'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

## Observing after the Meeting

### Elizabeth Warner

Following the meeting, members and guests are welcome to tour through the Observatory. Weather permitting, several of the telescopes will also be setup for viewing. On April 3 there will be a nearly full moon. But Jupiter and Saturn will also be quite prominent and will likely be targets. In addition, we'll try for some binaries like gamma Leonis, and depending on the transparency, we might try for M81/82 (galaxies in UMa). For those who arrive early, bring your cameras and tripods and try to get a shot of Venus by the Pleiades."

## Public Transportation

Please contact Jay Miller, 301-530-7942, 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 email at [jhmiller@os2bbs.com](mailto:jhmiller@os2bbs.com))

*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  
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## National Capital Astronomers, Inc.

<http://capitalastronomers.org>

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NCA Web Page: <http://capitalastronomers.org/>.

Appointed Officers and Committee Heads: Exploring the Sky - Joseph C. Morris; Meeting Facilities - Jay H. Miller;

Observing - Michael McNeal, [mcnealmi@verizon.net](mailto:mcnealmi@verizon.net); Telescope Making - Guy Brandenburg; *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.

**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](mailto: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).

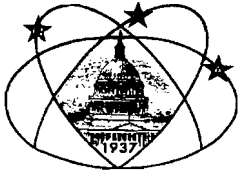
\_\_\_ \$150 Sustaining member (with *Sky & Telescope*) (\$90 tax-deductible).

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

Tax deductible contribution: \_\_\_\_\_ Thank You.

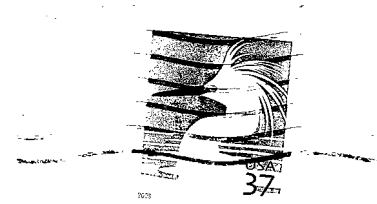
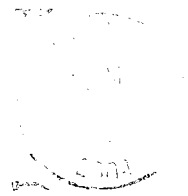
Please send this form, with your check payable to National Capital Astronomers, Inc., to:

Mr. Jeffrey Norman, NCA Treasurer, 5410 Connecticut Ave NW #717, Washington DC 20015-2837



## National Capital Astronomers, Inc.

If undeliverable, return to  
NCA c/o Nancy Roman  
4620 N. Park Ave., #306W  
Chevy Chase, MD 20815-4551



## FIRST CLASS DATED MATERIAL

Wayne H, Jr & Martha H Warren  
8001 Brett Place  
Greenbelt, MD 20770-3001

20770+3001 05



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### *Inside this issue:*

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<b>President's Corner</b>	<b>1</b>	<b>Mid-Atlantic Occultations and Expeditions</b>	<b>4</b>
<b>April Speaker and His Talk</b>	<b>1</b>	<b>Mirror-Making Group</b>	<b>5</b>
<b>NCA Events This Month</b>	<b>2</b>	<b>Transits of Venus Exhibition</b>	<b>5</b>
<b>Observing with the NCA C-14</b>	<b>2</b>	<b>Maps to Dinner and Meeting Place</b>	<b>2, 5</b>
<b>Reserve your Ride and/or Restaurant Seat</b>	<b>2</b>	<b>Directions to Dinner and Meeting Place</b>	<b>6</b>
<b>From the NCA Secretary</b>	<b>2</b>	<b>Observing after the Meeting</b>	<b>6</b>
<b>Exploring the Sky</b>	<b>3</b>	<b>About NCA</b>	<b>7</b>
<b>April Meteor Showers</b>	<b>3</b>	<b>Membership Application</b>	<b>8</b>

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