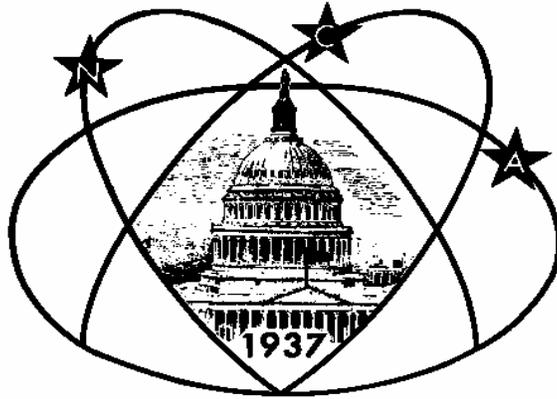


Star



Dust

National Capital Astronomers, Inc.

<http://capitalastronomers.org>

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Notice

*New Times:
NCA Dinners
are at 5:30 P.M.
& Meetings are
at 7:30 P.M.*

The President's Corner

I don't have much for this issue. I have one request and a note on amateur observing. The request is for reviewers of our lectures. We always need them. Presently I'm videotaping our talks and can easily produce a VCR tape to assist in your review. It's a good way to go over the talk and maybe pick up on something you might have missed. Like any organization such as ours, we always need members to help out. If many volunteer, then no one is overburdened or becomes burned out.

As for the observing, I've been reading about an amateur with a modest three-inch refractor who has recently discovered a new star in Orion. This star has just turned on and begun to light up the gas around it. It's been confirmed by a large professional observatory. So for those of you who think their small telescope is just a toy, this shows you a little of what you can do with it. Even binoculars can be used for making useful observations.

Ah, one more timely item. Please help us

(Continued on page 2)

March Speaker: Dr. Albert Holm, "The American Association of Variable Star Observers: A Bridge between Amateurs and Professionals"

Submitted by Jeff Guerber

Dr. Albert Holm will present the featured talk: "The American Association of Variable Star Observers: A Bridge Between Amateurs and Professionals" at the March 6 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

Since its founding at the Harvard College Observatory in 1911, the AAVSO has provided a channel to deliver observations by

amateur astronomers to their professional colleagues and to publicize data requests made by the professionals. This talk describes how the AAVSO provides these services and more today. It also discusses how recent technological advances — or

(Continued on page 4)

"X-raying a Stellar Monster" A Talk by Dr. Michael F. Corcoran *Reviewed by Dr. Nancy Grace Roman*

At the January 3 meeting of National Capital Astronomers in the University of Maryland Astronomy Observatory, Dr. Michael F. Corcoran treated members to a fascinating talk about supermassive stars. Dr. Corcoran is an astrophysicist with the Universities Space Research Association working at the Laboratory for High Energy Astrophysics at the Goddard Space Flight Center.

The "monster" is Eta Carina (Eta Car), probably one of a rare class of luminous blue variables (LBV's), although it is so peculiar that its assignment to that class is uncertain. These highly variable stars are more massive than 30 solar masses, 20 to 30 times as large as the Sun, have a temperature of 20,000° to 50,000°, and are expected to explode as supernovae or hypernovae after short lives. At that time, they

are expected to emit as much energy as an entire galaxy of stars and decay into massive black holes. Eta Car could actually damage the earth when it explodes. These stars produce all elements up through iron in their cores after which, no heavier element can be produced until the star explodes. These elements are dispersed into the galaxy by both the stellar winds and the

(Continued on page 3)

NCA Events This Month

The Public is Welcome!

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

Fridays, March 5, 12, 19, and 26, 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. For more information, see the article on the Page 5.

Sunday, March 7, and Saturdays, March 13, 20, & 27, 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, March 6 at 7:30 P.M. NCA meeting at the University of Maryland Astronomy Observatory on Metzertott Road in College Park, MD. Dr. Albert Holm will present the featured talk "The American Association of Variable Star Observers: A Bridge between Amateurs and Professionals" See maps below and on Page 7 and directions on Page 8

Saturday, March 6, 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 7 and directions on Page 8

Other National Capital meetings on Page 5

President's Corner

(Continued from page 1)

in our science fair judging in March and April. I mentioned them in last month's Stardust. You really don't have to be a Ph.D. astronomer or even an expert amateur astronomer to assist. There will be an experienced NCA member with you.

- March 13 - Fairfax County and Northern Virginia (Arlington)
- March 20- D.C. at Howard University
- March 27- Montgomery County (Gaithersburg) and P.G. County (Largo)

Contact me if you can assist in judging a science fair at 301-530-7942 or jhmiller@os2bbs.com.

Thanks.

Jay Miller, President NCA

Observing with the NCA C-14

Mike McNeal

<u>All at 8:30 p.m.</u>	<u>Prime Objects</u>
Sunday, March 7	TBD
Saturday, March 13	TBD
Saturday, March 20	TBD
Saturday, March 27	TBD

In Mike McNeal's backyard, 5410 Grove St, Chevy Chase, MD, (Friendship Heights Metro). Call Mike at 301.907.9449 or email: mnealmi@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.roan6@verizon.net or 301-656-6092 (home).



See written directions on Page 8.

X-raying a Stellar Monster

(Continued from page 1)

final explosion. Each step along the way of producing heavier elements is faster than the proceeding step, ranging from a few million years for the production of helium to a few hours for the production of iron. LBV's are also characterized by strong, extremely fast stellar winds. They make a major contribution to galactic energy both by their winds and their explosive energy. They can trigger star formation as their winds compress surrounding material and disperse the clouds. We think that the explosions of such stars are responsible for gamma ray bursts. After the maximum amount of iron has been created, the core collapses and material spirals in, leading to a shock and the propulsion of bi-polar outflows along the rotation axis of the star. These jets disperse the stellar material, leaving a black hole at the center. Material accretion onto the black hole continues to power the jets.

In an X-ray picture of Eta Car from Chandra, the star appears as a small dot, surrounded by material of 50 – 100 million degrees and, outside that, 20 million-degree gas. There is a less dense region between the two major rings and the cooler ring is not uniform. At the distance of Eta Car, about 8000 light years, the outer ring spans about 2 light years. The nebula surrounding Eta Car is called a homunculus, as it resembles roughly a human or fat doll. Along its major axis is a pair of opposite jets, presumably along the rotation axis.

Eta Car has been observed for at least 400 years. In 1843, it was the second brightest star in the sky, an event called The Great Eruption. It faded rapidly so that 30 years later it was below naked eye visibility. A smaller eruption occurred in 1890. During the Great Eruption about 2-10% of the mass of the star probably was expelled forming the nebula. When it cooled, dust formed, blocking the light from the star. This nebula is not only extended along the rotation axis, but is tilted about 43° to the plane of the sky. Radio interferometry shows that the star is football shape, in line with the extension of the nebula. There appears to be an uneven disk of material around the star perpendicular to this extension.

Eta Car is about 100 times as massive as the Sun. (This much mass is needed to hold the star together against its radiant energy.)

As it has been losing mass at a high rate, it must have been even more massive when it was formed. Eta Car is located in the southern Carina nebula in which dense dust and gas is condensing into massive stars. The nebula houses one of the hottest stars we know. Because Eta Car is much too bright for its temperature, it must be very unstable.

X rays can be produced in shock waves, in strong magnetic fields, and by the energy conversion from accretion in a strong gravitational field. They must be observed from above our atmosphere and cannot be focused by normal incidence mirrors. Instead, the X rays are scattered to a focus by a pair of conical mirrors that the X rays strike at a very small angle. Although the Eta Car region was one of the first X ray sources detected, it was not until later that a picture of a number of sources and surrounding hot gas was resolved in the Carina nebula. A Hubble picture in a nitrogen line that emphasizes the nebula, displays the homunculus surrounded by fainter, extended material, but the X ray emission is much more extended. A bright point in the nebula that shows in both the X ray and the optical band is apparently a particularly massive blob of material hitting the surrounding matter. The southern portion of the nebula is weaker in X rays; it is apparently an area in which the material has been blown out.

In 1997, a Brazilian, Augusto Damineli, discovered that the red light from the star varied in a period of about 5½ years. The helium emission also varied with inverse strength. In 1992, at the same time that Damineli was observing Eta Car in the optical, both Rosat and an Australian radio telescope were also observing it. In the radio frequencies, the intensity varies in the same period, but the variation is strikingly large. Although this variation must be driven by the star, there is much confusion between the stellar variation and the variation in the surrounding material in red light and helium. The cooler X ray emission does not change much, but there are major changes in the hotter emission (20 – 30 million degrees) that are directly correlated with the neutral helium intensity.

The Rossi X ray Timing Explorer found that the star is usually randomly variable at a low level. In 1997 and again in 2002, the X ray intensity climbed gradually to a very

sharp peak and then dropped precipitously to an unusually low level. Again, the indicated period is 5½ years. One explanation is that Eta Car is a binary with the X rays eclipsed for about three months each cycle. The X rays are probably produced when the winds from Eta Car hit the wind from the companion. The 50 million-degree X rays indicate that the collision speed is 3000 km/sec, about five times faster than the wind from Eta Car itself. Binaries with colliding winds are often seen in massive star systems. The orbits of the components in Eta Car are quite elliptical. There are probably also cooler shocks at a greater distance from the stars that are absorbed by the hotter shocks and by the homunculus.

A model of colliding winds fits moderately well, but does not predict the variation between cycles. We assume that the stellar orbits are tilted by 43° from the plane of the sky. There is always a shock wave, but it strengthens as the stars approach. Then the companion eclipses the shock. The stellar wind gradually clears the material around the star until the star erupts again. In the level portion of the X ray intensity curve, Chandra shows the ring that was seen earlier in the talk. Then, as the X ray intensity rises, the star brightens enough that the ring can no longer be seen. At X ray maximum, Eta Car is brighter and dominates the picture: at minimum, the star is still visible with X ray structure around it. There does not seem to be much variation in the gamma ray region.

In the future, we will use the X ray observations to define better the orbit and its inclination. This information will then be used to interpret the variations in the other wavelengths. We need to understand the cycle-to-cycle variation: each cycle is getting fainter in the radio frequencies but brighter in the X rays. We want to look for Doppler shifts to tell what the orbital velocity really is. We also want to understand the effects of the companion on the evolution of Eta Car. Perhaps during the Great Eruption, Eta Car expanded and the companion actually moved into its atmosphere. We will use the abundances of the elements in the winds to determine how close the star is to exploding. We hope to determine which star exploded in the Great Eruption.

The reviewer thanks the speaker for reviewing this summary and suggesting several corrections.

March Speaker

(Continued from page 1)

biting astronomical telescopes, digital computers, the Internet, automated sky surveys — have provided the AAVSO with both opportunities and challenges.

Bio

After completing his Ph.D. at the University of Wisconsin with an analysis of the condensations in planetary nebulae, Albert Holm joined the Wisconsin team in running the Orbiting Astronomical Observatory-2 in 1970. He became a founding member of the operations team for the International Ultraviolet Explorer in 1977. In 1983, he transferred to the Space Telescope Science Institute, where he is now responsible for data processing operations. His research interests include white dwarfs and subdwarfs, dwarf novae, R CrB-type variables, and ultraviolet calibration and photometry. He was a member of the AAVSO Council from 1991 to 1999, and served as its president from 1995 to 1997.

The deadline for the April Star Dust is March 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.

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 Cen-

ter. 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

Full Moon: March 6

Major Activity: None

Minor Activity

Radiant	Duration	Maximum
Eta Draconids	March 22-April 8	Mar. 29-31
Beta Leonids	February 14-April 25	Mar. 19-21
Rho Leonids	February 13-March 13	Mar. 1-4
Leonids-Ursids	March 18-April 7	Mar. 10/11
Delta Mensids	March 14-21	Mar. 18/19
Gamma Normids	March 11-21	Mar. 16/17
Eta Virginids	February 24-March 27	Mar. 18/19
Pi Virginids	February 13-April 8	Mar. 3-9
Theta Virginids	March 10-April 21	Mar. 20/21

Daylight Activity

Radiant	Duration	Maximum
March Aquarids	February ??-April ??	Mar. 15-18

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

Other National Capital Area Meetings, etc.

Montgomery College's Planetarium

Fenton St. in Takoma Park, MD.

Exciting public planetarium programs are offered at Montgomery College at Takoma Park. Please come to a public planetarium program and explore the universe with us.

Saturday, March 20 at 7:00 P.M.

"The Rites of Spring", the Vernal Equinox. The Vernal Equinox is 6:49 UT on March 20, 2004 which is 1:49AM EST on March 20. The planetarium show will explore the astronomical events associated with the first day of spring and will demonstrate how the position of the equinox has changed over the millennia with respect to the fixed stars. The vernal equinox, which is both a time and a direction in space is called the first point of Aries. Come find out how the Vernal Equinox got to be in Pisces now and when last it was in Aries.

Saturday, 17 April 2004 at 7:00 P.M.

Space-time Invariance and Quantum Gravity. What significance does using Discrete Numbers (there is a smallest or shortest quantity) versus Real Numbers (where there is no smallest or shortest

quantity) to measure length and time have in the observable universe. Is it time to abandon the Real Numbers in describing space-time? What are the physical consequences to our freedom to move forward and backward in space, but only forward in time?

Source: <http://www.mc.cc.md.us/Departments/planet/>

Northern Virginia Astronomy Club

General membership meetings are open to the public, and are held at Enterprise Hall, Room 80, on the campus of George Mason University in Fairfax, Virginia.

The meeting hall is in the basement floor of the building. It is best to park in parking lot B and walk up the hill to the rear of Enterprise Hall. Meetings start at 7:00 P.M., on the second Sunday of every month. Please note: GMU has two parking lots designated as B. One of them has closed temporarily. Please continue further around Patriot Circle to the 2nd lot B or park in the Patriot center lot and walk to Enterprise Hall.

Sunday, March 14, Greg Redfern, "The Palomar Observatory" The principal instruments at Palomar are the 200-inch

Hale Telescope, the 48-inch Oschin Telescope, the 18-inch Schmidt telescope, and the 60-inch reflecting telescope. Greg Redfern has been an amateur astronomer and space exploration enthusiast for over four decades. His writings, media appearances, and public lectures have reached thousands of people worldwide. Using telescopes and meteorites, he has studied the solar system from afar and up close and personal. His favorite solar system objects are the Moon and his meteorite collection.

Sunday, April 11, Ian Jordan, "The Occulter Project" UMBRAS (Umbral Missions Blocking Radiating Astronomical Sources) is a technique and a class of space science missions. The UMBRAS goal is direct observation of planets around other stars. "Direct observation" means images, photometry, and spectroscopy, as contrasted to the measurement of stellar reflex motion and variations in starlight flux used to demonstrate the discovery of extrasolar planets found so far. Source: <http://novac.com>

(Continued on page 7)

The NCA Mirror-Making Group Continues

Guy Brandenburg

Wade Duvall and David Gordon have done a lot of work in trying to modify the mirror-grinding/polishing machine that we were given, without much success in getting it to perform well. The problem (as some of us see it) is that since the turntable and the grinding/polishing arm are controlled by the same motor, there is not enough randomness in the motion of the arm. After the latest modifications that Wade, David, and others performed, the tool now performs sort of a kidney-shaped motion on the mirror, grinding the same area at all times. That is NOT acceptable! Wade is now thinking about going back to doing his 16-inch thin plate glass blank by hand! We may try some other modifications, such as adding a different, variable motor for the grinding arm. If anybody has such a motor that he or she would like to donate, please let us know.

Michael Chesnes appears to have finished his 4.25" plate glass f/9 mirror at long last. (Sorry, we misspelled his name last month.) We didn't have time to do any zonal measurements last week, but it looked very, very good. It is remarkable

how much the figure will change on this plate-glass mirror between a polishing/figuring session and when it cools down later, which is a good argument for using Pyrex whenever possible. Because of the lower coefficient of expansion, Pyrex mirrors do not change their figure by nearly as much as plate glass mirrors between the time immediately after polishing and the next day, when the mirror has cooled down.

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. A couple of weeks ago, Wade's mother and some of his friends even brought in a birthday cake and candles for his 16th birthday! (We all got some delicious carrot cake and soft drinks.)

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.

If you compare these prices to those for commercial telescopes of the same size, you will be amazed. However, you still would need to build the rest of the telescope, but there are published designs for equatorial or alt-az (Dobsonian) mounts that are rather easy to do. Naturally, it is much faster to purchase a telescope, but you learn a whole lot more if you make it yourself.

For more information, contact Guy Brandenburg at 202-262-4274 or visit his website at http://home.earthlink.net/~gfbranden/GFB_Home_Page.html.

Mid-Atlantic Occultations and Expeditions

by David Dunham

Asteroidal Occultations

Date	Day	EST	Star	Mag	Asteroid	dmag	dur.	Ap.	s in.	Location
Mar 8	Mon	23:30	TYC18981398	11.0	Dodona	3.3	17	7	7	Indiana
Mar 12	Fri	3:57	TYC03000136	11.6	Princeton	1.7	14	8	8	Penn., NJ
Mar 20	Sat	21:46	TYC14360907	11.0	Naema	3.5	4	7	n.	NY, Maine
Mar 23	Tue	22:40	SA0 098368	9.5	Itha	6.7	3	4	4	Florida?
Mar 26	Fri	1:58	SA0 140135	9.8	Walkure	5.5	5	5	5	New York City
Mar 31	Tue	21:54	SA0 078441	8.6	Mimi	6.8	2	3	3	Maine
Apr 2	Fri	23:18	SA0 140023	10.2	Palatia	4.2	6	6	6	Maine

Grazing Occultations

DATE	Day	EST	Star	Mag	% alt	CA	Location
Mar 11	Thu	4:00	SA0 158974	7.9	77- 33	14S	La Plata, MD & Fairfax, VA
Mar 14	Sun	5:37	ZC 2617	4.5	44- 23	10S	Apex & Smithfield, NC
Mar 22	Mon	19:32	SA0 110038	8.5	4+ 8	6S	Herndon, VA; DC; Woodmore&BowieMD
Mar 29	Mon	20:24	SA0 79530	8.2	60+ 70	6N	Manassas, VA; Hughesville, MD
Mar 30	Tue	20:32	SA0 80209	7.0	69+ 75	6N	Ashland, VA
Apr 2	Fri	1:52	42 Leonis	6.2	87+ 31	6N	Gettysb. PA; Westmstr&Balto, MD

Total Lunar Occultations

DATE	Day	EST	Ph Star	Mag	% alt	CA	Sp.	Notes
Mar 2	Tue	1:56	D ZC 1089	6.7	78+ 24	84S	K0	
Mar 2	Tue	23:05	D omega Cnc	5.9	85+ 65	39N	G8	ZC 1206
Mar 2	Tue	23:32	D ZC 1211	6.3	85+ 60	83S	A1	
Mar 4	Thu	20:31	D ZC 1435	6.5	96+ 52	39N	K0	
Mar 4	Thu	21:25	D ZC 1436	6.8	96+ 61	48N	K0	
Mar 5	Fri	18:25	D 46 Leonis	5.4	99+ 17	55N	M2	Az 85; term. 14"; ZC 1544
Mar 9	Tue	0:31	R theta Vir	4.4	93- 40	57N	A1	ZC1891; mg2 6.8". 5, mg3 8
Mar 12	Fri	1:28	R ZC 2274	6.9	67- 14	62S	B9	Azimuth 135 deg.
Mar 13	Sat	2:39	R SA0 184849	7.4	56- 12	42N	K5	Azimuth 139 deg.
Mar 14	Sun	3:20	R ZC 2601	6.8	44- 9	39N	K4	Azimuth 137 deg.
Mar 14	Sun	5:27	R SA0 186286	7.1	43- 20	56S	B7	Sun alt. -11
Mar 14	Sun	6:01	R ZC 2617	4.6	43- 22	37S	K0	Sun-4 grz. mg2 5.9 ". 3
Mar 15	Mon	3:27	R tau Sgr	3.3	33- 1	29N	K1	ZC2784 az. 127, closeDbl.
Mar 22	Mon	19:32	G SA0 110038	8.5	4+ 8	6N	G0	graze, az 275, double?
Mar 22	Mon	19:40	D ZC 247	6.3	4+ 6	85N	F2	azimuth 276 deg.
Mar 25	Thu	19:25	D SA0 076406	7.8	23+ 42	88N	F5	
Mar 26	Fri	19:46	D ZC 733	7.2	31+ 49	59N	A0	mag2 8.8 ". 2, mg3 10 ". 5
Mar 26	Fri	22:26	D 98 Tauri	5.8	32+ 19	21S	A0	ZC743, mag2 9.9 95", PA289
Mar 28	Sun	20:38	D ZC 1028	7.5	50+ 59	46S	G8	
Mar 30	Tue	0:56	D 76 Gem	5.3	61+ 20	73N	K5	ZC 1169
Mar 30	Tue	19:21	D CX Cancr	6.1	69+ 73	87S	F0	ZC 1270; spec. binary
Mar 30	Tue	21:28	D ups'n1 Cnc	5.7	70+ 67	45N	F0	ZC 1274 graze, CT, s. NY
Apr 2	Fri	1:47	D 42 Leonis	6.2	88+ 32	15N	A1	ZC1514; graze, Baltimore
Apr 2	Fri	22:04	D ZC 1612	7.3	93+ 61	42N	F5	
Apr 3	Sat	22:59	D ZC 1728	6.7	98+ 54	79S	M4	

David Dunham, e-mail dunham@erols.com, Web <http://iota.jhuapl.edu>
 Phone home 301-474-4722; office 240-228-5609; car 301-526-5590

Support the IDA

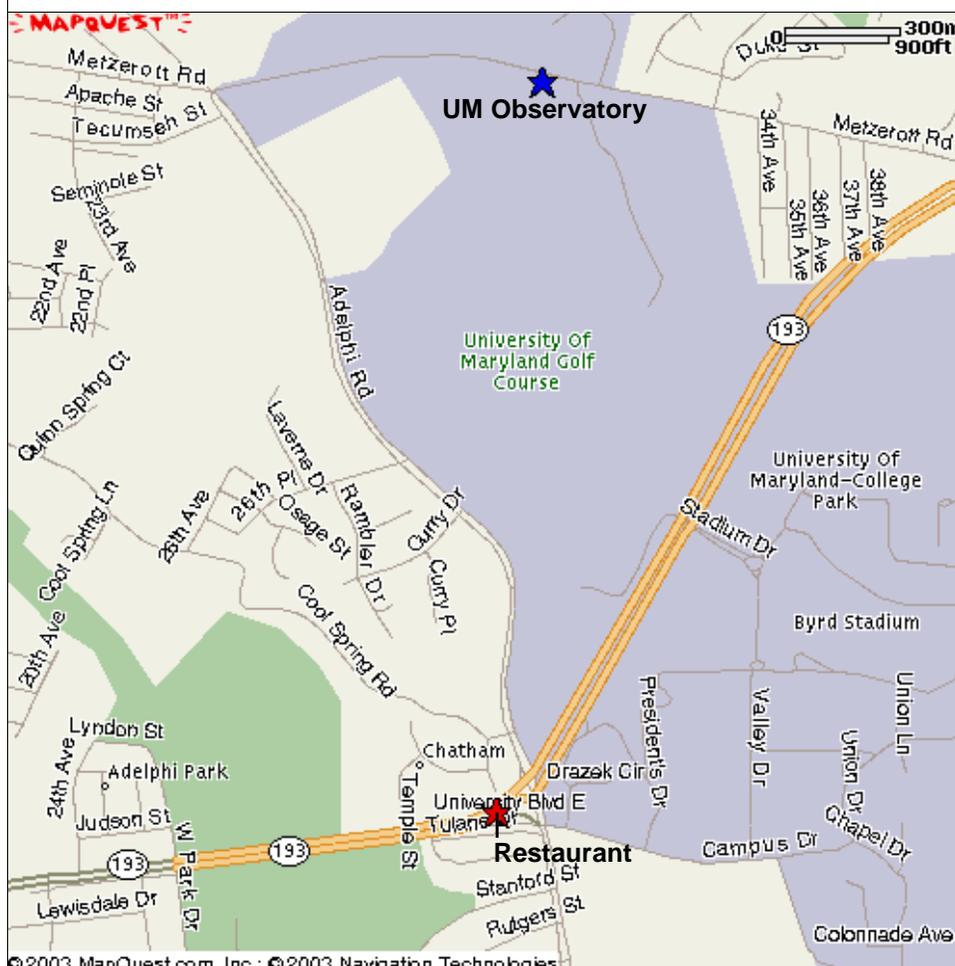
Join the International
Dark-Sky Association

3225 N. First Avenue
Tucson, AZ 85719-
2103

www.darksky.org

Getting to the NCA Monthly Meeting

See next page for written directions.



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, so that we can make reser-

vations for the right number of people. 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 her know in advance by email: warnerem@astro.umd.edu or calling at 301-405-6555 so that she will know who to expect.)

Other National Capital Area Meetings, etc.

(Continued from page 5)

National Air & Space Museum – Albert Einstein Planetarium
Thursday, March 11, 8:00 P.M. to 9:00 P.M.
“New Strategies for Detecting Life in the Universe: The Search for Earth-like Extrasolar Planets” Dr. Sara Seager starts this year’s four-part Exploring Space Lecture Series. An astrophysicist at the Carnegie Institution in Washington, D.C., Dr. Seager will detail the technological challenges and prospects in the search for Earth-like planets and indications of extraterrestrial life. This lecture is free, but tickets are required.

Source: <http://www.nasm.si.edu/>

Goddard Space Flight Center

Note: Individuals not badged for entry into Goddard should obtain the current procedure by contacting Main Gate security at 301-286-7211.

LASP Science Seminar Series

Laboratory for Astronomy and Solar Physics, Day: Thursday, Time: 3:30 P.M., Place: Building 21, Room 183
March 11 Ricardo Piorno Schiavon, University of Virginia, “Stellar Population Synthesis in the Blue, from Galactic Clus-

ters, through Nearby Galaxies, to the Distant Universe”

March 18 Barbara Thompson, GSFC Solar Physics Branch, “What Have We Learned from 200 EIT Waves?”

March 25 Peter Searson, APL, “Nanotechnology”

April 1 Scott McIntosh, USRA, “Mapping the Solar Chromosphere”

For additional information contact Ted Gull(301-286-6184), Terry Kucera (301-286-0829), or Dan Gezari(301-286-3432). Source: <http://www.gsfc.nasa.gov/index.html>

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.

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

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

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 her know in advance by email at warnerem@astro.umd.edu or calling at 301-405-6555 so that she knows who to expect.)

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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 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).

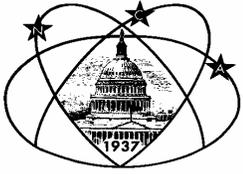
___ \$150 Sustaining member (with *Sky & Telescope*) (\$90 tax-deductible).

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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**FIRST CLASS
DATED MATERIAL**

*NCA
Dinners
Are Now at
5:30 P.M.
& Meetings
are at
7:30 P.M.*

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