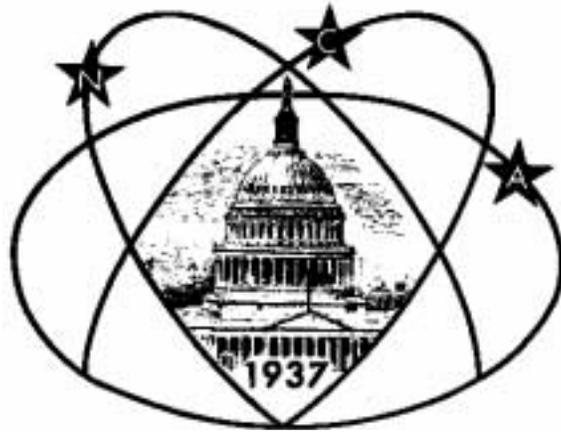


Star



Dust

National Capital Astronomers, Inc.

<http://capitalastronomers.org>

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May Speaker: Dr. Robert W. Farquhar, “The Flight of ISEE-3/ICE and the Utilization of Libration Points in Future Space Exploration”

Submitted by Dr. Walter L. Faust

Dr. Robert W. Farquhar, The Johns Hopkins Applied Physics Laboratory; NASA Mission Manager of Launch Scenarios and Maneuver Planning, will present the talk “The Flight of ISEE-3/ICE and the Utilization of Libration Points in Future Space Exploration” at the May 13 meeting of the National Capital Astronomers.

Abstract of Talk

A brief history of the ISEE-3/ICE mission will be presented. ISEE-3/ICE was the first spacecraft to use a “halo orbit” and lunar gravity-assist maneuvers to achieve its

mission objectives. These enabled ISEE-3/ICE to perform: The first continuous measurements of solar-wind conditions upstream from the Earth; the first exploration of the Earth’s magnetotail between 80 and 240 Earth radii; and the first encounter with a comet. In demonstrating the usefulness and practicality of halo orbits and lunar gravity-assist trajectories, ISEE-3/ICE paved the way for numerous follow-on missions: SOHO, WIND, Geotail, ACE, MAP, Genesis, Herschel, Planck, GAIA, JWST, and TPF.

Dr. Farquhar will describe a plan to use the Sun-Earth L2 libration point as the primary hub for future human space activities in the Earth’s neighborhood. It is anticipated that this will be the location of choice for a number of large astronomical observatories over the next 50 years. These observatories will probably require some level of servicing and/or repair by astronauts. It is shown that NASA’s Crew Exploration Vehicle (CEV), currently in a development phase, could be used to provide human access to the L2 observatories.

(Continued on page 2)

Congratulations to Science Fair Award Winners!

We are pleased to announce that Julie E. Walker and James M. Bonnell are the winners (to date) of the NCA Astroscience Awards in the 2006 science fairs. The Prince Georges County Science Fair was held at Prince Georges Community College, Largo, Maryland. The NCA judges were Dr. Wayne H. Warren Jr. and Dr. Andrew W. Seacord II.

Julie E. Walker lives in Hollywood MD and attends Leonardtown Regional High School. Her project: *The Dust Devils Did It: Wind Erosion on Mars.*

James M. Bonnell lives in Greenbelt MD and attends Eleanor Roosevelt High School. His project: *Infrared Photometry of a GRB Afterglow.*

These award winners will be honored at the June NCA meeting. They will bring their projects to the meeting, where each will give a three to five-minute summary of his or her project. Each student will be presented with a certificate, a one-year membership in NCA, and a one-year subscription to Sky and Telescope.

In the News Reported by Dr. Nancy Grace Roman

Stellar Stag Party

By Michael Schirber
Science/NOW Daily News

Of the stars apparent to the naked eye, more than half are actually two or more stars clumped in tight orbit around each other. Many astronomers have assumed that most stars in the galaxy have a stellar

companion. Not so, according to a new census. The realization that single stars, such as our sun, are the rule and not the exception may mean that planets are more common than thought.

The stars most visible in the night sky are often bright, massive ones, of which 80% have companions. But recent studies of

less massive stars, less than 1% as bright as the sun, have found they are not nearly as social as their bigger counterparts. In fact, three-quarters of red dwarfs—less than half the sun’s mass—are alone.

Astronomer Charles Lada of Harvard

(Continued on page 2)

NCA Events This Month

The Public is Welcome!

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

NCA Mirror- and Telescope-making Classes: Fridays, May 5, 12, 19, and 26, 6:30 to 9:30 P.M. 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.

Open house talks and observing at the University of Maryland Observatory in

College Park on the 5th and 20th of every month at 9 P.M. The talks are non-technical. There is telescope viewing afterward if the sky is clear.

Next NCA Meeting: Saturday, May 13 at 7:30 P.M., at the University of Maryland's Observatory on Metzerott Road: Dr. Robert W. Farquhar will present the talk "The Flight of ISEE-3/ICE and the Utilization of Libration Points in Future Space Exploration." See map and

directions on Page 6.

Dinner with NCA members and speaker: Saturday, May 13 at 5:30 P.M., preceding the meeting, at the Garden Restaurant in the University of Maryland University College Inn and Conference Center. See map and directions on Page 6.

Upcoming NCA Meetings—Saturdays June 10: TBA.

May Speaker: Dr. Robert W. Farquhar

Bio

Dr. Farquhar earned a B. S. in Aeronautical Engineering at the University of Illinois (1959), an M. S. in Engineering at UCLA (1961), and a Ph. D. in Astronautical Sciences at Stanford University (1969). As NASA's trajectory champion, he has since 1970 directed more missions than can conceivably be detailed within this available space!

Ongoing are the Messenger Mission to Mercury and the New Horizons Mission, an unmanned Pluto-Kuiper Belt probe launched January 19, 2006.

Relevant Experience

Mission Director, New Horizons Mission, 2002–Present. Mission Manager, MESSENGER Mission to Mercury, 1999–Present. Mission Director, CONTOUR Mission, 1998–2002. Mission Director, Near Earth Asteroid Rendezvous (NEAR) Mission, 1990–2001. Dr. Farquhar was Mission Director for NEAR/Shoemaker, which in 2000–2001 spent a year orbiting, and then landed on, the asteroid (433) Eros. Dr. Farquhar had experience in many other missions, too many to list here.

Honors and Awards

Dr. Farquhar has received many honors and awards: in just 2002, he received: *NASA Medal for Exceptional Engineering Achievement; *NASA Group Achievement Award (Eros orbit, landing); *2001 Laureate Award for Space from Aviation Week & Space Technology; *NASM Trophy for Current Achievement from the National Air and Space Museum *2001 Tycho Brahe Award from The Institute of Navigation.

In the News

(Continued from page 1)

Smithsonian Center for Astrophysics decided to combine star surveys to work out the overall fraction of stars with and without partners. In a paper submitted to *Astrophysical Journal Letters*, he reports that upwards of two-thirds of all stellar systems in the Milky Way are loners. The balance tips towards stellar solitude because red

dwarfs are by far the most common type of star in our galaxy. Lada argues that this situation rules out theories that assume all stars form in multiple systems, from which single stars later escape. He thinks it more likely that big and small stars form in different kinds of environments: the former in massive clouds of turbulent gas and dust, which are prone to fragment into multiple stars, and the latter in smaller, more quiescent clouds that stay in one piece and form just one star.

Single stars are often touted as being more conducive for planets because there is no extra star to disrupt the planet-forming disk, Lada says. His new tally could mean that more of the galaxy is planet friendly.

Or maybe not: "I'm skeptical," says planet

(Continued on page 3)

Observing with the NCA C-14

Mike McNeal

Schedule is open, generally, Saturdays at 7:30 P.M. Call to set up a time.

In Mike McNeal's backyard, 5410 Grove St, Chevy Chase, MD, (Friendship Heights Metro).

Please make reservations by 10 p.m. the Friday before.

Call Mike at 301-526-2648 or email him at mcnealmi@verizon.net.

We need a new volunteer to house NCA's C-14, make it available for weekly viewing, and transport it to other sites, e.g., Exploring the Sky and star parties.

The deadline for the June Star Dust is May 24. Please send your material to Elliott Fein by that date to ensure inclusion. Send submissions to Elliott Fein at elliott.fein@verizon.net.

Articles submitted may be edited to fit the space available.

In the News

(Continued from page 2)

hunter Michel Mayor of the Observatory of Geneva in Switzerland. Mayor thinks that small stars—even if single—may have a hard time building up planets. Only four red dwarfs—out of 200 to 300 studied—have been found to harbor planets, he says. Mayor plans to focus his team's research on red dwarfs, because more data on them are necessary to compare planet formation around big versus small stars.

There's More to The North Star Than Meets The Eye

By stretching the capabilities of NASA's Hubble Space Telescope to the limit, astronomers photographed the close companion to Polaris, known also as the North Star, for the first time.

The North Star is thought to be a steady, solitary point of light that guided sailors for ages, but there is more to this star than meets the eye. The North Star is actually a triple star system. While one companion is easily viewed with small telescopes, the other hugs Polaris so tightly that it has never been seen until now.

"The star we observed is so close to Polaris that we needed every available bit of Hubble's resolution to see it," said astronomer Nancy Evans of the Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass. The companion proved to be less than two-tenths of an arcsecond from Polaris. That is an incredibly tiny angle equivalent to the apparent diameter of a quarter located 19 miles away. At the system's distance of 430 light-years from Earth, that translates into a separation of about 2 billion miles.

"The brightness difference between the two stars made it even more difficult to resolve them," said astronomer Howard Bond of the Space Telescope Science Institute, Baltimore. Polaris is a super-giant more than two thousand times brighter than the sun, while its companion is a dwarf star. "With Hubble, we've pulled the North Star's companion out of the shadows and into the spotlight," he said.

"Our ultimate goal is to get the accurate mass for Polaris," Evans said. "To do that, the next milestone is to measure the motion of the companion in its orbit," she added. Astronomers want to determine the mass of Polaris, because it is the nearest Cepheid

Exploring the Sky

by Joe Morris

2006 Schedule

<u>Date</u>	<u>Time</u>	<u>Things of interest</u>
5/20	9:00 P.M.	Last quarter Moon; Saturn near the Beehive
6/17	9:00 P.M.	The Big Dipper and the Summer Triangle
7/22	9:00 P.M.	Mars disappearing but Jupiter still good
8/26	8:30 P.M.	Pegasus and Andromeda rising; Hercules
9/30	8:00 P.M.	Rock Creek Park day
10/21	7:30 P.M.	Orionid meteor shower peak
11/4	7:00 P.M.	Moon (in Aries) near full; Pleiades

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 immedi-

ately 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>
<http://www.capitalastronomers.org>

A presentation of the National Park Service and National Capital Astronomers.

variable star. Cepheids' brightness variations are used to measure the distances of galaxies and the expansion rate of the universe. It is essential to understand their intrinsic physics makeup and evolution. Knowing their mass is the most important ingredient in this understanding.

The researchers plan to continue observing the Polaris system for several years. The movement of the small companion during its 30-year orbit around the primary should be detectable. The researchers presented their data during the 207th meeting of the American Astronomical Society in Washington.

New Map of Milky Way Reveals Millions of Unseen Objects

Nearly 400 years after Galileo determined that the wispy Milky Way actually comprises myriad individual stars, scientists using NASA's Rossi X-ray Timing Explorer have done the same for the "X-ray Milky Way."

The origin of this X-ray counterpart to the Milky Way, known to scientists as the galactic X-ray background, has been a longstanding mystery. Scientists have determined that the background is not diffuse, as many have thought. Rather, it emanates

from untold hundreds of millions of individual sources dominated by a type of dead star called a white dwarf, along with stars with unusually strong coronas.

If confirmed, this new finding would have a profound impact on our understanding of the history of our galaxy, from star-formation and supernova rates to stellar evolution. The result solves major theoretical problems yet points to a surprising undercounting of stellar objects, perhaps by a hundredfold.

Scientists from the Max Planck Institute for Astrophysics in Garching, Germany and the Space Research Institute of the Russian Academy of Sciences in Moscow discuss these results in two papers that will be published in future editions of *Astronomy & Astrophysics*.

"From an airplane you can see a diffuse glow from a city at night," said lead author Mikhail Revnivtsev of the Max Planck Institute for Astrophysics. "To simply say cities produce light is not enough. Only when you get closer do you see individual sources that make up that glow — the house lights, street lamps and automobile headlights. In this respect, we have identified the individual sources of local X-ray

(Continued on page 5)

Mid-Atlantic Occultations and Expeditions

by Dr. David Dunham

Asteroidal Occultations

Date	Day	EDT	Star	Mag	Asteroid	dmag	dur.	Ap.	Location
May 5	Fri	5:02	16 Piscium	5.8	Iris	4.5	5	2	MD, DC, nVA, PA
May 6	Sat	23:43	PPM 228372	10.0	Atala	3.1	5	6	DE, MD, DC, nVA
May 11	Thu	0:01	TYC55470289	11.5	Ganymed	2.7	2	8	SC, wNC, eTN, eKY
May 27	Sat	22:49	2UC26908898	11.2	Rosamunde	1.9	2	7	N. Carolina
May 28	Sun	23:17	2UC38072338	11.8	Hertha	2.3	3	8	PA, MD, DC, nVA
May 29	Mon	2:39	SAO 140367	9.7	Isara	3.8	3	4	NJ, Penn., Ohio
Jun 10	Sat	0:14	TYC05251110	10.9	Philippina	3.1	6	6	Carolinas

The May 5th event is the best asteroidal occultation of 2006 in the USA

Grazing Occultations

DATE	Day	EDT	Star	Mag	% alt	CA	Location
May 5	Fri	21:13	ZC 1450	8.0	57+ 64	18N	Ashland&Chesapeake, VA; Sun-13
May 28	Sun	21:13	SAO 77777	8.6	4+ 12	20N	Mauzy & Williamsb., VA; Sun-8
May 28	Sun	21:58	SAO 77818	6.7	4+ 5	19N	Bridgewater, VA; Sun -14d

Total Lunar Occultations

DATE	Day	EDT	Ph Star	Mag	% alt	CA	Sp.	Notes
May 7	Sun	23:02	D ZC 1643	7.2	76+ 49	67S	F2	
May 8	Mon	2:57	D 80 Leonis	6.4	77+ 9	41S	F3	Az. 268; spec. binary
May 10	Wed	18:28	D Spica	1.0	95+ 6	75S	B1	ZC 1925; Az. 110; Sun+18
May 10	Wed	19:34	R Spica	1.0	95+ 18	-70N	B1	ZC 1925; Sun +5 deg.
May 11	Thu	2:39	D y Virginis	5.9	96+ 21	9S	A0	ZC 1949; term. dist. 2"
May 13	Sat	23:39	R ZC 2298	5.0	99- 19	84N	K3	WA 302dg. -Mare Crisium
May 14	Sun	2:48	R ZC 2312	5.4	99- 23	89N	M2	WA 296 deg. " "
May 15	Mon	1:11	R ZC 2453	6.6	95- 19	81S	K1	WA 274 deg.
May 22	Mon	4:10	R SAO 146935	7.9	28- 12	81S	K0	Azimuth 103 deg.
May 23	Tue	4:07	R ZC 90	7.6	18- 7	27S	F8	Azimuth 90 deg.
May 28	Sun	22:16	D ZC 909	6.0	4+ 1	-1S	B9	Azimuth 306 deg.
May 29	Mon	21:26	D SAO 78916	8.4	9+ 18	48S	G5	Sun alt. -11 deg.
May 29	Mon	22:20	D SAO 78957	7.5	9+ 9	49S	G8	Azimuth 297 deg.
May 29	Mon	22:36	D ZC 1067	7.1	9+ 7	55N	K2	Az. 300; close double??
May 30	Tue	22:26	D ZC 1194	7.8	16+ 16	61S	K0	mg2 10.6 19", PA160dg.
Jun 1	Thu	22:25	D SAO 98666	8.5	32+ 29	53N	K0	
Jun 1	Thu	23:22	D SAO 98681	7.9	33+ 18	90S	G5	
Jun 5	Mon	21:17	D SAO 138809	8.2	69+ 46	66N	F0	Sun alt. -9 deg.
Jun 5	Mon	21:36	D FT Vir	6.2	70+ 44	11S	F2	ZC1787; Sun-11; spec. bin.
Jun 5	Mon	23:58	D ZC 1798	6.2	70+ 27	80S	G9	
Jun 6	Tue	23:30	D ZC 1900	7.0	79+ 32	40N	K5	
Jun 10	Sat	22:48	D ZC 2397	6.5	99+ 19	53S	K1	terminator distance 8"
Jun 14	Wed	2:51	R SAO 188724	7.7	92- 24	16S	F5	term. dist. 15"; double??
Jun 14	Wed	3:21	R omega Sgr	4.7	92- 25	77S	G3	ZC 2910
Jun 14	Wed	4:57	R 60 Sgr	4.8	91- 22	41S	G8	ZC2914; spec. bin.; Sun-8

David Dunham, e-mail dunham@starpower.net, more info. <http://iota.jhuapl.edu>
 Phone home 301-474-4722; office 240-228-5609; cell 301-526-5590

Other National Capital Area Meetings

Northern Virginia Astronomy Club

Sunday, May 21, 7:00 p.m.

The next NOVAC general meeting will be on a special day to avoid Mother's Day. On May 21 our guest speaker will be Astronaut Tom Jones, author of the book *Space Walking: An Astronaut's Memoir*. 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

Please Join Us for Dinner!

Since February 1995, a number of NOVAC members have been congregating on the night of our regular meetings for dinner. Hopefully this assists in getting to know one another, at a more relaxed location than at the meeting itself. It's also nice to see who it is you're talking to for a change and be able to connect faces with names — unlike the usual observing situation. All are welcome to attend, whether NOVAC members or prospective members, guests or whoever — just be prepared to discuss a little astronomy or any other topic that pops up! If you'd like to join us, stop by the Red, Hot and Blue restaurant at 5:30 P.M. See you there!

Source: <http://novac.com/>

Montgomery College Planetarium

is located at the Takoma Park/Silver Spring Campus Maryland, United States of America, Planet Earth around star named Sol, in the Milky Way Galaxy an outlying member of the Virgo Super Cluster around 13.7 billion years after creation

Astronomy is the oldest science and one of the few sciences that welcomes amateurs. Everyone who looks up at the stars with wonder is an astronomer.

All evening planetarium programs include a star party after the show, if it is clear. Star party means we look at the sky with telescopes. We have a 10-inch (2540mm) Meade LX200-GPS-SMT, a 3 1/2 inch (88.9mm) Questar, and a 4 1/8 inch (105mm) Edmund Astroscan telescopes that we bring outside the planetarium when clear. Bring your telescope to the star

party, and we can have even more fun sharing, the more the merrier.

Free Public Shows

Saturday, 20 May 2006 at 7 P.M. *The Search for Extraterrestrial Intelligence* Discover how you can help look for ET using your computer at home and how it all is tied together.

Wednesday, 8 November 2006 at 1 P.M. Transit of Mercury across the disk of the sun from the roof of the King Street Parking Garage.

The planetarium shows 1,834 naked-eye stars, the Milky Way (the diffuse band of light caused by the disk of our own gal-

axy), and the five naked eye planets (Mercury, Venus, Mars, Jupiter, and Saturn) under a twenty-four-foot dome with forty-two comfortable chairs.

The planetarium is located on Fenton Street on the Takoma Park/Silver Spring campus of Montgomery College. It is attached to the Science South building on the ground level and has a conspicuous silver-colored domed roof. The stars are the province of all of mankind. An astrophysicist will answer questions about the universe. There is no admission charge for these public planetarium programs.

Source: www.montgomerycollege.edu/departments/planet/

In the News

(Continued from page 3)

light. What we found will surprise many scientists."

X-rays are a high-energy light form, invisible to our eyes and far more energetic than optical light. The X-ray background is more pervasive than the optical haze called the "Milky Way," leading astronomers to think that the X-ray haze is diffuse, not from point sources. Previous observations have not revealed enough X-ray sources to account for the "X-ray Milky Way." This has led to theoretical problems. If the X-ray glow were from hot and diffuse gas, it would ultimately rise and escape the confines of the galaxy. Also, all that hot gas would need to have come from millions of past star explosions called supernovae, which would imply estimates of star formation and star death were way off.

"X-ray telescopes that can resolve the emission into discrete sources looked but could not account for more than 30 percent of the emission," said Jean Swank, project scientist for the Rossi Explorer at NASA's Goddard Space Flight Center, Greenbelt, Md. "Many have thought that the lion's share was truly diffuse, for example, from hot gas between the stars."

The new study is based on nearly 10 years of data collected by the Rossi Explorer and constitutes the most thorough map of the galaxy in X-rays. The science team concluded the Milky Way galaxy is teeming with X-ray stars, most of them not very bright, and that scientists over the years had underestimated their numbers.

Surprisingly, the regular suspects of X-ray emission, black holes and neutron stars, are not implicated here. At higher X-ray energies, the glow arises nearly entirely from sources called cataclysmic variables. A cataclysmic variable is a binary star system containing a relatively normal star and a white dwarf, which is a stellar ember of a star like the Earth's sun that has run out of fuel. On its own, a white dwarf is dim. In a binary, it can pull away matter from its companion star to heat itself in a process called accretion. The accreted gas is very hot, a source of considerable X-rays.

At lower X-ray energies, the glow is a mix of about one-third cataclysmic variables and two-thirds active stellar coronas. A corona is the outermost part of a star's atmosphere. Most of the stellar corona activity also takes place in binaries, where a nearby companion effectively stirs up the outer parts of the star. That energizes the stellar analog to solar flares, which emit X-rays. The science team said there are upwards of a million cataclysmic variables in our galaxy and close to a billion active stars. Both of these numbers reflect a major undercounting in previous estimates.

The scientists could not image individual objects. What they saw was a perfect match between X-rays and infrared light detected by NASA's Cosmic Background Explorer mission in the 1990's. This indicates X-ray emission traces the stellar mass distribution and implies that the galactic X-ray background comprises a huge number of faint discrete sources.

Getting to the NCA Monthly Meeting and the Dinner Before the Meeting

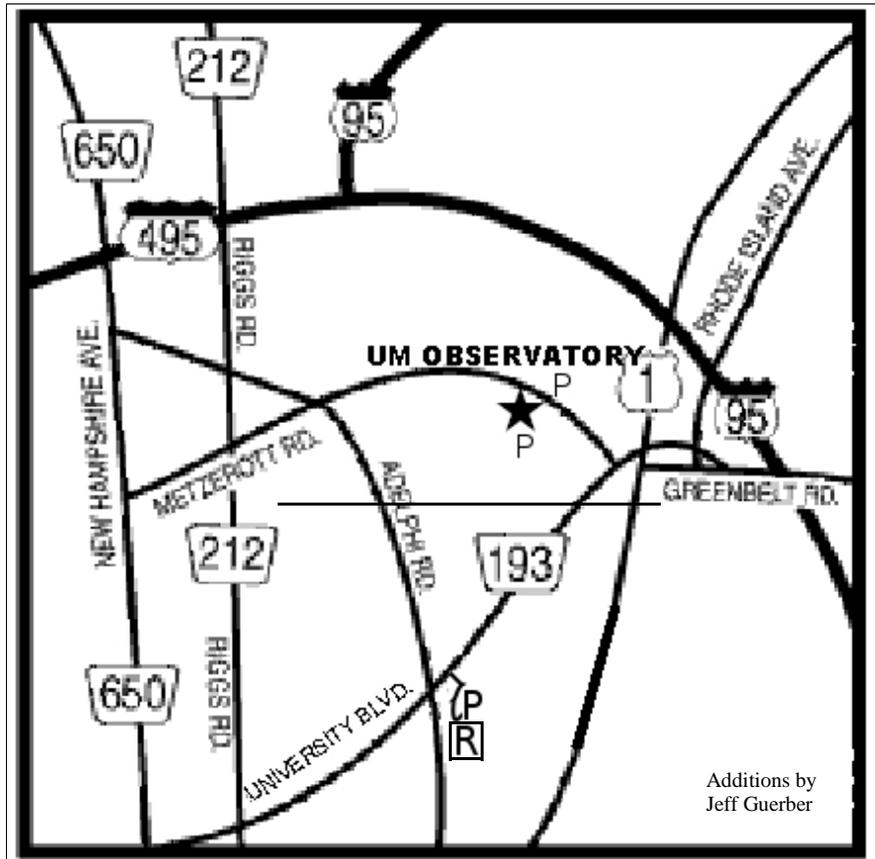
Jeff Guerber

NCA meetings are now held at 7:30 p.m. at the University of Maryland Observatory, in College Park on Metzertott Rd. between University Blvd. (MD-193) and Adelphi Rd. To get there from the Capital Beltway (I-495), either take US Rt. 1 south about a mile, turning right onto MD-193 West, then at the first light turn right onto Metzertott; or, take New Hampshire Ave. (MD-650) south, turn left at the second light onto Adelphi Rd., two more lights, turn left onto Metzertott, and proceed about a mile to the observatory. The observatory is on the south side of Metzertott Rd., directly opposite the UM System Administration building; you can park there if the observatory lot is full, but be careful crossing Metzertott Rd.

At 5:30 p.m., before the meeting, please join us for dinner at the Garden Restaurant in the UMD University College Inn and Conference Center, 3501 University Blvd. East at Adelphi Rd. From the Beltway, either take New Hampshire Ave. south, turn left onto Adelphi, and at the third light (passing Metzertott) turn left onto University then immediately right into the garage; or, take US-1 south, turn right onto University Blvd. west, and take it to the intersection with Adelphi Rd. Park either in the garage (costs), or in Lot 1 nearby (free). To get to the Observatory, exit to the right onto University Blvd. (MD-193) east, and at the second light turn left onto Metzertott Rd.

Do You Want to Get *Star Dust* 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).



Getting to the NCA Meeting
Star=Observatory R=Restaurant P=Parking

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 set up for viewing.

Are You Coming to Dinner?

If you are planning to come to the dinner before the meeting, please tell Benson J. Simon, telephone: 301-776-6721, e-mail bjs32@cornell.edu so that we can make reservations for the right number of people.

Do You Need a Ride?

Please contact Jay Miller, 240-401-8693, if you need a ride from the metro to dinner or to the meeting at the observatory. (Please try to let him know in advance by email at rigell@starpower.net.)

Support the IDA

Join the International Dark-Sky Association
3225 N. First Avenue Tucson, AZ
85719-2103
www.darksky.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; 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. NCA is an IRS Section 501(c)(3) tax-deductible organization. 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.

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).

Classes: Some NCA members are available for educational programs for schools and other organizations. The instruction settings include star parties, classroom instruction, and school-teacher 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."

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Student Membership: \$15with *Sky and Telescope*...\$48

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Please mail this form with your check payable to National Capital Astronomers, to:

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***NCA
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