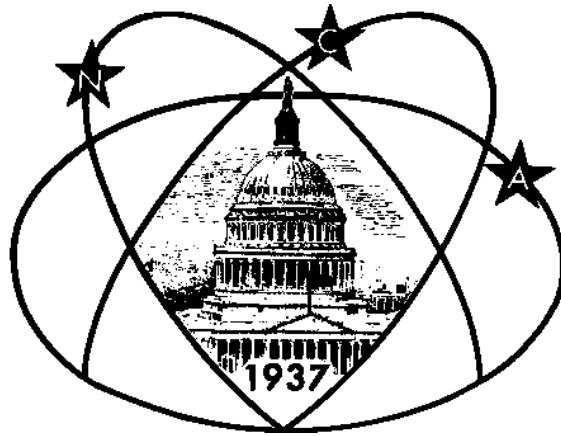


Star



Dust

National Capital Astronomers, Inc.

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Dr. James R. Zimbelman: "Galileo at Jupiter" *submitted by Gary Joaquin*

Dr. James R. Zimbelman will present the featured talk for the November 3 meeting of National Capital Astronomers, "Galileo at Jupiter" The meeting will be held in the Bethesda-Chevy Chase Regional Services Center of Montgomery County, 4805 Edgemoor Lane, Bethesda, MD at 3:00 P.M. The synopsis and biography that follow were written by the speaker.

Synopsis

The Galileo spacecraft reached Jupiter in early 1996, dropped an instrumented probe into the largest planet in the Solar System, and placed the first spacecraft in orbit around a gas giant planet. The high-gain antenna on the Orbiter failed to fully deploy early in the mission, but engineers devised a way to transmit a limited data set to Earth through the non-directional low-gain antenna. The new data about Jupiter and its four largest moons have steadily improved our understanding of this very un-Earth-like part of our Solar System. This lecture will summarize some of the highlights of the Galileo mission to Jupiter, along with a brief look at the anticipated similar revolution in our understanding of Saturn and its moons when the Cassini

spacecraft arrives there in 2004.

Bio

James R. Zimbelman is a Geologist at the Center for Earth and Planetary Studies (CEPS) of the National Air and Space Museum (NASM). He has a B.A. degree (Summa Cum Laude) in Physics and Mathematics (1976) from Northwest Nazarene College in Nampa, Idaho, a M.S. degree in Geophysics and Space Physics (1978) from U.C.L.A. in Los Angeles, California, and a Ph.D. degree in Geology (1984) from Arizona State University in Tempe, Arizona. He was a Post-Doctoral Fellow and a Staff Scientist at the Lunar and Planetary Institute in Houston, Texas, from 1984 to 1988. In February of 1988 he joined the CEPS staff at NASM.

Research interests include topical geologic mapping of Mars and Venus, analysis of remote sensing data of Earth, Mars, and Venus at visual, infrared, and radar wavelengths, investigations of long lava flow emplacement on the terrestrial planets, paleoflood studies on Earth and Mars, and field studies in volcanic and desert terrains. He has over 40 peer-reviewed articles published in scientific journals and books, sev-

eral planetary maps published by the U.S. Geological Survey, and over 200 published abstracts for presentations to scientific audiences. He was elected a Fellow of the Geological Society of America in 1999, and he is a member of the American Geophysical Union, the International Association of Volcanology and Chemistry of the Earth's Interior, and the International Cartographic Association. He has served on many committees for NASA, including Chairman of the Planetary Cartography Working Group (1991-4), Chairman of the RPIF Directors and Data Managers Working Group (1994-7), Chairman of the Mars Surveyor '98 Instrument Review Panel (1995), Chairman of the Planetary Geology and Geophysics Review Panel (1997-9), as well as Chairman of NASM's Professional Accomplishments Evaluation Committee (1994-5). At NASM, James serves as Curator for the "Exploring the Planets" gallery, is the Director of the Regional Planetary Image Facility (RPIF) in CEPS, and he gives public lectures on topics in planetary science for the Smithsonian Institution's national and international lecture programs.

The Review of the October Lecture by Dr. Tom Van Flandern: "Why Do Planets Explode?"

Will Appear in the Next Issue.

NCA Events This Month

The Public is Welcome!

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

Wednesdays, November 7, 14, 21, and 28, from 7:00 to 10:00 P.M. The NCA Mirror-Making Class will continue to be on *Wednesdays* in November at American University's McKinley Hall, Rooms 9 and 13, just off Ward Circle in Northwest Washington, D.C. See article on this page.

Fridays. Open nights with NCA's 14-inch telescope at Ridgeview Observatory near Alexandria, Virginia. See below.

Saturday, November 3, 3:00 P.M. - NCA meeting in the Bethesda-Chevy

Chase Regional Services Center of Montgomery County, 4805 Edgemoor Lane, Bethesda, MD. See the map and directions on Page 6.

Dr. James R. Zimelman will present the featured talk "Galileo at Jupiter".

Saturday, November 3, following the meeting

Dinner with the speaker and NCA members at the Rio Grande Restaurant, 4919 Fairmont Ave., Bethesda, tel. 301-656-2981. See the map and directions on Page 6.

Mirror Making Classes

by Guy Brandenburg

The NCA Mirror-Making class will continue to be held on Wednesdays in November. Classes are very informal; you can start or finish a mirror at any time. We have all the necessary abrasives, glass, pitch, and testing equipment on hand, and you will find that in learning how to make a fine primary mirror, you will learn a lot about optics and astronomy that will be very helpful in observing the sky later on. Plus, you can then brag about how you made your own mirror and how you tested it to be accurate to a small fraction of a wavelength of light! Prices for entire packages (instruction, blank, tool, grit, pitch, other abrasives, rouge, testing, and so on) run about \$70 for a 6-inch mirror, and more for larger ones. Our prices are actually lower than ordering an entire kit from Willmann-Bell or Newport Glass. We can also test optics that you purchased or found elsewhere, and can aluminize mirrors up to 12.5 inches for an additional fee. For more information, e-mail Guy Brandenburg at gfbranden@earthlink.net or phone him in the evenings or weekends at 202-635-1860.

Meteor Showers

November Radiants

Full Moon: November 1, 30

Major Activity

Radiant	Duration	Maximum
Leonids (LEO)	November 14-20	Nov. 18 10:01 UT

Moderate Activity

Radiant	Duration	Maximum
Northern Taurids (NTA)	October 12-December 2	Nov. 4-7
Southern Taurids (STA)	September 17-November 27	Oct. 30-Nov. 7

Minor Activity

Radiant	Duration	Maximum
Andromedids	September 25-December 6	November 14/15
Alpha Monocerotids (AMO)	November 13-December 2	November 21
Alpha Pegasids	October 29?-November 17?	November 1-12

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

Amateur Astronomy Survey

Submitted by Jay Miller

From: Gretchen Walker
<gwalker@astro.umd.edu>.

The University of Maryland Observatory is planning to offer courses for amateur astronomers in the summer of 2002. In order to find out how we might best serve the local community's needs and who out there might be interested in participating either as a student or as an instructor, I've put together a survey form. Both the online version and the downloadable PDF version can be found on the observatory web site at <http://www.astro.umd.edu/openhouse/astroam.html>. If you prefer, you can get a copy of the survey form by calling me at 301-405-0355 or write to me at the address given below. Thank you!

Gretchen Walker
Observatory Outreach and Education
Coordinator, Astronomy Department,
University of Maryland College Park,
MD 20742-2421.

Observing with the NCA C-14

by Bob Bolster

Date (All at 8:30 p.m.)
November 9, 16
November 23

Prime Objects
M15, M32, Double Cluster
Gibbous Moon, Saturn after 11pm

At Ridgeview Observatory in Bob Bolster's backyard, 6007 Ridge View Drive, Franconia, Virginia (off Franconia Road between Telegraph Road and Rose Hill Drive). Call Bob at 703-960-9126 before 6:00 p.m., to let him know you are coming.

Other National Capital Area Meetings

Northern Virginia Astronomy Club (NOVAC) meets 7:00 p.m. on the second Sunday of every month.

The meeting site is Enterprise Hall, Room 80 on oi Mason University.

November 11 - Tom Dietz "Preparing for the Holidays". Tom will speak on types of telescopes and what to look for to put in Santa's sleigh.

Source: <http://novac.com>

Baltimore-Washington Starburst Series

Next Event: Seppo Laine (STScI)

"Nested and Single Bars"

November 13, 12:00 noon (Tuesday)

Place: STScI, Lyman Spitzer Boardroom

November 13 STScI, Seppo Laine, "Nested and Single Bars".

Mostly one event per month. Location will depend on the speaker. Talks are usually at 12:00 noon.

Location (usually): GSFC: Bldg. 21, Room 191;

NRL: Bldg. 2, Room 208;

STScI: Cafeteria Conference Room, Boardroom, or Auditorium.

For comments and to volunteer for a talk, contact one of us: JHU:Gerhardt Meurer (410-516-6265, meurer@pha.jhu.edu); GSFC Jon Gardner (301-286-3938, gardner@harmony.gsfc.nasa.gov); NRL: Jackie Fischer (202-767-3058, jfischer@irfp1.nrl.navy.mil); STScI: Claus Leitherer(410-338-4425, leitherer@stsci.edu)

If you are not sure about access to these locations, contact us. Please send questions to the appropriate person from the above list. Note that visitor badges for GSFC and NRL need to be requested several days prior to the talk. See below for further information.

LOGISTICS

JHU: See STScI.

STScI: No advance registration for visitor badges is required for STScI. You will have to check in at the STScI reception and receive your visitor badge. Parking passes will also be available from the receptionist. You should be prepared to be asked to use the overflow lot, which is a 10 min. walk from STScI. (General STScI visitor information is also available here.) If you send an e-mail to Claus Leitherer at least 4 business days before a scheduled talk, visitor badges and parking permits will be prepared in advance and are ready upon ar-

rival on the day of the talk. This guarantees you a space to park either in our garage or in a nearby JHU lot. (The alternative would be the more distant overflow lot). Of course everybody will still be admitted even if not preregistered. Vice versa, there is no damage if you give your name but don't show up later. Please contact Claus Leitherer if you need directions and if you have questions about access to STScI and parking. If you include your fax number in your e-mail, a detailed map with directions will be faxed to you.

http://www.stsci.edu/science/starburst/SB_Series.html

Stellar & Extragalactic Astronomy Lunch

Talks are Wednesdays at 12:00 Noon in Room 191 of Building 21, GSFC

November 7 George Sonneborn, GSFC/FUSE, "Observations of Planetary Nebulae".

November 14 Allen Sweigart, GSFC, "Origin of Extreme Horizontal-Branch Stars in NGC 2808".

November 21 no speaker, Thanksgiving. November 28 Ed Cheng, GSFCHST, "Wide Field Camera 3".

For more information, contact Jonathan P. Gardner, email gardner@harmony.gsfc.nasa.gov.

Source: <http://hires.gsfc.nasa.gov/~gardner/seal>

Goddard Scientific Colloquia

The Scientific Colloquia will be held at 3:30 p.m. on Fridays. Due to construction in Building 3, the Colloquium will be held in the Building 8 auditorium, except as noted. For the time being, access to Goddard Space Flight Center is limited to those holding Goddard badges or official visitors. You can become an official visitor by finding a badged Goddard employee to escort you. The Scientific Colloquium Committee cannot promise to provide escorts. We regret the inconvenience to our regular guests.

November 2 Herbert Frey, Goddard Space Flight Center, "Buried Ancient Lowlands on Mars: Laser Altimetry, Hidden Craters, and Primordial Crustal Dichotomy".

If you plan to attend and do not have a NASA badge, please contact Carol Krueger, at (301) 286-6878, at least 24 hours beforehand. Source: lhea.gsfc.nasa.gov

gsfc.nasa.gov/users/djt/colloq/

University of Maryland at College Park Astronomy Colloquia

All Astronomy Colloquia are held in Room CSS 2400 on Wednesdays at 4:00-5:00 p.m. unless otherwise noted.

November 7 Dr. Ken Sembach, STScI, "Hot Gas in the Low Redshift Universe".

November 14 Dr. Chuck Dermer, NRL, "High Energy Neutrinos from Blazars, and the Evolution of Quasars".

Special accommodations for individuals with disabilities can be made by calling (301) 405-3001. It would be appreciated if we are notified at least one week in advance. Parking: Most parking meters in Parking Garage 2 have been removed. Parking for visitors is available in the Cashier-Attended Parking Lot at the intersection of Paint Branch & Technology Drive. It is a 5-10 minute walk from the parking lot to the Computer & Space Sciences building.

Source: <http://www.astro.umd.edu/colloquia/colloquium.html>

Laboratory for High Energy Astrophysics (LHEA) Goddard's Tuesday Seminar Series.

NASA Goddard Space Flight Center Building 2, Ground Floor Conference Room 3:30 P.M. Cookies, Coffee and Tea 3.45 P.M. Seminar November 6 Dr. Vikram Dwarkadas, U. Del., "The Evolution of Supernova Remnants in Circumstellar Wind-Blown Bubbles".

November 13 Dr. Joe Cassinelli, U. Wisconsin, "The Unexpected Properties of X-ray Sources in Early-Type Stars as derived from Chandra HETG line Profiles".

November 20 Dr. Chris Reynolds, U. Md., College Park, TBA.

Source: <http://lhea.gsfc.nasa.gov/docs/seminar.html>

Space Telescope Science Institute

(STScI). Public Lectures at the Space Telescope Science Institute. Are you interested in planets, stars, galaxies, black holes? Come to the free public lectures at the Space Telescope Science Institute. Each month a noted scientist discusses a different cosmic topic. Lectures are at 8 p.m. the first Tuesday of every month in the STScI auditorium, on the campus of Johns Hopkins University. Upcoming

(Continued on page 4)

Other National Capital Area Meetings

(Continued from page 3)

Lecture:

November 6 Keith Noll, STScI, "Hubble Heritage".

Free parking is available. For directions, call 410-338-4700.

Source: http://hubble.stsci.edu/about_us/open-night.shtml

National Air & Space Museum

Sixth Street and Independence Avenue, SW, Washington, DC 20560

All programs are free unless otherwise noted.

Saturday, November 17 Dusk to 11 p.m., Evening Stargazing, Sky Meadows State Park. As darkness falls, join Sean O'Brien, staff astronomer of the Einstein Planetarium, for a public stargazing event. The evening begins with an orientation to the night sky, followed by a telescopic viewing of star clusters, planetary nebulae, galaxies and more. Local astronomers will be on hand to guide you through the sky.

There is a \$2 park entrance fee per vehicle. For complete information and directions, contact Sky Meadows State Park at (540) 592-3556. Information: Claire Brown (202) 357-1553, (202) 357-2700.

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

Montgomery College's Planetarium Fenton St. in Takoma Park, MD. Planetarium Montgomery College's Plane-

tarium at Takoma Park, Maryland. Exciting public planetarium programs are offered at Takoma Park's own planetarium. **Saturday, November 24** 7:00 P.M. "Total Solar Eclipses".

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

All planetarium programs and shows are free, but better than many that cost an admission price. e-mail: hwilliam@mc.cc.md.us phone 301-650-1463

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

U.S. Naval Observatory (USNO)

All Public Tours of the USNO have been suspended until further notice. Call the USNO Public Affairs Office, 202/762-1438 for further information

Support
the
IDA

Join the International
Dark-Sky Association

3225 N. First Avenue
Tucson, AZ 85719-
2103

www.darksky.org

Deadline for December *Star Dust*: November 15

Please send submissions to Elliott Fein at elliott.fein@erols.com.

Text must be in ASCII, MS Word, or WordPerfect.

Thanks.

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 ngroman@erols.com, or via telephone at 301-656-6092 (home)

Come See the Stars!

by Joe Morris

Exploring the Sky 2001 Schedule

Date	Time	Notes
11/10	7:00 P.M. (EST)	Leonids peak 11/18

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 Sat-

urday night from April through November, in the field south of the intersection of Military and Glover Roads, near the Nature Center.

Beginners (including children) and experienced stargazers are all welcome - and it's free!

Questions? Call the Nature Center at (202) 426-6829 or check the Internet sites: <http://www.nps.gov/rocr/planetarium> or <http://www.capitalastronomers.org>

Mid-Atlantic Occultations and Expeditions for November

by David Dunham

Asteroidal Occultations

DATE	Day	EST	Star	Mag	Asteroid	dmag	Dur	Ap. s	in.	Location
Nov 1	Thu	4:47	TYC19471075	10.2	Pandora	2.7	5	6	n.	Florida
Nov 10	Sat	0:07	TYC11961360	11.6	Aline	1.0	12	8		Michigan
Nov 14	Wed	3:13	TYC08460040	11.9	Euterpe	0.5	5	10		Pennsylvania
Nov 17	Sat	0:10	TYC00401089	11.9	Thetis	0.7	9	10		Ontario
Nov 17	Sat	21:28	TYC52161576	11.3	Marion	3.5	7	8		Key West, Fla.
Nov 30	Fri	23:54	TYC02560598	11.0	Menelaus	7.0	6	8		Arctic (Trojan)

Lunar Grazing Occultations and a Grazing Annular Solar Eclipse

DATE	Day	EST	Star	Mag	% alt	CA	Location
Nov 6	Tue	3:49	48 Gem	5.8	74-	77	4N Rocky Mount, NC
Nov 20	Tue	20:50	SAO 189613	7.2	31+	7	8S Greencastle, PA
Dec 14	Fri	17:30	The Sun	-27	0	13	N Liberia, Costa Rica*

* see <http://iota.jhuapl.edu> for more about this annular solar eclipse

Total Lunar Occultations

DATE	Day	EST	Star	Mag	% alt	CA	Sp.	Notes
Nov 3	Sat	22:55	R ZC 0755	6.2	91-	43	64S K0	possible close double
Nov 4	Sun	1:06	R 105 Tauri	5.8	90-	66	89N B2	close double? ZC 0766
Nov 4	Sun	5:29	R 108 Tauri	6.3	90-	48	30N A2	ZC 0784
Nov 4	Sun	23:53	R 1 Gem	4.2	83-	45	76S G7	2nd mag. 5.1, 0.2" ZC 0916
Nov 5	Mon	1:12	R 2 Gem	6.7	83-	60	45N K0	maybe close double; ZC 0923
Nov 7	Wed	0:53	R 9 Cancri	6.0	64-	34	83S M3	ZC 1221; mag. 5.97-6.04
Nov 7	Wed	0:54	R ZC 1222	7.2	63-	34	42S G5	
Nov 7	Wed	1:04	R SAO 79951	7.8	63-	36	65N G5	
Nov 12	Mon	6:09	R ZC 1856	6.6	10-	28	88N F5	Sun -8; 2nd 7.6, 0.9", PA105
Nov 13	Tue	5:09	R ZC 1976	7.0	4-	5	56S A3	
Nov 13	Tue	5:35	R 88 Vir	6.6	4-	9	52S K0	ZC 1978 Close double?
Nov 27	Tue	1:33	D ZC 0210	6.6	86+	32	56S B9	2nd star 8.6, 6", PA 328
Nov 27	Tue	23:24	D 64 Ceti	5.6	92+	53	54N G0	ZC 0322
Nov 28	Wed	0:46	D xi 1 Ceti	4.4	92+	41	43N G8	ZC 0327; close double??
Nov 29	Thu	23:34	D ZC 0577	6.0	99+	68	50S F4	graze seen Sept. 9
Nov 30	Fri	4:30	D ZC 0593	5.9	100+	23	67N F4	terminator 6" away
Nov 30	Fri	19:39	D Saturn	-0.4	100-	30	-16N	disk duration 42 seconds
Nov 30	Fri	20:38	R Saturn	-0.4	100-	41	65S	disk duration 45 seconds

Lunar Leonids

During the evenings of November 17 and 18, observers with video cameras are encouraged to record the dark side of the thin crescent waxing Moon for Leonid meteor impacts, since a strong display is expected at both the Earth and the Moon this year. This will probably be the best opportunity for lunar meteor impacts for about 30 years when the Leonid storms return.

D following the time denotes a disappearance, while R indicates that the event is a reappearance. When a power (x; actually, zoom factor) is given in the Notes, the event can probably be recorded directly with a camcorder of that power with no telescope needed. The times are for Greenbelt, MD, and will be good to within +/-1 min. for other locations in the Washington-Baltimore metropolitan areas unless the cusp angle (CA) is less than 30 deg., in which case, it might be as much as 5 minutes different for other locations across the region. Mag is the star's magnitude. % is the percent of the Moon's visible disk that is sunlit, followed by a + indicating that the Moon is waxing and - showing that it is waning. So 0 is new moon, 50+ is first quarter, 100+ or - is full moon, and 50- is last quarter. The Moon is crescent if % is less than 50 and is gibbous if it is more than 50. Cusp Angle is described more fully at <http://www.lunar-occultations.com/iota>. Sp. is spectral type-color, O,B,blue; A,F,white; G,yellow; K,orange; M,N,S,C red

For updates, etc., call the IOTA phone line at 301-474-4945 or see <http://www.lunar-occultations.com/iota>
David Dunham, e-mail dunham@erols.com Phone 301-474-4722

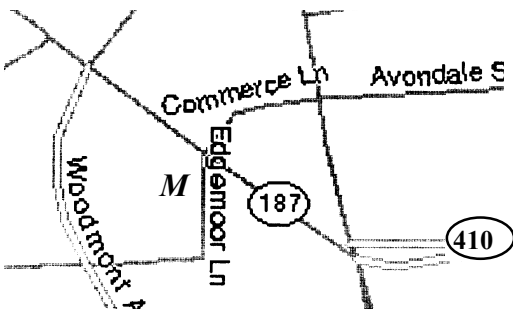
Getting to the NCA Monthly Meeting

Saturday, November 3

3:00 P.M. - NCA Meeting in the Bethesda-Chevy Chase Regional Services Center of Montgomery County, 4805 Edgemoor Lane, Bethesda, MD.

Dr. James R. Zimbelman will present the featured talk "Galileo at Jupiter".

Following the meeting, dinner with the speakers and NCA members at the Rio Grande Restaurant, 4919 Fairmont Ave., Bethesda, MD
Tel. 301 - 656-2981



Directions to the New Meeting Place

From North of Bethesda

1. Take Rockville Pike/MD-355 South.
2. Rockville Pike/MD-355 S becomes MD-355/Wisconsin Ave.
3. Shortly after Cheltenham Dr. (and one block before reaching Rt. 410), turn right onto Commerce Lane.
4. Commerce Lane becomes Edgemoor Lane.
5. After crossing Old Georgetown Rd., 4805 is the second entrance on the right. (See **M** on map.)
6. To get to public parking, continue on Edgemoor Lane which will make a sharp right turn. The parking garage is then on your right. See note below.

From Old Georgetown Rd.

1. Go South toward Rt. 410 (East West Hwy.).
2. One block before reaching Rt. 410, turn right onto Edgemoor Lane. 4805 is the second entrance on the right. (See **M** on map.)
3. To get to public parking, continue on Edgemoor Lane which will make a sharp right turn. The parking garage is then on your right. See note below.

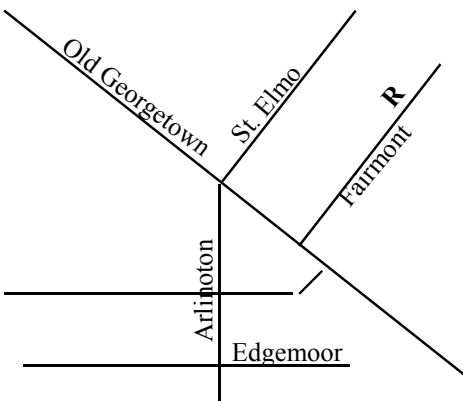
From South of Bethesda

1. Take MD-355/Wisconsin Ave. North.
2. Turn slight left onto MD-187/Old Georgetown Rd.
3. Turn next left onto Edgemoor Ln. 4805 is the second entrance on the right. (See **M** on map.)
4. To get to public parking, continue on Edgemoor Lane which will make a sharp right turn. The parking garage is then on your right.

Note: there are two parking lots. The one on Woodmont is for the apartments and may have a fee. The one on Edgemoor is marked "Public" and does not charge on weekends.

Directions to the Restaurant

1. Following the meeting, turn right out of the parking garage.
2. Continue on Edgemoor Lane and cross Woodmont Ave.
3. Turn right onto Arlington Blvd.
4. Turn right onto MD-187/Old Georgetown Rd.
5. Take next left into Fairmont Avenue.
6. The restaurant is three-quarters of the way down the block, on the left side. Look for blue letters, "Rio Grande", on a black canopy. (#4919 Fairmont Ave.)
7. There is metered parking on the street and a public parking garage on St. Elmo Ave. (See **R** on map.)



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Editor: Elliott Fein, Co-editor: Adele Fein, Editorial Advisor: Nancy Byrd.
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Observing - Robert N. Bolster; Telescope Making - Guy Brandenburg; Travel Director - Sue Bassett; *Star Dust* Editor - Elliott Fein

SERVING SCIENCE & SOCIETY SINCE 1937

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

SERVICES & ACTIVITIES:

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

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

Publications received by members include the

monthly newsletter of NCA, *Star Dust*, and an optional discount subscription to *Sky & Telescope* magazine.

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

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

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

“Calendar of Monthly Events”.

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

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

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

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

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

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

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

Date:

Name(s): _____

Address: _____

Telephone: _____ E-mail: _____

Other family members who should receive a membership card: _____

Dues:

___ \$57 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*) (\$43 tax-deductible).

___ \$150 Sustaining member (with *Sky & Telescope*) (\$93 tax-deductible).

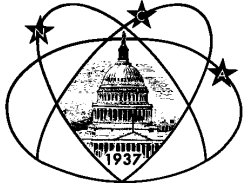
Junior members only: Date of Birth: _____ Only members under the age of 18 may join as juniors.

Tax deductible contribution: _____ Thank You.

___ I prefer to receive *Star Dust* by e-mail.

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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DATED MATERIAL**

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