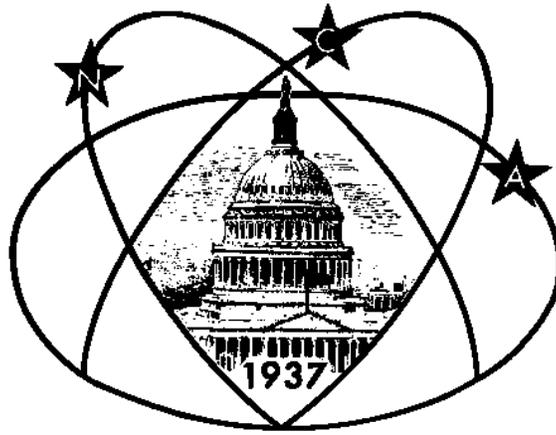


# Star



# Dust

National Capital Astronomers, Inc.

<http://capitalastronomers.org>

Volume 60, Number 9

May 2002

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## May Talk: Dr. Jerry Bonnell, "Gamma-ray Bursts, Galaxies, and Supernovae" *Submitted by Gary Joaquin*

Dr. Jerry Bonnell will present the featured talk for the May 4 meeting of National Capital Astronomers, "Gamma-ray Bursts, Galaxies, and Supernovae". The meeting will be held in the Bethesda-Chevy Chase Regional Services Center of Montgomery County, 4805 Edgemoor Lane (Second Floor), Bethesda, MD at 3:00 P.M.

### Synopsis

Gamma-ray bursts, sudden unpredictable flashes of high-energy photons coming from space, were serendipitously detected by satellites in the 1960s. Sources of the bursts, the most powerful explosions seen in the Universe, are now known to lie in galaxies billions of light-years distant. However, recent developments indicate that some fraction of the bursts may originate

only(!) a few hundred million light-years away and be associated with a peculiar class of supernovae. Dr. Bonnell will present a brief overview of gamma-ray burst astronomy and new developments in understanding the signatures of what may prove to be relatively nearby gamma-ray bursters.

### Biography

Dr. Jerry Bonnell is an astrophysicist at Goddard Space Flight Center's Laboratory for High-Energy Astrophysics in Greenbelt, Maryland. There, he studies gamma-ray bursts (<http://www.pbs.org/wgbh/nova/gamma/milkyway.html>), co-organizes astronomical debates ([http://antwrp.gsfc.nasa.gov/diamond\\_jubilee/debate.html](http://antwrp.gsfc.nasa.gov/diamond_jubilee/debate.html)), and co-edits the Astronomy Picture of the Day Web site (<http://apod.gsfc.nasa.gov>).

## The President's Corner

I would like to congratulate the NCA's science fair winners and look forward to seeing their projects at this month's meeting.

Note the alignment in the West of five planets for the next month. The Moon will also be sticking its nose in the group.

Lastly, in the fall I gave a little tutorial on solar observing. I am going to repeat it in May on Sunday the 19th with the 26th as the rain/cloud date. It will be at 11 A.M. at my house in Bethesda and extend for as long as people wish, but about an hour or two I would guess. Interested people can call or email me for directions to my house. That's one way to see who is coming. Please let me know, though, if you will be attending; if you know how to get to my house. My phone number and e-mail address are in Stardust (top of Page 7).

Jay H. Miller

## Congratulations to NCA Science Fair Winners!

We are pleased to announce the winners in the 2002 science fair judging, They are

### Prince George's Regional Science Fair Junior Division

James M. Bonnell, Kenmoor Middle School, 8th Grade, *Moon Shadow: Correlating Crater Wall Heights with Size*

### Senior Division

Katherine R. Conner, Northwestern High School, 9th Grade, *Estimating the Hyades Diameter with Drift Observations*

Sruti Sathyanadhan, Eleanor Roosevelt High School, 12th Grade, *Asteroidal Oscillations and their Comparison with Apulse Observations*

Judges: Dr. Wayne H. Warren, Jr. and Dr. Harold Williams

### Montgomery County Science Fair

Clair Briggs, Stone Ridge School of the Sacred Heart

*The Nature of Missing Matter*

Peter Yang, Montgomery Blair H.S.  
*Determination of a Correlation Between Ion and Electron Acceleration in Weak*

### Solar Flares

Judges: Dr. Nancy Grace Roman and Jay Miller

### The Fairfax County Science Fair

Margaret Barusch, Thomas Jefferson High School for Science & Technology, 12th Grade, *NRL Infrared Supernovae Search at USNO*

(Continued on page 2)

The review of the April speaker's talk will appear in the next issue of *Star Dust*.

**Reminder: The  
June Meeting is  
on June 15**

## NCA Events This Month

The Public is Welcome!

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

**Fridays, May 3, 10, 17, 24, and 31, 7:00 to 10:00 P.M.,** NCA Mirror-Making Classes. See article, this page.

**Saturday, May 4, 8:00 P.M.,**

**Fridays, May 10, & 17, 9:00 P.M.**

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

**Saturday, May 4, 3:00 P.M.** - NCA meeting in the Bethesda-Chevy Chase Regional Services Center of Montgomery County, 4805 Edgemoor Lane, (Second Floor), Bethesda, MD. See map and directions on Page 8.

Dr. Jerry Bonnell will present the fea-

tured talk "Gamma-ray Bursts, Galaxies, and Supernovae". We will also have presentations by some of the Science Fair winners.

**Saturday, May 4, following the meeting,** dinner with the speaker and NCA members at

Il Forno Pizzeria  
4926 Cordell Avenue  
Bethesda, MD  
301 652-7757

See Page 6 for more National Capital Area astronomical doings.

To join NCA, use the membership application on Page 9.

## Mirror Making Classes by Guy Brandenburg

The NCA Mirror-Making Workshop will be held on Fridays, May 3, 10, 17, 24, and 31, from 7:00 to 10:00 P.M., at the American University's McKinley Hall, Rooms 9 and 13, just off Ward Circle in Northwest Washington, DC. Classes are very informal, and you can start or finish a mirror at any time. We have all the necessary abrasives, glass, pitch, and testing equipment on hand.

For more information, email Guy Brandenburg at [gbranden@earthlink.net](mailto:gbranden@earthlink.net) or phone him in the evenings or weekends at 202-635-1860.

### [from the Sept. 2001 Star Dust] NCA E-mail List by Guy Brandenburg

NCA has an email list that members can use to exchange information quickly and easily, at [capitalastronomers@yahoo.com](mailto:capitalastronomers@yahoo.com).

To subscribe to the list, simply send a message to:  
[capitalastronomers-subscribe@yahoo.com](mailto:capitalastronomers-subscribe@yahoo.com)  
You will then receive a confirmation.

To post a message for all members to read, send it to:  
[capitalastronomers@yahoo.com](mailto:capitalastronomers@yahoo.com)

Your list moderator is Guy Brandenburg.

## Science Fair Winners

(Continued from page 1)

Sandeep K. Garg and Ryan W. Cooper, Langley High School, 11th Grade, *The Effect of Light Pollution on Limiting Magnitude of Stars*.

Judges: Bob Bolster and Ken Short

These winners will be honored at the May NCA meeting. The science fair winners 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. The award also includes a one-year membership in NCA with a one-year subscription to *Sky and Telescope*.

## The deadline for the June *Star Dust* is May 15. Your cooperation in adhering to the deadline would be appreciated.

Please send submissions to Elliott Fein at [elliott.fein@erols.com](mailto:elliott.fein@erols.com).  
Text must be in ASCII, MS Word, or WordPerfect.  
Thank you.

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

## Observing with the NCA C-14 by Bob Bolster

### Date, Time

Saturday, May 4, 9:30 p.m.  
Friday, May 10, 9:30 p.m.  
Friday, May 17, 9:30 p.m.

### Prime Objects

Jupiter, M44  
Jupiter, M44  
5-day crescent Moon

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

# Support the IDA

Join the International Dark-Sky  
Association

3225 N. First Avenue Tucson, AZ  
85719-2103

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

## Space Telescope Science Institute Symposium: Astrophysics of Life by Dr. Nancy Grace Roman

The topic of the next Space Telescope Science Institute Symposium will be "Astrophysics of Life". The goal of the symposium is to understand the astronomical and astrophysical foundations upon which searches for life in the universe must be based, and which bear on the nature and origin of life. Topics will include extrasolar planet searches and properties, the physics of brown dwarfs, dust disks, star and planet formation, interstellar and solar system chemistry, galactic chemical evolution and dynamics, and cosmological considerations. Our aim is to lay the astrophysical groundwork for locating habitable places in the Universe. New astronomical mission concepts will also be an important element of the conference. Dates: May 6-9, 2002. For more information, contact: Quindairian Gryce, Symposium Coordinator, STScI, 3700 San Martin Drive, Baltimore, MD 21218. Tel: (410) 338-4970, e-mail: [gryce@stsci.edu](mailto:gryce@stsci.edu)

## Come See the Stars!

by Joe Morris

### Exploring the Sky 2002 Schedule

Date	Time	Notes
May 11	9:00 P.M.	Mercury, Venus, Mars, Saturn low in WNW
June 8	9:00 P.M.	Summer solstice 9:23 A.M. June 21
July 13	9:00 P.M.	3-1/2 day old Moon
August 3	8:30 P.M.	Perseid meteor shower August 12-13
September 7	8:00 P.M.	Fall equinox September 23
October 5	7:30 P.M.	New Moon at perigee October 6
November 2	7:00 P.M.	Leonid meteor shower November 17 and 19

Exploring the Sky is an informal program that for nearly fifty years has offered monthly opportunities for anyone in the Washington area to see the stars and planets through telescopes from a location within the District of Columbia.

Sessions are held in Rock Creek Park once each month on a Saturday night from April through November, starting shortly after sunset. We meet in the field just south of the intersection of Military and Glover Roads NW, near the Nature Center. A parking lot is located immediately next to the field.

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

Questions? Call the Nature Center at (202) 426-6829 or check the Internet sites: <http://www.nps.gov/rocr/planetarium> and <http://www.capitalastronomers.org>  
A presentation of the National Park Service and National Capital Astronomers

## Meteor Showers May Radiants

### Full Moon: May 26

#### Major Activity

Radiant	Duration	Maximum
Eta Aquarids (ETA)	April 21 - May 12	May 5 at 05:30 UT

#### Minor Activity

Radiant	Duration	Maximum
Epsilon Aquilids	May 4-27	May 17/18
May Librids	May 1-9	May 6/7
Eta Lyrids	May 3-12	May 8-10
Northern May Ophiuchids	April 8-June 16	May 18/19
Southern May Ophiuchids	April 21-June 4	May 13-18

#### Daylight Activity

Radiant	Duration	Maximum
Epsilon Arietids	April 25 - May 27	May 9/10
May Arietids	May 4 - June 6	May 16/17
Omicron Cetids	May 7 - June 9	May 14-25
May Piscids	May 4 - 27	May 12/13

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

## Other National Capital Area Meetings

**Attention: 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.**

**University of Maryland Observatory** on Metzerott Road. The Department of Astronomy at the University of Maryland, College Park hosts open houses at the Campus Observatory on the 5th and the 20th of every month. On Open House evenings a guest speaker will give approximately a half hour talk about a topic in astronomy. The talk is followed by viewing celestial objects through the observatory's telescopes, weather permitting. If weather does not permit viewing, the talk will still go on as scheduled. Starred talks are those that are likely to be kid-friendly.

Sunday, May 5 8:15 and 9:00 p.m.  
Dr. Marc Pound on topic TBA.

Monday, May 20 9:00 pm Dr. Jim Stone on "The Sun's Magnetic Field".  
Info: (301) 405-0355.

Source: <http://www.astro.umd.edu/openhouse/>

### **Goddard Scientific Colloquia**

Due to continued construction in Building 3, the Colloquium will be held in the Building 8 auditorium. 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. Coffee and tea will be served at 3:00 p.m., courtesy of GEWA. 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.

May 3 William Dunham, Muhlenberg College, "Newton's (Original) Method or - Though This be Method, yet There's Madness in't".

May 10 Peter Ward, University of Washington, "Rare Earth".

May 17V. Ramanathan, Scripps Institution, "Aerosols and Climate - A Hazy Future for the Blue Planet?".

May 24 David Charbonneau, California Institute of Technology, "Extra-solar Planets and the Power of the Dark Side?".

May 31 Kip Thorne, California Institute of Technology, The John C. Lindsay

Memorial Lecture "LISA and LIGO: Probing the Universe with Gravitational Waves".

Source: <http://heawww.gsfc.nasa.gov/users/djt/colloq/>

### **Stellar & Extragalactic Astronomy Lunch**

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

May 1 Harry Teplitz, GSFC/NOAO, "Emission-Line Galaxies in the STIS Parallels".

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

### **Solar Physics Talk Calendar**

Talks are Wednesday at 3:30 in Building 26, Rm. G10 of Goddard Space Flight Center.

May 1 Bernhard Kliem, Potsdam, "MHD Simulations of Dynamic Resistive Magnetic Reconnection in Solar Flares".

May 8 Michael Uzzo, SAO, "Streamer Abundance Results from 2001 UVCS Observations".

Source: [http://orpheus.nascom.nasa.gov/~kucera/solar\\_talks/](http://orpheus.nascom.nasa.gov/~kucera/solar_talks/)

### **U.S. Naval Observatory**

Tours of the U.S. Naval Observatory have resumed, but on a limited basis. Public tours of the USNO are now offered on alternating Monday evenings from 8:30 pm until 10:00 p.m. Tours will include a video presentation overview of the Mission and History of the Naval Observatory, a view of the development of USNO's timekeeping responsibilities with a member of the Observatory's Time Service Department staff, and viewing of celestial objects with the 12-inch Alvan Clark refractor with a staff Astronomer. Call the Public Affairs Office at 202-762-1438 for more information.

Source: <http://www.usno.navy.mil/>

### **Department of Terrestrial Magnetism**

Carnegie Institution of Washington  
5241 Broad Branch Road, N.W., Washington, D.C. 20015. (202) 478-8820

May 1 Joan Centrella, NASA Goddard Space Flight Center Laboratory for High Energy Astrophysics, "Gravitational Waves -- Cosmic Mes-

sengers".

May 8 Jonathan M. Lees, University of North Carolina, Chapel Hill Department of Geological Sciences, "Implications of Slab Tear on Geodynamics, Seismology and Volcano Geochemistry".

May 15 James B. Gaherty, Georgia Institute of Technology, School of Earth and Atmospheric Sciences, "Seismic Evidence for Hotspot-Induced Buoyant Flow Beneath the Reykjanes Ridge".

May 22 Sujoy Mukhopadhyay, Department of Terrestrial Magnetism, "3He, Comet-showers, and the K-T Mass Extinction Event".

Seminars are all at 11:00 a.m. and are generally held on Wednesdays in the Seminar Room of the Main Building. DTM is located on 32nd Street one block south of its intersection with Military Road. Proceed south on 32nd Street one block to Jocelyn Street, turn left on Jocelyn and right into the parking lot. Coffee and tea will be served at 10:45 a.m. Please call to confirm that there have been no cancellations.

Source: [esparza@dtm.ciw.edu](mailto:esparza@dtm.ciw.edu)

### **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. 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. Upcoming NOVAC Meeting Programs:

May 12 Ed Witkowski, "Preparing for an Observing Session". Experienced amateur astronomer Ed Witkowski illuminates some of the factors that go into maximizing your night beneath the stars. These include the weather, charts, and observing lists.

June 9 Dr. Jack Greenblat "The Life Cycle of Our Sun" Join Jack Greenblat, scientist and amateur astronomer, as he examines the birth, long life, and future death-throes of our home star. How do astronomers think they know the details of the Sun's multi-billion year life cycle? Come to the meeting and find out!  
Source: <http://novac.com>

# Mid-Atlantic Occultations and Expeditions

by David Dunham

## Asteroidal Occultations

DATE	Day	EST	Star	Mag	Asteroid	dmag	Dur	Ap.	s in.	Location
May 2	Thu	0: 27	TYC19321078	11. 8	Metis	0. 4	8	8	8	Louisiana
May 5	Sun	1: 22	TYC14190791	10. 3	Bellona	1. 6	12	6	6	DC, Maryland
May 6	Mon	0: 57	N03 06200	9. 6	Protesilao	6. 4	4	5	5	s. Virginia
May 10	Fri	3: 41	TYC56140026	11. 2	Maira	1. 7	8	7	7	VA, s. Maryland
May 22	Wed	2: 53	SAO 190300	9. 8	Rachele	3. 6	11	7	7	s. Florida(ow)
May 25	Sat	5: 11	SAO 184638	9. 9	Scheila	2. 2	11	6	6	w. Ohio

## Grazing Occultations

DATE	Day	EST	Star	Mag	% alt	CA	Location
May 6	Mon	4: 22	SAO 165327	7. 8	31-	7	5S Lakesville & Assateague, MD
May 18	Sat	20: 39	ZC 1393	6. 5	40+	58	9N DC; Pr. Frederick, MD; Sun - 5
May 18	Sat	23: 01	ZC 1400	8. 2	41+	32	7N Aberdeen, MD; Harrington, DE
May 20	Mon	22: 35	ZC 1638	8. 1	64+	51	10N Richmond, VA

## Total Lunar Occultations

DATE	Day	EST	Star	Mag	% alt	CA	Sp.	Notes
May 5	Sun	4: 13	R ZC 3227	6. 3	40-	10	57N K0	
May 14	Tue	21: 20	D SAO 077246	7. 9	7+	12	23S K0	Az. 290 deg.
May 16	Thu	22: 18	D SAO 079470	7. 6	21+	23	69S K0	
May 16	Thu	22: 29	D SAO 079477	7. 9	21+	21	65S K2	
May 18	Sat	21: 47	D SAO 098567	7. 5	41+	47	36S A3	
May 18	Sat	22: 54	D ZC 1400	8. 1	42+	34	21N F5	Double; graze
May 19	Sun	0: 54	D SAO 098640	8. 0	43+	12	50N K0	Az. 285 deg.
May 19	Sun	20: 52	D 42 Leonis	6. 2	52+	61	61S A1	ZC 1514
May 20	Mon	0: 39	D ZC 1535	6. 9	54+	22	55N K0	
May 20	Mon	23: 58	D ZC 1647	6. 7	65+	36	61N A2	
May 21	Tue	2: 22	D ZC 1659	6. 7	66+	9	31N K0	Azimuth 274 deg.
May 21	Tue	22: 24	D SAO 119272	7. 6	75+	52	63S F5	
May 24	Fri	1: 11	D ZC 2016	6. 7	93+	34	34N A0	
May 24	Fri	1: 29	D SAO 139704	7. 3	93+	31	29S K0	
May 25	Sat	23: 21	D 47 Librae	6. 0	100+	28	64N B2	Double; ZC2275
May 27	Mon	1: 59	R 24 Oph	5. 6	99-	28	56N A0	Double; ZC2434
Jun 1	Sat	2: 54	R ZC 3178	6. 2	66-	15	82S A0	

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

Phone the IOTA occultation line, 301-474-4945, for weather go/cancel decisions, and other updates and details, or check IOTA's Web site at <http://www.lunar-occultations.com/iota>

David Dunham, e-mail [dunham@erols.com](mailto:dunham@erols.com)  
Phone home 301-474-4722; office 240-228-5609; car 301-526-5590

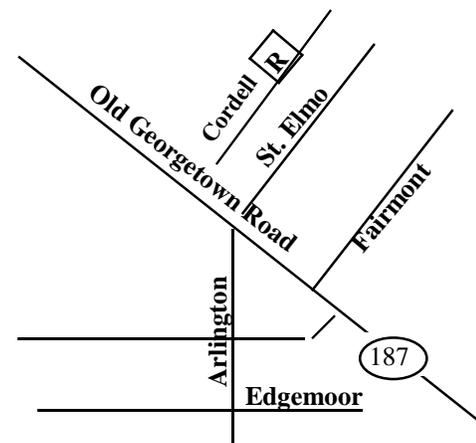
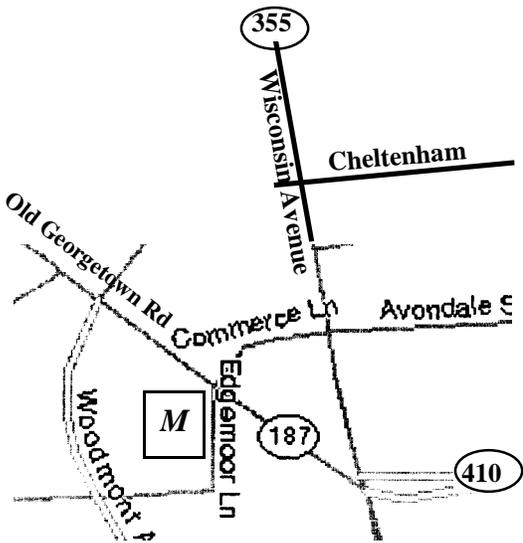
# Getting to the NCA Monthly Meeting

## Saturday, May 4

**3:00 P.M. - NCA Meeting** in the Bethesda-Chevy Chase Regional Services Center of Montgomery County, 4805 Edgemoor Lane (**2nd Floor**), Bethesda, MD.

Dr. Jerry Bonnell will present the featured talk for the May meeting of National Capital Astronomers, "Gamma-ray Bursts, Galaxies, and Supernovae".

**Following the meeting, dinner** with the speaker and NCA members at  
Il Forno Pizzeria  
4926 Cordell Avenue  
Bethesda, MD  
301 652-7757



## 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 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 left onto MD-187/Old Georgetown Rd.
5. Turn right at Cordell Ave. The restaurant, Il Forno Pizzeria, will be on your right between the Betawi Grill (blue canopy with orange lettering) and Nam's (red canopy).  
Have change available for meters (still in operation at that time) or use the public parking garage near the restaurant.

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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](mailto: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](mailto:joemorris@erols.com) or (703) 620-0996.

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

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

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

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

**Date:**

Name(s): \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_ E-mail: \_\_\_\_\_

Other family members who should receive a membership card: \_\_\_\_\_

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).

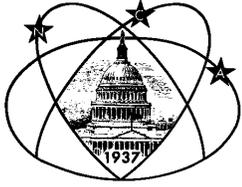
Junior members only: Date of Birth: \_\_\_\_\_ Only members under the age of 18 may join as juniors.

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



**National Capital Astronomers, Inc.**

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

**FIRST CLASS  
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*Inside this issue:*

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May Speaker and His Talk	1
President's Corner	1
Science Fair Winners	1
NCA Events This Month	2
Observing with the NCA C-14	2
Mirror Making Classes	2
April Meteor Showers	3
Space Telescope Science Institute Symposium	3
Exploring the Sky	3
Other National Capital Area Meetings, etc.	4
Mid-Atlantic Occultations and Expeditions	5
Directions with Map to Meeting Place	6
About NCA & Membership Application	7