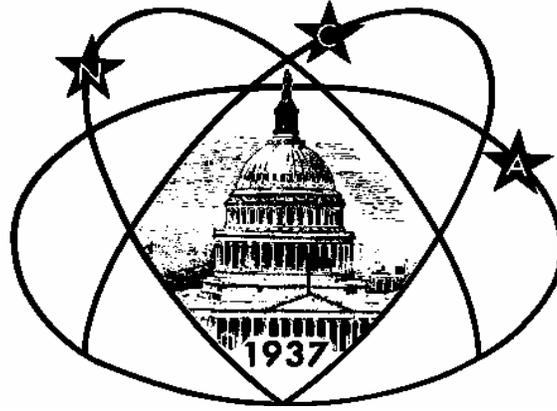


# Star



# Dust

National Capital Astronomers, Inc.

<http://capitalastronomers.org>

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## November Talk: Dr. Philip A. Ianna: "Dim Stars and Bright Skies" *Submitted by Gary Joaquin*

Dr. Philip A. Ianna will give the featured talk, "Dim Stars and Bright Skies", at the December 2 meeting of the National Capital Astronomers. 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.

### Abstract

The nearby stars, those within about 25 parsecs, are a sample of stars whose time has come (again). In the first quarter of this century, a large proportion of astronomical research focused on working out distances and luminosities for stars in our neighborhood. As astrophysics developed, the emphasis shifted outwards to the farthest reaches of the Milky Way and the galaxies beyond.

Following a period of relative neglect,

there is renewed interest in nearby stars in the wake of the discoveries of extra-solar Jovian mass planets, circumstellar dust, and planetary debris disks. Future space missions will have unprecedented sensitivity to the detection of planets around nearby stars, but the evidence suggests we may know less than half the stars in this sample. Work is now focusing on filling in the gaps in our knowledge of the nearby stars by means of parallax determinations and other measurements. Dr. Ianna will present results from recent work in the southern hemisphere.

At the same time, degradation of nighttime skies throughout the world has caused concern. There is a growing effort to halt this trend, with amateur and professional astronomers, lighting professionals, and fixture manufacturers joining to help protect dark skies.

### Bio

Phil Ianna is Professor Emeritus in the Department of Astronomy at the University of Virginia. His research focuses on nearby stars, including measuring distances to low luminosity dwarfs and identifying new candidates within 25 parsecs, with much of this work done in Australia and Chile. He is currently Program Director for Stellar Astronomy and Astrophysics at the National Science Foundation in Arlington. He serves on the Board of Directors of the International Dark-sky Association, started the first state section of IDA (Virginia), and is active on several committees of the Illuminating Engineering Society of North America. He is co-founder of the Charlottesville Astronomical Society. Dr. Ianna received his B.A. and M.A. degrees from Swarthmore College, and Ph.D. from the Ohio State University.

## "Building the Universe (Gallery): Explore the Universe" A Talk by Dr. David DeVorkin *Reviewed by Dr. Andrew W. Seacord, II*

The Smithsonian Institution National Air and Space Museum (NASM) opened the Explore the Universe gallery in September 2001. On September 14, 2002, Dr. David DeVorkin presented NCA with a behind-the-scenes tour of the gallery, emphasizing its design and construction. The gallery, which was ten years in the making, is organized into nine units based on the theme "Tools of Perception" which define visual, telescopic, photographic, spectroscopic, and digital universes. As we develop new tools of perception, we discover new ways of looking at and thinking about the universe. The primary

instruments featured in the gallery include an original William Herschel 20-foot telescope, a Huygens lens from the 1680s used in an aerial telescope, the Newtonian focus cage from the 100-inch Hooker telescope, a Kamiokande neutrino detector photomultiplier tube, the Hubble Space Telescope (HST) back-up mirror, the Brashear spectrograph from the Lick Observatory which was used to obtain the first galaxy radial velocities, the original HST Wide Field Planetary Camera (WFPC-1) and Faint Object Spectrograph (FOS), the image-tube spectrograph used by Vera Rubin, COBE instruments, the

Z-Machine used by Margaret Geller and John Huchra in mapping the distribution of galaxies, and the Hopkins Ultraviolet Telescope flight instrument, an astrolabe, and an equatorial armillary sphere.

### Divisions of the Gallery

There is a "What's New" section at the end of the gallery which shows that the universe is enigmatic. As we continue to find new ways to look at the universe, we will continue to discover "new universes."

*(Continued on page 3)*

## NCA Events This Month

The Public is Welcome!

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

**Fridays, November 1, 8, 15, 22, and 29, 6:30 to 9:30 P.M.,** NCA Telescope-making Classes at the Chevy Chase Community Center, at the northeast corner of the intersection of McKinley Street and Connecticut Avenue, NW. See more information at right. Contact instructor Guy Brandenburg at [gfbranden@earthlink.net](mailto:gfbranden@earthlink.net) or 202-262-4274.

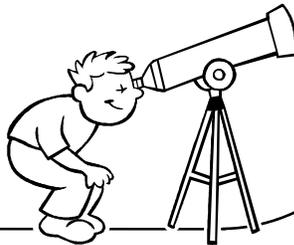
**Fridays, November 1, 8, 15, and 29, 8:30 P.M.** Open nights with NCA's 14-inch telescope at Ridgeview Observatory near Alexandria, Virginia. See below.

**Saturday, November 2 at 7:00 P.M.** Exploring the Sky session in Rock Creek Park in the field just south of the intersection of Military and Glover Roads NW, near the Nature Center. See the article "Come See the Stars" by Joe Morris in this issue.

**Saturday, November 2, 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. Philip A. Ianna will give the featured talk, "Dim Stars and Bright Skies."

**Saturday, November 2, following the meeting,** dinner with the speaker and NCA members at the Rio Grande Restaurant, 4919 Fairmont Ave., Bethesda, MD  
Tel. 301 - 656-2981

See Page 5 for more National Capital Area astronomical doings.



## The deadline for the December *Star Dust* is November 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.

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

Thank you.

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

### Date, Time: All 8:30 p.m.

Friday, November 1, 8

Friday, November 15

Friday, November 29

### Prime Objects

Uranus, M57, Double Cluster, M15, M31

Gibbous Moon

M31, M15, Double Cluster

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.

## NCA Telescope/ Mirror-making Workshop Guy Brandenburg

Classes for amateur telescope-makers continue on Friday nights at the Chevy Chase Community Center in Washington, D.C., on November 1, 8, 15, 22, and 29. We have Pyrex blanks and tools in sizes from 6" through 12.5", though we can get larger ones as well. We have all of the abrasives and pitch you will need, as well as the Foucault and Ronchi testers needed to test your mirror to within about a few millionths of an inch. We even have an aluminizer, to put that ultra-thin reflective coating on the front face of your mirror. We have some woodworking tools available, such as a band saw and a drill press, and even a metalworking lathe, so that you can make some of the other parts of your telescope as well.

Classes are very informal, and are hands-on, not lectures. We average somewhere between four and eight people per session, so we are not crowded, and you can start and finish your project at any time. When you are done, you will not only have made an excellent telescope, but you will have made the telescope that you want to have, and with which you can begin to delve into the mysteries of the universe. You could buy one as good, perhaps, but a really good mirror costs a lot. You will also notice that a decently-made Newtonian reflector will almost always give brighter and clearer views of objects than a Schmidt-Cassegrain telescope (SCT) of the same aperture — and the SCT will cost many times as much.

Our fees are only for the materials and for the aluminizing. For more information, either show up one Friday night between 6:30 and 9:30 P.M. at the Chevy Chase Community Center, on the northeast corner of McKinley Street and Connecticut Avenue, NW, or else contact class leader Guy Brandenburg at [gfbranden@earthlink.net](mailto:gfbranden@earthlink.net) or 202-262-4274.

## 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@erolscom](mailto:ngroman@erolscom) or 301-656-6092 (home).

## Review of talk by Dr. David DeVorkin, continued

(Continued from page 1)

The windowless gallery occupies 4,600 square feet on the first floor of the NASM next to the entrance to the restaurant. Its location places it away from vibrations caused by a variety of sources, including acoustic pressure from the IMAX Theater, metrorail, and the NASM air handling equipment. A unique feature of the gallery is that its entrance and exit are co-located. Also, in order to enhance its educational value, interactive computer terminals are interspersed among its exhibits.

There is an interesting story behind each of the exhibits. Because time was limited, the audience was asked to choose three of them. Herschel's telescope, the Hooker Newtonian focus cage, and the HST back-up mirror were chosen.

### Herschel's Telescope

William Herschel's 20-foot telescope is the center piece of a diorama which shows him observing with the instrument in December 1791. The telescope is located next to his house on King's Street, Slough, London, England where he lived after he became the King's Astronomer. His sister, Caroline, served as his observing assistant and can be seen in a window communicating with him as he observes. The designation "20-foot" refers to the length of the telescope, not its aperture. The 18.5-inch, 130- pound mirror is made of speculum metal. Its back side is dated 1820 and has a marking thought to be the symbol for Uranus, the planet he discovered in 1781 while looking for comets. It is the last mirror he and his son John made before William's death in 1822.

The tube, which has an octagonal cross-section, is made of British pine with an oak frame and reinforcements. Part of the outside surface is sheathed with copper cladding. The mirror rests in a slot at the end of the

tube. One half of the last foot or so of this end of the tube is hinged, providing a door to the mirror chamber.

Although there is a hole in the side of the tube near its open end for a Newtonian focus, the telescope was apparently not used (at least usually) as a Newtonian. The speculum mirrors had a relatively small reflectivity, only about 60 percent. With the use of the two-mirror Newtonian system, only about 25 percent of the light will enter the eyepiece. Since his goal was to see as far into the universe as possible, he needed to maximize the telescope's efficiency. In order to do this, he eliminated the secondary mirror and used only the primary mirror, which was tilted in the tube slightly so that its (prime) focus was located at the inner edge of the tube's open end. A rack was fastened there, on which Herschel placed the eyepiece. He observed from there, facing down the tube as he looked through the eyepiece. The telescope was a meridian transit instrument. He was able to extend the time during which he could observe an object by moving the eyepiece along the rack.

Herschel's telescope is on a ten-year loan to the Smithsonian from the National Maritime Museum of London where it was displayed for fifteen years. It was transported to Baltimore on a container ship and brought to the NASM by truck from the harbor. FedEx had offered to ship it to the Smithsonian free of charge, but could not do so because of regulations. The Maritime Museum placed a value on the telescope less than a million dollars and required that the telescope be accompanied by a curator or other responsible person. There is, however, a Federal Aviation Administration ruling preventing a person from accompanying FedEx cargo valued less than a million dollars. So, Herschel's telescope made the voyage in the bowels of a cargo ship. The tube was placed

in a hermetically sealed crate which was held with braces in the center of a cargo container. The telescope was treated as a work of art!

After arriving at the NASM, a frame, similar to that which Herschel used, was constructed to hold the tube in an observing position. This system is much like a Dobsonian telescope. Within the frame, the tube was supported, and moved in elevation (or declination), by a block and tackle. The NASM display follows this design, but for security of the tube, support is augmented by steel brackets clamped to one-and-a-half-inch steel rods that are welded to the I-beam frame of the gallery wall.

### Herschel's Work

William Herschel's goal was to penetrate as deeply into the universe as he could and understand the elements of which the universe is made. He based his astronomy on three assumptions: (1) he could see to the end of the universe, (2) all stars have the same intrinsic brightness, and (3) the stars are equally distributed in space. He considered the number of stars he counted in any one direction to be a relative indicator of the distance to the end of the sidereal system. He counted stars in every direction over many years. His son, John, continued his survey with observations made in South Africa. William also cataloged thousands of nebulae and noted that their distribution in space differed from that of stars. He considered nebulae to be of a different order from stars, but did not understand what that order is.

### Herschel's Background

After Herschel discovered the planet Uranus on March 23, 1781, King George III gave William Herschel a grant, making him the King's Astronomer. Prior to this event, Herschel was a professional musician. He

(Continued on page 4)

## Come See the Stars! by Joe Morris

### Exploring the Sky 2002 Schedule

Date	Time
November 2	7:00 P.M.

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.

## Review of talk by Dr. David DeVorkin, continued

(Continued from page 3)

was an oboist, organist (at the Octagon Chapel), and composer. As visitors view Herschel and his telescope, one of his oboe concertos is played softly in the background.

### The Hooker Telescope Cage

The next exhibit in the Explore the Universe gallery which Dr. DeVorkin presented is the Newtonian focus cage from the Mt. Wilson Observatory 100-inch Hooker telescope. This cage, which was used by Edwin Hubble, is one of several interchangeable cages placed at the end of tube opposite that of the primary mirror. It formed the last eight feet of the tube and supported the secondary mirror that directed the light toward the side where the Newtonian focus is located. The focal ratio of the Newtonian system is about  $f/5$ . The short focal ratio of this Newtonian system makes the telescope ineffective with increasing sky brightness. Consequently, this cage has not been used for a long time and has been stored on the mezzanine of the observatory building. The crane used for maneuvering the telescope focus cages lowered the Newtonian cage to the flat-bed, 18-wheel truck that carried the cage from the observatory.

A camera was placed at the Newtonian focus. The camera assembly is a double-slide plate holder designed to accommodate an 8x10-inch glass photographic plate. It could, however, accommodate plates of other sizes. Hubble used 5x7-inch plates.

The 11,000-pound cage, including the secondary mirror, arrived at the Smithsonian in

November of 2000. At that time, it was painted a light blue color. The Mt. Wilson Observatory gave NASM permission to repaint it a dark color closer to that of the rest of the telescope.

To create the gallery display, a wedge having the same structure as the Hooker telescope itself, was built and attached to the lower end of the cage so that the telescope is oblique to the floor and appears to be engaged with observing. The floor around the cage was modified to resemble the observing platform. A manikin resembling Edwin Hubble was placed in the Newtonian focus observing position. The face of the Hubble manikin is actually that of the astronaut Jake Garn! To add to the authenticity, Hubble is seen sitting in an arch back wooden chair similar to the one he actually used. To complete the ambiance, a portion of a waterproof fabric dome was constructed behind and over the cage to somewhat resemble the observatory dome.

### The HST Backup Mirror

The third exhibit of the Explore the Universe gallery which Dr. DeVorkin presented is the display of the 2.4-meter Hubble Space Telescope (HST) back-up mirror. It was built in case the mirror actually flown in the telescope was destroyed. The flight mirror was built by Perkin-Elmer; the back-up mirror was made by Kodak. After it was made, the back-up mirror was stored at the Hughes-Danbury (formerly Perkin-Elmer) facility in Danbury, Connecticut and was shipped to the Smithsonian from there. Included in the

shipment were some of the hardware used in moving the flight mirror around.

At the NASM, a steel frame was used to mount the 1,500-pound mirror in a vertical position. The flight mirror was mounted with invar pads and three large bolts that passed through the mirror. The pads and bolts were also used to mount the back-up mirror to its display frame. Since there were no back-up invar mounting pads, those for the display were made from stainless steel. Because the mirror is displayed vertically, top and bottom plates and rubber-backed steel shoes were added to the frame to provide additional support for it.

It was noted that the flight and back-up mirrors were figured to  $1/50$  wavelength and were not designed for use at 1g. The force of the Earth's gravity will cause the mirror's surface to slump significantly when positioned vertically; consequently, the  $1/50$  wavelength figure cannot be maintained.

In an adjacent exhibits, other parts of the HST were on display. Some elements of the first Wide Field Planetary Camera (WFPC-1) and Faint Object Spectrograph (FOS) flight hardware are there. They were removed from the HST during a servicing mission and were replaced by the WFPC-2.

It is unfortunate that there was not enough time for Dr. DeVorkin to cover the other exhibits in the gallery. What we learned about the three he did cover was fascinating and we thank him for a most informative and enjoyable presentation.

## ASP Special Fund-Raising Event Submitted by Nancy Grace Roman

From: "Astronomical Society of the Pacific"  
<newsletter@astrosociety.org>

Dear ASP Member,  
Thanks to incredible support and cooperation from former ASP board member Geoff Marcy, and from the staff of the W.M. Keck Observatory, the ASP is pleased to announce a unique fundraising event.

We are offering for auction a 5-day trip to Hawaii for two—including a night in the Keck control room with Geoff during one of his regularly scheduled planet hunting observing runs.

We hope this once-in-a-lifetime opportunity will prove to be very attractive to amateur astronomers and astronomy enthusiasts who do

not normally have personal access to large observatory control rooms or to working researchers like Geoff.

As Rick Fienberg, editor in chief of *Sky & Telescope* put it, "This might be the amateur astronomer's version of a trip to the space station."

In recognition of the ASP's long-time connection to the amateur community, we will be donating 5% of the auction proceeds to the amateur club of the winner's choice. The balance of the proceeds will be used to help support our own nationwide education programs which are not grant or contract-supported, such as *The Universe in the Classroom* teacher's newsletter, Project ASTRO (which is no longer supported

by NSF), and other programs.

Full details about the upcoming auction are available at our web site, <http://www.astrosociety.org>.

The auction will be publicized in *Sky & Telescope*, *Astronomy*, and in other publications and web sites.

If you know of anyone who might be interested in bidding on this once-in-a-lifetime opportunity, please encourage them to visit our web site.

Cordially,  
Mike Bennett  
Executive Director

# 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.**

## **NASA/GSFC LEP Seminar Laboratory for Extraterrestrial Physics (aka Brown Bag Seminar)**

The Laboratory for Extraterrestrial Physics (LEP) at NASA's Goddard Space Flight Center conducts weekly science seminars. They are held on Fridays at noon in the Conference Room (Room 8) in Building 2 at Goddard. The topics cover the interests of the Laboratory, including astrochemistry, interplanetary physics, planetary systems, planetary magnetospheres, and electrodynamics. Since the seminar is conducted during the lunch hour, members of the audience often bring their lunch, hence the moniker "brown bag seminar."

November 1 Dr. Alex Klimas, (NASA/GSFC), "Self-Organized Criticality in Earth's Magnetotail Dynamics"

November 8 Dr. Dennis Haggerty, (JHU/APL)

November 22 Dr. G. Thejappa, (University of Maryland, College Park, MD), "Polarization and Fragmentation of Solar Type II Radio Bursts"

The duration of the seminar is typically one hour with questions asked during and after the seminar. The audience is usually diverse, including scientists with interests ranging throughout the heliosphere.

Source: [http://lepjas.gsfc.nasa.gov/~seminar/lep\\_seminar.html](http://lepjas.gsfc.nasa.gov/~seminar/lep_seminar.html)

## **Observatory Open House, Department of Astronomy, University of Maryland**

Our Open House program will continue this fall just as it has for the last 30 years. Come see local astronomers give a short 25-minute presentation about their research or other new developments in astronomy! The talk is then followed by observing through the telescopes, weather permitting.

All observatory events are free and do not require reservations for groups smaller than 15 people. If you have a group larger than 15 people, please call 301-405-6555 to make special arrangements at least five days in advance.

November 5 8:00 p.m. Dr. Virginia Trimble, "Life in the Universe"

November 20 8:00 p.m. Dr. Rosemary Killen, "Space Weather in the Solar System from Mercury to the Galilean System"

December 5 8:00 p.m. Dr. Derek Richardson, "Using Earth's Tides to Make Asteroid Moons"

For more information, please call 301-405-6555 or check out the Observatory web pages at <http://www.astro.umd.edu/openhouse>

## **University of Maryland at College Park Astronomy Colloquia**

All Astronomy Colloquia are held on Wednesdays in Room CSS 2400 at 16:00-17:00 unless otherwise noted.

November 6 Karl Glazebrook (JHU), TBD  
November 13 Sean Carroll (Chicago), TBD

November 20 Jeremy Heyl (CfA), "The Secret Life of Neutron Stars"

December 4 Arthur Kosowsky (Rutgers), "The Atacama Cosmology Telescope"

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 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. There are a limited number of parking meters in Lot DD; there are no parking meters in Parking Garage 2. Parking at non-metered spaces in Lot DD and PG2 is free after 4 p.m. and on weekends. More information is available from the Department of Campus Parking.

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

## **Goddard Scientific Colloquia**

All colloquia will be held in the Building 3 auditorium at the Goddard Space Flight Center except as noted.

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. To be added to our mailing list, call the same number.

November 1 Erast Gliner (A. Ioffe Institute), "Significant Problems with the Current Theory of Inflationary Cosmology"

November 8 Hamish Robertson

(University of Washington), "SNO Flies: The Solar Neutrino Problem Resolved"

November 15 Eric Adelberger (University of Washington), *The William Nordberg Memorial Lecture*: "Lunar Laser Ranging"

November 22 Sheldon Rampton (Center for Media and Democracy) "Public Relations Manipulation of Science"

December 6 Steward Pickett (Institute for Ecosystem Studies), "The Structure and Function of Metropolitan Baltimore as an Ecological System"

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

## **Solar Physics Talks**

Talks are Wednesday at 3:30 in Building 26, Room G10 of Goddard Space Flight Center, unless otherwise specified.

November 6 Ken Phillips, TBA

November 13 LWS Workshop

November 20 Alex Klimas (GSFC), "Self-Organized Criticality in Earth's Magnetospheric Dynamics"

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

## **The Northern Virginia Astronomy Club (NOVAC) - Meetings.**

November 10 Tom Dietz, "Buying a Telescope"

General membership meetings are open to the public, and are held at Enterprise Hall, Room 80, on the campus of George Mason University (directions) in Fairfax, Virginia. It is best to park in Parking Lot B and walk up the hill to the rear of Enterprise Hall.

Source: [novac.com](http://novac.com)

## **Stellar & Extragalactic Astronomy Lunch**

Talks are Wednesdays at 12:00 Noon in Room 242 of Building 21, except as noted. Talks labeled BWSS are part of the Baltimore-Washington Starburst Seminar Series, and will be held on Tuesdays at 12:00 Noon. BWSS talks are in the Aerospace Building (see below).

October 30 Neal Miller (GSFC/NRC), "Star Formation in Abell 2256"

November 6 Kailash Sahu (STScI), "On Microlensing" (BWSS)

November 13 Jason Rhodes (GSFC/NRC), "Weak Lensing with SNAP"

(Continued on page 6)

## Other National Capital Area Meetings

(Continued from page 5)

November 20 Susan Neff (GSFC), “Super-Eddington X-ray Sources and Merging Galaxies”

December 4 Dale Fixsen (GSFC/SSAI) “Towards an Optimal Read Rate and Integration”

Talks labeled BWSS are part of the Baltimore-Washington Starburst Seminar Series. The BWSS talks are in the Aerospace building at 10210 Greenbelt Road, room 408 on the 4th floor; a free pizza lunch will be provided. To get to the Aerospace building, go out the main gate of

GSFC, turn left and go about 3/4 mile. The Aerospace building will be on your left, just after a Lutheran church.

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

### Department of Terrestrial Magnetism

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

November 6 Michael J. Mumma (NASA Goddard Space Flight Center), “A Current View of Organic Volatiles in Comets”

November 13 Sangeeta Malhotra (Space Telescope Science Institute), “Star Forming Galaxies”

November 20 Scott King (Purdue University), “Mantle Convection; Fluid Dynamics”

December 4 Nader Haghighipour (DTM) “Solar System Dynamics”

Seminars are held on Wednesdays at 11:00 a.m. 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 or email Brooke

Hunter to confirm that there have been no cancellations.

Source: <http://www.ciw.edu/DTM-seminars.html>

### Goddard Engineering Colloquia

All colloquia are held at 3:30 p.m. on Mondays in the Building 3 Auditorium, unless otherwise indicated below.

November 18 Hannah Holmes (Author), “The Secret Life of Dust: From the Cosmos to the Kitchen Counter”

November 25 John D. Rummel (NASA/HQ), “Protecting All of The Planets, All of The Time: Scientific and Engineering Challenges”

December 2 William A. Wulf (National Academy of Engineering), “Technology Societal Issues”

December 9 Bob Zimmerman (Author), “‘We have Capture!’ The Story of Rendezvous and Docking in Space, and How What Today Seems Routine Was Once Considered Almost Unachievable”

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

Source: <http://ecolloq.gsfc.nasa.gov/sched.html>

# Support

# the

# IDA

Join the International  
Dark-Sky Association  
3225 N. First Avenue  
Tucson, AZ 85719-2103  
[www.darksky.org](http://www.darksky.org)

## Meteor Showers

### November Radiants

Full Moon: November 20

#### Major Activity

Radiant	Duration	Maximum
Leonids (LEO)	November 14-20	Nov. 19 @ 3:48-4:04 UT Nov. 19 @ 10:20-10:40 UT

#### Moderate Activity

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

#### Minor Activity

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

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

# Mid-Atlantic Occultations and Expeditions

## by David Dunham

### Asteroidal Occultations through Early December 2002

Date	Day	EST	Star	Mag	Asteroid	dmag	s in.	Location
Nov 2	Sat	20:48	ZC 0593	5.9	Nephele	7.3	9 1	WV, w. MD, e. PA
Nov 10	Sun	2:32	pi Arietis	5.2	Lindemannia	9.5	4 .3	s. GA, s. SC
Nov 16	Sat	0:46	SAO 098512	9.1	Jupiter	0.0	267m 8	e. N. America
Nov 17	Sun	22:07	TYC23611655	11.7	Leontina	2.5	5 8	s. e. MD, s. VA
Dec 1	Sun	2:03	SAO 80909	6.4	Carnegia	8.8	10 1	e. Cuba

### Grazing Occultations

Date	Day	EST	Star	Mag	% alt	CA	Location
Nov 14	Thu	21:26	30 Piscium	4.4	79+ 44	12S	nw DC; Laurel, MD; ZC 3536
Nov 23	Sat	8:07	epsilonGem	3.1	89- 23	8S	Wilson, NC; Sun +11; ZC 1030
Nov 29	Fri	4:41	X18106	9.6	30- 36	6S	Spotsylvania, VA

### Total Lunar Occultations

Date	Day	EST	Ph Star	Mag	% alt	CA	Sp.	Notes
Nov 3	Sun	5:36	R 66 Vir	5.8	3- 7	55S	F3	ZC 1924, Azimuth 103 deg.
Nov 8	Fri	18:24	D ZC 2735	7.2	21+ 15	40S	A5	Azimuth 216
Nov 8	Fri	19:15	D ZC 2740	6.3	21+ 9	57S	G8	Azimuth 225
Nov 11	Mon	20:02	D SAO 190556	7.0	51+ 27	87S	K1	
Nov 14	Thu	19:56	D ZC 3529	6.6	79+ 45	25N	G5	
Nov 22	Fri	07:59	R SAO 077276	6.8	95- 73	32S	K0	WA 208
Nov 22	Fri	21:26	R ZC 0977	6.4	91- 27	36S	K2	WA 212, close double
Nov 23	Sat	7:46	D epsilonGem	3.1	89- 26	-28S	A3	Sun +7; difficult
Nov 23	Sat	8:09	R = ZC 1030	3.1	89- 19	42S	A3	Sun +13; graze in NC
Nov 23	Sat	22:30	R 57 Gem	5.0	84- 29	74S	G8	ZC 1117; close double?
Nov 24	Sun	9:06	D kappa Gem	3.6	81- 21	-70S	G8	Sun +19; very difficult
Nov 24	Sun	10:01	R = ZC 1170	3.6	81- 11	84S	G8	Sun +25; azimuth 293
Nov 27	Wed	0:10	R ZC 1499	7.1	54- 12	77S	K0	Azimuth 79 deg.
Nov 27	Wed	4:47	R SAO 099091	7.3	52- 61	66S	G5	mgs. 7.5&9.6, sep. ~1"
Nov 28	Thu	3:02	R SAO 099505	7.5	42- 32	84S	K2	
Nov 29	Fri	3:42	R SAO 119227	7.5	30- 26	42N	K0	
Nov 29	Fri	4:53	R X18106	9.0	30- 38	26S	G5	Graze south of DC
Nov 30	Sat	4:37	R SAO 139080	7.8	20- 12	54S	K0	Azimuth 102 deg.

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

Your observations are welcome for the major events in the area, the Nephele binoculars asteroidal occultation on Nov. 2 and the bright graze across the region on Nov. 14; see Oct. Stardust for timing info. Phone the IOTA occultation line, 301-474-4945, for updates, or check the local IOTA Web site at <http://iota.jhuapl.edu>  
David Dunham, e-mail [dunham@erols.com](mailto:dunham@erols.com), phone 301-474-4722

# Getting to the NCA Monthly Meeting

## Saturday, November 2

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

**Note:** The meeting will be held across the hall from our usual meeting place.

Dr. Philip A. Ianna will give the featured talk, "Dim Stars and Bright Skies."

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

## Directions to the 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.

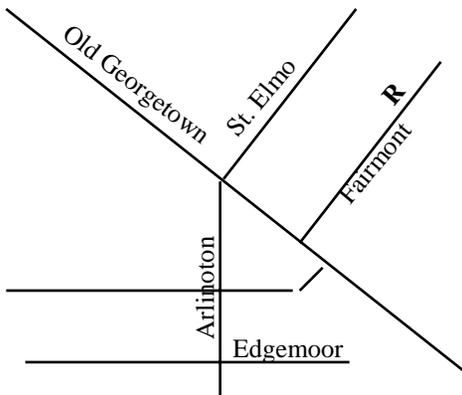
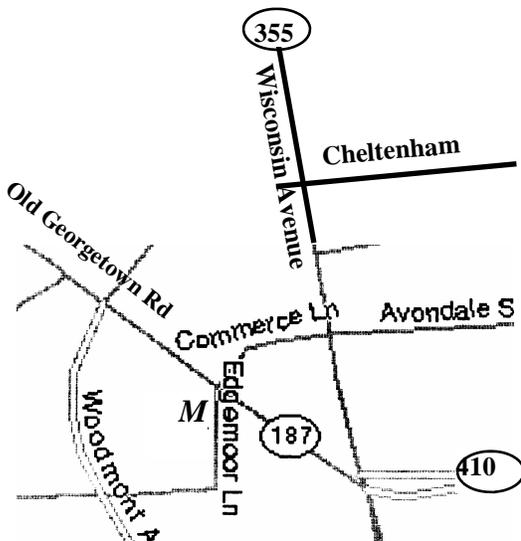
## From South of Bethesda

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 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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### 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**

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

Dues:

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\$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).

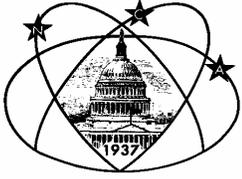
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Tax deductible contribution: \_\_\_\_\_ Thank You.

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