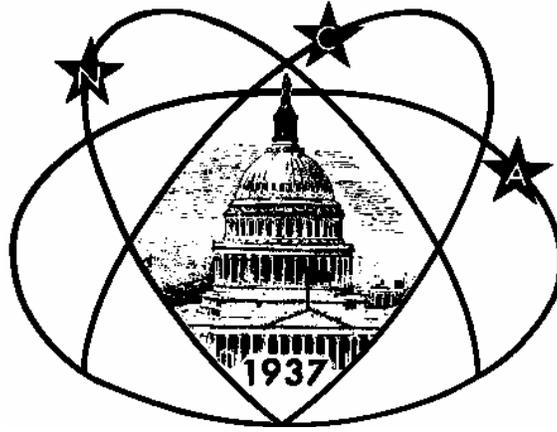


Star



Dust

National Capital Astronomers, Inc.

<http://capitalastronomers.org>

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February Speaker: Dr. Vera C. Rubin, "Polar-Ring Galaxies" submitted by Dr. Walter L. Faust

Dr. Vera Rubin, Senior Fellow at the Department of Terrestrial Magnetism, Carnegie Institution of Washington, will present the talk "Polar-Ring Galaxies" at the February 11 meeting of the National Capital Astronomers, 7:30 P.M., at the University of Maryland Observatory, in College Park, Maryland.

Abstract

A polar ring galaxy is encircled over its poles by a ring of matter, a ring that may actually be a massive disk. Although polar ring galaxies constitute only a small fraction of the galaxy population, they offer a unique insight into the formation and evolution of galaxies, and the details of

dark matter halos. Polar ring galaxies constitute a fraction of multi-spin galaxies, galaxies with more than one sense of rotation. After a brief discussion of rotation in normal galaxies, Dr. Rubin will describe a few of these curious objects, and what astronomers have learned from them.

Bio

Vera C. Rubin is an observational astronomer who has studied the motions of gas and stars in galaxies and motions of galaxies in the universe for 75% of her life. Her work was influential in discovering that most of the matter in the universe is dark. She is a graduate of Vassar College, Cornell University, and Georgetown Univer-

sity; George Gamow was her thesis professor. A staff member at the Department of Terrestrial Magnetism, Carnegie Institution of Washington, she is now a Senior Fellow. She is a member of the National Academy of Sciences, and the Pontifical Academy of Sciences. President Clinton awarded her the National Medal of Science in 1993. Among other honors, she received the Gold Medal of the Royal Astronomical Society (London) in 1996. The previous woman to receive this medal was Caroline Herschel in 1828. Vera is active in encouraging and supporting women in science. Her husband and their four children are Ph.D. scientists.

Two Talks at Two NCA Meetings in January Reviewed by Dr. Harold Alden Williams

Dr. Joel Tohline

On January 7, 2006, Dr. Joel Tohline from Louisiana State University spoke to us on "Contact Binary White Dwarfs Exchanging Matter." Double stars, binary stars, are quite common: close binary stars, while maybe not common, are at least not extremely rare. Several very interesting astronomical phenomena are probably caused by very close binary stars. Double white dwarf, DWD, systems are responsible for many if not all planetary nebulae. Planetary Nebula NGC2336, a Hubble Heritage image, is a DWD system with a period of 16 days and a separation of only 16 Solar radii. AM Hercules is a binary star with a period of only 3.1 hours and it is a cataclysmic

variable (CV). Cataclysmic variable stars are binary stars that undergo Nova outbursts occasionally when hydrogen is dumped from a large radius star onto a white dwarf, WD, that has already burned up all of its hydrogen; the larger radius star fills its Roche lobe.

See Figure 1. A Roche lobe is "the volume around a star in a binary system in which, if you were to release a particle, it would fall back onto the surface of that star. A particle released above the Roche lobe of either star will, in general, occupy the 'circumbinary' region that surrounds both stars. The point at which the Roche lobes of the two stars touch is called the inner Lagrangian or L1 point. If a star in a close binary system evolves to the point at which it fills its Roche lobe, theoretical calculations predict that material from this star will overflow both onto the companion star (via the L1 point) and into the environment around the binary sys-

(Continued on page 3)

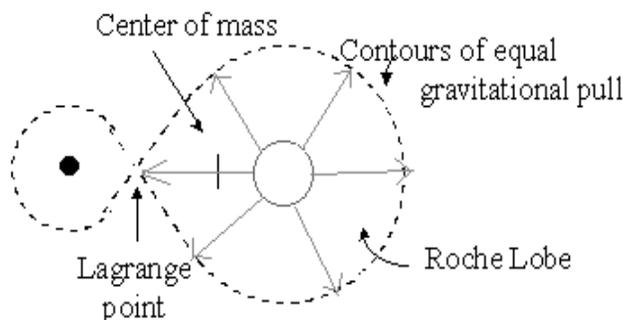


Figure 1

NCA Events This Month

The Public is Welcome!

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

NCA Mirror- and Telescope-making Classes: Fridays, Feb. 3, 10, 17, and 24, 6:30 to 9:30 P.M. at the Chevy Chase Community Center, at the northeast corner of the intersection of McKinley Street and Connecticut Avenue, N.W. Contact instructor Guy Brandenburg at 202-635-1860 or email him at gbrandenburg@yahoo.com.

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

Next NCA Meeting: Saturday, February 11 at 7:30 P.M., at the University of Maryland's Observatory on Metzerott Road:

Vera Rubin, Carnegie Institution: "Polar-Ring Galaxies." See map and directions on Page 6.

Dinner with NCA members and speaker: Saturday, February 11 at 5:30 P.M., preceding the meeting, at the Garden Restaurant in the University of Maryland University College Inn and Conference Center. See map and directions on Page 6.

Upcoming NCA Meetings—Saturdays
March 11: Michael A'Hearn, Astronomy Department, University of Maryland: "Deep Impact"
April 8: Alan Bunner, NASA HQ (retired): "The Anthropic Principle"
May 13: Robert W. Farquhar, The Johns Hopkins University Applied Physics Laboratory, Space Department: "The Lagrange Points"
June 10: TBA.

Observing with the NCA C-14 Mike McNeal

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

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

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

Call Mike at 301-907-9449 or email him at mcnealmi@verizon.net.

The deadline for the March Star Dust is February 22. Please send your material to Elliott Fein by that date to ensure inclusion. Send submissions to Elliott Fein at elliott.fein@verizon.net.

Articles submitted may be edited to fit the space available.

Making of a Scientist: Images and Reality GSFC Public Lecture Series

[Your editor was prompted to include this information by Jeffrey Guerber]

NASA's Goddard Space Flight Center invites you to a new public lecture series featuring some of the most fascinating and inspiring women in space, science and scientific leadership.

Time and Location

Colloquia will be held on scheduled Thursday evenings at 7 p.m. in the Goddard Visitor Center Auditorium. Refreshments and informal interaction with speakers will follow each lecture. Appropriate for high school/college level and above. Free parking is available at the Visitor Center.

Upcoming Lecture

Dr. Anne Kinney will deliver the next lecture of the series "Blue Planets, Black Holes" on Thursday, Feb. 9.

Brief Biographical Sketch

As the Director of the Astrophysics Division, in the Science Mission Directorate at NASA Headquarters, Dr. Kinney manages over thirty flight projects including such missions as Spitzer Space Telescope, Chandra, Hubble, as well as future mis-

sions like JWST and LISA. Originally from Wisconsin, Dr. Kinney received her bachelor's degree in 1975. She studied for several years at the Niels Bohr Institute in Denmark, and received her doctorate in Physics from New York University in 1984. Dr. Kinney has served on the Council of the American Astronomical Society, and has been a visiting scholar at the Institute of Astronomy in Cambridge. An expert in extragalactic astronomy, Dr. Kinney has worked on characterizing the optical and UV spectra of quasars, blazars, active and normal galaxies. She has also studied active galaxies accretion disk signatures.

Abstract of talk

A decade ago, all the planets we knew were in our own solar system. Today we know of over a hundred large planets surrounding other stars. Astronomers are now in hot pursuit of ever smaller planets, with the ultimate goal of finding earth-like planets that could potentially support life. How do astronomers detect these distant, faint objects, and what missions are planned in the future to find such earth analogues? The search for terrestrial planets is a central theme of the Explora-

tion Initiative at NASA.

Opposite in every way from such blue planets are black holes. Like extra-solar planets, the first hard evidence for black holes is barely a decade old. These discontinuities in space-time are known now to be ubiquitous, inhabiting the centers of galaxies in the distant universe, and serving as the end of the road for massive stars. Current progress and future missions on black holes will be discussed.

Finally, courtesy of the three Great Observatories currently in orbit, we will have a short tour of our known universe, starting from 300,000 years after the beginning of time, proceeding through the most distant, early galaxies, then through our galaxy, and finally into our own home solar system, 13.7 billion years later.

Reservations

Admission is free but on-line reservations are requested to help us plan for the event. Please help us avoid chaos! RSVP at <http://university.gsfc.nasa.gov/mos/rsvp.jsp>.

Source: <http://university.gsfc.nasa.gov/mos/>

Two Talks in January

(Continued from page 1)

tem.” (Per www.astro.northwestern.edu)

When enough hydrogen is deposited on the hydrogen depleted WD, a runaway nuclear reaction occurs and many hydrogen bombs go off in a Nova outburst. A plot of the number of CVs versus the log of the orbital period reveals at least two types of cataclysmic variable stars with a third type possible with extremely short orbital periods like AM Canes Venatici, AM CVn, of 1029 seconds \approx 17 minutes. AM CVn is 235 pc = 766 light-years away and has a total mass of 0.8 solar masses with a donor to accretor mass ratio of 1/10 and an orbital separation of only 0.2 solar radii or 22 earth radii. The donor's radius is 4.4 earth radii and the accretor's radius is 2 earth radii.

A beautiful movie of an AM CVn-like system with mass flowing through the Roche lobes between the DWD can be seen at URL http://charybdis.phys.lsu.edu/%7Epatrickmott/aas_207_viz_comp/LSU_Quicktime.mov. This is “Computational Fluid Dynamics” done on SuperMike, a 3 TeraFlop supercomputer with 1024 processors.

The gravitational radiation of AM CVn will not be detectable by LIGO (the Laser Interferometer Space Antenna) (<http://www.ligo.caltech.edu/>), but it will be detectable by LISA (the Laser Interferometer Gravitational-Wave Observatory) (<http://lisa.jpl.nasa.gov/>), easily. LIGO is now operating, but LISA is still, unfortunately, in the far future. The strain, change in length divided by the length in both detectors, is similar, but the frequency or wavelength of the gravitational waves detected is very different. The frequency is hundreds of hertz for LIGO and hundredths of hertz for LISA. Low frequency for LISA means very large wavelengths and therefore space distances for it to work.

The PowerPoint presentation that Dr. Tohline used may be seen at <http://capitalastronomers.org/DWD.accretion.ppt>

Dr. Harold Williams

On January 14, 2006, Dr. Harold Williams from Montgomery College spoke to us on “Things That Excited Me at the 207th AAS Meeting, January 8-12.”

About the meeting

It was a good meeting, but the request for volunteers should have gone out earlier so more NCA members could have volunteered and gotten free admission for two days work. Jay Miller, Jeff Guerber, and two Montgomery College students got to go free as volunteers. Remember, the next opportunity for an AAS meeting in the Washington metro area will be January 2010.

Here is some of what excited Dr. Williams:

Astronomy pod casting

Pod casting at <http://slackerastronomy.org/> “Because if you aren't going to care about something, you may as well not care about astronomy,” hosted by AAVSO (American Association of Variable Star Observers).

Abigail Fraeman

Abigail Fraeman, NCA member and NCA science fair winner on several occasions, who has now completed her first semester at Yale University, presented poster paper 74.03 entitled “Extrasolar Comets and Asymmetric Distribution of Water Vapor Cloud around Star IRC +10216,” reminded me that I was her sixth grade science fair mentor. (I think on an AAVSO-type project.) Other NCA members mentored her later, and better.

A galaxy without stars

VIRGOHI21 still appears to be a dark galaxy of gas without any stars. I first heard about VIRGOHI21 in September at the Blackwater Falls State Park star party. I thought Dark Matter would encourage star formation, so how come the Dark Matter to Gas Mass for this object is 750?

Cold Dark Matter

Maybe CDM, “Cold Dark Matter,” is in trouble. MOND, MODified Newtonian Dynamics, needs no Dark Matter, and since August of 2005 there are two different general relativistic theories now that are consistent with MOND, one by Jacob D. Bekenstein and the other by R. H. Sanders. So MOND, not having a relativistic theory, but just being an ad hoc fix, can no longer be given for not further examining this possibility. Occam's razor has for some time not favored CDM, since CDM needs many more free parameters to fit every galaxy's rotation curve, whereas MOND needs just one parameter.

Dan Lewis

A long time NCA member, Dan Lewis died on January 28. He was a past president and treasurer.

Astronomy visualization

A couple of DVDs were given out at the NCA talk from “Session 160. Astronomy Visualization: The State of the Art.” During this session, Michael Norman showed a stunning visualization which did not appear on the DVD (I wish it had). Population III stars start at $z=100$, 3 Mega years to AGB, Asymptotic Giant Branch, dispersal of heavy elements, with very large variance using 3D Adaptive Mesh hydrodynamics. Early on, there were pockets of heavy elements even greater than the current solar system, though the average was much, much lower. What all does this mean for cosmic chemical evolution?

Cosmology

In 50 years, we have gone from a cosmology with only two numbers, so poorly determined that factors of two were in dispute, to ten-parameter cosmology with numbers determined within 10% or less. Plus not only is the universe expanding from a “big bang,” but the rate of expansion, which had been decelerating due to gravity, is now accelerating for the last 6 billion years due to Dark Energy in a universe 14 billion years old! So a curious and strange universe has gotten more curious and strange.

Is it astronomy?

Particle physics via the Pierre Auger Observatory, on the pampas of Argentina at <http://www.auger.org> has even invaded real astronomy, observing, not just astrophysical science fiction, Nobel laureate J. W. Cronin (U. Chicago) informed us with his halting title “The Pierre Auger Observatory for the Highest Energy Cosmic Rays: Is it Really Astronomy?” I think yes, but only a little data is in now in this interesting dual detector system still coming on line with water-filled Cherenkov counters for massive air showers, that work all of the time, and telescopes that detect the fluorescence of the shower particles in the nitrogen of the atmosphere only during the dark of the Moon. Cosmic rays of 10^{19} eV have been detected with 1.5 degree seeing.

The PowerPoint presentation that Dr. Williams used (with some additional slides) may be seen at <http://capitalastronomers.org/AAS207Excite.ppt>

Mid-Atlantic Occultations and Expeditions

by David Dunham

Asteroidal Occultations

Date	Day	EST	Star	Mag	Asteroid	dmag	dur	Ap.	s in.	Location
Feb 3	Fri	18:35	2UC29027376	11.6	Tokio	2.2	2	7	cNC,se	Virginia
Feb 6	Mon	21:04	2UC34265225	11.9	Olga	2.3	5	8	sOH,scVA,neNC	
Feb 9	Thu	3:22	TYC01760343	10.9	Olga	3.4	6	7	OH,WV,cVA,eNC	
Feb 20	Mon	23:02	SAO 76327	9.0	Deimos	7.3	1	3	S.	Carolina
Feb 22	Wed	3:17	TYC08051277	11.5	Eurynome	0.6	8	8	wNY,ePenn,NJ	
Feb 24	Fri	2:29	SAO 80107	7.9	Turandot	7.2	7	2	sOH,WV,wVA,eNC	

Grazing Occultations

DATE	Day	EST	Star	Mag	% alt	CA	Location
Feb 9	Thu	1:59	ZC 996	6.9	86+ 32	6N	Woodbine,Columbia,&Hanover,MD
Feb 20	Mon	5:06	SAO 183234	8.0	60- 28	14S	StephensC,Staford,Dahlgren,VA
Feb 21	Tue	3:59	SAO 184053	8.3	50- 18	15S	Hanovr,PA;WhitMrsh,Tuckaho,MD
Mar 2	Thu	20:35	ZC 209	7.2	12+ 10	1S	SterlngVA;Bethsda,Woodmore,MD
Mar 4	Sat	22:28	ZC 474	9.0	31+ 15	5N	Frostburg, MD; Ladysmith, VA
Mar 6	Mon	21:40	ZC 771	6.0	52+ 47	6N	LewsbyPA;StantonDE;SomrsPtNJ
Mar 6	Mon	21:40	SAO 76991	8.6	52+ 47	6N	Logansville,PA; North East,MD

Total Lunar Occultations

DATE	Day	EST	Ph Star	Mag	% alt	CA	Sp.	Notes
Feb 2	Thu	20:42	D SAO 109533	7.4	26+ 21	47N	K0	
Feb 2	Thu	21:56	D ZC 132	6.7	26+ 8	50S	G5	Azimuth 273 deg.
Feb 4	Sat	21:46	D ZC 397	7.5	48+ 35	87N	B9	mag.2 7.4 3.3",PA119
Feb 5	Sun	17:45	D 66 Arietis	6.2	57+ 71	47N	K0	ZC 501; Sun -3 deg.
Feb 5	Sun	21:24	D SAO 75987	7.2	58+ 51	21N	A3	mag.2 11.4 10",PA321
Feb 5	Sun	21:31	D SAO 75988	7.6	58+ 50	13N	G5	
Feb 5	Sun	22:52	D 9 Tauri	6.7	59+ 35	67S	A2	ZC 521
Feb 7	Tue	17:48	D ZC 797	6.4	77+ 57	60N	B9	Sun -3; spectro.sdbl.
Feb 8	Wed	0:30	D SAO 77224	7.4	78+ 39	27S	F8	Maybe close double
Feb 8	Wed	2:36	D ZC 840	6.3	79+ 16	31S	K0	spectroscopic binary
Feb 8	Wed	19:10	D SAO 78233	7.5	85+ 63	53N	A3	mg2 8.1,.2";mg3 9.2 3"
Feb 9	Thu	1:54	D ZC 996	6.9	86+ 33	15N	A2	close dbl.?. MD graze
Feb 9	Thu	22:17	D ZC 1108	7.0	92+ 77	33S	G8	Maybe close double
Feb 15	Wed	22:15	R ZC 1730	6.2	92- 22	52N	K2	
Feb 17	Fri	2:49	R ZC 1836	6.3	85- 45	12N	F7	
Feb 17	Fri	22:59	R Spica	1.0	79- 8	72S	B1	ZC 1925; Az. 111 deg.
Feb 20	Mon	2:57	R ZC 2157	6.1	59- 21	83S	K0	
Feb 20	Mon	5:17	R SAO 183234	8.0	59- 28	27S	F5	VAgaze;mg2 10 2",PA132
Feb 21	Tue	4:09	R SAO 184047	7.5	49- 20	56S	M2	V1043 Sco, range .1mag
Feb 21	Tue	4:24	R ZC 2298	5.0	49- 21	42N	K3	
Feb 22	Wed	3:34	R ZC 2444	7.6	38- 7	35S	A0	Azimuth 136 deg.
Feb 22	Wed	4:05	R SAO 184914	7.5	38- 11	75S	K2	Azimuth 142 deg.
Feb 22	Wed	5:55	R ZC 2453	6.6	38- 21	63N	K1	
Feb 23	Thu	4:40	R W Sgr	4.7	28- 7	58S	G0	ZC 2609; Az. 138 deg.
Feb 23	Thu	4:58	R SAO 186256	7.3	28- 10	48N	A2	Azimuth 141 deg.
Mar 2	Thu	18:42	D ZC 201	7.5	12+ 31	77N	G5	Sun alt. -9 deg.
Mar 3	Fri	21:48	D ZC 348	6.8	22+ 9	47S	A2	Az. 284; close dbl?
Mar 4	Sat	19:42	D SAO 75799	8.2	31+ 46	63S	F5	

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

Other National Capital Area Meetings

Northern Virginia Astronomy Club
General Membership Meetings at GMU
General membership meetings are open to the public, and are held at Enterprise Hall, Room 80, on the campus of George Mason University in Fairfax, Virginia. The meeting hall is in the basement floor of the building. It is best to park in parking Lot B and walk up the hill to the rear of Enterprise Hall

Please note: GMU has two parking lots designated as B. One of them has closed temporarily. Please continue further around Patriot Circle to the 2nd Lot B or park in the Patriot center lot and walk to Enterprise Hall. Handicapped parking remains the same.

Upcoming Meeting

Sunday, February 12, 7:00 p.m.

“Outreach How-To/Survey of Open Clusters” Everything you always wanted to know about outreach but were afraid to ask! Ed Witkowski will give members tips on how to prepare for an outreach event.

Later he will discuss a wide range of open clusters viewable by amateurs. Numerous winter objects will be discussed in detail. Along with the cataloging of open clusters, viewing techniques will be discussed.

Meetings start at 7:00 P.M., on the second Sunday of every month. If you come earlier you can do a little socializing. The first part of the meeting is club business, during which the officers make reports about their activities and areas of responsibility.

The next part of the meeting usually includes:

- Show and Tell, where members share gadgets, books, techniques, etc.
- The Observing Report, describing the astronomical events for the next month.
- Q&A, where beginning astronomers are encouraged to ask questions to be answered by more experienced members.
- The Sky Tour, describing what's where in the sky for the next month.

The final part of the meeting is a program, usually by one of the members, but sometimes by “outside experts.”

We've had presenters from all aspects of

Astronomy.

There's a good deal of socializing before and after meetings, allowing members to put faces with the voices they've heard in the dark.

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

For more information, see <http://www.novac.com>

Planetarium at Montgomery College

Astronomy is the oldest science and one of the few sciences that welcomes amateurs. *Everyone who looks up at the stars with wonder is an astronomer.* The planetarium is open from the last week in August until the Friday before Memorial day in May. This is an academic institution so there are a few holidays like Thanksgiving and around Christmas and New Year's Day when the entire institution is closed.

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

Free Public Shows

Tuesday, 21 February 6:30 P.M. A Montgomery College Community Colloquium: “Faith in Science?”, not in the planetarium, but in the Health Science Building Room 122 at 7977 Georgia Avenue, Silver Spring, MD 20910

Monday, 20 March 7 P.M. “The Rites of

Spring, the Vernal Equinox” The vernal equinox is at 1:26 P.M.

Tuesday, 11 April 6:30 P.M. A Montgomery College Community Colloquium: “Navigating Uncertainties” not in the planetarium, but in the Health Science Building Room 122 at 7977 Georgia Avenue, Silver Spring, MD 20910

Saturday, 15 April 7 P.M., “Space-time Invariance and Quantum Gravity” Discover the smallest distances and times measurable and how the universe is pixelated.

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

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

For more information, see <http://www.montgomerycollege.edu/departments/planet/>

Do You Want to Get Star Dust Electronically?

Any member wishing to receive *Star Dust*, the newsletter of the National Capital Astronomers, via e-mail as a PDF file attachment, instead of hardcopy via U.S. Mail, should contact Nancy Grace Roman, the NCA Secretary, at nancy.roman6@verizon.net or 301-656-6092 (home).

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

Jeff Guerber

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

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



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

Observing after the Meeting

Elizabeth Warner

Following the meeting, members and guests are welcome to tour through the Observatory. Weather permitting, several of the telescopes will also be set up for viewing.

Are You Coming to Dinner?

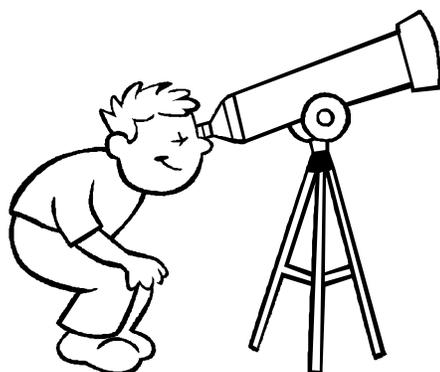
If you are planning to come to the dinner before the meeting, please tell Benson J. Simon, telephone: 301-776-6721, e-mail st88@ioip.com, so that we can make reservations for the right number of people.

Do You Need a Ride?

Please contact Jay Miller, 240-401-8693, if you need a ride from the metro to dinner or to the meeting at the observatory. (Please try to let him know in advance by email at rigel1@starpower.net.)

Support the IDA

Join the International Dark-Sky Association
3225 N. First Avenue Tucson, AZ
85719-2103
www.darksky.org



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<http://capitalastronomers.org>

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Jeffrey Norman, NCA Treasurer, jeffrey.norman@att.net, 5410 Connecticut Avenue, NW, Apt. #717, Washington, DC 20015-2837, 202-966-0739

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

Appointed Officers and Committee Heads: Exploring the Sky - Joseph C. Morris; Meeting Facilities - Jay H. Miller;

Observing - Michael McNeal, mcnealmi@verizon.net; Telescope Making - Guy Brandenburg; *Star Dust* Editor - Elliott Fein

SERVING SCIENCE & SOCIETY SINCE 1937

NCA is a nonprofit, membership-supported, volunteer-run, public-service corporation dedicated to advancing astronomy, space technology, and related sciences through information, participation, and inspiration, via research, lectures, presentations, publications, expeditions, tours, public interpretation, and education. NCA is the astronomy affiliate of the Washington Academy of Sciences. NCA is an IRS Section 501(c)(3) tax-deductible organization. All are welcome to join NCA.

SERVICES & ACTIVITIES:

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

NCA Volunteers serve in a number of capacities. Many members serve as teachers, clinicians, and science fair judges. Some members observe total or graze occultations of stars occulted by the Moon or asteroids.

Publications received by members include the

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

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

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

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

the *Star Dust* "Calendar of Monthly Events."

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

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

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

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

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

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

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

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MEMBERSHIP CATEGORIES AND ANNUAL DUES RATES

All members receive Star Dust, the monthly newsletter announcing NCA activities. As an added optional benefit to extend your knowledge of astronomy you may also choose Sky and Telescope magazine at the discounted rate of \$33.

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

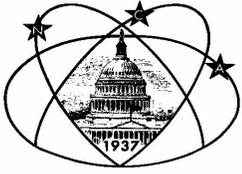
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You are welcome to make contributions in any amount in addition to the dues shown above.

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Mr. Jeffrey Norman, NCA Treasurer; 5410 Connecticut Avenue, NW #717; Washington, D.C. 20015



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**FIRST CLASS
DATED MATERIAL**

***NCA Will
Meet on
February
11!***

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