Star Dust

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NCA 70th Anniversary Party Update

By Elizabeth Warner

The 70th Anniversary party is on Saturday 8 Dec, 7:30 p.m. at the UM Observatory!!

Preparations are well under way for a fantastic evening. But there are still some missing pieces:

-- Please, if you have not yet RSVPed, please let me (warnerem@astro.umd.edu) know whether or not you will be able to come.

We need a head count in order to make sure we have enough food.

-- In addition, since it will be a potluck, we are looking for folks to bring various dishes if they can.

I've posted a summary of who has RSVPed and who plans on bringing what at http://a.tinyurl.com/2ds8f3
which is http://www.astro.umd.edu/openhouse/programs/NCA70th.html
in clickable form. (The posted information is for coordination purposes only.)

Right now, we have just under 30 people signed up but we usually average about 45-50 in attendance. And as you can see, we are a little light on the food. I think we will be fine on desserts since the main one will be a large anniversary cake. But we are a little shy on most everything else. So please do let me know if you are coming and if you will able to bring something!

What else? We still need

-- someone to organize the digitized images into a coherent slideshow,

-- volunteers to help decorate.

Entertainment:

-- Wayne Warren is putting together a list and short talk about "famous astronomers who have been NCA members and/or have spoken to NCA."

-- Our president, Walt Faust, will be the Master of Ceremonies and will coordinate the talks of long-time members who will speak (briefly!) about the "Good Old Days of NCA,"

-- Slides: if you have any photos or slides, please scan them and email them to me (warnerem@astro.umd.edu). We will be putting together a slide show showing pics from NCA's past. (Please include information about the image — the who, what, where, when, & why.)

Decorations:

-- I have 3 bulletin boards that can be decorated with NCA stories (pictures/text about particular events).

-- general decorations?? volunteers??

Please visit
http://a.tinyurl.com/2ds8f3
which is
http://www.astro.umd.edu/openhouse/programs/NCA70th.html
in clickable form. to get the latest status on what is needed, etc.

NCA has some wonderful history and this is an extraordinary opportunity for long time members to pass along/share their memories with the newer members.

Clear Skies!

Elizabeth
warnerem@astro.umd.edu
301-405-6555

News from the NCA Telescope-Making Workshop at the Chevy Chase Community Center

By Guy Brandenburg

The drainage and flooding problem that has plagued the workshop for the past eight years or so has finally been solved. The city's contractors finally figured out whatever it was that they had done that had made it worse, not better, and they also finally fixed the original problem.

Many thanks are due to Alan Bromborsky, who donated numerous items to the workshop. These include a shop-vac, a circular saw with numerous extra blades, that he rigged up to an ingenious jig for cutting perfectly straight lines, two long clamps to accomplish the same, and a router that he rigged up to another ingenious jig for cutting beautiful circles. He also made a beautiful, and ingenious, three-legged mirror-holder for mirrors up to 18 inches. Alan also did about 90% of the work necessary to get an old, but high-quality, Sears radial arm saw back into operation, including making a new cutting table, cleaning and lubricating all of the guides, and much more. Jerry Schnall used the lathe to fashion a new arbor, because the old one had

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Calendar of Events

The Public is Welcome!

NCA Home Page: http://capitalastronomers.org

NCA Mirror- and Telescope-making Classes: Fridays, December 7, 14, 21, and 28, 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 gfbrandenburg @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 8 P.M. (Nov.-Apr.) or 9 P.M. (May-Oct.). The talks are non-technical. There is telescope viewing afterward if the sky is clear.

Upcoming NCA Meetings—Saturdays

December 8,
NCA 70th Anniversary Celebration

January 12, 2008,
Dr. James Zimbleman, from the National Air and Space Museum, who will speak about "Mars' Geology"

February 9, 2008,
Dr. Rhonda Stroud from the Naval Research Laboratory will speak about the Stardust Mission

March 8, 2008,
tba

April 12, 2008,
tba

May 10, 2008,
tba

June 14, 2008,
Dr. Harold Williams from Montgomery College.

Please Get *Star Dust* Only Electronically

National Capital Astronomer members able to receive *Star Dust,* the newsletter of the NCA via e-mail as a PDF file attachment, instead of hardcopy via U.S. Mail, can save NCA a considerable amount of money on the printing and postage in the production of Star Dust (the NCA's single largest expense) and also save some trees. If you can switch from paper to PDF please contact Michael L. Brabanski, the NCA Secretary-Treasurer, at mlbrabanski@verizon.net or 301-649-4328 (home). Thank you.

See NCA Video Production, Page 6

In the News

Reported by Dr. Nancy Grace Roman

Special Online Collection

The story of water on Mars has a checkered past. The arrival of the first spacecraft showed that the red planet was bone dry, but subsequent missions have found evidence of ancient salty seas and gushing gullies. Or have they? As described in a special collection of Reports in the September 21, 2007 issue of *Science*, new details afforded by the Mars Reconnaissance Orbiter (MRO) — the latest arrival on Mars — are bringing into question many earlier geologic interpretations involving surface water. The High Resolution Imaging Science Experiment (HiRISE), which can image features as small as a half-meter in size, has revealed a plethora of boulders ranging up to about 2 meters in diameter in the middle to high latitudes, which include deposits previously interpreted as fine-grained ocean sediments or dusty snow. Other images of supposed ancient ocean floors and riverbeds show no obvious signs that liquid water was ever present, and re-examination of some landforms implies that they have been formed by flowing lava, not water. The mission has not been devoid of aqueous evidence, however. Features on the rims of impact craters and some gullies indicate the presence of liquid water in the recent past, and radar gravity data show that the cap on Mars' south pole now holds the largest reservoir of relatively pure water ice on the planet.

Dark Matter and Early Stars

Standard models of early star formation posit that the first stars were seeded by clumps of slow-moving, cold dark matter that pulled in and condensed nearby clouds of gas by gravitational force. In a Report in the September 14, 2007 *Science* Liang Gao and Tom Theuns presented supercomputer simulations that challenge that view and show that the stars' properties depend critically on the currently unknown nature of the dark matter itself. The new model includes a "warmer" form of dark matter comprising faster-moving particles. Instead of clumping, this warm dark matter would have first stretched into massive filament-like structures and then fragmented to form stars with a range of masses. The simulations further suggest that coalescence of fragments and stars during the filament's ultimate collapse may seed the supermassive black holes that lurk in the centers of most massive galaxies.

(Continued on page 4)

The deadline for the January Star Dust is December 26. Please send your material to Elliott Fein by that date to ensure inclusion.

Send submissions to Elliott Fein at ed.fein @verizon.net.

Articles submitted may be edited to fit the space available.

If a reviewer wants to have the speaker review the review then any corrections therefrom must be completed when the review is sent to me by the deadline. I need to have a final version by the stated deadline. Also, if a reviewer sends me a review before the deadline (which is great!) and says that it "final" then I will not accept changes to it after I receive it.

News from the NCA Telescope-Making Workshop at the Chevy Chase Community Center

(Continued from page 1)
disappeared. We still need to find a suitable motor, since the old one died out.

Jerry Schnall, who led the workshop for over 30 years, is unfortunately not feeling well enough to get out these days to give his expert advice, which is often really needed during the final phases of figuring a parabolic mirror. I hope he feels better soon.

A project to build a little-known catadioptric telescope known as a Lurie-Houghton, initiated by Nagesh Kanvindeh and finished by me, has unfortunately so far yielded a totally unusable telescope. This project was started nearly three years ago, and involves making two full-aperture corrector plates (or lenses) made out of identical glass and with opposite but equal curves, and has all spherical surfaces. The failure doesn't detract too much from what we learned — how to use a lathe to make a cell to hold the lenses, how to use a monochromatic light box to figure convex surfaces, and how to figure surfaces that have really, really long radii of curvature. What is wrong is not quite clear. Either the glass for the lenses is not what we thought it was, or our calculations of the proper radii for the lenses were wrong, or the corrector plates are not aligned properly, or else the tolerances are a LOT more stringent than we thought, or else the design isn't a good one from the outset. It had first light at the Almost Heaven Star Party on the slopes of Spruce Knob, West Virginia, where I gave a short presentation on telescope-making. I am not sure how to proceed.

A young fellow from western Maryland with great hopes for making a large public astronomical observatory came and demonstrated a proof-of-concept idea by using a tile saw to cut a thick piece of float glass (a table top that had been discarded) into a fairly decent circle with a diameter of about 16 inches.

Jim McPherson, who in a short time has converted into an amazing glass-pusher with lots of projects on hand, has made a Mirror-O-Matic, and has put videos of it in action on YouTube. You can find it at http://a.tinyurl.com/37np74

Francis O'Reilly drove down from New York to get a mirror aluminized in our vacuum chamber. Shortly thereafter, he posted some videos on making optical flats on YouTube as well. They can be viewed at http://a.tinyurl.com/365n5r.

I purchased for the workshop a used, but decent-condition, table saw from Michael Mills, another avid telescope maker who lives in Northern Virginia.

I've also had to purchase nearly a dozen 8- inch blanks this year for people to make into telescopes, which is a lot more than usual. I buy them from United Lens in Massachusetts.

Ian Carmack finished a mirror and then began investigating the schematics for the heliostat that we were given by some folks at NASA - Goddard. This is a really massive machine with a 12-inch flat that was built around 1984, with electronics to match (I think Commodore-64). He has most of it figured out, and thinks that it would probably be best NOT just to throw away the electronics and start all over, but to see if they actually work as is, which will be no mean feat.

Bill Blackmore, with assistance from others, has been able to get the homemade mirror making machine that was donated to us, to run reasonably well. It's not a Mirror-O-Matic. Using that machine, and also doing them by hand, he has ground and/or polished and/or figured quite a few decent little mirrors in the 4 to 6 inch range. Some of those mirrors were ones that had been sitting around in the ATM workshop closets for years, generally polished out, but with absolutely horrible figures. The original makers are totally unknown; even Jerry Schnall couldn't remember who had worked on them. In a couple of cases, they were mirrors that I purchased from Surplus Shack, who had gotten them from A. Jaegers optical corporation, which had burned down and gone out of business, and had left a number of blemished blanks that were polished but had horrible figures.

With considerable assistance from others, including construction work by Jim Edmonds and the jigs designed by Alan Bromborsky , I was able to design, cut out the parts for, and supervise the construction of five small Dobsonian-mounted telescopes for the Carnegie Institution's First Light program, which includes 6th through 8th grade students living in D.C. who are interested in science. The students did most of the drilling, screwing, glueing, and painting of the tubes and mounts, and I did all of the optical assembly. The mirrors themselves were done either by me or by Bill Blackmore. I fabricated a couple of 3-leg spiders, which are OK, but not great. The students were at least able to see Comet Holmes from a state park along the Potomac in Virginia. The tubes have a tendency to shift too much in their cradles, however, which needs to be remedied.

Jack Booth went to a yard sale and bought a short-tube Televue refractor that dated from Comet Halley's last return. It turned out that it was originally sold by Company Seven in Laurel. For all that he has done for the NCA ATM workshop in the past, I gave Jack a used wooden surveyor's tripod that I had purchased at a binocular and optical repair shop in Baltimore several years earlier but had never put to use. He was able to make a connection between the tripod and the telescope. (Despite the illustrious name on the tube, some of us weren't all that impressed with the optics.)

As usual, we are open every Friday evening from 6:30 to 10 PM, except when the place is closed for holidays, snow, and the like. We have on hand all of the materials needed for any telescope mirror in diameters up through 12.5 inches, and you can also engage in interesting conversation about all sorts of topics as you push glass (or whatever). The address is 5601 Connecticut Ave NW, Washington , DC, and the center's phone number is (202) 282- 2204, which you can call to see if it's closed for any reason.

See NCA Video Production, Page 6

In the News

(Continued from page 2)

A Void Within the Void
From Phil Berardelli
/Science/NOW Daily News
August 24, 2007

Astronomers have discovered an enormous zone that appears to contain nothing except the faint radiation left over from the Big Bang. So far, no one knows what could have caused the zone, and the discovery could force astronomers to revise some of the fundamental assumptions about the structure of the universe.

Outer space might seem empty, but even between the galaxies it can teem with gas and dust, as well as elusive dark matter. Radiation also abounds, including the cosmic microwave background (CMB) from the big bang. In some parts of the cosmos, there is nothing but this background radiation. A leading model, known as inflation, suggests that shortly after the big bang, the universe underwent an exponential growth spurt that established its structure. The inflation model predicts that these voids should be roughly comparable in size and number to the galaxy clusters.

But now, researchers have discovered a zone of emptiness that dwarfs all other objects in the universe. A team from the University of Minnesota, Twin Cities, had been studying data from the Very Large Array Sky Survey, which is mapping the entire universe with radio waves. The team members focused on one part of the survey where the temperature of the CMB is lower than normal. This cooling is significant because interactions with both visible and dark matter warm the CMB slightly, and so the team suspected that matter was absent.

Further observations of the zone, located between 6 billion and 10 billion light-years away, revealed it to be not only devoid of galaxies but also about a billion light-years wide. "What we're suggesting is that there is no matter in this void, either normal or dark," says radio astronomer and co-author Lawrence Rudnick.

Odd Little Stars
From Phil Berardelli
/Science/NOW Daily News
November 21, 2007

Until this year, all known white dwarfs boasted atmospheres consisting of either hydrogen or helium, which can be easily identified by their respective spectral lines. Not so the nine discovered by an international team and reported in *Nature*. These were plucked from millions of stars and galaxies analyzed over the past seven years by the Sloan Digital Sky Survey. They are considerably cooler than normal and contain atmospheres made entirely of carbon, with no traces of hydrogen or helium. Astronomers don't have a clue why. Usually, a very large star produces excess carbon when it is about to shut down the nuclear-fusion cycle. The shutdown of the fusion means gravitational collapse followed by a supernova explosion. So why are these white dwarfs still around? One possibility, notes astronomer and lead author Patrick Dufour of the University of Arizona, Tucson, is that the stars simply might not have grown massive enough — about 10 times heavier than the sun — to explode but are so close to the limit that they might be harboring abnormally high amounts of carbon. The unique chemical signature of the stars may provide clues to what's going on. "It tells us that nature has found a way that we didn't know, to make white dwarf stars without the usual hydrogen or helium surface layers."

Extreme Life
From Science/NOW Daily News
By Marissa Cevallos
July 6, 2007

Scientists should be peering through microscopes, not telescopes, to find life on other planets, says a report by the National Academies' National Research Council. The report urges more research on Earth--both in the lab and in extreme environments such as Yellowstone's boiling hot springs — in order to understand the potential for life based on chemistry that differs drastically from our own. Without such work, the report warns, future searches run the risk of finding life in space but not recognizing it.

According to the report, prepared by a committee of chemists, biologists, geologists, and astronomers, the search for life on other planets has been hampered by Earth-centric assumptions — that life depends on water, for example. Yet the committee suggests that liquid such as ammonia or formamide, a derivative of formic acid, could serve as a solvent for cellular compounds. Indeed, liquid mixtures of water and ammonia have been reported in the interior of Saturn's moon Titan, considered by the committee to be one of the solar system's potentially promising homes to extraterrestrial life.

The report urges scientists to adopt a threefold approach to finding extraterrestrial life: research in the lab, in the field, and in space. Chemists need to create life in the lab with building blocks not used in Earthly organisms. Field studies of extreme environments, such as the Martian-like Atacama Desert in Chile or the Arctic waters, might turn up organisms with a biochemistry vastly different from our own. Combining such lab and fieldwork, space missions should be better equipped to find strange life.

Failed Stars Still Have a Pulse
By Govert Schilling
/Science/NOW Daily News
April 18, 2007

PRESTON, U.K.— If someone discovered that turtles could sing like larks, biologists would take notice. Likewise, astronomers are intrigued by today's announcement that brown dwarfs — failed stars a couple dozen times more massive than Jupiter — apparently can behave like pulsars, the rapidly spinning, super-dense and highly magnetized remains of exploded giant stars.

Compared to pulsars, brown dwarfs come off as dull and boring. Too small and lightweight to ignite nuclear fusion reactions in their cores, these failed stars appear cool and faint in the night sky. Gregg Hallinan of the National University of Ireland in Galway and colleagues were therefore surprised when the Very Large Array radio observatory near Socorro, New Mexico, caught three brown dwarfs in our solar neighborhood emitting powerful radio pulses usually seen coming from much more energetic pulsars.

The radio waves are produced above the star's magnetic poles, the team reports. The pulses result from the star/s rotation, which brings the poles in and out of view. Astronomers had thought that a pulsar's very strong magnetic fields were needed to produce such waves, but brown dwarf fields are a billion times weaker than those of pulsars.

"Apparently, the same universal mechanism of radio pulse production works over a very wide range of magnetic field strengths," says pulsar astronomer Joeri van Leeuwen of the University of California, Berkeley.

Mid-Atlantic Occultations and Expeditions to Early January

by Dr. David Dunham

Asteroidal Occultations

2007					Planet or		dur.	Ap.	
Date	Day	EST	Star	Mag	Asteroid	dmag	s	in.	Location
Dec 9	Sun	19:17	TYC12880498	10.0	Alsatia	2.5	6	4	sNJ,MD,nVA,WV
Dec 9	Sun	21:50	SAO 77370	8.9	Mizunohiroshi	6.7	1	2	NJ,nMD,sPA
Dec 16	Sun	5:17	2UC35561707	11.0	Prudentia	3.9	3	7	NJ,PA,neOhio
Dec 18	Tue	22:46	TYC19511026	9.8	Demiddelaer	5.9	2	4	e&nVA,WV,sOH
Dec 20	Thu	0:09	TYC24160772	9.4	Lamberta	3.3	9	2	s.VA,sWV,KY
Dec 21	Fri	1:32	TYC18550125	10.2	Bergholz	4.9	1	4	MD,DC,nVA,WV
Dec 24	Mon	3:26	TYC49441079	11.2	Carina	3.4	6	7	NC,swVA,sKY
Dec 25	Tue	0:20	TYC18930054	11.9	Grechko	3.5	5	8	sVA,sKY
Dec 29	Sat	6:50	TYC34420145	10.6	Tanete	2.8	8	5	wNC,wVA,MD,PA
2008									
Jan 6	Sun	4:56	2UC22246887	12.0	Wratislavia	2.7	4	9	s&wNY,NJ,nPA
Jan 8	Tue	19:44	SAO 152113	8.7	Ganymed	4.8	2	3	N.Carolina
Jan 10	Thu	1:18	TYC18453713	11.5	Young	3.6	5	8	NJ,PA,nOhio
Jan 11	Fri	2:48	TYC29441269	12.3	Oppavia	1.9	5	9	DE,neMD,PA
Jan 12	Sat	0:04	TYC25010817	11.1	Panopaea	2.0	10	6	N.Car.,TN

Lunar Grazing Occultations

DATE	Day	EST	Star	Mag	%	alt	CA	Location
Dec 15	Sat	19:17	SAO 146111	7.7	34+	32	17S	Beaver Ck, MD; Gettysburg, PA
Dec 15	Sat	19:30	ZC 3301	8.8	34+	30	17S	Richmond, VA;St.MarysCity, MD
Dec 18	Tue	18:23	ZC 124	7.8	67+	60	17S	Stedman, NC; Langley, VA
Dec 21	Fri	16:22	Alcyone	2.9	93+	18	15S	Sun +4; Petersburg, OH

Total Lunar Occultations

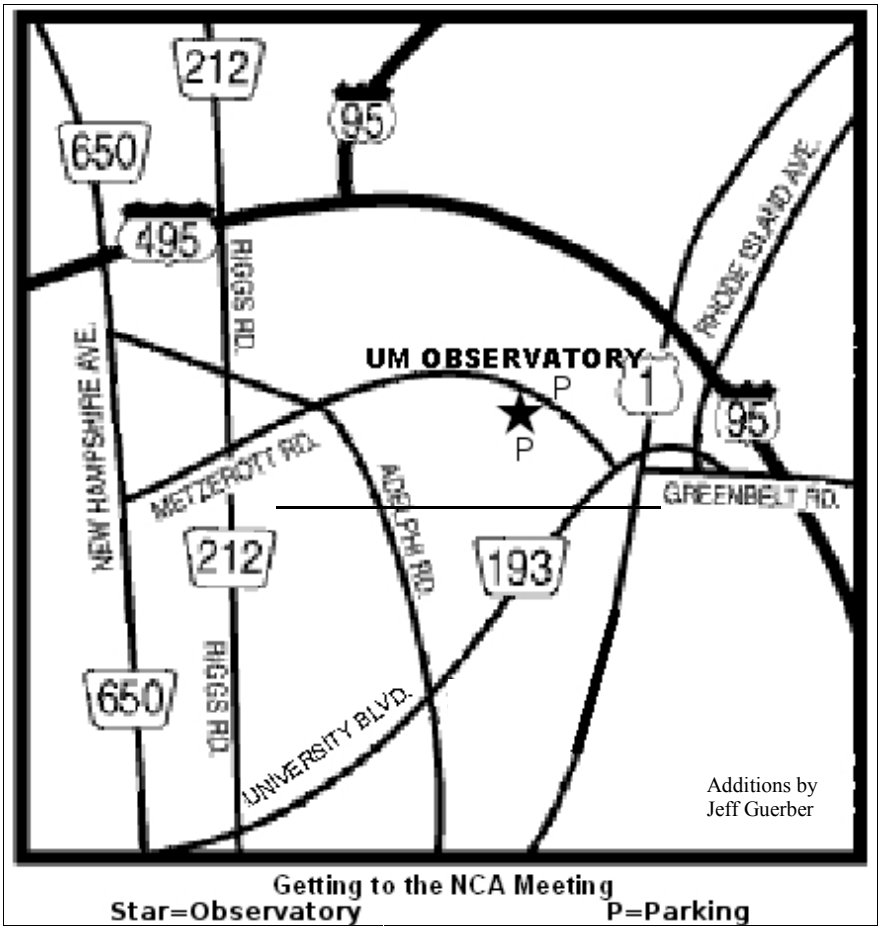
DATE	Day	EST	Ph	Star	Mag	%	alt	CA	Sp.	Notes
Dec 14	Fri	20:00	D	SAO 164579	7.2	24+	15	71N	F3	Az 236;mg2 11 18",PA107
Dec 14	Fri	21:18	D	44 Cap	5.9	25+	2	31N	A9	Az 250; ZC 3177; dbl?
Dec 15	Sat	19:19	D	ZC 3301	8.8	34+	32	35S	K0	MDgraze;mg2 11 9",PA291
Dec 16	Sun	17:48	D	ZC 3416	5.6	45+	48	57N	A3	Sun -12; spec. binary
Dec 17	Mon	22:16	D	SAO 109052	7.4	57+	29	75N	G5	
Dec 18	Tue	18:08	D	ZC 124	7.8	67+	57	41S	K0	seVA graze
Dec 21	Fri	16:48	D	ZC 562	6.6	93+	25	57S	B9	Sun -1; close dbl.?
Dec 21	Fri	17:14	D	SAO 76259	7.4	94+	29	62S	A2	Sun -5; close dbl.?
Dec 21	Fri	20:23	D	SAO 76345	7.5	94+	65	79N	G8	Pleiades passage
Dec 22	Sat	2:17	D	SAO 76472	7.2	95+	38	70N	G8	spec. binary
Dec 22	Sat	18:39	D	ZC 746	7.0	98+	35	24N	B7	terminator dist. 6"
Dec 22	Sat	23:16	D	ZC 773	7.0	99+	78	68N	F8	
Dec 25	Tue	0:24	R	57 Gem	5.0	98-	72	79S	G8	ZC 1117; close dbl?
Dec 26	Wed	2:32	R	ZC 1269	6.9	93-	72	47N	G5	
Dec 26	Wed	5:30	R	eta Cancri	5.3	93-	46	65N	K3	ZC 1277
Dec 28	Fri	23:35	R	SAO 118579	7.8	70-	15	67N	A2	Azimuth 95 deg.
Dec 29	Sat	5:34	R	SAO 118638	7.3	68-	53	64S	F0	mg2 8 sep 1.2", PA 121
Dec 30	Sun	6:56	R	ZC 1711	7.9	58-	43	73N	G0	mg2 11 sep 1.9",PA 220
Jan 1	Tue	5:38	R	ZC 1906	7.8	39-	36	76N	K0	mg2 11 sep 46", PA 100
Jan 4	Fri	6:16	R	ZC 2238	8.0	14-	16	72S	F0	
Jan 12	Sat	18:08	D	ZC 3385	6.7	20+	35	79S	F8	

More information is at http://iota.jhuapl.edu/exped.htm .
David Dunham, dunham@starpower.net, phone 301-474-4722

NCA Video Production

A professional video crew will be at the NCA 70th anniversary celebration. They will be shooting for a program about NCA which will appear on Montgomery County Television. The purpose of the program will be to record our history and to encourage new members to join NCA.

We are looking for volunteers to appear in the program. Please contact Michael Chesnes at (301) 317-0937 or m.chesnes@verizon.net if you would like to participate. The crew will only be interested in shooting video of NCA members who want to participate. You need to sign a waiver at the celebration to appear in the program. If you are concerned about appearing in the program please contact Michael, so the videographers can take extra precautions not to include you.



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

The NCA Meeting

NCA meetings are now held at 7:30 p.m. at the University of Maryland Observatory, in College Park. The observatory is located on Metzerott Road between Adelphi Road and University Blvd. in College Park. From the beltway (I-495):

- if on the Inner Loop, take Exit 28B toward Takoma Park, which puts you on New Hampshire Ave. (MD-650) south, turn left at the second light onto Adelphi Road, two more lights, turn left onto Metzerott Road, and proceed 0.6 miles to the observatory entrance (on your right);

- if on the Outer Loop, take the College Park/Route 1 exit. Head south on Route 1 for about a mile until you see a sign for 193 West. Get on 193 West. The first traffic light is at Metzerott Road. Take a right onto Metzerott Road. Once on Metzerott Rd., continue past a traffic light at St. Andrews Place. The observatory entrance is about a quarter of a mile on the left side of the road after that. The observatory entrance is slightly hidden, so slow down to turn left as soon as you pass a large "System Administration" sign. The observatory entrance is almost directly across the street from the UM System Administration sign (3300 Metzerott Rd.).

Do You Need a Ride?

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

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.

Support the IDA

Join the International Dark-Sky Association

3225 N. First Avenue
Tucson, AZ 85719-2103

www.darksky.org

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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. 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.

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 semi-annual 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.

✂

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FIRST CLASS
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NCA Will Meet on December 8!

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