

Star Dust

National Capital Astronomers, Inc.

December 2010

Volume 69, Issue 4

<http://capitlastronomers.org>

Next Meeting

When: Sat. Dec. 11, 2010
Time: 7:30 pm
Where: UM Observatory
Speaker: Scott Sheppard,
DTM
(Postponed from
Feb. 2010 for snow)

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Directions to Dinner/Meeting

Members and guests are invited to join us for dinner at the Garden Restaurant located in the UMUC Inn & Conference Center, 3501 University Blvd E. The meeting is held at the UM Astronomy Observatory on Metzert Rd about halfway between Adelphi Rd and University Blvd.

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 e-mail at rigel1@starpower.net.

Observing after the Meeting

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.

December 2010: Dr. Scott Sheppard Department of Terrestrial Magnetism Carnegie Institution of Washington Completing the Inventory of the Outer Solar System

Abstract: The dynamical and physical properties of asteroids offer us a glimpse at the processes operating in the Solar System, and allow us to understand planet formation and evolution. The recent advent of sensitive, wide-field CCD detectors is allowing us to complete the inventory of the Solar System and obtain detailed knowledge about the small bodies it contains. I will discuss the recent dynamical and physical results, with a focus on minor planets in stable reservoirs such as the Neptune Trojans, Trans-Neptunian objects and outer satellites of the giant planets.

Biography: Scott S. Sheppard is a research scientist at the Carnegie Institution of Washington's Department of Terrestrial Magnetism (DTM) in Washington, D.C. He obtained his Ph.D. in astronomy from the University of Hawaii, where he learned the art of discovering asteroids, satellites and Kuiper Belt objects. Scott's research interests are the origin and evolution of planetary systems. To this end Scott studies small bodies in our solar system in order to understand how the planets formed and migrated; and he observes young stellar objects and brown dwarfs to see how other stellar systems may form.



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Thank you!

Reminder

After the meeting, everyone is invited to join us at Plato's Diner in College Park. Plato's is located at 7150 Baltimore Ave. (US Rt. 1 at Calvert Rd.), just south of the university's campus. What if it's clear and you want to stick around and observe? No problem -- just come over when you're through. This is very informal, and we fully expect people to wander in and out.

The Season for Giving Giving Back to Your Astronomy Club

By Tom Koonce

December, 2010
Lancaster, California

The holiday season is here once again. It's a time to recognize those in need and for giving to others. With the fun that I've had through the years with my astronomy club and fellow amateur astronomers across the country, I started thinking about ways that I might give something back to amateur astronomy. You know that running any organization is a lot of time and work, so you can imagine that our club leaders would be appreciative of any help that is offered. I realized that the best gift I could give to the club would be to step up and help out with an aspect of the club that fits into my schedule. If this sounds like something you're interested in doing too, I have a few ideas for you to consider.

It's surprising how many astronomy-related bits and pieces that we accumulate that we haven't used in a long time such as basic amateur astronomy books, old binoculars, our first eyepieces, and perhaps an old telescope. Consider donating items like these to the club to be gathered up into a potential spring garage sale for the benefit of the club's treasury. Maybe this could jumpstart the club savings for the summer picnic or piece of equipment that all members could share.

Even if you don't have items to donate, consider donating the benefit of your amateur astronomy knowledge by volunteering to teach a 30 minute to 1 hour class on the area of astronomy that interests you. If enough people wanted to teach small classes, perhaps a Saturday event could be put together that would really interest and excite members!

Even with no preparation, acting as a "Star Guide" mentor for a new member is a way of giving that means a lot.

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We all remember the first experienced club member who showed us the ropes when we were beginning in astronomy. Why not be that memorable mentor for another person?

I always find it interesting to read the newsletter when someone has written up his/her observing session. It doesn't have to entail the discovery of a new comet or anything, just the simple observations. (Of course a discovering a new comet would be a pretty nice write-up!) A photo, sketch or even a star map of the area that is being discussed is a plus, but not required. Give back to the organization by summarizing your next observing session and share the evening with your fellow members.

If schedule is tight, giving even a bit of your time is appreciated. For instance, a nice gesture is to assist with greeting people at the monthly meetings. Many clubs do this as a way of welcoming new and long-time members at the door. If you would like to help increase club membership, making others feel welcome each month and taking a personal interest in them is one of the best ways.

If you have a bit more time, you can help the club out by volunteering to help on a committee or (longer term) running for an officer position to give back to the club in tangible ways that are also rewarding for the volunteers. Frankly, sometimes these are positions that can get a bit stale if the same people are in them again and again. If you are one of the people who has been in a particular job in the organization for a while, thank you for all that you do! Consider mentoring another person to take on this position while you try out something different. The club needs you! But changes can keep the organization fresh and vibrant and it will keep you excited about why we're involved in the first place... because it's fun. It might be a gift that both you and the mentee could give for the long-term vitality of the club.

Happy Holidays to you and your families. Clear Skies! - Tom

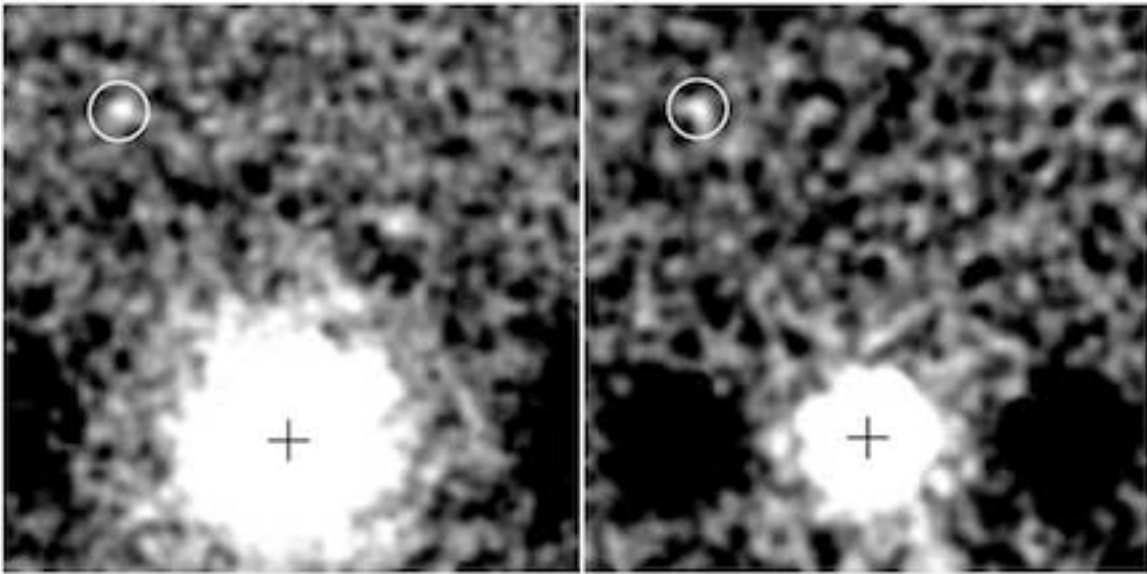
Science News

Thank you Nancy Grace Roman for finding these articles.

Distant Planet

Credit: David Lafrenière, et al.
The Astrophysical Journal (2010)

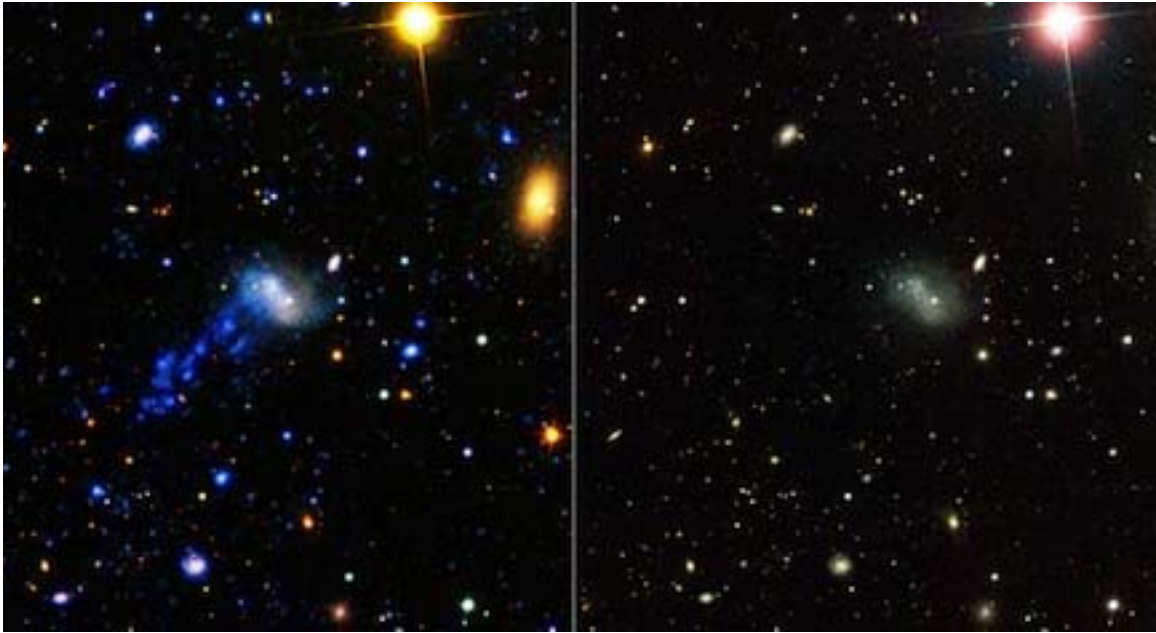
Now that's a lonely planet! Astronomers have discovered a world orbiting its star from 50-billion-kilometers away—or nearly 10 times farther out than Pluto. The planet is following an orbit that takes about 6000 years to complete. How did such a large body form so far away from its star? Astronomers say the same cloud of dust and gas that gave birth to the star—known as 1RXS J160929.1-210524 and located about 450 light-years away in the constellation Scorpius—probably split apart, which is what often happens when binary star systems are born. Except that in this case, the fragment was too small to produce anything but a very large, very cold, and extremely isolated planet.



Galaxy Tail

From June Astrophysical Journal Letters

IC 3418 has a secret. At first glance, it looks like any other spiral/elliptical galaxy but in ultraviolet light, IC 3418 has a tail—one that's filled with thousands of young stars. The galaxy is located about 54 million light-years away in the middle of the immense Virgo cluster—a collection of about 1500 closely packed galaxies. So closely packed, in fact, that Virgo's gravitational tug is pulling IC 3418 through its heart at 3.6 million kilometers an hour, ripping away huge amounts of gas and trailing it behind. The galaxy has been whipped up so much by its encounter with the intergalactic medium—like a comet's tail of ice crystals getting buffeted by the solar wind—that it has condensed into stars.



Occultation Notes

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.

Some stars in Flamsteed's catalog are in the wrong constellation, according to the official IAU constellation boundaries that were established well after Flamsteed's catalog was published. In these cases, Flamsteed's constellation is in parentheses and the actual constellation is given in the notes following a /.

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 the main IOTA Web site.

Sp. is the star's spectral type (color), O,B,blue; A,F,white; G,yellow; K,orange; M,N,S,C red.

Also in the notes, information about double stars is often given. "Close double" with no other information usually means nearly equal components with a separation less than 0.2". "mg2" or "m2" means the magnitude of the secondary component, followed by its separation in arc seconds ("), and sometimes its PA from the primary. If there is a 3rd component (for a triple star), it might be indicated with "mg3" or "m3". Double is sometime abbreviated "dbl".

Sometimes the Watts angle (WA) is given; it is aligned with the Moon's rotation axis and can be used to estimate where a star will reappear relative to lunar features. The selenographic latitude is WA -270. For example, WA 305 - 310 is near Mare Crisium.

Mid-Atlantic Occultations and Expeditions

David Dunham

Asteroidal Occultations

Date	Day	EDT	Star	Mag.	Asteroid	dmag	s "	dur.	Ap.	Location
Dec 13	Mon	0:31	2UC35745382	12.0	Bellona	0.3	31	8		LI,nNJ,PA,nOH
Dec 20	Mon	1:54	SAO 93193	9.0	Filatov	7.5	5	4		sMD?,VA,KY,TN
Dec 24	Fri	0:04	TYC24451074	11.2	Minerva	1.4	11	7		DE,MD,DC,nVA,WV
Dec 27	Mon	6:55	TYC29060929	9.7	Ursula	2.8	16	4		MD-alt8,Sun-5;PA
Dec 30	Thu	20:41	2UC35157066	11.7	Marbachia	2.3	3	7		sNE, NYC, PA, nMD?
Dec 31	Fri	0:51	2UC39098062	13.2	2000 WK183	9.7	7	10		TNO Americas?
Jan 9	Sun	2:51	SAO 57731	9.3	Felix	5.3	5	4		neNC,s.cen.VA,WV

Lunar Grazing Occultations (*, Dunham plans no expedition)

Date	Day	EDT	Star	Mag.	% alt	CA	Location
Dec 10	Fri	17:49	SAO 164359	8.0	26+	34 14S	Roanoke&Strlng,VA;Syksvil,MD
Dec 12	Sun	17:28	ZC 3354	7.9	44+	48 14S	Charltsv&Strlng,VA;Skysvil,MD
Dec 21	Tue	2:05	SAO 77641	8.3	53E	59 95U	NwFdm,PA;BelAr&Abdn,MD;Mlf,DE
Dec 21	Tue	2:35	X 79290	10.3	3E	54 94U	Manassas&DaleC.,VA;LaPlata,MD
Dec 21	Tue	2:53	X 79334	10.3	0E	50 35U	Stroudsbrg,PA;Bernardsvil,NJ
Dec 21	Tue	4:14	X 7876	10.3	27E	35 67U	Springfield,VA &Mattawoman,MD
Dec 31	Fri	5:32	SAO 183296	9.2	16-	16 10S	Verona &ColonialHgts,VA; dbl?
Jan 6	Thu	18:07	SAO 164138	8.1	6+	14 7S	Charltsv&Woodbrg,VA;Clintn,MD

Total Lunar Occultations

DATE	Day	EDT	Ph	Star	Mag.	% alt	CA	Sp.	Notes
Dec 11	Sat	20:37	D	ZC 3259	7.4	35+	22	77N	G0
Dec 11	Sat	21:49	D	SAO 145963	7.5	36+	9	56S	A2 Azimuth 254 deg.
Dec 12	Sun	21:55	D	ZC 3371	6.4	45+	19	88S	F0
Dec 17	Fri	23:36	D	SAO 75633	7.0	89+	55	86N	K0
Dec 17	Fri	23:48	D	ZC 425	7.1	89+	53	24N	K0
Dec 18	Sat	1:47	D	47 Ari	5.8	89+	30	42N	F5 ZC 435
Dec 18	Sat	23:24	D	ZC 563	7.0	94+	67	45S	B9
Dec 19	Sun	17:10	D	ZC 693	6.0	98+	18	64S	F5 Sun alt. -5 deg.
Dec 21	Tue	2:04	D	SAO 77666	8.8	55E	60	85U	K2 lunar eclipse
Dec 21	Tue	2:37	D	SAO 77692	8.9	2E	54	29U	A0
Dec 21	Tue	2:41	R	ZC 887	7.0	0E	53	86U	K5 double?
Dec 21	Tue	3:04	R	SAO 77666	8.8	0E	49	81U	K2
Dec 21	Tue	3:36	R	SAO 77692	8.9	0E	42	29U	A0
Dec 21	Tue	4:21	D	SAO 77760	8.6	39E	34	60S	F8
Dec 21	Tue	19:27	R	ZC 1021	6.1	99-	21	64S	G9 WA 252,Term.Dist. 10"
Dec 22	Wed	2:10	R	36 Gem	5.3	99-	67	77N	A2 WA 290,ZC1047,dbl
Dec 23	Thu	7:31	R	3 Cancr	5.6	94-	16	73S	K3 Sun 0,WA260,ZC1207,dbl?
Dec 25	Sat	0:39	R	ZC 1429	6.8	81-	41	58S	F0 maybe close double
Dec 25	Sat	4:00	R	ZC 1440	7.0	80-	59	28N	F0
Dec 26	Sun	23:39	R	ZC 1655	6.8	60-	4	81S	A5 Az. 96
Dec 27	Mon	2:39	R	87 Leonis	4.8	59-	35	73S	K4 ZC1670
Dec 29	Wed	5:49	R	ZC 1918	6.8	35-	34	41N	K5
Jan 1	Sat	6:24	R	ZC 2328	6.4	9-	12	67S	B6 Az.136,mg2 10,sep 1.7"
Jan 1	Sat	6:24	R	SAO 184242	8.4	9-	12	76N	A1 Sun-12, Az. 136
Jan 6	Thu	18:02	D	SAO 164138	8.1	6+	15	17S	K0 Sun-12, Az. 239
Jan 6	Thu	18:09	D	SAO 164146	8.4	6+	14	88S	K5 Az. 240
Jan 6	Thu	18:13	R	SAO 164138	8.1	6+	13	-2S	K0 Az. 241
Jan 8	Sat	19:20	D	SAO 146222	8.0	19+	23	85S	K0
Jan 8	Sat	20:21	D	ZC 3326	6.4	19+	12	46S	F6 Az.255, close double

Explanations & more information are at <http://iota.jhuapl.edu/exped.htm>.
 David Dunham, dunham@starpower.net
 Phones: home 301-220-0415; cell 301-526-5590

Timing equipment and even telescopes can be loaned for most expeditions that we actually undertake; we are always shortest of observers who can fit these events into their schedules, so we hope that you might be able to. Information on timing occultations is at: <http://iota.jhuapl.edu/timng920.htm>.

Good luck with your observations.

Evaporating Exoplanet

Credit: C. Carreau / ESA
Astrophysical Journal.
714, L222 (2010).

First detected in 2008, WASP-12b is a planet with a mass 1.4 times that of Jupiter. Unlike Jupiter, though, it orbits very close to its parent star—so close that its period is only 26 hours. Thus, WASP-12b is subject to intense tidal forces and is one of the hottest and most intensely irradiated planets known. To understand the consequences of such close stellar proximity, Fossati et al. observed WASP-12b with the Cosmic Origins Spectrograph recently installed on the Hubble Space Telescope.

Analysis of the near-ultraviolet part of the planet's transmission spectrum shows that WASP-12b is surrounded by an extended layer that absorbs light at the wavelengths of neutral sodium, tin, and manganese, as well as singly ionized ytterbium, scandium, manganese, aluminum, vanadium, and magnesium. This layer extends as far as 2.69 times the radius of Jupiter, well beyond the distance within which orbiting material is gravitationally bound to the planet; thus, as previously predicted, the planet is actively losing material to the star. Giant planets, like the ones in the Solar System, are not expected to have elements other than hydrogen and helium in their upper atmospheres because there is little vertical mixing.

To have such a metal-rich exosphere, WASP-12b must have suffered extreme mixing, possibly induced by the intense stellar irradiation and tidal effects.

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NASA Telescope Finds Elusive Buckyballs in Space for First Time

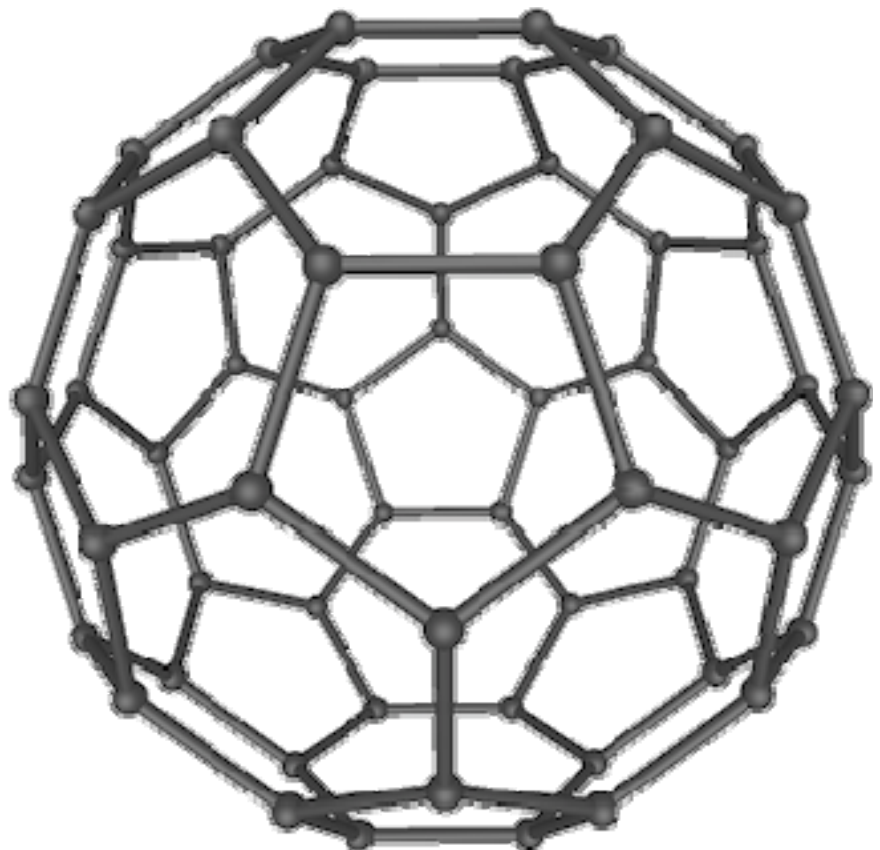
Credit: J.D. Harrington (NASA Headquarters)
Whitney Clavin (JPL)

WASHINGTON -- Astronomers using NASA's Spitzer Space Telescope have discovered carbon molecules, known as "buckyballs," in a planetary nebula named Tc 1, perhaps reflecting a short stage in the star's life, when it sloughs off a puff of material rich in carbon. These have been found in space for the first time. Buckyballs are soccer-ball-shaped molecules that were first observed in a laboratory 25 years ago.

Buckyballs are made of 60 carbon atoms arranged in three-dimensional, spherical structures. Their alternating patterns of hexagons and pentagons match a typical black-and-white soccer ball. The research team also found the more elongated relative of buckyballs, known as C70, for the first time in space. These molecules consist of 70 carbon atoms and are shaped more like an oval rugby ball. Both types of molecules belong to a class known officially as buckminsterfullerenes, or fullerenes.

Illustration of buckyball (C60) molecule.

<http://commons.wikimedia.org/wiki/File:C60a.png>



Arlington Planetarium Holiday Schedule

The planetarium's popular annual holiday show—'Tis the Season—will begin this Friday, November 19th, and run through Sunday, December 19th at Arlington's David M. Brown Planetarium.

Show times: Fridays and Saturdays, 7:30 PM
Sundays, 1:30 and 3:00 PM
The Planetarium will be open over Thanksgiving weekend.

Tickets: \$3.00 for adults and \$2.00 for seniors 62 and older and children 12 and under. Doors open 15 minutes prior to show time and are closed and locked once the program begins. The planetarium has a 69-seat capacity. Once full capacity is reached, doors will be closed.

The next Stars Tonight show: Monday December 6th at 7:30 PM. Bring your friends and family! For more information, go to the APS website (www.apsva.us) and select "Programs." Then choose "planetarium."

Calendar of Events

NCA Mirror- and Telescope-making Classes: Tuesdays Dec. 7, 14, 21, 28, and Fridays, Dec. 3, 10, 17, 6:30 to 9:30 pm 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. In case there is snow, call 202-282-2204 to see if the CCCC is open.

There will be no amateur telescope making classes on Friday Dec. 24 or 31.

Open house talks and observing at the University of Maryland Observatory in College Park on the 5th and 20th of every month at 8:00 pm (Nov-Apr) or 9:00 pm (May-Oct). There is telescope viewing afterward if the sky is clear.

Dinner: Saturday, Dec. 11 at 5:30 pm, preceding the meeting, at the [Garden Restaurant](#) in the University of Maryland University College Inn and Conference Center.

Upcoming NCA Meetings at the University of Maryland Observatory

Dec 11, 2010 **Scott Sheppard** (DTM) - *Completing the Inventory of the Outer Solar System*

Jan 8, 2011 **Ruben Kier** - *Best Targets for Winter Astrophotography*

Feb 12, 2011 **Brian Jackson** (GSFC) - *From Extrasolar Gas Giant to Hot, Rocky Planet*

National Capital Astronomers Membership Form

Name: _____ **Date:** ___/___/___

Address: _____ **ZIP Code:** _____

Home Phone: ___-___-___ **E-mail:** _____ **Age:** _____

Present or Former Occupation (Or, If Student, Field of Study): _____

Academic Degrees: _____ **Field(s) of Specialization:** _____

Employer or Educational Institution: _____

Student Membership: \$ 5

Standard Individual or Family Membership: \$10

Optional additional contribution to NCA: \$__

Total Payment (circle applicable membership category above): \$__

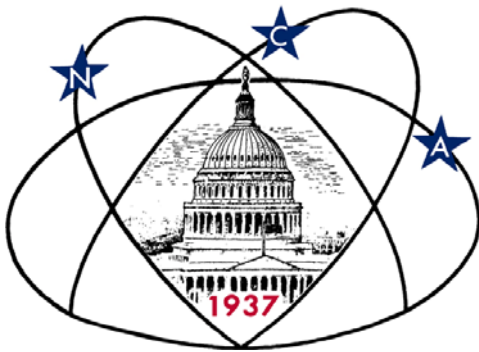
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First Class



Next NCA Mtg:

Dec. 11

7:30 pm

@ UM Obs

Dr. Scott Sheppard

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