

# Star Dust

National Capital Astronomers, Inc.

November 2010

Volume 69, Issue 3

<http://capitalastronomers.org>

## Next Meeting

**When:** Sat. Nov. 13, 2010  
**Time:** 7:30 pm  
**Where:** UM Observatory  
**Speaker:** Tamara Bogdanovic,  
UM

## Table of Contents

Preview of Nov. 2010 Talk.....	1
Astronomy Disasters.....	2
Green Bank Astrophotos.....	3
Occultations.....	5
Calendar.....	7

## 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](mailto: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.

November 2010

Tamara Bogdanovic  
University of Maryland

## Signatures of Binary Supermassive Black Holes Before and After Coalescence

### Abstract:

Coincident detections of electromagnetic (EM) and gravitational wave (GW) signatures from coalescence events of supermassive black holes (SBHs) are the next observational grand challenge. Such detections will provide the means to study cosmological evolution and the accretion processes associated with these massive compact objects. Most of the information about these systems so far has had to be derived from theoretical studies and simulations, since EM searches for signals from these processes have proved difficult to find.



I will summarize the current understanding of the evolution of supermassive black hole binaries and present results from the first fully general relativistic, hydrodynamic study of the late inspiral and merger of equal-mass, spinning supermassive black hole binaries in a gas cloud. I will discuss implications for observational properties of merging binary systems in the context of modeled characteristic EM and GW signatures that arise from interactions of binaries with the gas. Furthermore, numerical relativistic simulations of black hole coalescence have also provided an exciting insight into the evolution of the post-coalescence, remnant SBHs: they showed that in certain alignments the emission of gravitational radiation can produce a kick of several thousand kilometers per second.

Continued on Page 2

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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.

Continued from Page 1

This exceeds galactic escape speeds; hence, unless there is a mechanism to prevent this, one would expect many galaxies that had merged to lack a central black hole. We found that in most galactic mergers, torques from the accreting gas suffice to align the orbit and spins of both black holes with the large-scale gas flow. Such a configuration has a maximum kick speed <200 km/s, safely below galactic escape speeds. However, in mergers of galaxies without much gas, the remnant may be kicked out several percent of the time. I will discuss predictions of this scenario, including implications for observational signatures associated with "runaway" black holes.

### **Biography:**

Tamara Bogdanovic's research interests are in the astrophysics of black holes. She studies observational signatures associated with single and binary supermassive black holes interacting with gas and stars in galactic nuclei, as well as the effects of these interactions on the black holes. Dr. Bogdanovic also investigates physical processes in the intercluster medium (the diffuse, hot, X-ray emitting gas that occupies a large volume in each cluster of galaxies), and the role that weak magnetic fields play in cooling flows in clusters of galaxies.

Currently, Bogdanovic is an Einstein Postdoctoral Fellow at the University of Maryland. Prior to moving to Maryland she received her PhD at the Pennsylvania State University, and her undergraduate degree in astrophysics from the University of Belgrade (Serbia).

## Avoiding Amateur Astronomy Disasters November, 2010

*By Tom Koonce, Lancaster, CA*

The weather is turning cold and all of us want to maximize our observing time and minimize how long we're exposed to the bitter cold. In circumstances like this, we amateur astronomers tend to get in a hurry, or perhaps not think things through before doing something... and disaster can strike. Disasters come in many forms, among them, dropping an eyepiece to the ground because it wasn't held securely. Hearing the thud/crunch/tinkle sound is sickening, even for those observers around you. Having your secondary mirror come loose and drop onto your primary mirror is pretty bad, but what about dropping an expensive precision filter into the dirt? And then there are the truly dangerous mistakes such as not making sure a stepstool or ladder is on firm ground or loading your Dobsonian telescope lengthwise into the car with the secondary at the front and the primary at the back of the car. I'll explain each of these and how to reduce the risk of these happening to you. The cold affects each of us to a differing extent. I'm assuming you already know to dress for weather 20 degrees cooler than weather reports predict. After all, you're going to be standing still in freezing weather, not chopping a cord of wood. I also assume that you know to remain hydrated since this can affect your thought processes and reaction times. Some people get cold just thinking about going out at night, some must have a furnace built inside of them because they seem to remain warm with little notice of the thermometer. Most of us are in between these extremes. Fingers and toes get cold first, and then grasping objects becomes difficult, thought processes slow down, and our logic becomes blurry. The trick is to recognize how **you** respond and take steps to counteract it before you damage equipment.

Continued on Page 3

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Continued from Page 2

Disaster: Dropping eyepieces. Think ahead about which eyepieces you will need for the next hour. Keep a fanny pack on over your jacket that makes storing and switching eyepieces convenient and minimizes how long your fingers have to grasp them. Stick your hands inside of your jacket and under your armpits for a couple of minutes before you do the eyepiece switch. Another trick is to place a packing quilt or old rug under your entire telescope setup so that if something is dropped even after taking precautions it might survive the plunge.

Disaster: Secondary Mirror Drop. Always check your equipment. Before you start your evening's observing, do a "walk-around" of your telescope. Are there any frayed wires? Are there any loose bolts? If you have a Newtonian, is the secondary secured to its mount? Have you placed a small safety wire between the spider and the secondary... just in case? This is a disaster that can be avoided. I have seen/heard this happen to my buddy's 6 week-old 14" Dob at a public outreach event. It destroyed his primary mirror. During your walk-around, be conscious of any tools that you need to setup your telescope. Wrenches and screwdrivers can be devastating when applied to any optical surface. Tools tend to slip when brains and fingers are cold. Consider drilling a hole through the handle and affixing a cord loop to each tool to wrap around your wrist to eliminate the possibility of despair.

Disaster: Filter Drop. Think ahead about the dexterity you're going to need to take the small filter out of its case and screw it onto the eyepiece. It's possible that filters can be only partially screwed onto the eyepiece and may drop off onto the primary mirror during observing.

In my Dobsonian, I can vouch for the fact that a two inch O-III makes a heart-stopping sound when it bounces off of the primary mirror. Not good.

To remedy this situation, take the time to make sure that your fingers are warmed up and the filters are fully screwed on. Alternatively, consider installing a filter slide on Newtonian or Dobsonian telescopes. I have made this modification on my dob and it makes using filters simple, convenient and safe. If you have this type of telescope, check out <http://www.astrocrumb.com/> for the best filter slides I've found.

Disaster: Stepstool and Ladder Tilt. Anyone who is showing the night sky to the general public or who has a larger Dobsonian knows the pitfalls of using stepstools or ladders. They need to be sturdy and lightweight, but rarely are they made to be placed upon bare earth. Sometimes ground can be frozen hard on the surface, but mushy just an inch or two below. Take the time to be sure of the placement of their feet to avoid a fall in the darkness. Test the stepstool with your full weight with someone standing in the safety position to catch you before trusting it to anyone else.

Continued on Page 6

## Green Bank Astrophotos

*Jeff Guerber took the photographs on pages 4 and 6 during this year's Green Bank Star Quest in West Virginia, using Elite Chrome 200 film and a 50 mm lens. The astrophotos are: p.4 Star trails above 300 foot dish with Venus setting on horizon; Cygnus and Lyra (5 min. exposure at f2) with North American, Veil, and Ring Nebulae. p.6 Star trails above campers on observatory grounds; Simultaneous ISS and airplane passes; 300 foot dish.*



## 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
Nov 19	Fri	20:43	2UC39977912	12.9	2003 YL179	10.6	4	9	TNO,eN.Am.,Eur.?	
Nov 20	Sat	3:13	2UC39098507	13.6	2000 WK183	9.3	7	10	TNO, Americas?	
Nov 24	Wed	21:12	TYC06160602	11.3	Normannia	4.2	9	7	seVA,eNC,eSSC	
Nov 25	Thu	22:37	45 Cap	6.0	Floriac	10.4	1.3	2	sTX,seLA,nFL,sGA	
Nov 27	Sat	4:05	2UC40496344	11.9C	Sidonia	0.9	8	8	s&wMD,DC,nVA,wPA	
Dec 2	Thu	22:15	2UC41487032	12.4	1996 TQ66	10.2	5	8	TNO, Americas?	
Dec 4	Sat	2:02	SAO 119050	9.0	Christine	5.6	2	4	PA,sNY,CT,RI,eMA	
Dec 5	Sun	0:32	2UC41671468	10.8	Medea	1.6	12	6	nPA,NY,NH,MA,sME	
Dec 5	Sun	5:07	PPM 227878	10.0	Hygiea	1.5	10	5	ON,NY,nPA,NJ,sNE	
Dec 7	Tue	20:20	TYC07332046	10.0	Aquitania	2.6	7	5	N.Car.; s.e.VA?	
Dec 10	Fri	22:43	2UC43058228	12.7	Freda	1.5	7	9	LI,NYC,NJ,PA,OH	

### Lunar Grazing Occultations (\*, Dunham plans no expedition)

Date	Day	EDT	Star	Mag.	% alt	CA	Location
Nov 12	Fri	20:37	ZC 3066	6.0	43+	20 14S	*Pittsburgh, PA & Elmira, NY
Nov 24	Wed	1:19	6 Gem	6.5	93-	72 6S	*Glasgow,Richmond &Painter,VA
Dec 8	Wed	18:35	SAO 188563	8.3	11+	10 13S	*Carlisle, PA; n. NJ (low)
Dec 10	Fri	17:49	SAO 164359	8.0	26+	34 14S	Roanoke&Strlng,VA;Syksvill,MD
Dec 12	Sun	17:28	ZC 3354	7.9	44+	48 14S	Charltsv&Strlng,VA;Skysvill,MD

### Total Lunar Occultations

DATE	Day	EDT	Ph	Star	Mag.	% alt	CA	Sp.	Notes
Nov 13	Sat	22:09	D	AG Cap	6.0	53+	19	39N M3	ZC 3187
Nov 16	Tue	20:36	D	ZC 3524	6.9	80+	56	79S F0	2nd* 7.9,sep0.4",PA255
Nov 17	Wed	19:57	D	ZC 89	6.5	87+	57	78S F5	maybe close double
Nov 19	Fri	1:34	D	101 Psc	6.2	93+	36	69S B9	ZC 233, close double?
Nov 20	Sat	19:09	D	ZC 459	6.4	99+	34	69N K2	TermDist9";close dbl?
Nov 20	Sat	22:43	D	zeta Ari	4.9	100+	70	58S A1	ZC 472,TrmDst5",dbl?
Nov 23	Tue	20:02	R	SAO 77842	7.4	94-	15	60N B3	Az. 72, AA 302
Nov 23	Tue	21:24	R	1 Gem	4.3	93-	30	77N G7	ZC916,AA285,close dbl
Nov 24	Wed	0:21	R	3 Gem	5.8	93-	63	72S B2	ZC929,AA254,mg2 8,0.6"
Nov 24	Wed	0:39	R	4 Gem	6.9	93-	66	46S B9	ZC931,AA228,close dbl
Nov 24	Wed	1:37	R	6 Gem	6.5	93-	73	30S M1	ZC 942, AA 212 deg.
Nov 24	Wed	1:41	R	WY Gem	7.2	93-	73	75N M2	SAO78094,AA287,double?
Nov 24	Wed	6:41	D	dmu Gem =	2.9	92-	32	-73S M3	Sun alt. -4, AA 110
Nov 24	Wed	7:41	R	ZC 976	2.9	92-	21	82N M3	Sun alt. +6 deg.
Nov 25	Thu	4:01	R	ZC 1098	7.2	85-	68	64S K0	
Nov 26	Fri	0:04	R	ZC 1219	7.9	78-	36	89N K5	
Nov 26	Fri	2:38	R	SAO 97614	7.3	77-	62	30S M2	mg2 10,sep. 74",PA 187
Nov 26	Fri	23:32	R	ZC 1344	6.5	68-	18	55S K5	
Nov 28	Sun	0:01	R	ZC 1454	7.0	57-	10	55N G5	Az. 88, close double?
Nov 28	Sun	1:09	R	ZC 1457	6.8	56-	23	82S K0	
Nov 29	Mon	5:51	R	55 Leonis	5.9	43-	51	56S F2	ZC1587,mg2 9, 1.1",PA47
Nov 30	Tue	3:38	R	SAO 138384	7.7	32-	24	71S F2	close double
Nov 30	Tue	7:41	R	ZC 1713	5.6	31-	46	65N K0	Sun +5, spec. binary
Dec 2	Thu	3:57	R	75 Virg	5.5	13-	2	63S K1	ZC 1944, Azimuth 111
Dec 8	Wed	17:47	D	56 Sgr	4.9	11+	17	84S K0	ZC 2886, Sun alt. -12
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
Dec 12	Sun	21:55	D	ZC 3371	6.4	45+	19	88S F0	

Explanations & more information are at <http://iota.jhuapl.edu/exped.htm>.  
David Dunham, [dunham@starpower.net](mailto: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.

Continued from Page 3

Disaster: Mirror Missile. Avoid this disaster by loading your Newtonian / Dobsonian telescope correctly into the back of your SUV. Think of what might happen during an emergency stop or front crash. If the tube is loaded so that the primary mirror and mirror cell are forward and the secondary mirror closest to the rear of the vehicle, an emergency stop will just press the primary mirror more securely into the mirror cell. However, if the secondary mirror is forward and the primary mirror is closest to the back of the vehicle, such a stop will likely rip the mirror from the three small protrusions that keep it centered on the mirror cell, sending it crashing forward, through the secondary mirror and likely into the back of the head of a person sitting in the front seat. Having your life saved in a crash by an airbag only to have your telescope's mirror kill you in a shower of glass shards milliseconds later is a serious disaster easily avoided.

OK... Take a deep breath... there is only a miniscule chance that any of these disasters will happen to you, and they are even less likely to happen if you take a few simple precautions involving just a bit of forethought and cost. Stay warm and keep safe out there.

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I'd like to draw your attention to the Astronomy Outreach Foundation which is trying to combat the "Graying" of our hobby by attracting Generations X and Y into the fun of amateur astronomy. This is a non-profit foundation started by a combination of amateur astronomical industry leaders "to stimulate greater public interest in astronomy and to assist everyone in becoming more engaged in activities that allow them to learn more about the universe." For more information, please visit <http://www.astronomyoutreachfoundation.org>

Continued on Page 7



Continued from Page 6

*Note: I have no vested interest in the Astronomy Outreach Foundation or in Astrocrumb Filter Slides. But I have found that both are worthwhile entities. – Tom Koonce*

### Star Dust Speaker Reviews

Michael Chesnes

I warmly encourage NCA members to write reviews for the talks at our meetings, so that they can be published in Star Dust. We have an excellent lineup of speakers every year, and our reviews are both a valuable historical record of our activities and a way to recognize our speakers.

### Calendar of Events

**NCA Mirror- and Telescope-making Classes:** Tuesdays Nov. 2, 9, 16, 23, 30 and Fridays, Nov. 5, 12, 19, 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 [gbrandenburg@yahoo.com](mailto:gbrandenburg@yahoo.com). In case there is snow, call 202-282-2204 to see if the CCCC is open.

**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, Nov. 13 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

Nov 13, 2010 **Tamara Bogdanović** (UMd) - *Signatures of Binary Supermassive Black Holes Before and After Coalescence*

Dec 11, 2010 **Scott Sheppard** (DTM) - *Satellites of the Giant Planets*

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

### National Capital Astronomers Membership Form

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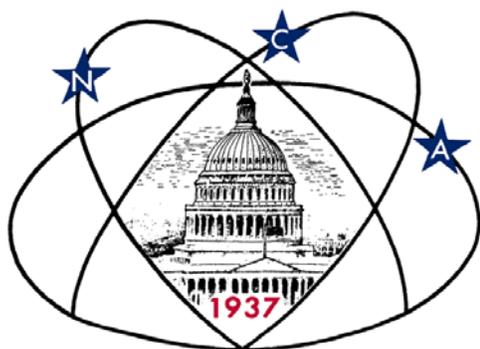
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## Inside This Issue

Next NCA Mtg:  
Nov. 13  
7:30 pm  
@ UM Obs  
Dr. Tamara  
Bogdanovic

Preview of Nov. 2010 Talk.....	1
Astronomy Disasters.....	2
Green Bank Astrophotos.....	3
Occultations.....	5
Calendar.....	7