

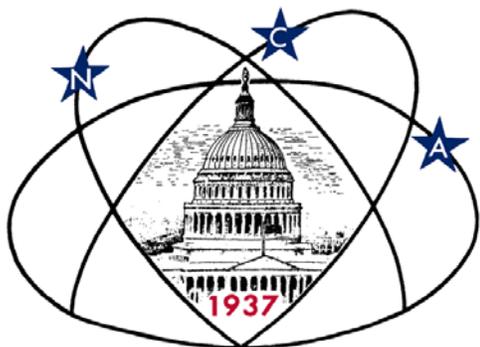
Star Dust

National Capital Astronomers, Inc.

April 2011

Volume 69, Issue 8

<http://capitalastronomers.org>



Next Meeting

When: Sat. April 9, 2011
Time: 7:30 pm
Where: UM Observatory
Speaker: Jessica Rosenberg, GMU

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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.

April 2011: Jessica L. Rosenberg
George Mason University

Gas and Stars in the Local Universe: What Normal Matter Can Teach Us About the Formation and Evolution of Galaxies

Abstract: The evolution of the structure of the universe from the earliest times up to the modern era is largely driven by the evolution of the dark matter. The evolution of many of the properties of the galaxies that we see, however, is driven by the gas and stars in those systems. Until recently it has been very difficult to study gas and stars in a large number of galaxies within the same volume of space. I will discuss our efforts to put together two large scale surveys, one in the optical (the Sloan Digital Sky Survey) and the other at radio wavelengths (ALFALFA), to enable the simultaneous study of the gas and stars in galaxies. I will talk about some of the interesting objects we have found. One class of interesting objects is one with gas extending well beyond the stars. I will talk about how we intend to use one of the new instruments on the Hubble Space Telescope to study these sources further.

Biography: Dr. Jessica L. Rosenberg is an assistant professor at George Mason University. Her research focuses on the gas and stellar content of galaxies as a way of studying their evolution. Currently she is undertaking the largest statistical study of gas and stars in the local universe to date. She has been principal investigator on studies using a wide array of optical, infrared and radio telescopes on the ground, as well as the GALEX, Spitzer, and Hubble Space Telescopes. She recently received the George Mason University Emerging Scholar Award. Prior to her arrival at George Mason University she was an NSF Astronomy and Astrophysics Postdoctoral Fellow at the Harvard-Smithsonian Center for Astrophysics, and before that at the University of Colorado at Boulder. She received her PhD from the University of Massachusetts in 2000.



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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.

Science News

Thank you Nancy Grace Roman for finding these articles.

Cepheid Wind

From NASA News

PASADENA, Calif. -- Astronomers have turned up the first direct proof that "standard candles" used to illuminate the size of the universe, termed Cepheids, shrink in mass, making them not quite as standard as once thought. The findings, made with NASA's Spitzer Space Telescope, will help astronomers make even more precise measurements of the size, age and expansion rate of our universe.

New observations from Spitzer show that keeping the distance ladder secure requires more careful attention to Cepheids. The telescope's infrared observations of one particular Cepheid provide the first direct evidence that these stars can lose mass-or essentially shrink. This could affect measurements of their distances. These particular standard candles are slowly consumed by their wind. When using Cepheids as standard candles, we must be extra careful because, much like actual candles, they are consumed as they burn. Observations of other Cepheids have shown that other Cepheids, up to 25 percent observed, are also losing mass.

Cool Brown Dwarf

From NASA News

Astrophysicists have discovered the coldest brown dwarf ever seen, with a temperature of 300 kelvin as they report in the 20 March *Astrophysical Journal Letters*. That's about as warm as a bright summer day on Earth. Meanwhile, other astronomers have found another very cold brown dwarf whose estimated temperature is about 370 K. The first dwarf is 200 K cooler than the previous record-holder.

Outcast Planets Could Support Life

Based on Science, 18 February 2011:

Vol. 331 no. 6019 p. 831

DOI: 10.1126/science.331.6019.831-a

Many astronomers assume a planet that harbors life would have to be warm and wet like Earth. Now, in a paper submitted to *The Astrophysical Journal Letters*, Dorian Abbot and Eric Switzer of the University of Chicago in Illinois suggest that a planet that has been slingshotted into the cold of outer space could also support life "in a hidden ocean under a blanket of ice, kept warm by geothermal activity."

They calculated that a planet with Earth's composition of rock and water but three times as big would, in spite of losing heat through its icy shell, generate enough warmth to maintain a hidden ocean. A planet with much more water, they say, would only need to be one-third Earth's size.

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Outline of (72) Feronia measured in Texas on March 9th

David Dunham

On the evening of 2003 November 4, a good occultation of 8.4-mag. SAO 117986, about 10° from Regulus, by the asteroid (72) Feronia, took place in an east-west path over northern Maryland. I had hoped to set up telescopes at perhaps 3 locations near I-83 north of Baltimore, or US 15 north of Frederick, to record the occultation with video cameras, but clouds moving in from the east covered that area and foiled those plans. But then Jared Zitwer, living in far western Maryland, telephoned to inform me that it was clear there. I called the police in Hagerstown, and a deputy there said that he could see the Moon; the Blue Ridge was blocking the advance of the low clouds. With a few hours to the 2:02 am occultation, I drove west to try to get out of the clouds. By the time I reached Hagerstown, the clouds were starting to stream over the mountains. I stopped at Indian Springs, several miles farther west, found a place, and started to set up my 8-inch SCT. But I soon realized that the clouds were filling the valley to the east and would soon reach the 14° altitude of the target star, rising in that direction. So I put the telescope back in my minivan and drove farther west, stopping at the Sideling Hill visitor center parking lot, from the eastern edge of which I had a good view to the Sickle of Leo rising in the east.

I set up my telescope and video camera, and acquired the target star a few minutes before the occultation, which lasted 8.0 seconds there. It was the first and only observation of an occultation by Feronia until 2007 Jan. 21, when two observers in the recently devastated Miyagi Prefecture of Japan timed another occultation. On March 28th of that year, two IOTA observers in southern Baja California recorded an occultation of 7.5-mag. SAO 96108 by Feronia; the star was revealed to be a close double star from those observations. On 2009 December 19, another occultation by Feronia was observed by two observers near Wickenburg, Arizona.

Just after midnight local time of March 8/9 this year, there was an occultation of another 8.4-mag. star, SAO 138141, by Feronia in a path across northern Texas. I used a free ticket that I had earned from frequent flyer miles to book a flight to Dallas, hoping that the weather would be clear; I had tried to use the same ticket, that had to be used before March 20, to try two earlier bright occultations, but both of those efforts were cancelled due to forecasts of poor weather.

The last forecasts showed that a front would move out of the Dallas area, leaving clear skies, but only an hour or so before the event. I made plans (during my flight to Dallas, using Google maps of the asteroid occultation path printed from an IOTA Web site) to observe from sites northwest of Dallas, where it should clear up earlier, allowing more time to set up remote stations across the path. As expected, it was very cloudy, even with some rain, when my flight landed in Dallas in the afternoon. I had to drive to Olney, 138 miles n.w. of the Dallas airport, to get out of the clouds. I was then a little short on time, arriving at my first station a little before 8pm CST. Infrared weather satellite images showed the clouds still over Dallas two hours before the occultation, but it had just cleared up there by the time of the occultation. This was reminiscent of my chase for the 2003 November Feronia occultation in western Maryland, but this time, I was better prepared and better equipped.

I was able to deploy 4 stations near Texas Hwy 79, as shown in Fig. 1. I would have been able to set up more if I had had time to set up my mighty mini's and pre-calibrate (time stamp) my cameras before sunset, but I didn't have time for that and had to grab things out of my suitcases and set up and pre-calibrate each station on site.

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After deploying these stations from south to north, I had about 45 minutes left, so I drove as far north as I could, to about 28 km north of the predicted central line, to try for a 5th attended station, near Dean, northwest of Wichita Falls, but I was clouded out there only about 10 min. before the occultation. Fortunately, the clouds didn't reach much farther south and the four remote stations all successfully recorded the target star.

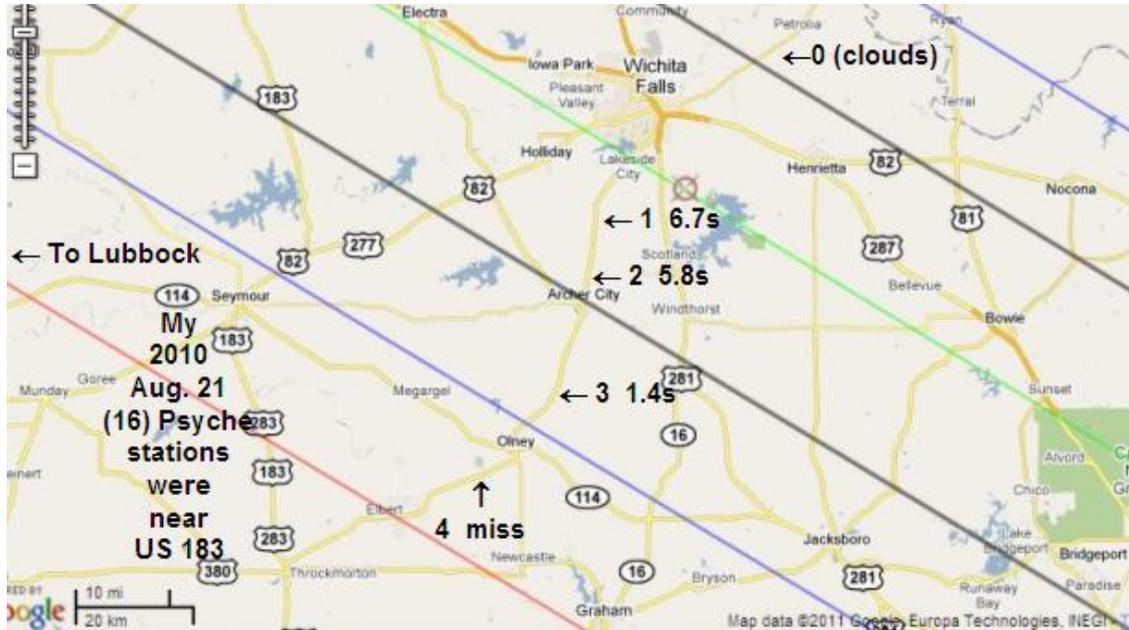


Figure 1 – Map of north-central Texas showing the five stations that I deployed (from south to north, but numbered from north to south) near Hwy 79 from s.w. of Olney to near Dean n.e. of Wichita Falls. The duration of the occultation recorded at stations 1, 2, and 3 is given to the right of the station number. The green line is the predicted central line; the blue lines are the predicted occultation limits; the red line is the s. limit in case of a 1-sigma s. shift, and the gray lines are 25 km north and south of center.

The outline of Feronia determined from my observations is shown in Fig. 2. It's too bad that apparently nobody else observed the occultation. As far as I know, Ben Hudgens was the only other observer who monitored the star at the right time, and he had a miss at his observatory in Stephenville, TX, which was south, relative to the path, of my southernmost (miss) station. Terry Redding drove down to the Florida Keys to try to observe the occultation, but was clouded out.

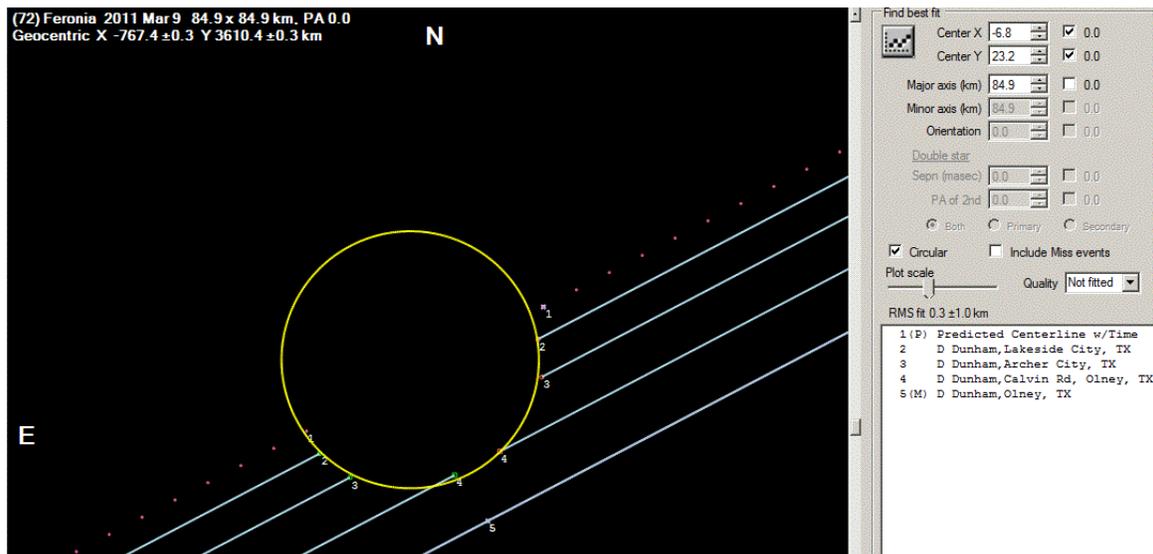


Figure 2 – Sky plane plot of my observed chords, including the best-fit circular solution.

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Feronia

Continued from Page 4

I had traveled to the same region to observe the occultation of another 8th-mag. star by the large asteroid (16) Psyche the morning of 2010 August 21. But then, I flew to Lubbock, where a large system of thunderstorms forced me to drive 160 miles east, and then I deployed five stations from west of Seymour to south of Throckmorton near US 183, indicated on the left side of Fig. 1.

Each of those stations recorded that occultation, which was also observed in twilight from central Maryland and Virginia. The outline obtained from that occultation was published on p. 63 of the March issue of Sky and Telescope, along with a note, fittingly, reminding observers of the March 9th Feronia event.

Only 9 hours before the March 9th Feronia occultation, the German amateur astronomer Eberhard Bredner made an expedition to successfully observe an occultation by the asteroid (554) Peraga. He dedicated this positive observation to the memory of Andrew Elliott, an English occultation observer who died late last year.

In that same spirit, I dedicate my three positive observations of the Feronia occultation to the three Boston-area astronomers who passed away during or close to the first week of March: Leif Robinson (former S&T editor), James Elliot (yes, another Elliot, but James spelled his with just one "t"; he discovered the rings of Uranus and Pluto's atmosphere from occultation observations), and Myron Lycar (Smithsonian Astrophysical Observatory).

Mid-Atlantic Occultations and Expeditions

David Dunham

Asteroidal Occultations

Date	Day	EDT	Star	Mag.	Asteroid	dmag	s	"	dur. Ap.	Location
Apr 10	Sun	23:36	2UC40341597	12.1	Adelinda	3.6	7	8	sOH,WV,c&eVA,eNC	
Apr 18	Mon	5:14	2UC32266709	12.5C	Eunike	0.4	10	10	VA,DC,MD,PA,NJ	
Apr 22	Fri	2:19	TYC14140749	12.1	Thetis	0.8	20	8	w&sPA,MD,DC;nVA?	
Apr 28	Thu	1:48	SAO 140830	9.6	Pauly	3.3	4	4	e&nNC,swVA,neKY	
Apr 28	Thu	22:21	2UC36799129	12.6	Comacina	1.9	5	9	OH,PA,MD,DC,VA	
Apr 30	Sat	0:31	TYC08080566	10.3	Iris	0.8	10	5	OH,WV,eKY,VA,nNC	
Apr 30	Sat	20:38	2UC42223574	12.8	Minerva	1.3	6	9	MD,DC,DE,sNJ	
May 1	Sun	23:40	SAO 59507	8.0	Takashimizuno	9.6	1	2	sON,wPA,MD,nVA	
May 4	Wed	1:31	PPM 262387	9.8	Lazarev	5.9	2	4	PA,MD,nVA,DE;DC?	
May 8	Sun	21:44	SAO 95229	9.0	Wratislavia	5.1	4	4	sTN,nAL,nGA,sSC	
May 11	Wed	22:04	PPM 706398	10.2	Ostanina	4.5	4	5	NJ,e&nPA,sON	
May 12	Thu	0:15	TYC49550800	10.9	Tercidina	1.8	18	6	w&sOH,wVA,wNC,sNC	

Lunar Grazing Occultations (*, Dunham plans no expedition)

Date	Day	EDT	Star	Mag.	% alt	CA	Location
Apr 9	Sat	21:42	SAO 77996	7.4	35+	41 15N	Athens,OH; Carson,VA; Duck,NC
Apr 10	Sun	0:58	eta Gem	3.5	36+	13 15N	CasaGrande,AZ; Dixon&Baker,CA
Apr 23	Sat	4:08	ZC 2739	6.6	68-	26 4N	*Roanoke,sPetersbg,nHamptn,VA
May 5	Thu	21:55	SAO 76878	9.3	7+	6 13N	Chantily&Woodbr,VA;LaPlata,MD
May 9	Mon	20:35	SAO 97978	7.6	41+	54 13N	Barnsvl,TakomaPk,UprMrlbro,MD
May 11	Wed	22:37	SAO 118313	8.3	64+	43 13N	Chantily&Woodbr,VA;LaPlata,MD
May 12	Thu	21:38	ZC 1639	7.1	74+	51 15N	*Charltsv&sRichmnd,VA;Ngsh,NC

Total Lunar Occultations

DATE	Day	EDT	Ph	Star	Mag.	% alt	CA	Sp.	Notes
Apr 9	Sat	22:17	D	ZC 928	5.9	35+	34	52S	K4
Apr 10	Sun	0:47	D	SAO 78129	7.0	36+	7	17S	K0 Azimuth 293 deg.
Apr 10	Sun	20:13	D	SAO 78993	7.8	45+	65	49N	A2 Sun alt. -7 deg.
Apr 10	Sun	21:17	D	SAO 79030	7.6	45+	55	69N	G zetaGemComp.,102",PA272
Apr 10	Sun	21:17	D	zet Gem	4.0	45+	55	75N	G3 ZC 1077,SAO 79030 102"
Apr 11	Mon	21:44	D	3 Cancri	5.6	56+	57	74N	K3 ZC1207, close double?
Apr 11	Mon	23:23	D	SAO 97512	7.4	56+	39	76S	K0
Apr 15	Fri	1:48	D	ZC 1582	6.4	88+	31	82N	A3
Apr 15	Fri	3:42	D	55 Leonis	5.9	88+	10	41N	F2 Az263,ZC1587,close dbl?
Apr 16	Sat	3:36	D	ZC 1713	5.6	95+	17	66N	K0 Spectroscopic binary
Apr 20	Wed	1:31	R	ZC 2249	6.7	93-	25	61N	K1 AA 303, close double
Apr 22	Fri	6:22	R	ZC 2584	6.5	77-	25	60S	K5 Sun -1, spec. binary
Apr 23	Sat	1:23	R	28 Sgr	5.4	68-	2	76S	K5 Az 122, ZC 2725
Apr 23	Sat	3:55	R	30 Sgr	6.3	68-	23	74N	F2 ZC 2736
May 4	Wed	21:14	D	37 Tauri	4.4	3+	4	78S	K0 Azimuth 295, ZC 599
May 6	Fri	21:31	D	SAO 77710	7.2	13+	20	67N	G7
May 7	Sat	21:12	D	SAO 78769	7.7	21+	32	14S	B8
May 9	Mon	20:35	G	SAO 97978	7.6	41+	54	14N	K0 Sun -6; graze in MD
May 11	Wed	1:22	D	SAO 117836	7.2	54+	7	87N	G5 Azimuth 275 deg.
May 11	Wed	21:25	D	RX Sex	6.7	64+	52	63N	A3 ZC 1528, close double?
May 11	Wed	22:23	D	SAO 118314	7.4	64+	45	88S	K0 mag2 9,sep. ".5,PA 130
May 12	Thu	0:57	D	ZC 1543	6.6	65+	18	64S	K0
May 16	Mon	0:56	D	ZC 2039	5.5	98+	31	40N	A0 Term. dist. 19";CTgraze
May 16	Mon	1:44	D	ZC 2045	6.4	98+	27	79S	K0
May 16	Mon	2:36	D	CS Vir	5.9	98+	21	75S	Ap ZC 2051

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.

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How to Grow Your Own Army of Citizen Scientists

From ScienceInsider
by Eli Kintisch, 24 February 2011

In 2007, astronomer Chris Lintott and colleagues were drowning under a data deluge: 1 million images of galaxies to characterize and only one graduate student to do it. His student characterized 50,000 in a week before telling him where to stick the other 950,000 galaxies and his collaborators set up a Web site in hopes of attracting some volunteers.

The goal was a few thousand helpers. But after some favorable news coverage, the site they dubbed Galaxy Zoo "went viral," says Lintott. The current count is 200 million classifications by 375,000 people working from the comfort of their own homes. More than 20 astronomical papers have come out of the project, including the discovery of two astronomical phenomena.

Computers and humans need each other. Multiple citizen scientists do a better job than one exhausted graduate student, and computer classifications have an error rate of 20% to 30%. Human classifications help train computers to reduce that error. With better telescopes finding millions more galaxies, the number of required classifications will simply overwhelm the human army. And with so much information available, scientists will weed out the objects easiest to classify first. That leaves the toughest challenges for the volunteers.

But machines aren't curious. In 2007, Dutch school teacher and Galaxy Zoo hobbyist Hanny van Arkel wondered about a greenish unidentified object appearing in images adjacent to galaxies. The object became known as "Hanny's Voorwerp" and astronomers took up the hunt to identify the new phenomenon. "People are now chasing it with some of the best telescopes on the planet," said Lintott. "Computers will slowly get better at classifying galaxies, but looking at an image and asking, 'What's that odd thing?' remains uniquely human," the Galaxy Zoo site explains.

APS Mid-Atlantic Senior Physicists Group

<http://www.aps.org/units/maspg/>

April 2011 Event

Date: Tuesday—April 19, 2011 (NOTE: DAY AND DATE)
Speaker: Professor Sarah Eno, Physics Department, University of Maryland
Topic: The LHC: Results from the Energy Frontier

Time and Location: Talk starts at 1:00 pm with Q&A to follow. It will be held in one of the first floor conference rooms at the American Center for Physics (www.acp.org), One Physics Ellipse, College Park, MD. This is located off River Road, between Kenilworth Ave. and Paint Branch Parkway.

Abstract: The Large Hadron Collider, a proton-proton collider located in Geneva, Switzerland, has finally commenced operation, thus opening the first new laboratory-based energy frontier since the commissioning of the Tevatron in the mid-1980's. In this talk, I will discuss results from proton-proton collisions at a center-of-mass energy of 7 TeV and from lead-ion collisions at 2.76 TeV per nuclear pair. I will discuss the performance of the experiments, comparison of data with expectations from production of the known standard model particles, searches for new particles, and some new results on soft interactions of particles via the strong force.

Biography: Sarah Eno received her Ph.D. from the University of Rochester and did post-doctoral work at the University of Chicago before taking a faculty position at the University of Maryland. She is interested in searching for new particles and precision tests of quantum chromodynamics using W and Z bosons. She is a Fellow of the APS.

Howard B. Owens Science Center Free Lecture "Dark Cosmos: In Search of Our Universe's Missing Matter and Energy"

When: Saturday, May 7, 2011 3:00 pm

Where: Howard B. Owens Science Center
9601 Greenbelt Road, Lanham, Maryland 20706

Speaker: Dr. Dan Hooper, Fermilab

What we can see makes up only 5 percent of the Universe. The rest is totally invisible to us; its presence discernible only by the weak effects it has on visible matter around us.

This invisible stuff comes in two varieties – dark matter and dark energy. One holds the Universe together, while the other tears it apart. What these forces are is a mystery, but the latest discoveries of experimental physics have brought us closer to that knowledge. Dr. Dan Hooper will present the latest findings surrounding this puzzle.

For more information, contact Russell Waugh at 301-918-8750
email: russell.waugh@pgcps.org

OR

Patty Seaton at 301-918-8750
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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 Apr. 5, 12, 19, 26 and Fridays, Apr. 1, 8, 15, 22, 29, 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.
- **Open House talks and observing** at the UMD 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, Apr. 9 at 5:30 pm, preceding the meeting, at the [Garden Restaurant](#) in the University of Maryland University College Inn and Conference Center.
- **APS Mid-Atlantic Senior Physicists Group:** Tuesday, April 19 1:00 pm. Speaker: Sarah Eno. *The LHC: Results from the Energy Frontier*
- **Owens Science Center:** Saturday, May 7 3:00 pm. Speaker: Dan Hooper. *Dark Cosmos: In Search of Our Universe's Missing Matter and Energy*
- **Upcoming NCA Meetings** at the University of Maryland Observatory
 - Apr 9, 2011 **Jessica Rosenberg** (GMU) - *Gas and Stars in the Local Universe: What Normal Matter Can Teach us About the Formation and Evolution of Galaxies*
 - May 14, 2011 **Tracy Clarke** (NRL) - *Clusters of Galaxies, the Biggest Bound Objects in the Universe*

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

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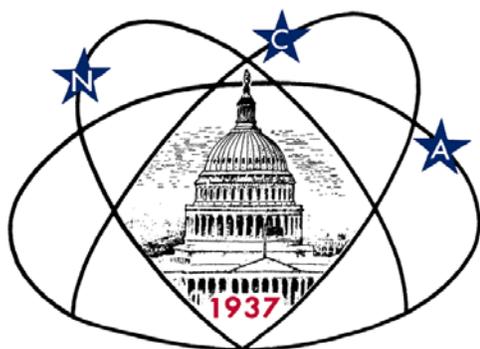
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First Class

Dated Material



Next NCA Mtg:

Apr. 9

7:30 pm

@ UM Obs

Dr. Jessica Rosenberg

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