Star Dust

National Capital Astronomers, Inc.

September 2010

Volume 69, Issue 1

http://capitalastronomers.org

Next Meeting

When: Sat. Sept. 11, 2010

Time: 7:30 pm

Where: UM Observatory

Speaker: Barry Rothberg, NRL

Table of Contents

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 Metzerott Rd about halfway between Adelphi Rd and University Blvd. (For Google map purposes only, you may use 3200 Metzerott as the address.)

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.

Barry Rothberg

Naval Research Laboratory

Mergers of Galaxies

Abstract:

The sky at night appears to our naked eyes as a nearly unchanging, tranquil realm, broken only by the slow motions of the planets, the occasional passage of a comet, or the brief meteor shower. However, the universe is a far more tumultuous than our unaided eyes reveal. Galaxy collisions and the nascent systems created from these complicated encounters form the basis for our current cosmological paradigm. These seemingly exotic systems have puzzled astronomers since before the time of Edwin Hubble and before we fully understood that they were outside the realm of our own Milky Way. I will discuss a brief history of the merger phenomenon, from early observations and theories, to the seminal "Toomre Hypothesis," which forms the basis of our current understanding of galaxy evolution. I will also discuss recent work and controversies which question not only our understanding of the very basic properties of galaxy mergers, but which may raise doubts about our current understanding of cosmology.

Biography:

Barry Rothberg is currently a National Research Council Postdoctoral Fellow at the Naval Research Laboratory (NRL) in Washington, D.C. Before joining NRL, he was a Postdoctoral Fellow at the Space Telescope Science Institute in Baltimore, MD. His current research focus is on the properties of interacting and colliding galaxies, with a particular interest in their dynamics, the formation of new stars and identifying the properties of different stellar populations. He has worked on a variety of astronomical projects, including radio and x-ray properties of the sun, calibrating the distances to local galaxies in the near-infrared, and the properties of Globular Clusters in massive elliptical galaxies. Barry received his Ph.D. in Astronomy from the University of Hawai'i at Manoa (2005) where he had the opportunity to observe with nearly all of the different telescopes on the summit of Mauna Kea. He received his Bachelors of Science in Astrophysics in 1997 from Tufts University.

Star Dust is published ten times yearly September through June, by the National Capital Astronomers, Inc. (NCA).

ISSN: 0898-7548

Editor: Michael Chesnes

Editorial Advisors:
Elizabeth Warner
Jeffrey Norman
Wayne Warren
Harold Williams
John D. Gaffey, Jr.

PDF Distributor: Jay Miller

Please Get Star Dust Electronically

NCA 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 digital, please contact Michael L. Brabanski, the NCA Sec-Treasurer, at mlbrabanski@verizon.net or 301-649-4328 (h).

Thank you!

Reminder

After the meeting, everyone is invited to join us at Plato's Diner in College Park. Plato's is 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.

Saving the Planetarium via Social Media

Raphael Perrino
Friends of Arlington's David M. Brown Planetarium

"Growing up attending Arlington Public Schools (Randolph, Jefferson, W-L), I can earnestly say the Planetarium has had a significant impact on my life. As someone with a career in Earth Science, I have fond memories of the demonstrations I experienced at the Planetarium and how they guided my future. The Planetarium was my first meaningful introduction to worlds beyond our own." – Sargon de Jesus

"As a professional astronomer and educational outreach participant, I have seen and experienced the impression made by a visit to a planetarium. In fact, I was so impressed by my first visit—to the Arlington Planetarium in 1972—it helped determine the course of my professional life." – Dr. Alice Monet

"My 8-year old daughter, as a direct result of her wonderful experiences at the planetarium, has decided she wants to be an astronomer." – Stephen Carrig

For 40 years, the David M. Brown Planetarium in Arlington, VA has inspired and educated thousands of children to pursue, teach, and admire the earth and space sciences. Nonetheless, Arlington Public Schools' Superintendent proposed closing the planetarium early this year.

A motley group of locals decided to make noise. We were a former CFO, an economist, a science teacher, an MBA, a software engineer, and a technical communicator. Through our special niches, we ignited a firestorm. Before we knew it, we were the primary organizers for a cause responsible for uniting generations: It took on a life of its own.

We sent hundreds of e-mails and letters to elected officials and networks of science educators and civic associations. We distributed flyers on street corners and outside grocery stores. But many think it was the online effort that created the tipping point.

I started the SavePlanetarium social media campaign to spread the word quickly and gather stories from planetarium supporters. I drew from my experience as a technical communicator, and sought out or studied the work of social media experts, graphic designers, and Web designers for guidance. Let me describe the four-part strategy I used to define the digital front lines of the struggle to save the planetarium.

1. Multiple Tools for Different Audiences and Goals

SavePlanetarium began on Facebook and an online petition. Our audience included students, teachers, parents, planetarium visitors, astronomy enthusiasts, amateur and professional astronomers, and administrators. The initial goal was to broadcast that the planetarium would be closing within weeks. Once the Arlington School Board voted to keep the planetarium open during FY2010-11, SavePlanetarium shifted to a fund-raising campaign under a newly formed organization, Friends of Arlington's David M. Brown Planetarium.

Continued on Page 3

2010-2011 Officers

President:
Joseph C. Morris
j.c.morrris@verizon.net
703-620-0996 (h)
703-983-5672 (w)

Vice-President:
John Hornstein
jshgwave@yahoo.com
301-593-1095 (h)

Secretary-Treasurer:
Michael L. Brabanski
mlbrabanski@verizon.net
301-649-4328 (h)

Asst. Secretary-Treasurer:
Jeffrey B. Norman
jeffreynorman@comcast.net

Trustees:
- Dr. Wayne Warren (2011)
- Dr. Walter Faust (2012)
- Benson Simon (2013)
- Andrew Seacord (2014)

Appointed Officers and Committee Heads:

Exploring the Sky
Joseph C. Morris
j.c.morrris@verizon.net

Telescope Making
Guy Brandenburg
gbrandenburg@yahoo.com
202-635-1860

NCA Webmaster
Dr. Harold Williams
Harold.Williams@montgomerycollege.edu
240-567-1463 (w)
301-565-3709 (h)

Meeting Facilities
Jay H. Miller
rigel1@starpower.net
240-401-8693

Star Dust Editor
Michael Chesnes
m.chesnes@verizon.net
301-313-0588

Continued from Page 2

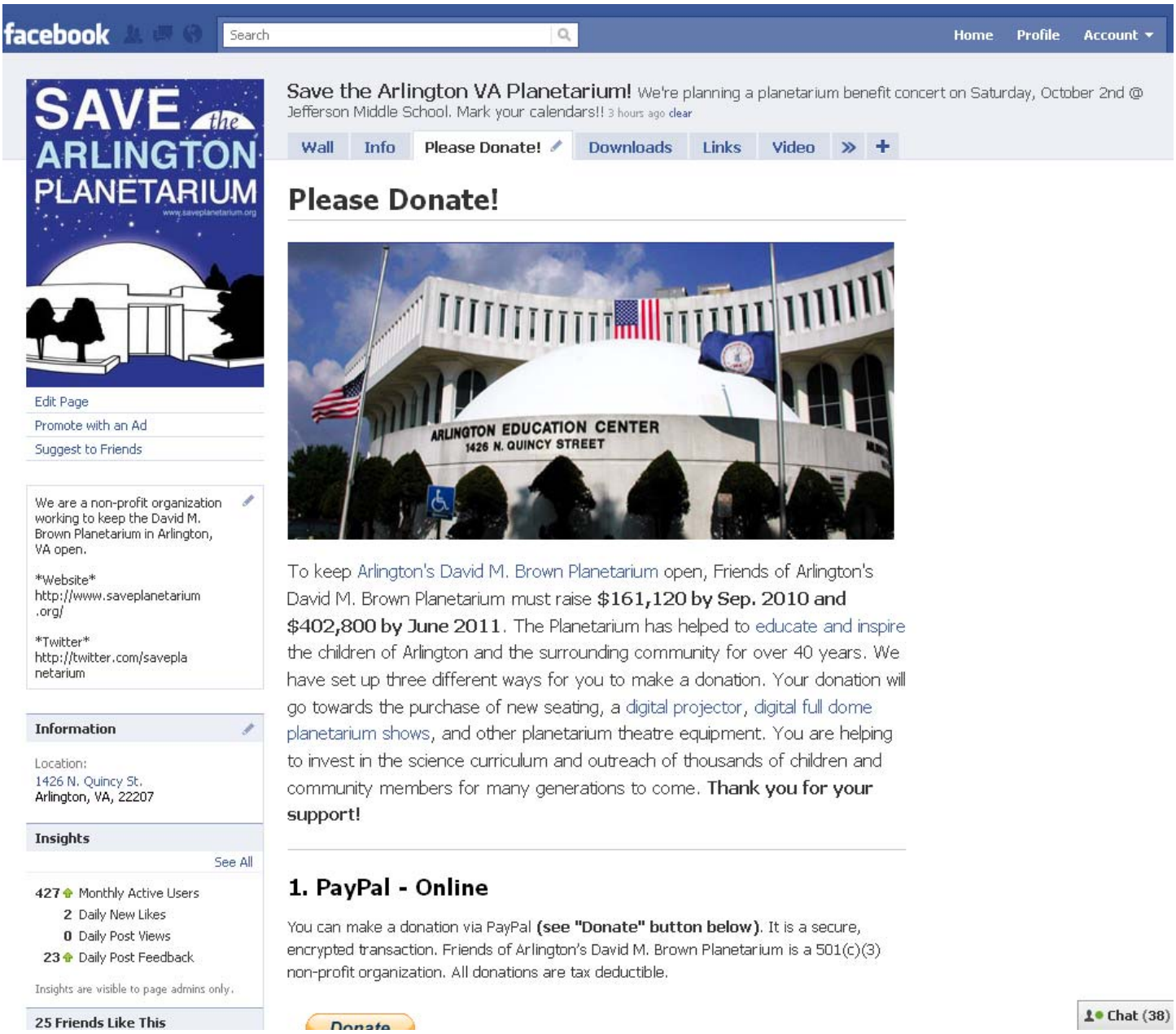
The project became larger. I teamed up with Ryan Hanna, a social media expert. He created @saveplanetarium on Twitter, I built our website, www.saveplanetarium.org, and we co-administered the Facebook page. The website has a blog element that is an excellent medium for posting in-depth content; Facebook is the optimal tool for shorter messages, varied content and community interaction; and Twitter can quickly spread a short message to a large number of people.

2. Echo Content, Brand, and Message

I started looking for an effective logo and message. As the campaign expanded and evolved, SavePlanetarium would need to maintain a consistent brand across all social media tools. For example, a supporter visiting our website and Facebook pages should know both were part of the same organization. Content posted to the website echoed the Facebook and Twitter pages. Our Facebook, Twitter, and website visitors all received updates.

Continued on Page 4

Continued from Page 3



3. Post Engaging and Relevant Content, Frequently

One of the most critical elements of social media is engaging, frequent posts and relevant content. There have been days in the campaign when I've had 10 things I want to communicate to supporters, but had to select 1-2 of the most interesting updates: Don't inundate supporters with posts, but keep them tuned into what's happening. On slower days, I'd sometimes post recent discoveries in astronomy and astrophysics to engage the astronomy enthusiasts in the SavePlanetarium community. The key has been balance and timing.

If I wanted to reach the maximum number of supporters, I aimed to post during times of high traffic: Weekdays at 9 a.m., noon, and 8 p.m.

Continued on Page 5

Cont from p4.

4. Create Sense of Community

In a social media environment, user feedback is everything. When nobody responds after posting to a 4,000-member Facebook fan page during a high traffic time, I need to re-evaluate my posts. If five users respond to a post, one of us needs to reply quickly. With the help of campaign members, we have used social media tools to encourage users to share stories, join the campaign, and spread the word.

The SavePlanetarium social media campaign is part of Friends of Arlington's David M. Brown Planetarium, a non-profit organization dedicated to raising funds to keep the David M. Brown Planetarium open. Friends of the Planetarium is doing a tremendous amount of work on the ground, and the SavePlanetarium social media campaign has played an integral role in publicizing, documenting, and coordinating those on-the-ground efforts. But despite the collective enthusiasm of thousands who have helped to breathe life back into this Arlingtonian gem of science communication, the ultimate test of this campaign will be whether the doors of the David M. Brown Planetarium remain open in June 2011. We need your support!

Website: www.SavePlanetarium.org,
Facebook: http://bit.ly/Facebook-planetarium
Twitter: @saveplanetarium

Raphael Perrino
Board Member, Online Lead
Friends of Arlington's David M. Brown Planetarium
rperrino@gmail.com

Mid-Atlantic Occultations and Expeditions

Dr. David Dunham

Asteroidal Occultations

Date	Day	EDT	Star	Mag.	Asteroid	dmag	dur. s	Ap. "	Location
Sep 11	Sat	1:54	2UC43061589	11.4	Diana	1.7	7	7	TN,eKY,eOH,wPA
Sep 11	Sat	4:37	2UC38919169	13.0	Lipperta	2.1	6	10	WV,nVA,MD,s&ePA
Sep 20	Mon	3:53	2UC40675313	12.5	Maja	1.8	3	8	eTN,w&cVA,sMD,DE
Sep 23	Thu	2:44	TYC23161541	11.4	Maria	2.2	6	7	se&cenVA,cWV,sOH
Sep 25	Sat	4:38	2UC41338574	13.5	Vaticana	1.0	6	10	VA,MD,DE,NJ
Oct 1	Fri	21:58	TYC52311421	10.4	Honkasalo	4.3	7	5	sePA,MD,DC,VA,NC
Oct 3	Sun	4:48	TYC19300413	11.2	Evelyn	2.9	3	6	sOH,sw&nePA,seNY
Oct 7	Thu	4:27	TYC23870186	9.7	Brunhild	3.4	8	4	eVA,DC,eMD,DE,NJ

Lunar Grazing Occultations (*, Dunham plans no expedition)

Date	Day	EDT	Star	Mag.	% alt	CA	Location
Sep 26	Sun	5:22	ZC 317	6.4	92- 52	7S	*Charlottsville,Ft.AP Hill,VA
Oct 4	Mon	4:35	SAO 117823	9.0	16- 14	5S	*York & Philadelphia, PA
Oct 4	Mon	5:14	SAO 117833	8.9	16- 21	7S	Rockville & s. Laurel, MD
Oct 4	Mon	5:33	SAO 117843	8.5	16- 24	8S	*Millersburg & Quakertown, PA

Total Lunar Occultations

DATE	Day	EDT	Ph	Star	Mag.	%	alt	CA	Sp.	Notes
Sep 13	Mon	21:31	D	SAO 184277	7.9	37+	8	62S	B8	Az. 228, close double?
Sep 14	Tue	20:17	D	SAO 185134	7.8	47+	22	56S	A0	
Sep 14	Tue	20:45	D	ZC 2469	6.5	48+	20	12N	A0	
Sep 14	Tue	22:43	D	ZC 2483	7.1	48+	6	68N	K1	Az. 231
Sep 16	Thu	19:44	D	SAO 187581	7.8	67+	27	49S	G8	Sun alt. -7
Sep 16	Thu	21:39	D	ZC 2777	6.9	68+	26	80S	A0	mg2 8.5 sep. 8",PA 308
Sep 16	Thu	23:35	D	ZC 2785	6.9	68+	15	69N	G8	Az. 224
Sep 18	Sat	23:33	D	ZC 3029	7.0	84+	31	40N	F2	maybe close double?
Sep 21	Tue	21:54	D	ZC 3370	6.2	98+	39	81N	G8	probably close double
Sep 23	Thu	1:56	D	TX Piscium	5.0	100+	51	18N	N5	ZC3501,19Psc,TermD 0.3"
Sep 24	Fri	23:34	R	ZC 177	6.9	97-	47	81N	F5	WA 268
Sep 26	Sun	5:36	R	ZC 317	6.4	92-	49	26S	F5	Graze in cen. Virginia
Sep 26	Sun	21:40	R	ZC 411	7.0	87-	14	56S	G0	Az. 76, mg2 8.2 sep 3"
Sep 27	Mon	2:14	R	SAO 75633	7.0	86-	64	70N	K0	
Sep 27	Mon	4:35	R	47 Arietis	5.8	86-	69	70N	F5	ZC 435
Sep 28	Tue	0:25	R	ZC 540	7.8	79-	37	42N	A0	mg2 11.4,sep.25",PA 136
Sep 28	Tue	2:13	R	ZC 563	7.0	78-	57	16S	B9	
Sep 28	Tue	2:21	R	SAO 76232	7.7	78-	58	54S	A0	
Sep 28	Tue	2:38	R	SAO 76254	7.3	78-	61	29S	F5	maybe close double
Sep 28	Tue	6:16	R	SAO 76314	8.0	77-	63	58N	B9	Sun alt. -9
Sep 29	Wed	0:45	R	SAO 76717	7.2	70-	31	58N	F5	
Sep 29	Wed	1:18	R	95 Tauri	6.2	70-	37	53N	F7	ZC 714
Sep 29	Wed	1:57	R	SAO 76731	8.2	69-	45	69N	G0	
Sep 30	Thu	2:30	R	SAO 77452	7.7	59-	41	64N	K0	May be close double
Sep 30	Thu	3:28	R	SAO 77526	8.0	59-	51	17S	A0	mg2 11.6,sep. 0.4"
Sep 30	Thu	3:37	R	SAO 77524	8.0	59-	53	32N	A3	mg2 9.1, sep. 0.1"
Sep 30	Thu	5:38	R	SAO 77597	7.6	58-	73	31N	K0	
Oct 1	Fri	3:37	R	SAO 78689	8.0	48-	42	63N	K2	
Oct 1	Fri	5:06	R	SAO 78742	7.0	47-	58	43S	K0	
Oct 1	Fri	6:30	R	SAO 78774	7.3	47-	71	87N	B9	Sun alt. -7
Oct 3	Sun	6:17	R	SAO 98096	7.8	25-	46	64N	F8	Sun alt. -10
Oct 4	Mon	5:05	D	omicron	3.5	16-	19	-54N	A5	spectroscopic binary
Oct 4	Mon	5:51	R	Leonis	3.5	16-	28	40N	A5	ZC 1428
Oct 10	Sun	18:53	D	ZC 2257	6.7	13+	12	72N	A2	Sun alt. -4, Az. 225
Oct 11	Mon	19:38	D	SAO 184678	7.6	22+	13	70N	K0	Az. 222

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.

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 is. 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 sun? Astronomers say the same cloud of dust and gas that gave birth to the star—known as 1RXS JI60929.1-210524 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 2010
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.

Science News

Thank you Nancy Grace Roman for finding these articles.

Evaporating Exoplanet

CREDIT: C. CARREAU/ESA
Astrophys. J. 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, WASP12-b 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 our 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.

Is Our Solar System Still Making Moons?

by Phil Berardelli on June 9, 2010 in Science Now

New simulations suggest that seven of Saturn's moons were formed as recently as 10 million years ago—over 4 billion years later than the 55 other major bodies orbiting the planet. Researchers think even more new moons could be in prospect because the processes that produced the most recent examples are still active.

Seven tiny moons of Saturn are peanut-shaped like asteroids, suggesting that they formed at the beginning of the solar system and were grabbed by Saturn's gravity. But Cassini's instruments discovered that the density of the ring moons was closer to that of Swiss cheese than asteroid rock: less than 1 gram per cubic centimeter. That difference means that unlike the sun, planets, and other moons in the solar system, the ring moons didn't condense from a huge primordial disk of gas and dust. So how were they born?

The most obvious answer is that material from Saturn's rings clumped to produce the moons, but no one could develop a coherent computer model that mimicked the process. Now a team of researchers has done exactly that. By combining and adapting computer models designed to simulate solar-system formation and the orbital migration of planets, the researchers were able to show that the seven moons could condense directly from the rings and retain their wispy consistency.

The gravitational interactions of ring material beyond the Roche limit made the formation of aggregates unavoidable. As the simulation proceeded it produced mergers among the aggregates, which yielded increasingly bigger objects. And soon, tiny moons "just like Pandora and Epimetheus appeared."

Star Dust Speaker Reviews

By 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 Sept. 7, 14, 21, 28 and Fridays, Sept. 3, 10, 17, 24, 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 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, June 12 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

Sep 11, 2010 **Barry Rothberg** (NRL) - *Mergers of Galaxies*

Oct 9, 2010 **Joseph Weingartner** (GMU) - *The Dusty Universe*

Nov 13, 2010 **Tamara Bogadanović** (UMd) - *Black Holes: Alignment of Spins, and Light from Mergers*

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

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

Name: ..... Date: _____/_____/_____

Street address: .....

City/State/ZIP: .....

Telephone: _____-_____-_____ E-mail: .....

Would you prefer to get Star Dust by e-mail? _____

MEMBERSHIP CATEGORIES AND ANNUAL DUES RATES

All members receive Star Dust, the monthly newsletter announcing NCA activities. The basic dues cover an electronic copy of Star Dust; paper copies are $10 extra. You may also choose to get Sky & Telescope magazine at the discounted rate of $33.

Student Membership	$ 5
Paper copy of Star Dust	$10
Sky & Telescope	$33
Total	_____

Individual/Family Membership	$10
Paper copy of Star Dust	$10
Sky & Telescope	$33
Total	_____

Please mail this form with your check payable to National Capital Astronomers to:

Mr. Michael L. Brabanski, NCA Treasurer; 10610 Bucknell Drive, Silver Spring, MD 20902-4254

National Capital Astronomers, Inc.

If undeliverable, return to
NCA c/o Michael L. Brabanski
10610 Bucknell Dr.
Silver Spring, MD 20902-4254

First Class
Dated Material

Next NCA Mtg:

Sept. 11

7:30 pm @ UM Obs

Dr. Barry Rothberg

Inside This Issue