THE SPECTROGRAM

Newsletter for the Society of Telescopy, Astronomy, and Radio

December 2009

Inside this Issue

S*T*A*R
P.O. Box 863
Red Bank, NJ 07701
On the web at:
http://www.starastronomy.org

Edited by: Bob Fowler

December's Meeting

The next meeting of S*T*A*R will be on Thursday, December 3, 2009. Our program will be ***"Meteorites"*** presented by Derek Yost. All are welcome. The meeting will begin promptly at 8:00pm at the Monmouth Museum on the Brookdale Community College campus.

Editor's Corner

Many thanks to Dave Nelson, Randy Walton, & Steve Fedor for contributing to this month's Spectrogram.

Reminder to pay membership dues $25/individual, $35/family. Donations are appreciated. Make payments to our treasurer Rob Nunn at a club meeting or mail a check payable to S*T*A*R Astronomy Society Inc to:

S*T*A*R Astronomy Society
P.O. Box 863
Red Bank, NJ 07701

January Issue

Please submit articles and contributions for the next *Spectrogram* by December 27. Please email to fowler@verizon.net.

Nobel Prize winner Dr. Robert Wilson addresses the October 2009 STAR meeting.

Calendar

- Dec 3, 2009 – ***"Meteorites"*** by Derek Yost.
- Dec 4, 2009 – Annual Bayonet Farms Star Party.
- Jan 7, 2010 - TBA
- Feb 4, 2010 – ATM Night!
- Mar 4, 2010 - TBA
- Apr 1, 2010 - TBA
- May 6, 2010 - TBA
- Jun 3, 2010 – Annual Business Meeting

Got Pix? Like to Write?

Have you been out observing with your friends? Have you made any great astro-images? How about a story and pictures of your latest ATM project? If you have anything you'd like to share, email fowler@verizon.net and let us know what you've got!

November Meeting Minutes

By Steve Fedor

The November 5th, 2009 meeting of S*T*A*R Astronomy club began at 8:03 p.m. and was chaired by president Nancy McQuire. There were 103 people in attendance. The unusually large crowd, which consisted of STAR and ASTRA members as well as the general public, was due to the evening's lecture being presented by a Nobel Prize winner. In order to better facilitate the crowd the usual club business was rescheduled to after coffee break.

The evening's lecture "The Discovery of Cosmic Microwave Background Radiation and its Role in Cosmology" was presented by Nobel Prize winner Dr. Robert Wilson.

Dr. Wilson discussed many aspects of his life and career beginning with his grad school days at Cal tech up to the present. As an introduction he discussed the basic principles of the Big Bang Theory. The main subject of his presentation was his days at Bell Labs here in NJ and the circumstances that led to him co-discovering the microwave background radiation in 1964. This discovery later would lead to a Nobel Prize for him and co-discoverer Anro Penzias in 1978. The talk concluded at 9:01 and was followed with Q&A.

At 9:14 Dennis O'Leary, STAR's NASA Ambassador, presented mission updates. Dennis discussed and showed pictures of the LCROSS mission impact crater. He also discussed the testing of the Aries rocket, Mars Reconnaissance orbiter and the Mars Rovers.

After coffee break Frank Loso presented "Object of the Month." This month's beginner object was NGC-7789, an open cluster in Cas. This month's challenge object was NGC-7635, the Bubble Nebula also located in Cas. The meeting was adjourned for coffee break.

At 9:51 the meeting resumed with a greatly diminished crowd for club business.
-Upcoming star parties:

11/24 Mill Lake School
11/13 Watchung Reservation (Steven Siegel)
12/4 Bayonett Farms

Nancy McQuire announced for Randy Walton that the observers guides, handbooks and calendars from the ASTRA group purchase were delayed. She also announced that ASTRA would be having a talk by meteorite hunter Phil Zollner on 11/13.

The meeting was then adjourned.

Are you a S*T*A*R Member?

S*T*A*R is the proud owner of a monstrous 25" Dobsonian Obsession reflector – which members can gain access to!

Meetings are the first Thursday of each month, except July and August, at 8:00 PM at the Monmouth Museum on the Brookdale Community College campus. Meetings generally consist of lectures and discussions by members or guest speakers on a variety of interesting astronomical topics. S*T*A*R is a member of United Astronomy Clubs of New Jersey (UACNJ), the Astronomical League (AL), and the International Dark Sky Association (IDA).

Memberships: ( )Individual....$25 ( ) Family...$35

Name_____

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City_____State___Zip_____

Phone_____

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Make checks payable to: S*T*A*R Astronomy Society, Inc. and mail to P.O. Box 863, Red Bank, NJ 07701

A Cosmic Crash

by Patrick Barry and Dr. Tony Phillips

Two small planets hurtle toward each other at 22,000 miles per hour. They're on a collision course. With unimaginable force, they smash into each other in a flash of light, blasting streams of molten rock far out into space.

This cataclysmic scene has happened countless times in countless solar systems. In fact, scientists think that such collisions could have created Earth's moon, tilted Uranus on its side, set Venus spinning backward, and sheared the crust off Mercury.

But witnessing such a short-lived collision while pointing your telescope in just the right direction would be a tremendous stroke of luck. Well, astronomers using NASA's Spitzer space telescope recently got lucky.

Artist's rendering of cosmic collision involving two objects whose combined mass was at least twice that of our Moon. Discovered using the Spitzer Space Telescope in the planetary system of a star called HD 172555 100 light-years away.

"It's unusual to catch such a collision in the act, that's for sure," said Geoffrey Bryden, A cosmic Crashspitzer_an astronomer specializing in extrasolar planet formation at NASA's Jet Propulsion Laboratory and a member of the science team that made the discovery.

When Bryden and his colleagues pointed Spitzer at a star 100 light-years away called HD 172555, they noticed something strange. Patterns in the spectrum of light coming from nearby the star showed distinctive signs of silicon monoxide gas — huge amounts of it — as well as a kind of volcanic rock called tektite.

It was like discovering the wreckage from a cosmic car crash. The silicon monoxide was produced as the high-speed collision literally vaporized huge volumes of rock, which is made largely of silicon and oxygen. The impact also blasted molten lava far out into space, where it later cooled to form chunks of tektite.

Based on the amount of silicon monoxide and tektites, Bryden's team calculated that the colliding planetary bodies must have had a combined mass more than twice that of Earth's moon. The collision probably happened between 1,000 and 100,000 years ago — a blink of an eye in cosmic terms.

The scientists used the Spitzer space telescope because, unlike normal telescopes, Spitzer detects light at invisible, infrared wavelengths.

"Spitzer wavelengths are the best wavelengths to identify types of rock," Bryden says. "You can pin down which type of rock, dust, or gas you're looking at."

Bryden says the discovery provides further evidence that planet-altering collisions are more common in other star systems than people once thought. The "crash-bang" processes at work in our own solar system may indeed be universal. If so, Spitzer has a front row seat on a truly smashing show.

See Spitzer Space Telescope's brand new Web site at http://spitzer.caltech.edu/. Kids can learn about infrared light and see beautiful Spitzer images by playing the new Spitzer Concentration game at:

http://spaceplace.jpl.nasa.gov/en/kids/spitzer/concentration.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

Cassini Captures Ghostly Dance of Saturn's Northern Lights

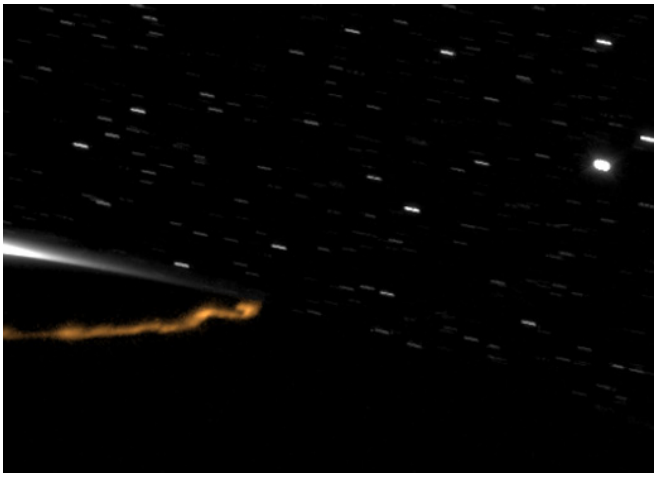
Jia-Rui C. Cook - Jet Propulsion Laboratory, Pasadena, CA
Joe Mason - Space Science Institute, Boulder, CO

PASADENA, Calif. – In the first video showing the auroras above the northern latitudes of Saturn, Cassini has spotted the tallest known "northern lights" in the solar system, flickering in shape and brightness high above the ringed planet.

The new video reveals changes in Saturn's aurora every few minutes, in high resolution, with three dimensions. The images show a previously unseen vertical profile to the auroras, which ripple in the video like tall curtains. These curtains reach more than 1,200 kilometers (750 miles) above the edge of the planet's northern hemisphere.

The new video and still images are online at: http://www.nasa.gov/cassini , http://saturn.jpl.nasa.gov and http://ciclops.org .

Auroras occur on Earth, Jupiter, Saturn and a few other planets, and the new images will help scientists better understand how they are generated.



An aurora, shining high above the northern part of Saturn, moves from the night side to the day side of the planet in this movie recorded by Cassini.Image credit: NASA/JPL/Space Science Institute

"The auroras have put on a dazzling show, shape-shifting rapidly and exposing curtains that we suspected were there, but hadn't seen on Saturn before," said Andrew Ingersoll of the California Institute of Technology in Pasadena, who is a member of the Cassini imaging team that processed the new video. "Seeing these things on another planet helps us understand them a little better when we see them on Earth."

Auroras appear mostly in the high latitudes near a planet's magnetic poles. When charged particles from the magnetosphere -- the magnetic bubble surrounding a planet -- plunge into the planet's upper atmosphere, they cause the atmosphere to glow. The curtain shapes show the paths that these charged particles take as they flow along the lines of the magnetic field between the magnetosphere and the uppermost part of the atmosphere.

The height of the curtains on Saturn exposes a key difference between Saturn's atmosphere and our own, Ingersoll said. While Earth's atmosphere has a lot of oxygen and nitrogen, Saturn's atmosphere is composed primarily of hydrogen. Because hydrogen is very light, the atmosphere and auroras reach far out from Saturn. Earth's auroras tend to flare only about 100 to 500 kilometers (60 to 300 miles) above the surface.

The speed of the auroral changes in the video is comparable to some of those on Earth, but scientists are still working to understand the processes that produce these rapid changes. The height will also help them learn how much energy is required to light up auroras.

"I was wowed when I saw these images and the curtain," said Tamas Gombosi of the University of Michigan in Ann Arbor, who chairs Cassini's magnetosphere and plasma science working group. "Put this together with the other data Cassini has collected on the auroras so far, and you really get a new science."

Ultraviolet and infrared instruments on Cassini have captured images of and data from Saturn's auroras before, but in these latest images, Cassini's narrow-angle camera was able to capture the northern lights in the visible part of the light spectrum, in higher resolution. The movie was assembled from nearly 500 still pictures spanning 81 hours between Oct. 5 and Oct. 8, 2009. Each picture had an exposure time of two or three minutes. The camera shot pictures from the night side of Saturn.

The images were originally obtained in black and white, and the imaging team highlighted the auroras in false-color orange. The oxygen and nitrogen in Earth's upper atmosphere contribute to the colorful flashes of green, red and even purple in our auroras. But scientists are still working to determine the true color of the auroras at Saturn, whose atmosphere lacks those chemicals.

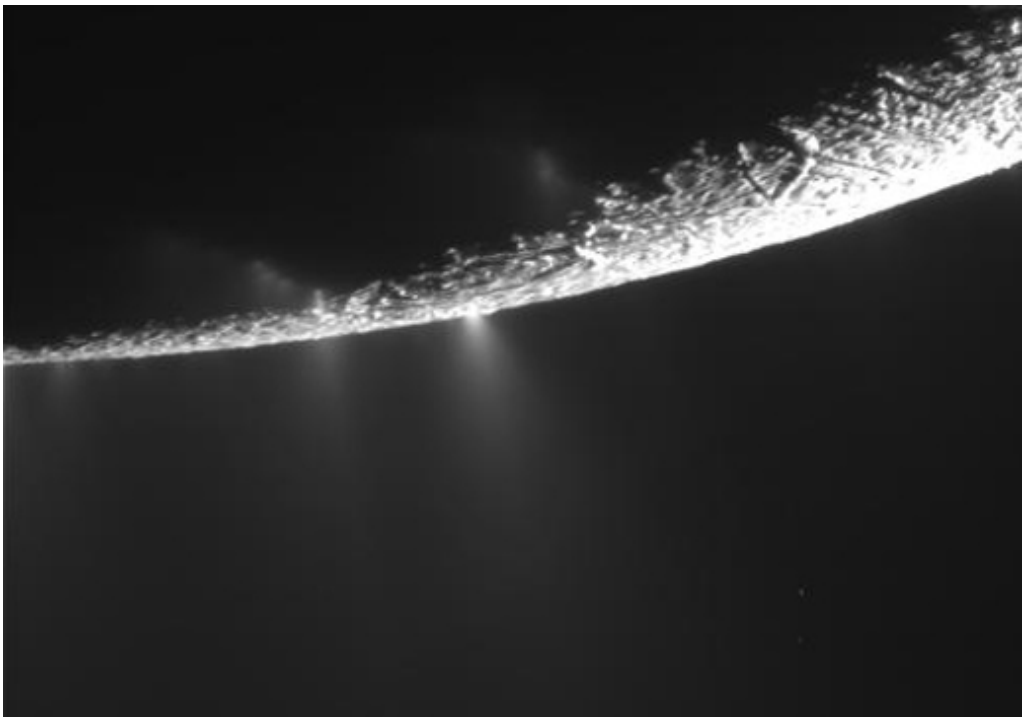
The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency and the Italian Space Agency. The Jet Propulsion Laboratory, a division of the California Institute of Technology in Pasadena, manages the mission for the Science Mission Directorate at NASA Headquarters in Washington. The Cassini orbiter and its two onboard cameras were designed, developed and assembled at JPL. The imaging team is based at the Space Science Institute, Boulder, Colo

In the Eyepiece

Here is a list of objects for this month. This is reproduced from www.skyhound.com with the kind permission of its creator and author of SkyTools Greg Crinklaw.

Object(s)	Class	Con	RA	Dec	Mag
NGC 1501	Planetary Nebula	Camelopardus	04h06m59.4s	+60°55'14"	13.3
Cleopatra's Eye	Planetary Nebula	Eridanus	04h14m15.8s	-12°44'21"	9.6
The California Nebula	Diffuse Nebula	Perseus	04h03m12.0s	+36°22'00"	5.0
NGC 1664	Open Cluster	Auriga	04h51m04.4s	+43°42'04"	7.2
MSH 04-12	Quasar	Eridanus	04h07m48.4s	-12°11'36"	14.8
NGC 1360	Planetary Nebula	Fornax	03h33m14.6s	-25°52'18"	9.6
Crystal Ball	Planetary Nebula	Taurus	04h09m17.0s	+30°46'33"	10.0
Palomar 2	Globular Cluster	Auriga	04h46m06.0s	+31°22'54"	13.0
K 2-1	Planetary Nebula	Auriga	05h07m07.1s	+30°49'18"	13.8
NGC 1624	Open Cluster	Perseus	04h40m25.4s	+50°26'49"	11.8

Coordinates are epoch 2000.0

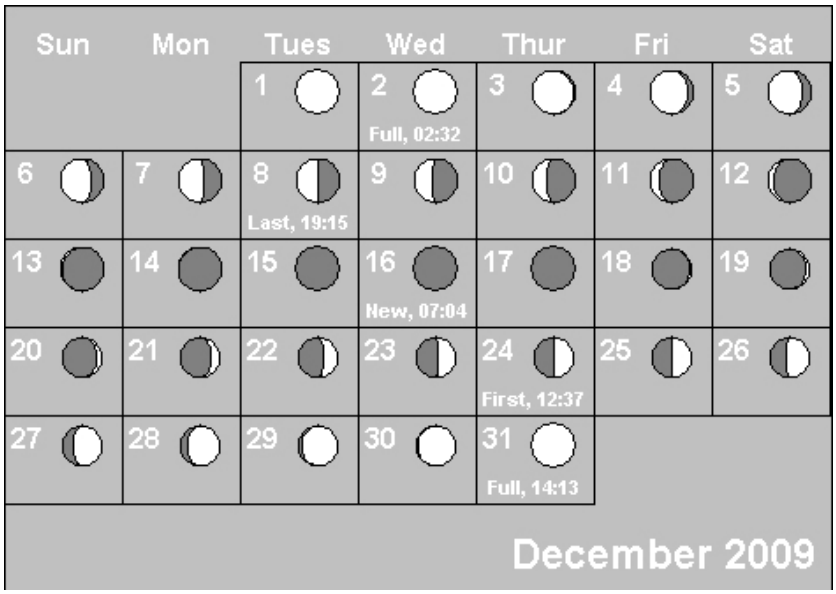


This unprocessed image was captured by NASA's Cassini spacecraft during its Nov. 21, 2009 flyby of Saturn's moon Enceladus. It shows the moon's south polar region, where jets of water vapor and other particles spew from fissures on the surface.

Image credit: NASA/JPL/Space Science Institute

Guides and Calendars

Lunar Phases

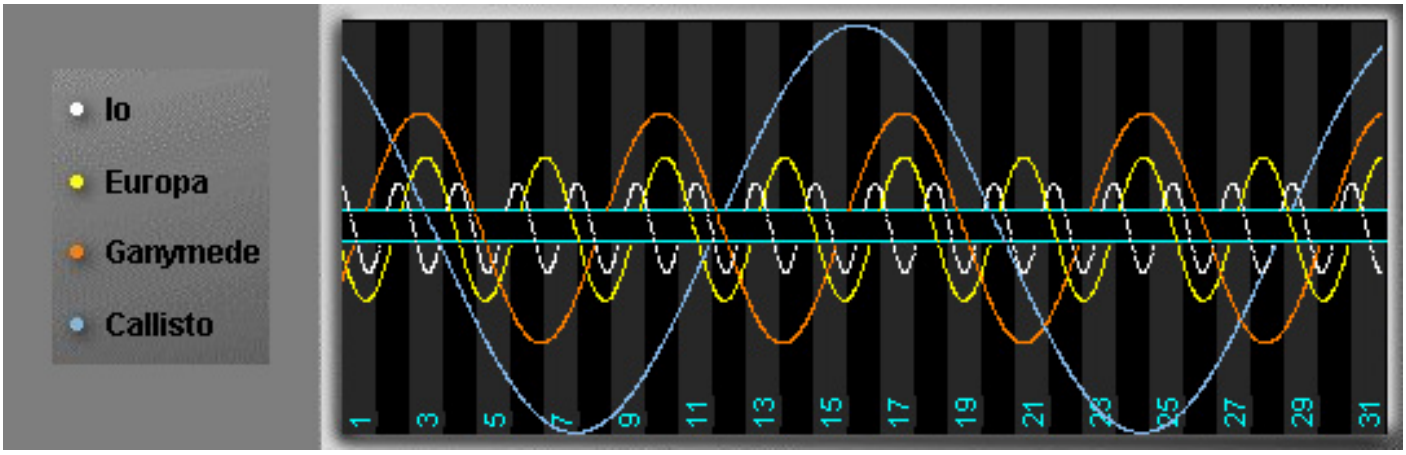


Great Red Spot Transit Times

1	03:28;	13:24;	23:20;
2	09:16;	19:11;	
3	05:07;	15:03;	
4	00:59;	10:55;	20:50;
5	06:46;	16:42;	
6	02:38;	12:34;	22:30;
7	08:26;	18:21;	
8	04:17;	14:13;	
9	00:09;	10:05;	20:00;
10	05:57;	15:52;	
11	01:48;	11:44;	21:40;
12	07:36;	17:31;	
13	03:27;	13:23;	23:19;
14	09:15;	19:11;	
15	05:07;	15:02;	
16	00:58;	10:54;	20:50;
17	06:46;	16:41;	
18	02:38;	12:33;	22:29;
19	08:25;	18:21;	
20	04:17;	14:12;	
21	00:09;	10:04;	20:00;
22	05:56;	15:52;	
23	01:48;	11:43;	21:39;
24	07:35;	17:31;	
25	03:27;	13:23;	23:18;
26	09:14;	19:10;	
27	05:06;	15:02;	
28	00:58;	10:54;	20:49;
29	06:45;	16:41;	
30	02:37;	12:33;	22:29;
31	08:25;	18:20;	

Jupiter Moon Calendar

Here is a graphical depiction of the visible moons of Jupiter for the month of September 2009.



December 2009 Celestial Events

supplied by J. Randolph Walton (Randy)

Day	Date	Time (EDT)	Event
Tue	1	06:00	**Moon 0.1 deg. S of Pleiades (M45)**
Wed	2	02:30	**Full Moon**
		07:34	Moon Set
Sat	5	01:12	Saturn Rises
		06:22	Venus Rises
		17:30	Mercury Sets
		20:27	Moon Rise
		21:20	Mars Rises
		21:50	Jupiter Sets
Tue	8	11:49	Moon Set
		19:13	**Last Quarter Moon**
Sat	12	00:45	Saturn Rises
		03:28	Moon Rise
		06:40	Venus Rises
		07:13	Sunrise
		17:47	Mercury Sets
		20:57	Mars Rises
		21:25	Jupiter Sets
Mon	14	00:00	**Geminid meteors (ZHR=120)**
Wed	16	07:02	**New Moon**
		07:32	Moon Rise
Sat	19	00:20	Saturn Rises
		06:53	Venus Rises
		18:00	Mercury Sets
		19:40	Moon Set
		20:30	Mars Rises
		21:05	Jupiter Sets
Sun	20	20:34	**Double shadow transit on Jupiter**
		20:40	Moon Set
Mon	21	12:47	**Winter Solstice**
Tue	22	09:00	Ursid meteors (ZHR=10)
Thu	24	11:30	Moon Rise
		12:36	**First Quarter Moon**
		18:00	**Lunar Straight Wall visible**
Sat	26	07:05	Venus Rises
		07:21	Sunrise
		12:22	Moon Rise
		17:58	Mercury Sets
		20:00	Mars Rises
		20:45	Jupiter Sets
		23:43	Saturn Rises
Mon	28	21:00	**Moon 0.1 deg. N of Pleiades (M45)**
Thu	31	13:52	Start minor Partial Lunar Eclipse
		14:13	**Full Moon**
		14:52	End minor Partial Lunar Eclipse
		16:44	Moon Rise