

December 2008

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Edited by: Ahmad & Hanna Jrad



December's Meeting

The next meeting of S*T*A*R will be on Thursday, December 4. Our program will be "**Low Energy Routes to the Moon and Beyond**" by Dr. Edward Belbruno of Innovative Orbital Design, Inc., Princeton University. All are welcome. The meeting will begin promptly at 8:00pm at the Monmouth Museum on the campus of Brookdale Community College.

Editor's Corner

Thanks to Gavin Warnes, Rob Nunn, Steve Fedor, Allen Malsbury, Ernie Rossi, & Randy Walton for contributing to this month's Spectrogram.

Reminder to pay membership dues \$25/individual, \$35/family. Donations are appreciated. Make payments to Paul Nadolny at the December 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 send articles and contributions for the next *Spectrogram* by **December 25**. Please email to stargaze07@verizon.net.



Calendar

Sep 4, 2008 – "**Past Saturn and 7 More Years to Pluto:**" New Horizons Mission, Michael Lewis, NASA Solar System Ambassador

Oct 2, 2008 – "**An Idea That Would Not Die**" by Robert Zimmerman

Nov 6, 2008 – "**TBD**"

Dec 4, 2008 – "**Low Energy Routes to the Moon and Beyond**" by Dr. Edward Belbruno, Innovative Orbital Design, Inc., Princeton University

Jan 8, 2009 – "**Celestial Navigation**" by Justin Dimmell, Island School, Eleuthera, Bahamas

Feb 5, 2009 - "**TBD**"

Mar 5, 2009 - "**Solar Telescopes**" by Alan Traino of Lunt Solar Systems

Apr 2, 2009 – "**TBD**"

May 7, 2009 – "**TBD**"

Jun 4, 2009 – AGM



President's Corner

By Gavin Warnes

Thanks to all of you who attended the last meeting. Or those of you who missed it we had a fun evening touring the museum exhibit and Dennis gave planetarium shows in the Starlab.

I'd like to encourage you all to do more observing. Not only does it help you to learn the sky, it's a great social activity. It's also the thing that new members of the club most want to do. As a club we have plenty of tools available to you from observing lists, a discussion board to coordinate activities and an 8" and 25" scope or people to use. The ATM group has also been working hard to re-furbish the 13" scope we acquired last year. They have put the base on a drastic diet (see pictures below) and are working on a new primary cell and better spider. That's to them for their efforts! Next we will build the 8" f/6 dob we have all the components for.



To this end I'm calling for a few members to volunteer to form an observing committee. Your role would be to coordinate an observing event once per month and invite new members to them. These need not be in far flung places – local nights are just fine. You don't need to be a super experienced observer – enthusiasm and commitment is all that is needed. If you would like to volunteer, please email me at gavin.warnes@gmail.com.

For as long as I can remember Charles Kirby had made the coffee at the meetings. Charles would like to pass the cup to the next S*T*A*R barista. Thank you very much to Charles for your dedication. Charles arrives about 30 minutes before the meeting to put the coffee on and brings cookies. If you would be willing to take over from Charles, please email me.

One final request. *Please can I ask those of you that have not done so to pay your dues in December either at the meeting or by mailing a check.* This is when your membership expires according to the club bylaws. Thanks!

Keep looking up!

Gavin

November Meeting Minutes

By Rob Nunn on behalf of Steve Fedor

The November meeting of S*T*A*R Astronomy Club began at 8:02 p.m. on 11/6/2008. The meeting was attended by 34 people. President Gavin Warnes chaired the meeting and began by welcoming six first-time attendees.

The program for the night consisted of two parts: a tour of Monmouth Museum's exhibit concerning space exploration, and a demonstration of a portable planetarium. Since the two events took place outside the meeting room, announcements were made before the beginning of the program:

Randy Walton noted that Ocean County Mall will hold a special event on November 23 to benefit the "Save the Planetarium" fund. The event will include family entertainment and food samples.

Steve Lewis informed the meeting that he is donating a binocular mount to the club. The mount includes a mirror that permits easier observing of overhead objects. He will keep the mount at his house for club members to borrow.

Dennis O'Leary asked for members to help with a star party for the Mill Lake School on November 20. About 160 students, together with parents are expected. Dennis also noted that 2009 will be the International year of Astronomy in recognition of Galileo's first use of a telescope to observe the night sky. There will be a link on the club web site to a site providing information.

Treasurer Rob Nunn noted that time is running out for payment of dues for the year, and that about 30 current members have not yet paid.

Steve Rich recommended a visit to the museum at the Green Bank, West Virginia radio telescope site.

At 8:20 the meeting split into two groups to tour the two exhibits.

Maureen, on the staff of the museum, led a tour of the museum's exhibit on space exploration. The exhibit included photographs of the control center for the early manned space missions, and a model representing the lunar

module that made landings on the moon. There was information about planets, together with a demonstration of the variation of the weight of an object between planets, and a piece of a meteorite that visitors can touch. Finally there was a display of types of objects that are taken into space on manned missions (such as duct tape and special toothpaste), and objects that must be left behind.

Dennis O’Leary gave a demonstration of the portable planetarium, which was set up inside the museum. The planetarium is inflated with a fan, and has room to hold a dozen people comfortably. Dennis explained how the projector works, showed how to set latitude and time, and showed the interchangeable cylinders that provide a variety of views. The projection of the night sky was quite effective – constellations were easy to identify. One cylinder provided a view of the constellations perceived by Native Americans, which have some remarkable correlations with those of Greek origin.

Because the meeting was split into two groups, there was no 50/50 drawing.

The meeting ended at 9:50.

What Happened to Comet Holmes?

By Dr. Tony Phillips

One year after Comet 17P/Holmes shocked onlookers by exploding in the night sky, researchers are beginning to understand what happened.

“We believe that a cavern full of ice, located as much as 100 meters beneath the crust of the comet’s nucleus, underwent a change of phase,” says Bill Reach of NASA’s Spitzer Science Center at the California Institute of Technology. “Amorphous ice turned into crystalline ice” and, in the transition, released enough heat to cause Holmes to blow its top.

Anyone watching the sky in October 2007 will remember how the comet brightened a million-fold to naked-eye

visibility. It looked more like a planet than a comet—strangely spherical and utterly lacking a tail. By November 2007, the expanding dust cloud was larger than Jupiter itself, and people were noticing it from brightly-lit cities.

Knowing that infrared telescopes are particularly sensitive to the warm glow of comet dust, Reach and colleague Jeremie Vaubaillon, also of Caltech, applied for observing time on the Spitzer Space Telescope—and they got it. “We used Spitzer to observe Comet Holmes in November and again in February and March 2008,” says Reach.

The infrared glow of the expanding dust cloud told the investigators how much mass was involved and how fast the material was moving. “The energy of the blast was about 10^{14} joules and the total mass was of order 10^{10} kg.” In other words, Holmes exploded like 24 kilotons of TNT and ejected 10 million metric tons of dust and gas into space.

These astonishing numbers are best explained by a subterranean cavern of phase-changing ice, Reach believes. “The mass and energy are in the right ballpark,” he says, and it also explains why Comet Holmes is a “repeat exploder.”

Another explosion was observed in 1892. It was a lesser blast than the 2007 event, but enough to attract the attention

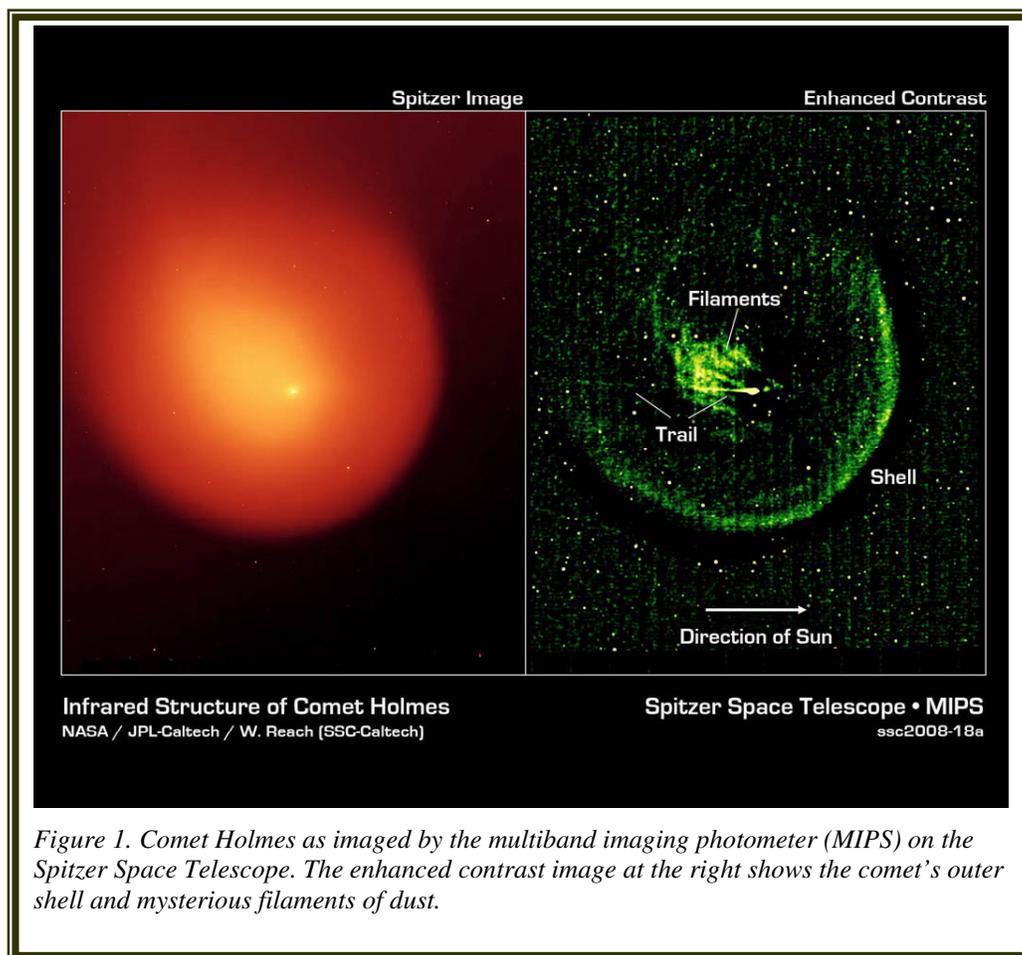


Figure 1. Comet Holmes as imaged by the multiband imaging photometer (MIPS) on the Spitzer Space Telescope. The enhanced contrast image at the right shows the comet’s outer shell and mysterious filaments of dust.

of American astronomer Edwin Holmes, who discovered the comet when it suddenly brightened. Two explosions (1892, 2007) would require two caverns. That's no problem because comets are notoriously porous and lumpy. In fact, there are probably more than two caverns, which would mean Comet Holmes is poised to explode again.

When?

"The astronomer who can answer that question will be famous!" laughs Vaubaillon.

"No one knows what triggered the phase change," says Reach. He speculates that maybe a comet-quake sent seismic waves echoing through the comet's caverns, compressing the ice and changing its form. Or a meteoroid might have penetrated the comet's crust and set events in motion that way. "It's still a mystery."

But not as much as it used to be.

See more Spitzer images of comets and other heavenly objects at www.spitzer.caltech.edu. Kids and grownups can challenge their spatial reasoning powers by solving Spitzer infrared "Slider" puzzles at <http://spaceplace.nasa.gov/en/kids/spitzer/slyder>.

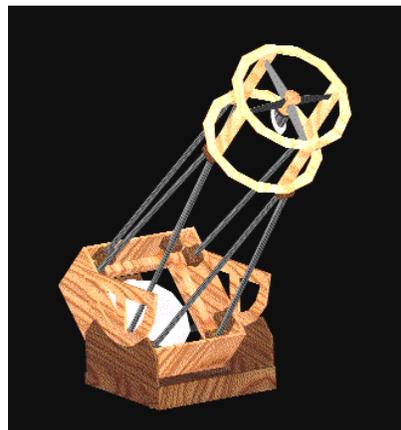
This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

Summer of 2008 – Patio Project

By Allen Malsbury

During the winter of 2008, while looking for a small diameter glass blank to make my own mirror, I lucked into a Meade DS-16 mirror set, a 16" primary and a 4" secondary pair. The first owner of had used the DS-16 for years. It was permanently mounted outside, in his back yard, and was stored under a tarp. It was just too heavy to bring inside. After years of enjoyment, the sonotube® construction fell prey to the humid conditions under the tarp near the Barnegat Bay. The original owner salvaged the 16" primary, the 4" secondary and the 1 ¼" rack & pinion focuser. He carefully boxed them up and stored them in his garage under his work bench. Many years later, he saw my post asking if anyone had a glass blank, and luckily for me, thought maybe I would like those old parts he had stored in his garage for years. (Believe or not, I was reluctant to begin such an ambitious first telescope project) He showed me his own 13" home made truss Dob. He even let me take pictures of it so I could copy it for a 16" version. I decided to buy the mirror pair and give building one a try. When would I

get another chance to own a large aperture telescope for a price of a small one? Besides, my generation grew up believing you can build anything out of plywood.



Before making the first cut, I started preparing some detailed sketches. As I developed design details I posted them on the STAR forum. I got lots of feedback. After several months and dozen's of revisions, I finished the overall arrangement as shown in the 3d rendering.

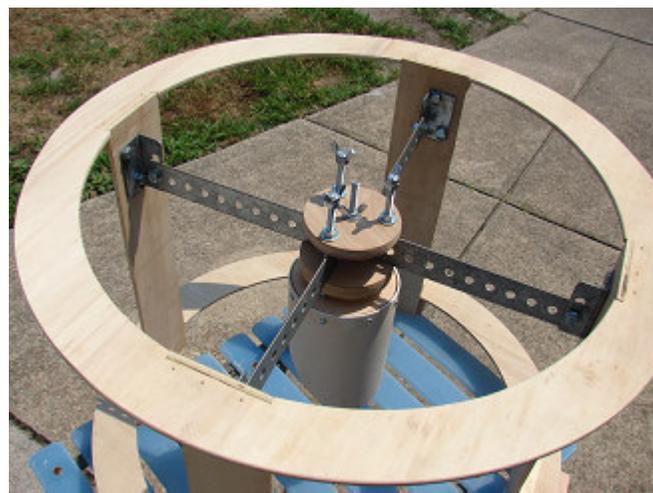
It was time to start cutting wood. Just in time for the summer of 2008. During the last ATM meeting before the summer break, Andy made the first plywood cuts for me. He cut the top rings for the secondary cage using his plunge router. He also cut out the front, back and sides for the mirror box using his table saw. Later that week I glued and finish nailed the mirror box together on my patio. My patio became my workshop. I assembled the top cage. It looked too flexible at first, but stiffened up later as I added the focuser, the Telrad and RACI finder mounting boards.



Next the cell was fabricated. A six point support cell was constructed using aluminum channels and 1/2" plywood support bars. The ends of the 1/2" plywood support bars were linked together using 1/4" plywood spars to keep the six support points evenly spaced. Primary collimation points were located at the ends of the tee bar. (The tee bar cell design was borrowed from Mike's web site. He used something similar to this in his 13" string scope.) Primary collimation is made from the top side and inside the mirror box. Hanging the cell, reduced the clearance needed under the mirror box, but did make the mirror box wider. A trade off needed for a lower eyepiece. The final feature of the cell is an adjustable support strap that carries the weight of the 26 lb mirror in off zenith orientations.



the next. I was careful to keep them in pairs to assure a good fit after final assembly.



I built the azimuth box and altitude bearings using 1/2" and 3/4" plywood. Three plywood feet, cut with a hole saw, were glued and screwed to a triangular 1/2" plywood ground board. Teflon slider bearings were placed atop the ground board at each of the three feet locations. The ground board was centered on the bottom of the azimuth box using a lazy-susan bearing. This bearing is used only for centering. The load of the scope passes through the sliders into the feet, not through the lazy-susan bearing.

Making the truss tube clamps was the most challenging woodworking task and could not be completed on the patio with hand held tools. The clamps were fashioned from a 2x4. Holes were drilled using a drill press and spade bit, after which the blocks were ripped into halves using a table-saw to form the clamp like shapes. The photo shows them before sanding and finishing. Since they are all hand made each pair was a little different that

I couldn't avoid building the secondary holder, spider and topside collimation unit any longer. It took a long session on the patio, in the hot summer sun. To my surprise, I had a working topside unit when done. It was constructed of scrap pvc pipe, left over plywood, 1/4-20 all thread, 4-tee nuts, a short length of steel strap and some hardware store nuts/bolts. I even used some parts from my garage door installation days.

I cut three identical plywood circles and center drilled all three together. The top two were then drilled with three additional holes for the three collimation all-thread adjustment bolts. I enlarged the hole on the underside of the bottom circle creating a spherical countersunk area

that accepted a semi-spherical shaped nut on its underside. (This is inside the pvc mirror holder.) This created a ball-joint-like connection to the central shaft and provides the x-y pivot needed for top side collimation. I then countersunk three spots on the top side of the bottom plywood circle. These countersunk areas each accepted one of three all-thread collimation rods and provide a socket for each rod to push against. The pvc mirror holder was screwed to the OD of the bottom plywood circle. The top two plywood circles have two functions. Firstly they clamp the two right angled sides of the spider together forming a stiff beam system. In addition, the middle plywood circle has tee nuts on its underside. The three collimation all-thread bolts are threaded through these tee nuts and push down on the bottom circle at each socket described above. This forms a stiff system of opposing forces. The center shaft is always in tension while the three collimation rods are always in compression. The central unit is supported using a pair of right angle beams made of steel strap available at the local hardware store. The steel straps were bent at right angles, over the edge of the patio, to form two "V" shaped supports beams. The end of each "V" was bolted to the inside of the plywood slats of the upper cage assembly using garage door right angle brackets I had in the drawer. I painted all the metal and pvc parts flat black. This home made system actually works well. I added a used JMI focuser, on its own mounting board, with a crude finder made of cardboard for first light on August 6, 2008.

Later I added a Telrad, a 9x50 RACI (Right Angle Correct Image) finder, a secondary cage liner and a home



made black fabric truss section cover.

This was a very rewarding project. I was relieved it actually worked out OK. Best of all it was a group effort. The following folks had input into this scope: Gene (ASTRA), Mike, Mitchell, Gordon, Gavin, Glen, Phil (ASTRA), Andy, Art, Marc, Bill N., Dan, Steve F., David G, Gary F., Jim E., Steve W., John H., Ernie, D. Nelson, not counting family members.

The 16" Meade mirror set, that served its previous owner well for so many years, has a new platform and the potential for many more years of service and plenty more good views.

It is possible to build almost anything out of plywood with a little help from your friends.



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 campus of Brookdale Community College. Meetings generally consist of lectures and discussion 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 _____

Address _____

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



2008 December Celestial Events

Supplied by J. Randolph Walton (Randy)

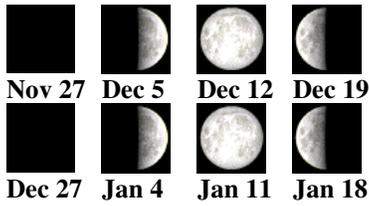
Day	Date	Time (EDT)	Event
Mon	1	16:33	Moon near Venus and Jupiter
		19:35	Venus Sets, Jupiter Sets
Fri	5	12:06	Moon Rise
		16:26	First Quarter Moon
Sat	6	00:05	Saturn Rises
		07:08	Sunrise
		12:29	Moon Rise
		16:35	Sunset
		19:20	Jupiter Sets
		19:43	Venus Sets
Thu	11	03:00	Moon 0.7 Deg. N of Pleiades (M45)
Fri	12	11:37	Full Moon
		16:26	Moon Rise
Sat	13	16:35	Sunset
		17:07	Mercury Sets
		17:39	Moon Rise
		18:00	Geminid meteors peak (ZHR=120)
		19:00	Jupiter Sets
		19:57	Venus Sets
		23:35	Saturn Rises
Fri	19	05:29	Last Quarter Moon
		11:49	Moon Sets
Sat	20	07:05	Mars Rises
		07:18	Sunrise
		12:12	Moon Sets
		16:38	Sunset
		17:30	Mercury Sets
		18:40	Jupiter Sets
		20:12	Venus Sets
		23:10	Saturn Rises
Sun	21	07:04	Winter Solstice
Mon	22	03:00	Ursid meteors peak (ZHR=10)
Sat	27	07:00	Mars Rises
		07:21	Sunrise
		07:22	New Moon
		16:42	Sunset
		16:46	Moon Sets
		17:55	Mercury Sets
		18:23	Jupiter Sets
		20:25	Venus Sets
		22:45	Saturn Rises
Wed	31	18:11	Jupiter Sets, Mercury Sets
Sat	Jan 3	06:55	Mars Rises
		07:22	Sunrise
		08:00	Quadrantid meteors peak (ZHR=120)
		10:55	Moon Rise
		16:47	Sunset
		18:03	Jupiter Sets
		18:20	Mercury Sets
		20:37	Venus Sets
		22:20	Saturn Rises

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
Iota Cas	Multiple Star	Cassiopeia	02h29m04.0s	+67°24'09"	4.5
6 Tri	Multiple Star	Triangulum	02h12m22.3s	+30°18'11"	4.9
Almaak	Multiple Star	Andromeda	02h03m53.9s	+42°19'47"	2.1
h and Chi Perseus	Open Clusters	Perseus	02h19m01.8s	+57°08'47"	4.3
NGC 1097	Galaxy	Fornax	02h46m18.9s	-30°16'21"	10.2
M 103	Open Cluster	Cassiopeia	01h33m13.8s	+60°42'23"	6.9
Little Dumbbell (M76)	Planetary Nebula	Perseus	01h42m19.3s	+51°34'30"	12.2
NGC 891	Galaxy	Andromeda	02h22m32.9s	+42°20'46"	10.8
NGC 1023	Galaxy	Perseus	02h40m27.7s	+39°04'04"	10.2
AGC 347	Galaxy Group	Andromeda	02h25m48.0s	+41°52'00"	--
IC 1747	Planetary Nebula	Cassiopeia	01h57m35.8s	+63°19'19"	13.6
NGC 470 & 474	Interacting Galaxy Pair	Pisces	01h19m44.9s	+03°24'35"	12.6
NGC 925	Galaxy	Triangulum	02h27m16.8s	+33°34'45"	10.9
NGC 784	Galaxy	Triangulum	02h01m16.8s	+28°50'14"	12.5
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

Moon Phases

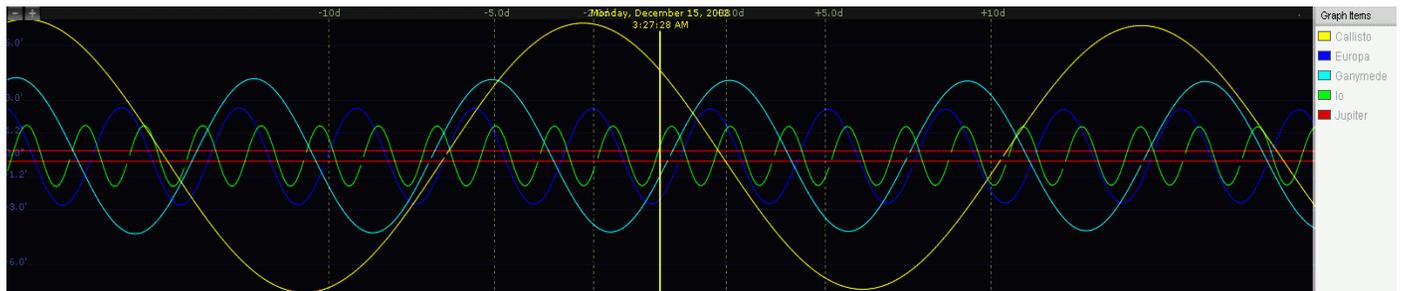


AstroPuzzle Solution for November 2008

1	2	3	4	5	6	7	8	9	10	11	12	13	
P	S	I	S	A	D	R	U	N	P	A	C	K	
14	L	T	D	O	B	E	Y	S	O	A	K	U	P
17	E	Y	E	Y	A	L	E	E	L	N	A	T	H
20	A	L	A	M	A	C	H	R	A	D			
23	T	U	T	U	K	I	W	I	N	A	V	A	L
	31	S	E	R	F	I	N	C	A	G	O	G	
40	41	42	I	S	O	N	O	A	T	C	A	K	E
46	I	T	E	M	W	E	I	D	O	C			
50	S	O	L	N	O	R	P	O	E	M			
55	S	P	I	C	A	N	E	A	R	S	L	A	M
67	68	69	F	A	I	R	H	U	G	E	P	E	G
72	C	R	A	T	E	R	U	S	E	S	S	U	N
75	S	I	R	I	U	S	E	E	L	S	E	P	A

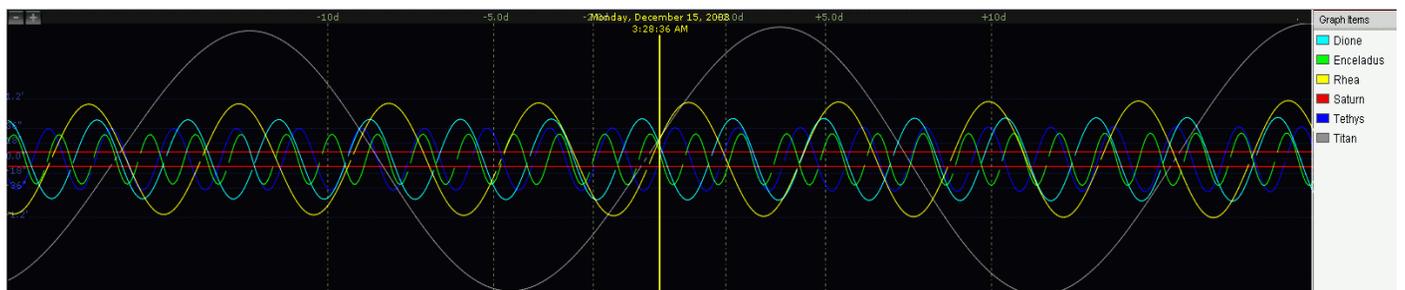
Jupiter Moon Calendar

Here is a graphical depiction of the visible moons of Jupiter for the month of December 2008.

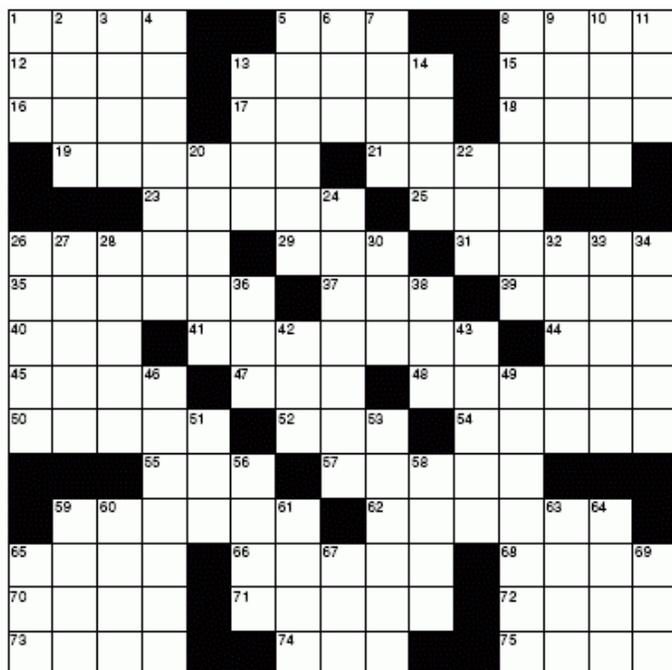


Saturn Moon Calendar

Here is a graphical depiction of the visible moons of Saturn for the month of December 2008.



AstroPuzzle - December 2008



ACROSS

- 1 Grasp
 5 Old-fashioned Dads
 8 Breaking sound
 12 Unclothed
 13 Glisten
 15 Top of the head
 16 Consumer
 17 Sound receiver
 18 On top
 19 Island
 21 Indian drum
 23 Sports
 25 *A negatively charged lepton, similar to an electron or a muon but much more massive and very short-lived.*
 26 Peaks
 29 Change color
 31 Dirt clumps
 35 Sounds
 37 Also
 39 Opera solo
 40 Still
 41 One of many layers
 44 Flying rodent

- 45 Asian dress
 47 Japanese money
 48 Capital of Saskatchewan
 50 High School dance
 52 Duck
 54 *Second largest moon in the solar system.*
 55 ___ of the covenant
 57 Fake chocolate
 59 Meat stew
 62 *A moon of an adjacent planet named after the greek God of fear.*
 65 Cab
 66 Beneficiary
 68 All right
 70 Against
 71 *The dark inner part of a sunspot, or shadow.*
 72 Goad
 73 Tactic
 74 Bight
 75 Talk back

DOWN

- 1 African antelope
 2 Corrode, like metal

- 3 Whim
 4 *the point at which an object in orbit around the Earth makes its closest approach to the Earth.*
 5 *An object moving around a star.*
 6 Relief
 7 Irritation
 8 Omelet flipper
 9 World organization
 10 *The smallest particle of any element.*
 11 High-school club
 13 Weight unit
 14 Blare
 20 Bees' cousins
 22 IBM Competitor
 24 Fiendish
 26 Chasm
 27 Shoe projection
 28 Railroad track
 30 Negative
 32 *The path one object takes around another.*
 33 Artemis
 34 Devil
 36 Eye infection
 38 Possessive pronoun
 42 Scarlet
 43 Ditto (2 wds.)
 46 Ideate
 49 *When the Moon is more than half full, but less than completely full.*
 51 Professional
 53 Very thin
 56 Antelope
 58 *The second largest moon of Saturn.*
 59 Prego's competition
 60 *An imaginary straight line on which an object rotates.*
 61 Grave
 63 Gumbo
 64 Droops
 65 Sticky black substance
 67 BB association
 69 Yea