

Martian Chronicles

Volume 24 Issue 9

September, 2005

Deep Space Mysteries 2005 Calendar on Sale.

Price \$6.00

Membership Dues

Dues are \$15.00 for single membership and \$20.00 for family membership.

See Mildred Simpson, Treasure for both calendar and membership dues.

Inside this issue:

<i>Minutes of August's Meeting</i>	2
<i>From the Keeper of the Frog Scope</i>	2
<i>NASA Space Place</i>	3
<i>Constellation of the Month</i>	4
<i>Where are They Now</i>	5
<i>Calendar</i>	5

Up Coming Club Events

September 2005

9th: M.A.R.S Club Meeting

Program: Update on the progress of the new Planetarium at MOSI.
by : Alan Peche, Director of Public Programs, MOSI

10th: MOSI SkyWatch

8:00 pm at MOSI if you want to know how the weather is on Sky watch Saturdays e-mail: Rocky Roderback at y00per@gate.net

October 2005

8th MOSI SkyWatch

14th M.A.R.S. Club meeting

Program: TBA

Planet Mars Public Observations: TBA



Astronomy Day 2006

Saturday, May, 6

Memberships

Important: All memberships for this year have now expired. The new year begins in September. Please plan on attending the September meeting and renewing your membership. We will also be updating all personal information

Night Sky Network

"Astronomy clubs bringing the wonders of the universe to the public"



Minutes of the August 2005 Meeting

Program was a question and answer session and open discussion. Dick Gage then took the club on a night tour of the sky. 21 members and guests were present.

Old Business

Star Party—no new information.

Club Shirts—Jimmy is still working on getting the information.

Astronomical League—Mildred Simpson provided information of the AL. Dennis Farr made the motion to join AL at the 3 month trial offer. Carolyn Olivero Seconded. Motion Passed.

Meeting adjourned at 9:00 pm.

Mildred Simpson also had the new 2006 Calendars for sale.

From the Keeper of the Frog Scope

By Frances Ferguson, President

I want to apologize to both Jimmy and the people who attended the last meeting. Jimmy was not aware I had placed him on the program and was not prepared for a presentation. I want to thank everyone who took part in the open discussion and question and answer session. I think the knowledge that is possessed by our members is awesome.

Dick Gage did a walk through of the night sky to round out the program.

Did you notice the new MARS club emblem. Jimmy Thomas has worked hard on the development of the cleaner logo to be used on shirts etc. He has also contacted John Simpson to get more information on the production cost.

Yes, here I go again. It is time to start thinking about serving as a club officer. Elections are coming up. I will be asking for names during the October meeting and I hope we are able to send out ballots at the November meeting so we can announce the New Officers at the December Christmas Party.

Mars is Coming

MOSI will be needing help with additional SkyWatch viewing sessions in October. For those members who help last time Mars came around you know how busy the telescopes were and members even helped with crowd control and providing accurate information. More information will be coming soon on dates, times and locations. This is a good opportunity to earn volunteer hours.

Joe Carr's Donations Continue

Joe Carr has generously donated many more items for our Club library. These also include door prizes and free handouts for our Astronomy Day Celebration.



Improbable Bulls-Eye

by Dr. Tony Phillips

Picture this: Eighty-eight million miles from Earth, a robot spacecraft plunges into a billowing cloud almost as wide as the planet Jupiter. It looks around. Somewhere in there, among jets of gas and dust, is an icy nugget invisible to telescopes on Earth—a 23,000 mph moving target.

The ship glides deeper into the cloud and jettisons its cargo, the “impactor.” Bulls-eye! A blinding flash, a perfect strike.

As incredible as it sounds, this really happened on the 4th of July, 2005. Gliding through the vast atmosphere of Comet Tempel 1, NASA’s Deep Impact spacecraft pinpointed the comet’s 3x7-mile wide nucleus and hit it with an 820-lb copper impactor. The resulting explosion gave scientists their first look beneath the crust of a comet.

That’s navigation.

Credit the JPL navigation team. By sending commands from Earth, they guided Deep Impact within sight of the comet’s core. But even greater precision would be needed to strike the comet’s spinning, oddly-shaped nucleus.

On July 3rd, a day before the strike, Deep Impact released the impactor. No dumb hunk of metal, the impactor was a spaceship in its own right, with its own camera, thrusters and computer brain. Most important of all, it had “AutoNav.”

AutoNav, short for *Autonomous Navigation*, is a computer program full of artificial intelligence. It uses a camera to see and thrusters to steer—no humans required. Keeping its “eye” on the target, AutoNav guided the impactor directly into the nucleus.

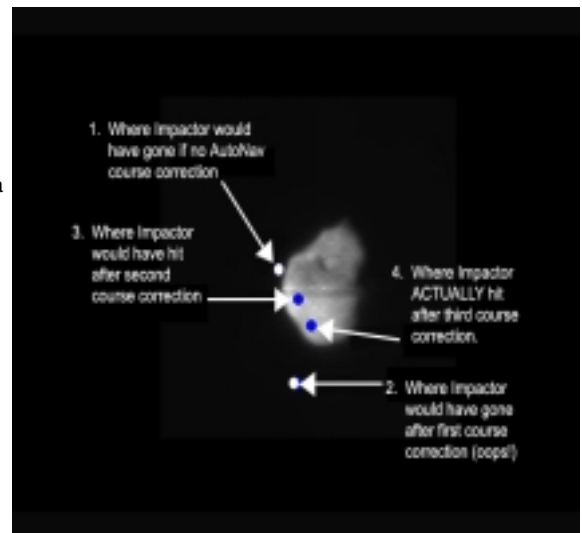
The system was developed and tested on another “Deep” spacecraft: Deep Space 1, which flew to asteroid Braille in 1999 and Comet Borrelly in 2001. The mission of Deep Space 1 was to try out a dozen new technologies, among them an ion propulsion drive, advanced solar panels and AutoNav. AutoNav worked so well it was eventually installed on Deep Impact.

“Without AutoNav, the impactor would have completely missed the nucleus,” says JPL’s Ed Riedel, who led the development of AutoNav on Deep Space 1 and helped colleague Dan Kubitschek implement it on Deep Impact.

En route to the nucleus, AutoNav “executed three maneuvers to keep the impactor on course: 90, 35, and 12.5 minutes before impact,” says Riedel. The nearest human navigators were 14 light-minutes away (round trip) on Earth, too far and too slow to make those critical last-minute changes.

Having proved itself with comets, AutoNav is ready for new challenges: moons, planets, asteroids ... wherever NASA needs an improbable bulls-eye.

Dr. Marc Rayman, project manager for Deep Space 1, describes the validation performance of AutoNav in his mission log at <http://nmp.nasa.gov/ds1/arch/mrlog13.html> (also check [mrlog24.html](http://nmp.nasa.gov/ds1/arch/mrlog24.html) and the two following). Also, for junior astronomers, the Deep Impact mission is described at <http://spaceplace.nasa.gov/en/kids/deepimpact/deepimpact.shtml>



Comet Tempel 1, as seen by the Deep Impact impactor’s camera. Three last-minute AutoNav-controlled impact correction maneuvers enabled the Impactor to hit the bulls-eye.

CONSTELLATION OF THE MONTH

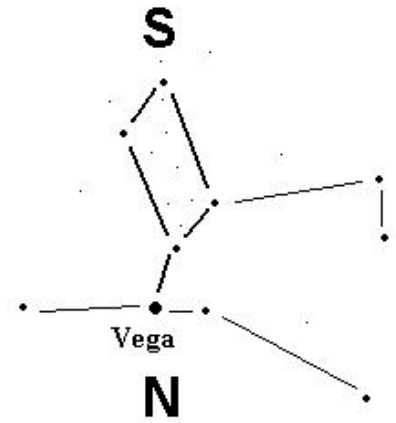
by Craig MacDougal

Lyra

To this point in our monthly excursions through the heavens, we have been looking for relatively big constellations. This is because these are the most obvious star patterns in the sky. One could argue that if they weren't so obvious, the ancients would have divided them into smaller constellations. One can argue many things however, and I find that I have digressed before I've even gotten started.....

This month we have an obvious constellation that is pretty small. It's easy to find simply because the brightest star in this constellation is the fourth brightest star that can be seen from Tampa, and the fifth brightest in the entire sky. The constellation is **LYRA** (LIE-ra), and its bright beacon is **VEGA** (VEE-ga. That's right Chevrolet, got it wrong, but few astronomers I know are very picky about how you pronounce it.) I said Lyra is small,

but I can hear you asking "How small is it?" Well, if you hold your arm stretched to the sky, palm of your hand facing up, and fingers together, you can cover up the main asterism of Lyra. Go out at 9:30, and if you can see any stars at all, face north and look straight up, and just a bit to your left (which is west). There you will find a very bright blueish-white star. It is the brightest star around that part of the sky. It is a tad dimmer than our friend Arcturus (remember Arcturus?) which is now low in the west. Compare the color of Vega to Arcturus, and you will get a good example of the range of star colors. Just to the south of Vega you will see a neat parallelogram of stars. Lyra represents a lyre, which is a small harp. This harp has a place in the sky because it was part of one of the most famous of the Greek legends. Although it was invented by Hermes, he gave it to Orpheus, by far the best musician in the land. Orpheus was able to charm trees to grow where he wanted, and to change the course of streams by playing this lyre. He went with Jason and the Argonauts on their quest, and saved them from the songs of the Sirens with his own music. Orpheus was married to Eurydice, a most beautiful Nymph. When she died of a snake-bite, Orpheus was heartbroken. He went to the Underworld to ask to have her restored. He played his lyre and charmed Hades, the big cheese of the Underworld. Hades said that he could have her back as long as he walked back up to daylight without looking back to see if she was behind him. Orpheus did OK until he just reached the daylight. He then turned back and saw her just long enough to watch her disappear. He was then inconsolable. He just sat on rocks and sang sad songs. Many ladies of the land offered to help him get over his loss, but he ignored them all. Thoroughly annoyed at this, the ladies ganged up and stoned him to death. Then, he finally joined Eurydice in the Underworld, and his lyre was placed in the sky. If you have some binoculars at hand, start at Vega and go east just a little ways. You should come across an obvious pair of stars. They are almost exactly the same magnitude, and aligned north-south, more or less. In some binoculars, you will get to this pair before Vega leaves the field of view. This is Epsilon Lyra, the so called double-double. It gets such a name because each of those two stars can be resolved into a pair of their own, if you have access to a telescope that is bigger than 4 inches in diameter. Now that you know where Epsilon is, take away the binoculars and look with the unaided eye. Can you resolve the pair? If you can, don't let anyone tell you that you need glasses.



Constellation Lyra

Where Are They Now: Updates from NASA

Cassini

08.30.05 - The Cassini spacecraft discovered the long, cracked features dubbed "tiger stripes" on Saturn's icy moon Enceladus are very young--between 10 and 1,000 years old.

Sep. 26, 2005: Cassini studies Hyperion at a range of 1,010 kilometers (628 miles), the closest approach ever to the tiny moon. It will be Cassini's only visit to the moon during the primary mission.

Mars Rovers

8/30/05 - Opportunity

Recovering from a Reset

On sol 560 (Aug. 21, 2005), Opportunity retracted the Moessbauer spectrometer from a rock target called "Lemon Rind" that had been brushed earlier with the rock abrasion tool.

9/1/05 - Spirit

Spirit rover successfully trekked to the top of "Husband Hill," in the "Columbia Hills" of Gusev Crater. The "little rover that could" spent the last 14 months climbing the hills.

Mars Orbiter

08.30.05 - Mars Orbiter Makes Course Correction
NASA's Mars Reconnaissance Orbiter (MRO) successfully tested its main engines by making a successful trajectory adjustment for reaching the red planet on March 10, 2006

Deep Impact Mission Update

08.22.05 -- Ever since Deep Impact's spectacularly successful collision with comet Tempel 1, Principal Investigator Michael A'Hearn and mission colleagues at the University of Maryland and seven

other institutions have been working at top speed to analyze the huge amount of raw data collected during the brief encounter. The mission's principal findings will be published in a September issue of the journal Science.

Mars Express Successfully Deploys Radar Boom - 6/16/05

The second radar boom used to detect water below the surface of Mars has been successfully deployed from the European Space Agency's Mars Express Orbiter. JPL is a partner on the Mars Advanced Radar for Subsurface and Ionosphere Sounding instrument, which includes three booms.

Image courtesy: ESA.

MESSENGER performed an Earth flyby on August 2, 2005

MESSENGER will rely on multiple planetary flybys – Earth once, Venus twice and Mercury three times – to “catch” Mercury and begin orbiting the planet. If the spacecraft attempted to fly straight from Earth to Mercury and move into orbit around the planet, it would have required an impractically large amount of onboard fuel (to slow it down) and a much larger launch vehicle.

In its first flyby, MESSENGER used Earth's gravity to change its trajectory and move in closer to the Sun. An engine burn (known as a Deep Space Maneuver) four months later will alter the orbit slightly and accurately target the spacecraft toward Venus for the next flybys

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Newsletter of the Museum Astronomical Resource Society

Martian Chronicles is published monthly by the Museum Astronomical Resource Society (also known as M.A.R.S. Astronomy Club), to provide club news and other items of interest to its member. MARS is sponsored by MOSI Tampa Florida. Annual club membership dues are \$15.00 single and \$20.00 for families. Dues can be paid to any club officer at a meeting or event or mailed to the Club Membership/Renewal Address listed below. Newsletters are available to nonmembers by requesting a complimentary issue. Please send all inquiries, comments and newsletter contributions to the address below. The deadline for submitted contributions is the 25th of the month prior to the next issue. Contribution may be delayed in publication due to available space.

*Membership/Renewal
Make checks payable to: Mildred Simpson, (Club Treasurer)
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2005 M.A.R.S. Club Officers

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Web Master— Dennis Farr

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Jimmy Thomas, 813-888-7187

Astronomy Day Coordinator— Your name could be here

Librarian—Douglas Ordetx

MOSI Contact—813-987-633,

*Membership
Club dues run from September to
August of each year. Dues will be
taken at the September Meeting.
\$15 single \$20 family*

September 2005

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3 <i>New Moon</i>
4	5	6	7	8	9 <i>MARS Club Meeting</i>	10 <i>MOSI SkyWatch</i>
11 <i>1st Quarter Moon</i>	12	13	14	15	16	17
18 <i>Full Moon</i>	19	20	21	22 <i>Autumnal equinox</i>	23	24
25 <i>Last Quarter Moon</i>	26	27	28	29	30	