M.A.R.S.
8712 Cobbler Place
Tampa, FL 33615

Visit our web site at:
http://members.aol.com/MARSAstro

E-mail: MARSAstro@aol.com

PLACE STAMP HERE

Martian Chronicles

Newsletter of the Museum Astronomical Resource Society
Volume 18, Number 7 July 2002

CONTENTS

UPCOMING EVENTS

JULY 2002

- Sat. 07/06, evening - MARS SkyWatch at MOSI
- Sat. 07/13, SPAC Star Party, from dusk until dawn, at Hickory Hill (possible, call SPAC to confirm)
- Fri. 07/12, 7:30 p.m. - Monthly Meeting at MOSI, Program: CONTOUR mission
- Sat. 07/13, SPAC Star Party, from dusk until dawn, at Hickory Hill (possible, call SPAC to confirm)
- Sat. 07/20, evening - MOSI SkyWatch
- Sat. 07/27, evening - MARS SkyWatch at MOSI

JULY 2002

- Sat. 08/03, evening - MARS SkyWatch at MOSI
- Fri. 08/09, 7:30 p.m. - Monthly Meeting at MOSI, Program: To Be Announced
- Sat. 08/09, SPAC Star Party, from dusk until dawn, at Hickory Hill (possible, call SPAC to confirm)
- Sat. 08/17, evening - MOSI SkyWatch
- Sat. 08/24, evening - MARS SkyWatch at MOSI
- Sat. 08/31, evening - MARS SkyWatch at MOSI

MOSI SkyWatch: Observing sessions are normally held on the Saturday evening nearest the First Quarter Moon and the two Saturday evenings following. SkyWatch sessions are held at MOSI. Call to check on any schedule changes. The Saunders Planetarium: 813-987-6360; MOSI Information Desk: 813-987-6012

SPAC Star Parties: Hosted by the St. Petersburg Astronomy Club (SPAC). Held on the Saturday evenings nearest the new moon, at Hickory Hill near Brooksville. For more information call the SPAC hotline: 813-792-0721

FIRST LIGHT

Hello, friends.

This month's issue features items that I would like to find in a good newsletter. There are several interesting things to learn as well as good observing reference information that you can look up at a moments notice. I hope you enjoy it.

Clear Skies,

Jimmy Thomas

MARTIAN HAPPENINGS

LAST MEETING
At the June 14 meeting we viewed a wonderful video on NASA's Jet Propulsion Laboratory. It went over so well that we might have an encore at a future meeting. For more details, consult the MARS Minutes elsewhere in this issue.

NEXT MEETING
At the July 12 meeting we will recognize those individuals who helped to make this year's Astronomy Day so successful. In addition, we will get a complete rundown on the CONTOUR mission with launches this month.

SKYWATCH
The SkyWatch observing sessions have been more cloudy than clear lately, including the one that almost happened on Saturday evening, June 22. However a few folks came out on that evening and got some questions answered by our own Craig MacDougal before they closed up for the evening. These evenings are running true to form for Florida in the summertime, but let's hope that we get a few good evenings soon.

WHAT PRESENTATIONS DO YOU WANT TO SEE?
Do you have a particular astronomical topic that you would like to learn more about? Get studying! We need presentations for our monthly meetings and our best ones come from enthusiastic and knowledgeable members. Why not start right now? Decide on a topic, schedule yourself for a particular month, and then get to work. You can do it. And we all will benefit.

MARS MINUTES

June 2002 Meeting of M.A.R.S.
June 14, 2002
Jimmy Thomas, President
Wade Holland, Vice President
Jerry Scalzo, Treasurer
Alvin Dozier, Secretary
Reported by Jimmy Thomas

The meeting was held in The Saunders Planetarium at MOSI in Tampa. The meeting began at 7:30 pm. There were 25 persons present. Jimmy welcomed the group and noted that the July meeting would feature recognition of those who made possible the Astronomy Day events held April 20 at MOSI. Jimmy and Craig MacDougal held some discussions with the group on how those participating individuals would be recognized. Preparations were still required prior to the meeting. Dave Winterbaer volunteered to shoulder some of the preparation work.

The group briefly discussed the announcement that week of the discovery of 15 new extrasolar planets. It was noted that one of the planets, while still large, was near to the size of Jupiter.

Jimmy passed out to the group copies of the April/May/June newsletter and asked for assistance in mailing out the rest. Mildred Simpson agreed to perform this task.

Jimmy then presented to the group a 20-minute video entitled "Journey to the Planets and Beyond." The video was produced by the Jet Propulsion Laboratory (JPL) for the 40th anniversary of the Smithsonian Air and Space Museum, celebrated in May of this year. The video reviewed the history of JPL, discussed some of the current missions, and gave an overview of the missions planned for the future. Following the video, Jimmy briefly discussed some of the missions shown in the video.

Jimmy noted that he would give a presentation of the CONTOUR mission at the July meeting. The meeting adjourned at 9:05 pm.

ON THE RECORD by Jimmy Thomas, President

The following items are presented for the club membership's consideration. Please review them with great care.

CLUB MEMBERSHIP RATES
It has been noted that the last few postage increases have raised the cost of newsletter production and distribution. This situation is underscored by the 3-cent increase on first class mail effective Sunday, June 30. For this reason it has been suggested by some members that we increase the amount of annual club dues from $12 to $15 per year. This modest increase would allow our club to maintain our insistence that astronomy is an affordable hobby for everyone.

DUES PAYMENT TIME
Since the club's beginnings in the early 1980s, the renewal time of each member's dues has fallen on the month in which they joined, or on the month that they re-joined if they previously allowed their membership to lapse. This renewal method makes it difficult to track membership renewal dates, and makes it impossible for club to determine the amount in the treasury at any point in time. To solve these

problems, it has been suggested that this club, like many others, adopt the method of membership renewal by a specific date each year or within a specific month each year. Those who join the club would pay an agreed upon fraction of the dues amount based upon the time remaining in the current year. For example, joining members could pay based upon the number of quarters remaining in the joining year, so members joining with 5 months remaining in the current year would pay the equivalent of 2 quarters, or one half of the annual dues amount.

The above two issues will be discussed further at the July12 meeting. If there is sufficient agreement one or both of these items will be voted upon at a future monthly meeting. Please remember that only members in good standing (i.e. dues paid up) are allowed to vote on club business.

ROAMING ASTRONOMER by James M. Thomas

Jeptha Knob, Kentucky

If you were to drive through Shelby County in central Kentucky on Interstate 64, you would pass over mile after mile of rolling farm land. As you neared mile marker 41 the land would rise a bit more sharply, creating a grassy ridge just to the north of the highway. Through the breaks between the trees you would glimps, in the distance beyond the ridge, at tall, tree-covered mound decorated with a few communication towers. The towers are well placed there, for it is one of the highest points around. Rising some 1,150 feet above sea level, it is a feature formerly known as Jeptha's Knob, but now simply as Jeptha Knob. Nearby in the small community of Clay Village along U.S. Route 60 is state marker number 161, provided by the Kentucky Department of Highways. The marker describes Jeptha Knob as a "cryptovolcanic structure" caused by forces in the Earth's crust, and that the forces failed to reach an eruptive stage.

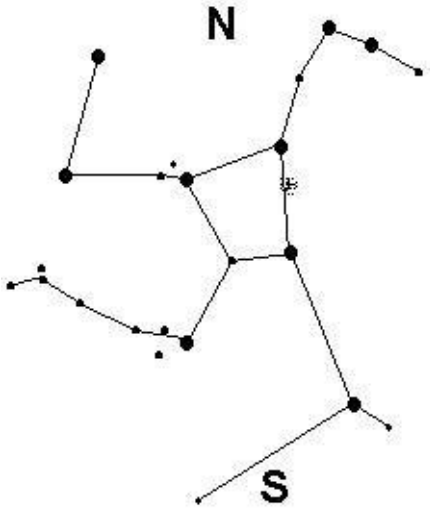
So it was thought until the late 1960s when geologists of the U.S. Geological Survey began to shed new light on the area. They saw that Jeptha Knob sits in the center of a network of faults, some radiating away, others arcing around the mound and surrounding lowland to intersect with other faults. As geologists studied the patchwork quilt of broken ground that spread out for one and one half miles in all directions, they stopped calling it a cryptovolcanic feature and began using the term "cryptoexplosive," realizing that the geologic disruption had not occurred over time, but quite suddenly and violently, though of unknown origin. Eventually their studies determined that the disruption did not come from crustal forces beneath Earth's surface, but from above. The evidence was clear: Jeptha Knob was the center point of an ancient meteorite impact crater.

More accurately, Jeptha Knob is an astrobleme; an impact crater that is roughly circular and may crack the earth's crust in a characteristic circular pattern. Astroblemes may have a "rebound structure" where a central core of rock has been brought up from deeper underground by the impact. In this case the rebound structure is in fact Jeptha Knob.
By studying the material, geologists have determined that the meteoroid stuck the earth about 425,000,000 (425 million) years ago, during the Silurian Period. The rebound structure, Jeptha Knob, includes a mixture of material from the end of the Ordovician Period, which ended about 440 million years ago, and material from the early-to-mid Silurian Period, about 440 to 425 million years ago. The impact crater was originally 6,600 feet in diameter, had a depth of 902 feet, and a rim height of 290 feet. The crustal fractures extend to 14,000 feet in diameter, indicating that the impact was very forceful. The size, composition and mass of the meteoroid is not known as of yet, but hopefully scientist will know more in time. I will let you know more as I find it out.

Jeptha Knob is only one of several impact craters that have been discovered in the last few decades. Kentucky alone has three, including Jeptha Knob. Learning more about these craters will definitely teach us more about the history of our solar system.

CONSTELLATION OF THE MONTH by Craig MacDougal

Hercules



If the afternoon thunderstorms have cleared out by 9:30 at night, then go out to get a look at our constellation for July. Face toward the east, and look most of the way up to zenith. There you will find a square made up of 2nd and 3rd magnitude stars. This square covers an area of the sky a bit smaller than your fist at arms length, and it's noticeably "squashed" on the right end. This "squashed square" (also known as the "keystone") is the key part of that legendary strong man of old: **HERCULES** (HER-q-lees). The keystone is generally considered to be his torso, or thereabouts. His head is generally considered to be off to the right of the keystone, and he's usually shown facing east. So you can imagine our strong man running full tilt back toward the horizon with the pelt of Leo on his back. (Remember Leo?) The story of Hercules is a long one that has been told in a variety of forms for thousands of years. His mother was Alcmene, the most beautiful and wise of the mortal women. His father was Zeus. (It's beginning to seem like half of the characters portrayed in the sky were fathered by Zeus.) Zeus visited Alcmene disguised as her husband. (Visiting beautiful women while in disguise was apparently a hobby of Zeus.) Anyway, Zeus also arranged for the infant to drink some of his wife's (Hera) milk. Having drunk the milk of a goddess, Hercules was now immortal. Hera was quite annoyed over the entire situation. She could not kill Hercules, but

she vowed to make his life very miserable. Hera made Hercules temporarily insane at one point, and this caused him to kill his family. When he came to himself, he was of course remorseful and asked the Oracle at Delphi how he might atone for this. The Oracle's instructions were to serve the king of Mycenae for twelve years. The king gave him a set of tasks that are known as the Labors of Heracles. (Heracles is the original form of the name. The version we know is Greek.) The first task was to kill a certain invincible lion. (Sound familiar yet?) He also killed a multi-headed monster, which became the constellation Hydra. While he was battling Hydra, a crab came out of the rocks and started going after Hercules' ankles. This didn't last long, since Hercules simply stepped on it between swings of his sword. For this short scene, the crab gets billing in the sky as the constellation Cancer. (I guess he had connections with Zeus, or something.) Anyway, Hercules completes the original ten Labors. The king however, points out that Hercules had help on one of them, and got greedy on another. So he gives him two more, expecting to do him in for sure this time. Hercules cheerfully dispatches a dragon (Draco), and rather than kill the three-headed watchdog of the underworld, dragged him back to the king. The king was surprised to see Hercules, and more surprised to be staring at this none-too-happy watchdog that Hercules had (for now) a firm grip on. The king wisely proclaimed that Hercules was a free man, and graciously suggested that he take his "puppy" outside before he let go of it. (Whew!) Let's turn back to the keystone, for about a third of the way from the upper left corner, to the upper right corner, is one of the glories of the heavens. Check this spot with binoculars, and you will find a fuzzy spot. This is M13, the great Hercules globular cluster. Now you have seen with your own eyeballs this grand collection of many thousands of stars that adorns the pages of every book on astronomy that I know.

CELESTIAL ALMANAC by James M. Thomas

For Reference: EDT = eastern daylight time; Dist. = object distance from Earth; AU = astronomical unit, the average distance from Earth to the Sun, roughly 92.9 million miles. Mag. = scale indicating the brightness (or magnitude) of an object in the sky, with 6.00 indicating the dimmest objects visible to the naked eye, 1.00 indicating the brighter stars and some objects having a zero or even a negative magnitude number.

MOON PHASES
Last Qtr - July 2, 1:22 pm EDT
New Moon - July 10, 6:27 am EDT
First Qtr - July 17, 12:48 am EDT
Full Moon - July 24, 5:07 am EDT
Last Qtr - Aug. 1, 6:24 am EDT
New Moon - Aug. 8, 3:15 pm EDT
First Qtr - Aug. 15, 6:13 am EDT

MOON APOGEE AND PERIGEE
Apogee - July 3, 7:56 am; 406,279 km or 252,450 mi from Earth
Perigee – July 18, 3:07 am; 358,514 km or 222,770 mi from Earth
Apogee – July 30, 3:57 pm; 405,685 km or 252,081 mi from Earth
Perigee – Aug. 15, 7:57 am; 362,283 km or 225,112 mi from Earth

SUN – Moving this month from the constellation Gemini into Cancer. Sun transits:
July 1 - Rise 6:38 am EDT; Set 8:31 pm EDT; Length 13:53
July 15 - Rise 6:05 am EDT; Set 19:56 pm EDT; Length 13:45
July 31 - Rise 6:53 am EDT; Set 8:21 pm EDT; Length 13:28

MERCURY – Going through inferior conjunction this month, moving through the constellations Taurus, Gemini, Cancer and Leo.
July 1 – Rise 5:22 am EDT; Set 6:55 pm EDT; Dist. 1.04 AU; Mag. -0.44
July 15 – Rise 6:16 am EDT; Set 8:04 pm EDT; Dist. 1.29 AU; Mag. -1.76
July 31 – Rise 7:47 am EDT; Set 9:02 pm EDT; Dist. 1.31 AU; Mag. -1.1

VENUS – Moving into superior conjunction, moving this month through Cancer, Leo and Virgo.
July 1 – Rise 9:45 am EDT; Set 11:00 pm EDT; Dist. 1.08 AU; Mag. -3.90
July 15 – Rise 10:04 am EDT; Set 10:52 pm EDT; Dist. 0.98 AU; Mag. -4.00
July 31 – Rise 10:21 am EDT; Set 10:36 pm EDT; Dist. 0.85 AU; Mag. -4.13

MARS – Approaching inferior conjunction, moving this month from the constellation Gemini into Cancer.
July 1 – Rise 7:38 am EDT; Set 9:22 pm EDT; Dist. 2.60 AU; Mag. 1.76
July 15 – Rise 7:25 am EDT; Set 9:01 pm EDT; Dist. 2.64 AU; Mag. 1.76
July 31 – Rise 7:10 am EDT; Set 8:34 pm EDT; Dist. 2.66 AU; Mag. 1.74

JUPITER – Approaching inferior conjunction, moving this month from the constellation Gemini into Cancer.
July 1 – Rise 7:43 am EDT; Set 9:22 pm EDT; Dist. 6.21 AU; Mag. -1.83
July 15 – Rise 7:02 am EDT; Set 8:39 pm EDT; Dist. 6.25 AU; Mag. -1.82
July 31 – Rise 6:16 am EDT; Set 7:46 pm EDT; Dist. 6.24 AU; Mag. -1.82

SATURN – Just past inferior conjunction, currently in the constellation Taurus.
July 1 – Rise 5:25 am EDT; Set 7:01 pm EDT; Dist. 10.02 AU; Mag. 0.88

July 15 – Rise 4:37 am EDT; Set 6:14 pm EDT; Dist. 9.93 AU; Mag. 0.91
July 31 – Rise 3:42 am EDT; Set 5:19 pm EDT; Dist. 9.77 AU; Mag. 0.93

URANUS – Approaching opposition; on the border of constellations Aquarius and Capricornus.
July 1 – Rise 11:24 pm EDT; Set 10:27 am EDT; Dist. 19.32 AU; Mag. 5.78
July 15 – Rise 10:28 pm EDT; Set 9:30 am EDT; Dist. 19.17 AU; Mag. 5.77
July 31 – Rise 9:23 pm EDT; Set 8:25 am EDT; Dist. 19.05 AU; Mag. 5.75

NEPTUNE – Approaching opposition; in the constellation Capricornus.
July 1 – Rise 10:23 pm EDT; Set 9:04 am EDT; Dist. 29.22 AU; Mag. 7.82
July 15 – Rise 9:27 pm EDT; Set 8:08 am EDT; Dist. 29.12 AU; Mag. 7.81
July 31 – Rise 8:23 pm EDT; Set 7:03 am EDT; Dist. 29.08 AU; Mag. 7.81

PLUTO – Passed opposition, trailing behind Earth, in the constellation Ophiuchus.
July 1 – Rise 6:19 pm EDT; Set 5:26 am EDT; Dist. 29.59 AU; Mag. 13.77
July 15 – Rise 5:22 pm EDT; Set 4:30 am EDT; Dist. 29.71 AU; Mag. 13.78
July 31 – Rise 4:18 pm EDT; Set 3:26 am EDT; Dist. 29.91 AU; Mag. 13.80

EVENTS
July 2 – Mercury is 0.2 degrees from Saturn
July 3 – Mars is 0.8 degrees from Jupiter
July 6 – Earth is at aphelion (1.017 AU from the Sun)
July 13 – Comet C/2002 K4 (NEAT) is at perihelion (2.765 AU from the Sun)
July 20 – Mercury is 1.2 degrees from Jupiter
July 20 – Comet C/2002 K4 (NEAT) at its closest approach to Earth (1.926 AU)
July 22 – Comet Holt-Olmstead is at its closest approach to Earth (2.061 AU)
July 25 – Mercury is 0.6 degrees from Mars
July 27 – Comet Mrkos is at perihelion (1.467 AU from the Sun)
July 27 – Comet P/2002 JN16 (LINEAR) is at its perihelion (1.790 AU from the Sun)
July 27 – Comet C/2002 J5 (LINEAR) is at its closest approach to Earth (5.622 AU)
July 29 – Peak of South Delta-Aquarid meteor shower
July 31 – Comet du Toit-Neujmin-Delporte is at perihelion (1.730 AU from the Sun)

METEOR SHOWERS by James M. Thomas

Delta Aquarids
This minor shower peaks on July 27/28 and has a maximum of 30-40 meteors per hour. The orbit of the meteor material is small, highly eccentric, with its perihelion very close to the Sun. The radiant of the shower is near the star delta Aquarii (Scheat) in the constellation Aquarius.

There are also two showers that peak in August with activity beginning in late July:

Alpha-Capricornids
This shower is caused by Periodic Comet Honda-Mrkos-Pajdusakova. Meteors from this shower may be visible from July 15 through Aug. 25 with the peak on Aug. 2/3. The meteor hourly rate may be about 8. The meteors will appear to originate from a point in the constellation of Capricornus (RA 20 hrs 36 min, Dec -10°).

Perseids
This shower is caused by Periodic Comet Swift-Tuttle, discovered on July 16, 1862 by Lewis Swift and then independently discovered three days later by Horace Tuttle. Meteors from this shower may be visible from July 25 through Aug. 21 with the peak on Aug.11/12. The meteor hourly rate may be about 75. The meteors will appear to originate from a point in the constellation of Perseus (RA 03 hrs 04 min, Dec +58°).

Observing Meteors

Meteors are best viewed from a dark-sky location. Observers in for the duration of the evening, or at least for several hours, should bring along a few things: a sleeping bag or blankets for warmth, a recliner or lawn chair, a hot beverage to help cut the chill, and binoculars to view the smoke trails of just-past meteors.

THIS MONTH IN HISTORY by James M. Thomas

July 6, 1687 – Isaac Newton's work Principia was first published.
July 10, 1832 – Telescope maker Alvan Clark was born.
July 1, 1847 – Astronomer Hencke discovered asteroid 6 Hebe.

July 24, 1950 - A U.S. Army team from the Ordnance Proving Grounds at White Sands, New Mexico, conducted the first rocket launch from Cape Canaveral, Florida. The rocket was called Bumper 8, a modified German V-2 missile with a WAC (Without Any Control) Corporal missile for a second stage. It achieved an altitude of 16 kilometers (10 miles). For the launch, Army technicians employed a painter's scaffold as a gantry to service the rocket before launch, and the control center was a converted tarpaper bathhouse surrounded by sandbags.
July 21, 1961 - A Redstone rocket launched U.S. astronaut Virgil I. "Guss" Grissom in the Mercury 4 spacecraft, *Libert Bell 7*. This was the second U.S. sub-orbital space flight, and very similar to the flight of Alan B. Shepard Jr. a month earlier. It lasted 15 minutes, with a trajectory that took Grissom over the Atlantic Ocean where the spacecraft parachuted into the water. Grissom was recovered by helicopter from the ocean after leaving the spacecraft. Unfortunately, his spacecraft, *Liberty Bell 7*, sank and was lost until its recovery by a Discovery Channel-sponsored expedition early in 1999.
July 10, 1962 – US communication satellite Telstar-1 was launched.
July 28, 1964 - The U.S. spacecraft Ranger 7 was launched. Ranger 7 became the first U.S. spacecraft to impact on the Moon. It returned a series of photos and other data.
July 14, 1965 - The U.S. spacecraft Mariner 4 (launched November 28, 1964) reached the planet Mars and flew by on the far side of the planet. Mariner 4 transmitted back 22 televsion pictures of the cratered Martian surface from distance as close as 9,846 kilometers (6,118 miles).
July 18, 1966 - John Young and Michael Collins were launched into Earth orbit aboard Gemini 10. They performed the first U.S. docking maneuver, using an Agena target vehicle. They returned safely to Earth on July 21.
July 19, 1967 – US spacecraft Explorer 35 was launched to orbit the Moon.
July 16, 1969 - Neil Armstrong, Edwin "Buzz" Aldrin and Michael Collins were launched in Apollo 11. Armstrong and Aldrin, aboard the Lunar Module *Eagle*, landed on the lunar surface on July 20. Armstrong, and then Aldrin, became the first men to walk on the moon. They spent a total of 21 hours, 36 minutes and 21 seconds on the lunar surface, and collected 48.5 pounds of soil and rock samples. They returned to the lunar orbit, docked with Collins in the Command-Service module, and returned safely to Earth on July 24.
July 22, 1972 – USSR spacecraft Venera 8 landed on Venus.
July 15, 1975 - Aleksei A. Leonov and Valery N. Kubasov were launched in Soyuz 19. That same day Vance Brand, Thomas P. Stafford and Donald K. "Deke" Slayton were launched in an Apollo spacecraft . Both launches were part of a U.S.-U.S.S.R. joint flight. The spacecraft docked on July 17. The crews conducted experiments, shared meals, and held a joint news conference. Soyuz 19 returned to Earth on July 21 and the Apollo crew returned on July 24.
July 20, 1976 - The Viking 1 spacecraft landed on Mars. Originally scheduled for a July 4th landing, in time for the U.S. bicentennial, the craft performed scientific experiments and transmitted images back to Earth for 6-1/2 years.
July 29, 1982 – USSR space station Salyut 6 burned up in Earth's atmosphere.
July 8, 1992 – Comet Shoemaker-Levy 9 flew very near to Jupiter (0.0008 AU) causing the comet to break up.
July 10, 1992 – Japanese spacecraft Giotto flew by Comet Grigg-Skjellerup.
July 4, 1996 - The Mars Pathfinder spacecraft, launched Dec. 4, 1996, landed on the Martian surface at 1:08pm EST. The following day the Lander was renamed Carl Sagan Memorial Station. On July 6th the Sojourner rover was released to begin its exploration of the Martian surface. The mission performed measurements of the Martian climate, soil composition, and send back thousands of surface images.
July 4, 1997 – US spacecraft Mars Pathfinder landed on Mars.

PUBLICATION INFORMATION

Martian Chronicles is published monthly by the Museum Astronomical Resource Society (also known as the MARS Astronomy Club) to provide club news and other items of interest to its members. MARS is sponsored by the Museum of Science and Industry (MOSI), Tampa, Florida. Annual club membership dues are $12.00, which may be paid to any officer at club-sponsored events or mailed to the address listed below. Make checks payable to Jerry Scalzo, our club treasurer. Newsletters are available to nonmembers by requesting a complimentary trial issue. Please send all inquiries, comments and newsletter contributions to the address below. The deadline for submitted contributions is the 15th of the month prior to the next issue. Contributions may be delayed in publication due to available space.

NEWSLETTER EDITION DETAILS

Martian Chronicles, July 2002, Vol. 18, No. 7
Editor: Jimmy Thomas
Contributors: Craig MacDougal

CLUB INFORMATION

MUSEUM ASTRONOMICAL RESOURCE SOCIETY
President - Jimmy Thomas, 813-888-7187, MARSAstro@aol.com
Vice President – Wade Holland, unreal_talon@hotmail.com
Treasurer – Jerry Scalzo, 813-263-6473, strek1@webtv.net
Secretary – Alvin Dozier, 813-979-0797, dozier12@hotmail.com
MOSI Contact - Craig MacDougal, 813-933-9617, MACDOUC@prodigy.net

Mailing address: 8712 Cobbler Place, Tampa, FL 33615
Web site: http://members.aol.com/MARSAstro
E-mail: MARSAstro@aol.com