

September-October
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The Observer

The Newsletter of Central Valley Astronomers of Fresno

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Curiosity Lands on Mars!

NASA's Mars Science Laboratory, nicknamed Curiosity, landed safely on the Red Planet on August 6, and is now in the process of being checked out and calibrated. Already, though, it has sent back hundreds of images, including some amazing ones of its daredevil landing. Above, a color image of Curiosity's landing site; the lighter area is from the rocket exhaust of the MSL carrier craft. More on the landing of Curiosity inside. Image-NASA/JPL

"For those who may ask what they can do to honor Neil, we have a simple request. Honor his example of service, accomplishment and modesty, and the next time you walk outside on a clear night and see the moon smiling down at you, think of Neil Armstrong and give him a wink."

-Neil Armstrong's family announcing his death on August 25, 2012

CVA Calendar

Sept 1-CVA meeting CSUF
7pm

Sept 15-CVA Star-B-Que
and Star Party-Eastman
Lake

Sept 22-CVA Public star
party at RiverPark

Oct 6-CVA meeting CSUF
7pm

Oct 13-CVA star party at
Eastman Lake

Oct 20-CVA public star
party at RiverPark



September 15-New Moon September 29-Full Moon October 15-New Moon October 29-Full moon

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Central Valley Astronomers of Fresno

Our Goals:

- Provide a place for those interested in astronomy to come together and share their hobby
- Share the wonders of astronomy with the public
- Be a source of astronomy education and information for our schools, the public, and the media

Our Interests:

- To learn about astronomy and related topics
- To enjoy the nights sky with the unaided eye, telescopes, and binoculars
- To learn from others and share what we know about astronomy from others

To all CVA members-

**The annual CVA Star-B-Que
And Starwatch
Will be Held on
Saturday, September 15,
At Eastman Lake
Don't Miss It!**

The President's Message

As you all are aware by now, the Mars Science Laboratory *Curiosity*, has successfully landed, and sent back beautiful pictures of Mars' desolate beauty. The night of the landing, I went to NASA / JPL MSL Landing Live website and did a voice recording play-by-play of the last 13 minutes. Their animation was incredible and so realistic, especially the 'landing' in Gale Crater. You could see the ground only a few feet from the ground. Now it's just a matter of time, up to a year, before *Curiosity* drives to Mount Sharp to look for microbial signs of life.

Now to business: The fundraising effort by our club this year garnered great results! Counting the money we netted from Solar Eclipse glasses added to the raffle, we made over \$1000 to add to our account for future club requirements. One of my goals this term was to increase our funds, and with the help of many club members we were able to do just that.

Thanks to all the astronomers that set up telescopes to show River Park guests the Moon and planets. I especially want to thank Clarence, Warren, Fred, Steve H., Brian, Garrett, Dale, Larry, Lynn, Joe, Scott, and Steve B. A big THANK YOU! to Casey for having the wherewithal to find out about fundraising for the club at River Park. Thanks to Brian for having secured River Park as a public observing site for these past five years.

Thank you to the following individuals and businesses that donated raffle prizes: Steve Harness; Fred Lusk; Larry Parmeter; me; Matthew Fine Furniture; Seafood in the Sea; and Central Valley Astronomers with memberships. Seven winners collected their prize that night. We are currently finalizing arrangements for the other 33 winners. Ten additional memberships, family and individual, were given out as prizes.

For me, it is a joy and great experience to show space and talk astronomy to a curious and eager public. I still hear of many people that have never looked through a telescope until their first time with us. River Park is such a pleasant event in which to participate.

We even have a wonderful story to go along with the Grand Prize winner, Alyssa McGee. Alyssa is a 17 year old high school student. She bought one two dollar raffle ticket the night of the drawing, August 25th. During the event, guests were treated to some great San Francisco East Bay blues rock by a band called Starr Choice. Great Name, huh? I asked Steve Britton to work the table while I left to see the band for a couple minutes. We stopped selling tickets at around 9:00 and proceeded to set up for the drawings. (Incidentally, \$150 worth of tickets was sold the final night). Steve came up to me and told me a River Park rep did not show to make the final grand prize ticket selection. I told him we'll play it by ear. My good friend Karen was the secretary, and Steve selected the prizes while I MC'd.

When it came time for the final draw, I saw Steve Britton in front of me and called for him to select. He chose Alyssa. What I didn't know until later as we were packing the unclaimed prizes, was that Steve sold Alyssa the ticket while I 'stepped away' to hear the band. He remembered her because she scribbled on the ticket to get the ink to work better.

So theoretically, the Grand Prize winner bought the ticket that night and won that same night. After we had thoroughly shuffled the tickets multiple times and put them in the barrel roller. Too bad she had to leave early. It would have been exciting to have her there. This was Kismet if ever there was a time for it! Her birthday is Saturday, September 1st, the night of our September meeting. We are trying to get her to accept her prize that night.

Alyssa and her family are also invited as special guests to the Star BQ at Eastman Lake on Saturday Sept 15th. We will gather at 5-6:00. A special club 60th Anniversary cake is planned. The club is purchasing the hamburgers and hot dogs. If you can attend, please contact me or another board member if you can bring a food item to share with the club.

We will have more about this at the meeting September 1st.

I invite all members to please come out for the Star BQ to share in this momentous occasion, our Silver Jubilee, if you will. Afterwards, we will have a deep sky viewing session. The skies are incredibly dark, much darker than Hensley Lake, and no lights at the viewing area, the boat ramp at the end of Road 29.

See you there!

Randy

Profiles in Astronomy

Jerome Ricard 1850-1930 and the Santa Clara Observatory

This past June, I took my son Nathan up to the Bay Area to look at colleges he might be interested in attending after high school. One of them was Santa Clara University, a Catholic institution run by the Jesuits, the Society of Jesus, which is known for its high powered intellectual approach to life (current California governor Jerry Brown was a Jesuit novice for several years before forsaking the priesthood for politics, which in many ways is the same thing). When I lived in the San Jose area during the 1980s, my apartment was only a few blocks from the Santa Clara U. campus, and I sometimes used its library. I never really paid any attention to or knew much about the Santa Clara Observatory, even though I probably went by it on many occasions. It was not until my recent visit that I found out more about it and realized the role it played in modern science. At the center of that role was Jerome Ricard, S.J., whose name graces the observatory today, and who was one of the true pioneers in modern astronomy, as well as meteorology.

Jerome Sixtus Ricard was born in Plaisans, France in 1850, the oldest of seven children. After attending local schools and then Jesuit colleges in France and Italy, he entered the Jesuit order in 1871. In 1873, he came to the U.S. and studied at both Santa Clara College and St. Ignatius College for many years before being ordained a priest in 1886. Afterwards, he returned to Santa Clara as a professor, teaching philosophy, mathematics, and history.

In 1890, Ricard became interested in astronomy after taking a summer class in the subject at Creighton College in Nebraska. In particular, he made sunspots his area of interest, and systemically studied them with an 8" refractor telescope he set up in the Santa Clara Mission garden. Over the next several years, he compiled vast amounts of data on sunspots, their frequency, cycles, and sizes, and began to form a theory about their relationship to the Earth. In 1907, Ricard was made a member of the American Association for the Advancement of Science, and at its annual meeting that year, put forth his theory that weather patterns on Earth are influenced by sunspot activity.

Right—the only known picture of Jerome Ricard

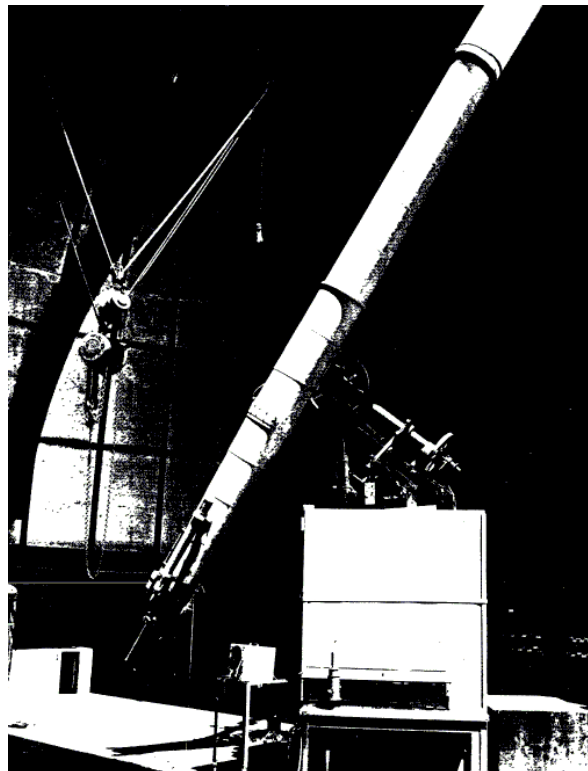


Initially, his idea was met with widespread skepticism and, in some cases outright ridicule. But Ricard was not discouraged, and made himself an expert in another area of science: meteorology. As well as sunspots, he began research into weather observations and published forecasts on a weekly, then monthly schedule. He started a monthly magazine, *The Sunspot*, which used both his solar and terrestrial observations to predict the weather. Eventually he became known as “the Padre of the Rains,” for his remarkably accurate forecasts, which were used by everyone from farmers to movie directors and producers.

During all this time, Ricard also did studies in seismology, reflecting another interest which he began after the 1906 San Francisco earthquake. Eventually, he built and directed a seismology station on the Santa Clara campus. In the nineteen teens and twenties, his reputation grew as a world class scientist, and eventually evidence accumulated from many other scientists that sunspot activity did in fact influence the weather on Earth, one of the major findings of 20th century Earth science. When he died in 1930 at the age of 80, he had achieved many honors for his work, and was lauded as one of the great scientists of the time, someone who excelled, in true Jesuit fashion, in many different areas.

The Santa Clara Observatory, now known as the Ricard Observatory, was built between 1924 and 1928 for Ricard’s solar and other astronomical studies. It was situated at the edge of the Santa Clara Mission garden about 100 yards from the mission church, and originally contained only Ricard’s 8" refractor. In 1940, the university bought and installed a 16" refractor that had originally been made by Alvan Clark in 1882 for the Warner Observatory in Rochester, New York (after several years in the East, it traveled west to the Mt. Lowe Observatory in Southern California before coming to Santa Clara). Eventually, two other smaller reflector telescopes went into service at the observatory. They were all used for many years by the professors and students from





the astronomy department at the university. Eventually, however, in the 1970s, telescope use at the observatory was curtailed due to the increasing light pollution in the San Jose-Santa Clara area. Since then, the observatory building has been used as a media center, classroom teaching area, and scientific research facility. The 8" and 16" refractors are still at the observatory today, although neither has been used for many years. In 2007, the building became the home of Santa Clara University's Archeology Research Laboratory.



Top left-the main dome at the Santa Clara Observatory, housing the 16" refractor
Top right-the 16" refractor
Left-The 8" Alvan Clark refractor at Santa Clara University after being restored

**Number of extra-solar planets found as of
August 2012-778
How many more are out there?
(Lots, I'll Bet)**

CVA Calendar September-October 2012

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						September 1 Pioneer 11 flies by Saturn 1979
						CVA meeting CSU Fresno 7pm
2	3 Labor Day-legal holiday	4	5	6	7	8
9 California Admission Day	10	11	12	13	14	15 New Moon 
						CVA Star-Be-Que and star party
16	17 Rosh Hashanah begins	18	19	20	21	22 CVA public star party at RiverPark
23 Fall Equinox	24	25	26 Yom Kippur	27	28	29 Full Moon 
30	October 1	2	3	4 Sputnik 1, first artificial satellite, launched 1957	5 Edwin Hubble discovers a Cepheid Variable in the Andromeda Nebula (M31)	6 Discovery of first extra-solar planet-1995
						CVA meeting CSU Fresno 7pm
7 Luna 3 takes first images of Moon's far side 1959	8	9	10	11	12 Columbus Day	13 CVA Star party at Eastman Lake
14	15 New Moon 	16	17	18	19	20 International Moon Night
						CVA public star party at RiverPark
21	22 Venera 9 takes first images of surface of Venus 1975	23	24	25	26	27
28	29 Full Moon 	30	31 Halloween			

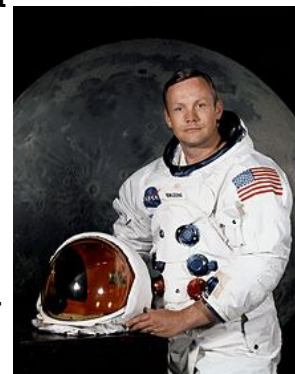
What's New in Space

America and the World Mourn Two Space Age Pioneers

Neil Armstrong 1930-2012

Neil Alden Armstrong, the laconic and unassuming engineer and test pilot, who became the first person to walk on another planetary body, died at age 82 on August 25. The cause of death was given as complications from heart surgery that he underwent earlier in the month. At the time of his death NASA chief administrator Charles Bolden, a former astronaut himself, said, "as long as there are history books, Neil Armstrong will be in them."

Armstrong was born in 1930 in Wapakoneta, a small rural farming town in western Ohio. He always had an interest in flying, and in 1938, with his father, he went for his first airplane ride, in a Ford Tri-Motor. In his teens, he worked odd jobs to pay for flying school, and received his pilot's license at age 16, even before he got his driver's license. After high school, he went to Purdue University to major in engineering, and left after his sophomore year to enter the Navy. There, he was trained as a pilot, and flew combat missions off of aircraft carriers during the Korean War. After the war, he returned to Purdue and finished his studies. Right-Armstrong's Apollo 11 portrait from NASA, 1969



In 1955, Armstrong went to work for the NACA, the National Advisory Committee on Aeronautics, the predecessor to NASA. There, he flew the latest experimental jet and rocket planes, the most advanced being the X-15, which he flew to 215,000 feet in 1960. Although a civilian, he was also involved in the Army's MISS (Man in Space Soonest) program in the late 1950s, and was chosen in 1961 as one of the pilots who would have flown the Air Force's X-20 Dyna-Soar (if it had ever been built.) Many of his colleagues regarded him as one of the best test pilots in the world. In 1962, when NASA announced that a second group of astronauts would be chosen, this time allowing civilians, Armstrong applied and was accepted along with eight others. With NASA, he and David Scott flew aboard Gemini 8 in 1966, which had to be cut short due to a thruster malfunction. NASA officials were extremely impressed with how Armstrong handled the situation, and in 1967, he was assigned as commander of one of the initial Moon missions. Originally, he and his crew were to have made a Moon orbiting mission (similar to Apollo 10), but in early 1969, it was decided that he would command the first landing mission, Apollo 11.

Everyone knows about the Apollo 11 flight now, and it would be a waste of space to recount the entire journey. Suffice to say, Armstrong, Edwin Aldrin, and Michael Collins were launched on July 16, 1969, and Armstrong and Aldrin landed on the moon on July 20. Armstrong's words "that's one small step for (a) man, one giant leap for mankind," have resonated around the world. Following the flight, the three were showered with honors and celebrated everywhere. Afterwards, they went their own ways. Collins went to work for the State Department, then the Smithsonian Museum of Air and Space; Aldrin went into private industry; and Armstrong became a NASA administrator. He left it after a year to accept an engineering professorship at the University of Cincinnati. At the same time, he bought a farm near New Lebanon, Ohio, and raised cattle and corn in it.



Armstrong left the university in 1979 to become the head of an avionics software company. In 1986, at the request of President Ronald Reagan, he served as vice-chairman of the Challenger accident committee. He also served on the boards of several major companies, including Marathon Oil, United Airlines, and Learjet. In 2002, he retired from his business activities, and in 2004 sold his farm and moved to a suburb of Cincinnati, where he lived for the rest of his life. Left-Armstrong with President George W. Bush, and Apollo 11 colleagues Michael Collins and Edwin Aldrin at the 35th anniversary of the Moon landing in 2004.

Armstrong was a very private person who rarely appeared in public and spoke in public even less. He was often criticized by some for not supporting NASA and the space program more forcefully. However, many of his astronaut colleagues and friends defended him and his privacy, saying he had earned and deserved it. As it was, he was a very graceful and eloquent speaker, and always gave credit to his colleagues and teams, and rarely mentioned himself. As he himself once said, "I am, and ever will be, a white socks, pocket protector, nerdy engineer. And I take a substantial amount of pride in the accomplishments of my profession." In 2010, in testimony before Congress, he and several

other 1960s era astronauts strongly criticized President Obama's decision to end the Shuttle and the Constellation programs, leaving the U.S. without any manned spacecraft for several years. Earlier this year, Armstrong spoke at a ceremony honoring John Glenn, his fellow Ohio astronaut colleague and a good friend, on the 50th anniversary of Glenn's *Friendship 7* flight. It was one of his last public appearances.

Armstrong was married twice. His first wife, who he married in 1956, divorced him in 1992. They had three children, two of whom lived to adulthood (his daughter died from a brain tumor at age 10). He remarried in 1994. In announcing his death, his family also asked people to remember his modesty and humility, as well as his service to the United States and to people everywhere. Since then, tributes have been pouring in from all over the world, and his place in history has been assured.

Sally Ride 1950-2012

Sally Ride, the first American woman in space, and one of the best known astronauts during the Space Shuttle era, died on July 23 at the age of 61. Only at her death was it revealed that she had had pancreatic cancer for almost two years, something that was known only to a few family members and friends. **Right-Sally Ride aboard Challenger in 1983**



Ride was born and raised in Encino, California, and attended Swarthmore College for two years before transferring to Stanford. She majored in both English and physics, and then stayed at Stanford and earned masters and doctorate degrees in physics. She was working



at Stanford on laser research when she applied, along with 8,000 other people, to become one of the first shuttle astronauts. She was one of 28 people in the astronaut class of 1978, and in June 1983, she flew aboard STS-7 as the first female American astronaut. In 1984, she made a second space mission, and was training for a third when the Challenger tragedy occurred in January 1986. Ride was on the investigation committee and strongly supported its conclusion that the accident could have been prevented. Afterwards, she essentially retired from the astronaut corps and took a NASA administrative position, heading a committee outlining the space agency's future in manned space travel. Once the report was complete, Ride left NASA and returned to Stanford. In 1989, she became a physics professor at the University of California-San Diego; there, she was also the head of the California Space Institute. She would remain in both positions for the rest of her life. **Left-Sally Ride in 2006**

Even though Ride officially left NASA in 1987, she continued to be involved with the space agency for many years afterwards. She served on various NASA panels and worked on programs promoting space flight. Most notably, she was a member of the Columbia investigation committee in 2003. She also worked with the Jet Propulsion Laboratory in the 1990s and 2000s to advance unmanned planetary space flight. She wrote several children's books on space travel, and promoted the space program with a series of fairs and conferences through over the years.

In 1982, Ride married fellow astronaut Steve Hawley; they had no children and divorced in 1987 when she left NASA. Not until her death was it made public that she had had a same-sex relationship with another woman for over 25 years; again, like much of her personal life, she kept it private, and only family members and a few close friends knew about it. She won many awards for her achievements during her lifetime, and several schools and other facilities are named after her.

"Neil was among the greatest of American heroes - not just of his time, but of all time. When he and his fellow crew members lifted off aboard Apollo 11 in 1969, they carried with them the aspirations of an entire nation. They set out to show the world that the American spirit can see beyond what seems unimaginable - that with enough drive and ingenuity, anything is possible. And when Neil stepped foot on the surface of the moon for the first time, he delivered a moment of human achievement that will never be forgotten. Today, Neil's spirit of discovery lives on in all the men and women who have devoted their lives to exploring the unknown - including those who are ensuring that we reach higher and go further in space. That legacy will endure - sparked by a man who taught us the enormous power of one small step."

President Obama-Speaking about Neil Armstrong's death, August 25, 2012

Mars Curiosity on the Surface of the Red Planet, and Getting Ready to Roll

NASA's MSL, known as Curiosity, landed safely on the Red Planet on August 6, using a never-before-tried "skyhook" landing system, where the rover was lowered to the ground via a cable from its rocket powered descent craft. The procedure went perfectly, and the SUV sized rover is now being checked out and updated for an eventual two year mission exploring Gale Crater, an ancient depression that may hold clues to past life on Mars. The MSL traveled over 200 million miles over eight months before its landing, and may travel up to 30 miles away from its landing spot before it is finished. Chances are that we have only begun to see what Curiosity will encounter over the next two years. Below are images of Curiosity's landing and first images from the Martian surface.

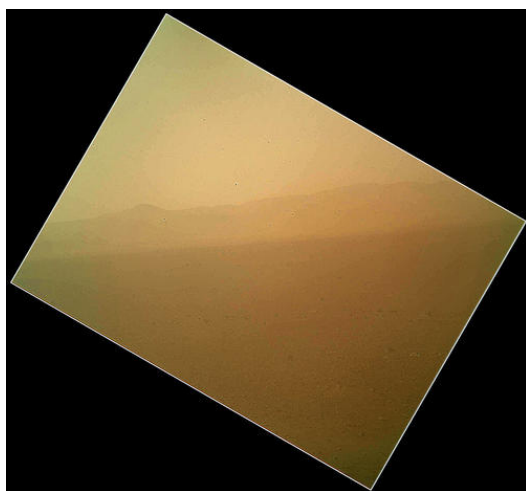
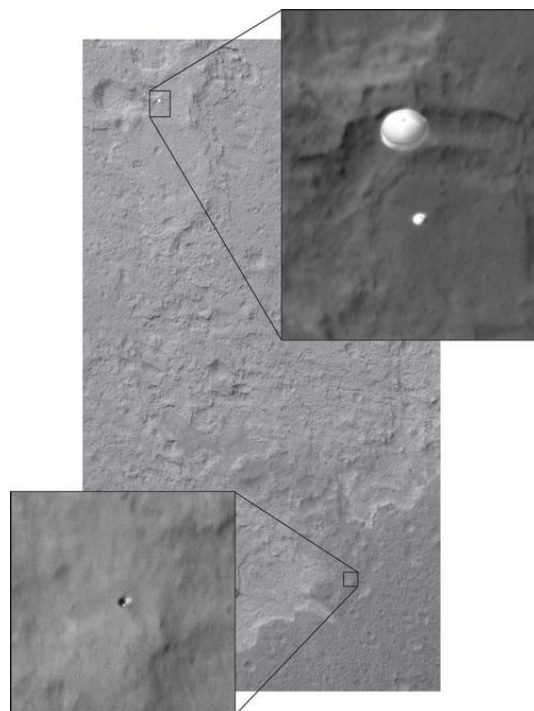


This amazing image show the MSL descent vehicle's heat shield detaching from the lander several miles above the Martian surface



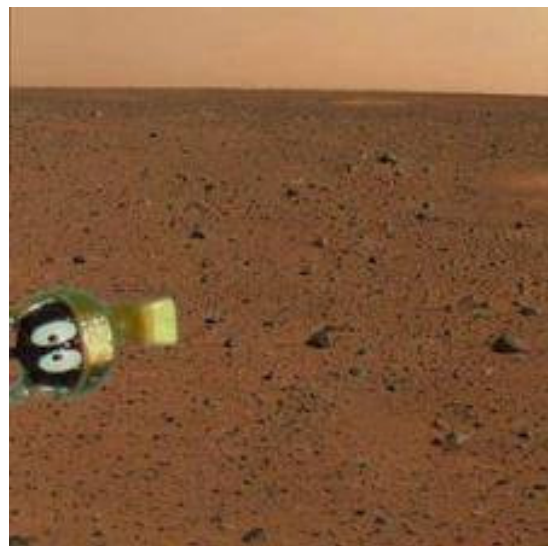
Right-Two more extraordinary images, taken by the Mars Reconnaissance Orbiter, showing Curiosity and its huge parachute descending towards the surface. The lower image is the detached heat shield tumbling towards the surface

Left-one of the first images taken from the surface, only a few minutes after the rover landed. It was taken by the black and white low resolution landing camera to ensure that the craft was safely on the surface.



Left-the first color image from the surface, the day after the landing

Right-a high resolution color image taken six days after landing, showing the Martian surface and one of Curiosity's instrumented "arms"

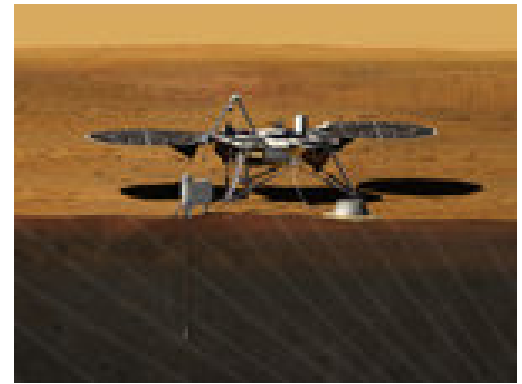


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Mars InSight Approved for 2016 Mission

Right on the heels of the tremendously successful (so far) Curiosity mission, NASA approved the Mars InSight craft for a 2016 launch and landing on the Red Planet. InSight, for Interior Exploration using Seismic Investigations, Geodesy and Heat Transport, is part of the Discovery class of spacecraft and looks like the Mars Phoenix lander of 2007. It will have a rocket propelled touchdown, and will carry a German made drill that will penetrate almost 30 feet into the Martian soil. Once that is done, a French made probe will be lowered to study the planet's interior. Its main mission will be to spend two years studying Mars' interior for evidence of "Marsquakes," interior heat flow, and other tectonic activity. As one NASA scientist put it, "we know quite a bit about the surface of Mars, but almost nothing about the interior." InSight is designed to provide some of that interior knowledge.



NASA is hoping that the incredibly enthusiastic response to the Mars Curiosity rover landing will generate more interest in the administration and Congress, and restore most, if not all of the funding that was cut in its budget this past year. Originally, the 2016 and 2018 proposed Mars flights had to be eliminated due to the budget cuts. Originally, the 2018 mission was to have been a soil sample return-to-Earth mission in partnership with ESA, the European Space Agency. Now that has been delayed, and ESA is teaming up with Russia for a 2018 Mars mission. As it is right now, NASA has no plans to send spacecraft to Mars after the 2016 InSight mission.

Currently, NASA is planning to launch the Mars MAVEN, for Mars Atmosphere and Volatile Evolution, mission in late 2013. It will arrive at the Red planet in 2014, and spend three years investigating its upper atmosphere. The spacecraft is now undergoing final tests at Lockheed-Martin's Space Systems facility near Denver before being shipped to the Kennedy space Center for eventual launch.

NASA Awards Funding to Commercial Space Firms

On August 1, NASA announced funding grants to three spaceflight companies to develop manned commercial space vehicles that can ferry astronauts in the next five years. Space-X, which is probably the furthest along with its Falcon-Dragon system, was awarded \$440 million; Sierra-Nevada Systems, which plans to test fly its Dreamchaser mini-shuttle as early as 2014, was given \$215 million; and Boeing, which is building the CVS-100 spacecraft, and plans to have manned launches starting in 2015, was awarded \$460. The space agency wants the three companies to have operational manned spacecraft ready to fly astronauts to and from ISS in 2017, when its contract with RKA, the Russian Space Agency for Soyuz seats, expires. All three companies will use the funding to develop launch systems and conduct test flights as early as 2014.



Above right-Sierra-Nevada's Dreamchaser Mini-shuttle

Left-Boeing's CVS-100 manned spacecraft

Right-Space-X's Dragon-the manned version

