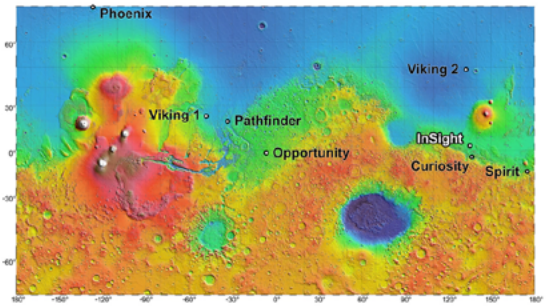
National Aeronautics and Space Administration

InSight Reaches Key Milestone

The InSight project reached a significant milestone in December as NASA's Science Mission Directorate (SMD) management met with project leadership to evaluate the mission's readiness for confirmation to move into Phase C/D, Design and Development. The Confirmation Review included an overview of the science by the principal investigator, an overview of the project and resources by the project manager, and an assessment by the NASA Standing Review Board (SRB) chair.

The SRB identified one issue and seven concerns that were addressed by the project. Ultimately, with input from JPL and Discovery Program management, SMD approved InSight to proceed to Phase C/D on an interim basis. The final decision will be made in 60 days following some additional actions by NASA and the project.



This topographic map of Mars shows InSight's potential landing area at middle right as well as landing sites of other NASA missions. The lowest elevations are dark blue, the highest are white. The elevation difference between green and orange is about 2.5 miles. Credit: NASA/JPL-Caltech

Planned for launch in March 2016, InSight (short for Interior Exploration using Seismic Investigations, Geodesy and Heat Transport) will place a single geophysical lander on the Red Planet to investigate whether the core of Mars is solid or liquid like Earth's and why Mars' crust is not divided into tectonic plates that drift like those on Earth. Detailed knowledge of the interior of Mars in comparison to Earth will help scientists understand how terrestrial planets form and evolve.

In September, NASA announced it had narrowed the number of potential landing sites for InSight. Scheduled to land on Mars six months after launch, it will touch down at one of four sites selected from a field of 22 candidates. All four spots lie near each other on an equatorial plain in an area of Mars called Elysium Planitia.

The mission's science goals are not related to any specific location on Mars but rather to study the planet as a whole, down to its core. Mission safety and survival drive the criteria for a landing site, so the sites selected appear to be the safest with mostly smooth terrain, few rocks and very little slope.

Scientists will focus two of NASA's Mars Reconnaissance Orbiter cameras on the semi-finalists in the coming months to acquire data they will use to select the best of the four sites well before InSight is launched.

Each candidate site is an ellipse measuring 81 miles from east to west and 17 miles from north to south. Engineers calculate the spacecraft will have a 99-percent chance of landing within that ellipse, if targeted for the center.

Elysium is one of three areas on Mars that meet two basic engineering constraints for InSight: be close enough to the equator for the lander's solar array to have adequate power all year and be low enough in elevation to have sufficient atmosphere above the site for a safe landing. The spacecraft will use the atmosphere for deceleration during descent.

InSight also needs penetrable ground, so it can deploy a heat-flow probe that will hammer itself 3 to 5 yards into the surface to monitor heat coming from the planet's interior. This tool can penetrate through broken-up surface material or soil, but could be foiled by solid bedrock or large rocks.

Education and Public Outreach Highlights

InSight teamed with one of their education partners, the Southern California Earthquake Center (SCEC), to conduct a full-day professional development (PD) workshop for 14 science teachers and program directors at JPL on July 19. The day included a tour of JPL, a visualization presentation in the Earth Science Center, and briefings on the mission by three team members. The workshop was part of a seven-week PD program SCEC offers, which also included a five-day field trip to research motion along the southern part of the North American/Pacific plate boundary.

Teachers at educator workshop listen during tour of JPL facilities.

I N S I D E

December 2013 • Volume 14 Number 2

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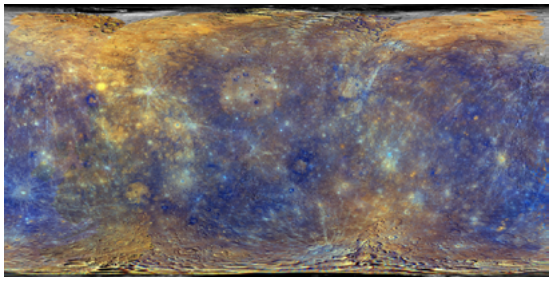
MESSENGER Passes 1,000 Days in Orbit around Mercury

On December 11, the MESSENGER spacecraft completed 1,000 Earth days of flight operations in orbit around Mercury. "MESSENGER was designed to function for eight years following launch and to withstand the harsh environmental conditions of the inner solar system," said Jim McAdams of the Johns Hopkins University Applied Physics Laboratory and the lead engineer for MESSENGER's mission design team. "The probe not only has continued to function, it has thrived, with very little loss of planned observations for more than nine years and four months since launch." To date, the spacecraft has returned 198,166 images from orbit.

The orbital phase of the mission, which was originally designed to last one Earth year, is now nine months into a second extended mission that is scheduled to conclude in March 2015, with data analysis and archiving continuing for another year. The lowest point of MESSENGER's orbit is now 201 miles above Mercury's surface. The altitude will continue to decrease until the first maneuver of the mission's low-altitude campaign in mid-June 2014.



This enhanced color mosaic shows 100% of Mercury's surface in daylight. These colors are not what Mercury would look like to the human eye, but rather the colors enhance the chemical, mineralogical, and physical differences between the rocks that make up Mercury's surface.
Credit: NASA/JHUAPL/CIW

Members of the MESSENGER team presented a broad range of findings from the spacecraft's orbital investigation of Mercury during the fall Division for Planetary Sciences, Geological Society of America and American Geophysical Union (AGU) meetings. In 33 oral and poster presentations at AGU in December, scientist team members reported on the analysis and interpretation of observations made by MESSENGER's instruments since the spacecraft entered orbit around Mercury in March 2011.

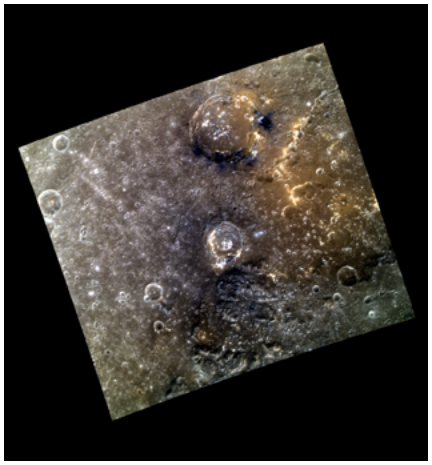
New findings were reported on Mercury's gravity field, surface composition, exosphere, and magnetotail; thermal models derived from MESSENGER topography; Mercury's permanently shadowed craters; and the planet's substorm cycle.

Abstracts can be found by going to AGU Fall Meeting and clicking on Scientific Program, then on Fall Meeting Program, where you can search for MESSENGER.

One of the AGU sessions reported that the polar regions of Mercury contain extensive water ice deposits located in polar cold traps that are shaded from direct solar radiation. Using MESSENGER topography data to calculate surface and subsurface temperatures in the north polar region, the results show that biannual maximum surface temperatures in the coldest parts of the coldest high-latitude craters are as low as 50 Kelvin or -370 F. Such low temperatures rival those measured at the lunar poles by the Lunar Reconnaissance Orbiter. This intriguing result makes Mercury both one of the hottest and one of the coldest bodies in the solar system.

Another report was on the composition of Caloris Basin, the largest well-preserved impact basin on Mercury and one of the most important geological features on the planet. Data from the Mercury Dual Imaging System were used to construct geological maps of the Caloris basin region. On the basis of distinctive reflectance properties, morphology, and impact crater size-frequency distributions, about 30% of Mercury's surface has been mapped as smooth plains. The majority of these, including the high-reflectance interior Caloris plains, are thought to have a volcanic origin. The smooth plains exterior to Caloris are younger than the basin and also possibly younger than the interior plains, which would be evidence for a volcanic origin.

MESSENGER Principal Investigator Sean Solomon of Columbia University said, "MESSENGER has not merely survived life in a tough neighborhood, it has produced a string of major scientific discoveries that have transformed our understanding of the innermost planet and how the inner solar system was formed. We expect those discoveries to continue as MESSENGER begins to pass progressively closer to Mercury's surface than ever before."



This image features several craters near the eastern edge of the Caloris Basin. The spectral signature of the reddish deposits suggest that this region may have once been the site of explosive volcanism.
Credit: NASA/JHUAPL/CIW

Education and Public Outreach Highlights

MESSENGER's education team has been adding new content to the Mosaic Postcards from Mercury activity and is in the process of developing an app for the project so it can be accessed from tablets.

You can still participate in Mercury Mappers, a citizen science project that gives the public the opportunity to access high-resolution images of Mercury and assist mission scientists in identifying craters, boulders and other features. The primary goal is to create a global crater database that will inform a variety of studies, focusing initially on the population of secondary craters.

On the Path to Pluto

More than nine years – that's how long it takes New Horizons to get to Pluto. Since launch in January 2006, the spacecraft has covered more than 2.7 billion miles, about 85 percent of its journey. A big milestone on New Horizons' path comes next summer, when it crosses the orbit of Neptune on August 25 — exactly 25 years after Voyager 2 made its historic exploration of that giant planet. When New Horizons arrives at Pluto on July 14, 2015, it will have traveled farther than any spacecraft ever has to get to its prime target.

"It's exciting to be closing in on the Pluto system," said Alan Stern, New Horizons principal investigator from Southwest Research Institute, Boulder, CO. "The encounter begins in January 2015 – one year from now! You can really feel the energy level rising on this mission."

This past July, the project organized a five-day scientific conference, "The Pluto System on the Eve of Exploration by New Horizons: Perspectives and Predictions," that was two years in the planning and attracted more than 100 scientists who brought a diverse range of knowledge and views about the Pluto system. The goal was to review everything known about Pluto and its satellites, their origin and evolution, and to hear informed scientific predictions about what New Horizons will find.

Participants at the July 22-26 Pluto system science conference.

The conference explored ideas for ground-based and satellite observations that could supplement the New Horizons encounter. The project shared details of the mission and spacecraft with scientists from the U.S. and other countries interested in analyzing the data returned from New Horizons.

The meeting included 103 talks, 30 poster presentations, and 13 topical sessions covering nearly every imaginable aspect of the Pluto system, including atmospheres, moons, dust and rings, magnetospheres, surface composition and geology, system origins, surface-atmosphere interactions, Kuiper Belt context, and the planned New Horizons encounter.

Some of the findings and predictions include:

- Hubble Space Telescope evidence that Pluto's smaller moons vary wildly in brightness on irregular schedules, indicating these tiny worlds orbiting Pluto may be tumbling chaotically
- Telescopic stellar occultation evidence that Pluto's atmosphere is still thickening and won't collapse before New Horizons arrives
- New predictions that Pluto could sport an interior ocean of water and active surface geology, possibly including geysers or volcanoes
- A prediction that Charon may, from time to time, have a transient atmosphere created by the importation of fresh volatiles by comet impacts from the Kuiper Belt
- Predictions that Pluto's atmosphere may contain low-altitude clouds or even ground fog, which excited some atmospheric physicists but worried some geologists who equate clouds and fog with curtains hiding the surface from view

New Horizons Deputy Project Scientist Kim Ennico covered the conference from start to finish; read her blogs here. You can also review the abstracts from the meeting. A variety of papers presented at the conference will be submitted to the journal Icarus.

The project team is already planning a summer 2017 science conference to digest the New Horizons results. After the closest approach in July 2015, it will take about a year to send home all the uncompressed data from the digital recorders. Stern said, "This spacecraft and this team are stoked to make the first flyby of a Kuiper Belt planet and to revolutionize what we know about the Pluto system."

New Horizons had a very busy summer which included routine activities such as thorough checkouts of the backup systems and the scientific instruments – all are working fine. The team also updated onboard fault protection software, collected interplanetary cruise science data, and tracked the spacecraft for hundreds of hours to improve trajectory knowledge.

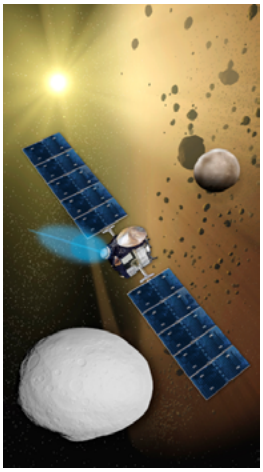
The team conducted two new major activities that had not been done before. In early July, New Horizons' highest resolution telescopic camera imaged Pluto and its largest satellite, Charon. This achievement is a major milestone on the 9½-year journey to the Pluto system and the Kuiper Belt and represents the beginning of the mission's long-range study of the Pluto system.

Flight controllers in the New Horizons Mission Operations Center keep an eye on the spacecraft's vitals near the end of the Pluto-encounter rehearsal on July 14.

The other unique activity was a successful flight rehearsal of the entire final week of flyby activities on approach to Pluto, along with the first data transmissions that will follow. This dry run, in which the actual flight sequence for closest encounter was loaded aboard New Horizons and executed exactly as it will be in July 2015, was a major test that the team had planned for more than six years. It yielded a bonus in that the measured fuel usage of the close encounter sequence was a little lower than predictions, showing there will be fuel in the tank after Pluto for the exploration of Kuiper Belt Objects.

Dawn's Newest Findings at Vesta Revealed as Ceres Get Closer

If you could watch the Dawn spacecraft gliding smoothly through the main asteroid belt between Mars and Jupiter, you would notice a captivating blue-green beam – the glow of the high-velocity xenon ions that propel the probe as it continues toward dwarf planet Ceres, its second orbital destination. While Dawn spends much of its long journey thrusting its ion propulsion engine, in November it began to coast, one of just two periods during the eight-year mission in which coasting is better for the trajectory than thrusting.



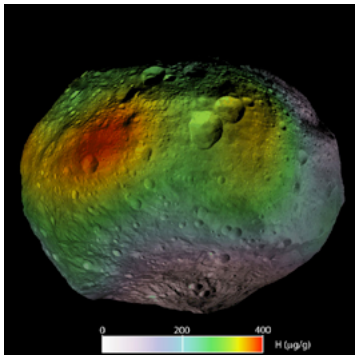
Artist rendition of Dawn orbiting Vesta. Credit: NASA/ JPL-Caltech/UCLA/ McREL

While most spacecraft rely on chemical propulsion and coast most of the time, Dawn's mission would be impossible if it did that. To orbit and explore two distant destinations, a feat never before attempted, Dawn uses its efficient ion propulsion system, constantly putting gentle pressure on the trajectory to gradually reshape it. Dawn will soon exceed four years of ion thrust. On December 27, Dawn was equally far – 19.4 million miles – from Vesta, the world already visited, and Ceres, the one yet to be reached.

During the coasting period, all of Dawn's scientific instruments were powered on and given thorough health checks, verifying that they remain fully functional. Science team members have been working to assure maximum science return during the orbital time at Ceres. A successful Ceres Design Review held in November demonstrated a strategy for exploring Ceres similar to that used at Vesta: a Survey orbit, a High Altitude Mapping Orbit and a Low Altitude Mapping Orbit.

Data from Vesta continue to be analyzed. Scientists created an atlas of the giant asteroid from mosaics of 10,000 framing camera images taken at an altitude of about 130 miles. View a gallery of stunning Images from Dawn's 302 days in orbit around Vesta.

Recent publications and presentations at science conferences by science team members continue to reveal the findings at Vesta, which both confirm expectations and offer many surprising discoveries, such as pitted terrain, low albedo regions, and hydrogen abundances. The surface of Vesta has steep slopes and evidence for global tectonics. Vesta shows evidence of non-permanent liquid flows in crater walls, indicating a wetter Vesta than many anticipated, suggesting the possible presence of water on other small solar system bodies and changing the traditional view that airless small solar system bodies are completely dry. Dawn's observations establish Vesta as a mini-world with many of the planetary processes found on the terrestrial planets.



This image shows the detected abundances of hydrogen around the equator of the Vesta. Scientists thought water ice might be able to survive near the surface around the poles but the strongest signature for hydrogen came from regions near the equator. Credit: NASA/JPL-Caltech/ UCLA/PSI/MPS/DLR/ IDA

While Dawn sails peacefully on, the mission team on Earth is always busy, sometimes with routine tasks and other times dealing with unanticipated challenges. In November, Dawn successfully operated in a mode that had not even been conceived of when it was designed and built. Its orientation was controlled using a "hybrid" method which was developed long after launch and operated flawlessly, validating the extensive work engineers invested in it and verifying its readiness for use at Ceres.

When Dawn embarked on its journey more than six years ago, it was outfitted with four reaction wheels. By electrically changing the speed at which these gyroscope-like devices rotate, the probe can turn or stabilize itself. It generally used three at a time, with a fourth kept in reserve. One of the wheels experienced increased friction in June 2010, but the mission continued with the other three. A second met the same fate in August 2012, as Dawn was departing from Vesta. Other spacecraft have encountered similar issues with their reaction wheels, and the consequences can be dire.

When the first wheel faltered, team members began working on a method to operate with fewer than three. They developed software to operate in a hybrid mode of two wheels plus the small hydrazine-powered jets of the reaction control system and installed it in the craft's main computer in April 2011 so it would be available at Vesta if needed.

If either or both the two remaining wheels fail, the team has devised a detailed plan that should allow Dawn to complete its extraordinary mission using only the hydrazine thrusters, achieving all of its objectives in exploring Ceres. Engineers continue to develop methods to conserve hydrazine and reduce anticipated usage. When the hydrazine is exhausted, the mission will conclude.

Education and Public Outreach Highlights

Dawn team members and their colleagues are sharing mission science through a series of Google+ Hangouts. Video clips from the first two are posted, the third will be available soon. You can also watch the full-length YouTube version of the entire series:

"Icy World Revealed?" – will Ceres be a game changer in our concept of solar system history?

"Great Expectations" – how does studying meteorites prepare scientists to investigate Ceres?

"Dawn Mission, Hubble Inspired" – how images of Ceres from the Hubble Space Telescope contributed to Dawn

Support the Dawn mission through Asteroid Mappers. Help scientists learn more about Vesta's history and geology by finding craters.

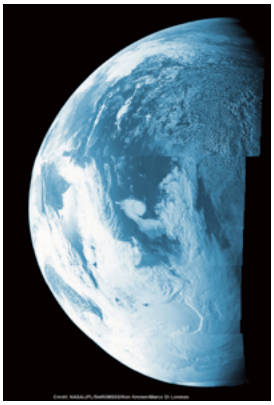
Earth Says "Hi" as Juno Flies By

When the Juno spacecraft flew past Earth on Oct. 9, 2013, it received a boost in speed of more than 8,800 mph which set it on course for a July 4, 2016, rendezvous with Jupiter. One of Juno's sensors, a special kind of camera optimized to track faint stars, also had a unique view of the Earth-Moon system. The result was an intriguing, low-resolution glimpse of what our world would look like to a visitor from afar. Watch the Juno Earth flyby movie.

Scott Bolton, Juno principal investigator at the Southwest Research Institute, San Antonio, said, "In the movie, you ride aboard Juno as it approaches Earth and then soars off into the blackness of space. No previous view of our world has ever captured the heavenly waltz of Earth and Moon."

The Juno spacecraft was launched from Kennedy Space Center in Florida on August 5, 2011. Juno's launch vehicle was capable of giving the spacecraft only enough energy to reach the asteroid belt, at which point the Sun's gravity pulled it back toward the inner solar system. Mission planners designed the swing by Earth as a gravity assist to increase the spacecraft's speed relative to the Sun, so that it could reach Jupiter.

During the flyby, Earth and the Moon came into view when Juno was about 600,000 miles away -- about three times the Earth to Moon distance. "Everything we humans are and everything we do is represented in that view," said the star tracker's designer, John Jørgensen of the Danish Technical University, near Copenhagen.



This colorized composite shows the Earth over the coast of Argentina and the South Atlantic Ocean.

Credit: NASA/JPL/SwRI/ MSSS/Ken Kremer/Marco Di Lorenzo

Also during the flyby, Juno's Waves instrument, which measures radio and plasma waves in Jupiter's magnetosphere, recorded amateur radio signals. This was part of a public outreach effort involving more than 1,400 ham radio operators from around the world. They were invited to say "HI" to Juno by coordinating radio transmissions that carried the same Morse-coded message. Operators from every continent, including Antarctica, participated.

This video shares how the HI JUNO experiment was carried out, while this short video presents natural radio signals from Earth's atmosphere along with pieces of the Morse code message.

Once Juno enters into orbit around Jupiter in 2016, the spacecraft will circle the planet 33 times, from pole to pole, and use its collection of science instruments to probe beneath the gas giant's obscuring cloud cover. Scientists will learn about Jupiter's origins, internal structure, atmosphere and magnetosphere.

As of December, the spacecraft is in excellent health and operating normally. The project continues to process the flyby data as Juno covers the long distance to Jupiter, traveling approximately 71,000 mph relative to the Sun. Since launch, Juno has traveled more than one billion miles.

Education and Public Outreach Highlights

Bill Nye describes many aspects of Jupiter and the Juno mission in a series of nine videos, Why With Nye on the Thinkr YouTube channel.

Juno's images of the Earth and Moon weren't the only intriguing photos taken during the fast Earth flyby. Amateur photographers in South Africa, Europe and Australia captured pictures and video of Juno as she zoomed above the Earth.

Kids - visit NASA Space Place and play "JunoQuest." You can help the Juno spacecraft explore the mysteries of Jupiter.

A Tribute to Deep Impact

After almost 9 years in space that included an unprecedented July 4th impact, flybys of two comets and the return of approximately 500,000 images of celestial objects, the Deep Impact mission has ended.

The project team at the Jet Propulsion Laboratory reluctantly pronounced the mission at an end in September after being unable to communicate with the spacecraft for over a month. Deep Impact was history's most traveled comet research mission, covering about 4.71 billion miles. It achieved much more than was ever envisioned and completely overturned what we thought we knew about comets. It also left a treasure trove of planetary science data that will be a source of research for years to come.

With its demise comes a deep sadness yet a deep appreciation for all that we learned from this unique spacecraft. The crater on comet Temple 1 wasn't as deep as many expected, but the depth of the findings made up for that. The spacecraft was re-purposed for a second mission to uncover more deep space mysteries. The flyby of comet Hartley 2 – at 27,500 mph according the NASA's Deep Space Network – brought a deep thrill to all who became intrigued by this small peanut-shaped, ice-spewing space rock, especially Malcolm Hartley who discovered it in 1986 at the Siding Spring Observatory in Australia. Principal investigator Michael A'Hearn is a deep thinker, indeed.

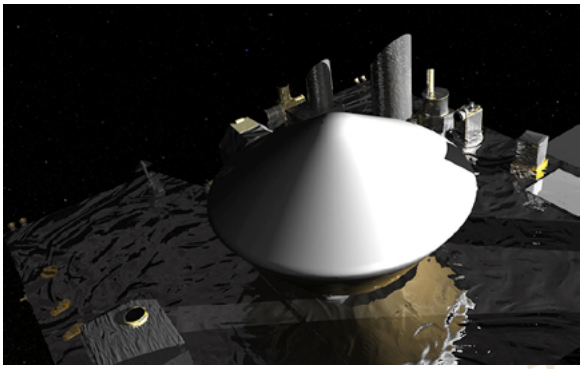
Countdown Begins for NASA's OSIRIS-REx Asteroid Mission

The OSIRIS-REx asteroid sample return mission began its countdown on December 9, at 7:43 PM EST, with 999 days remaining until the opening of the mission's launch window in September 2016.

"This is a pioneering effort, both technologically and scientifically," said Dante Lauretta, OSIRIS-REx principal investigator from the University of Arizona, Tucson. "Starting the countdown clock carries a lot of symbolism for us. After December 9, we will have a constant reminder of the time remaining to send OSIRIS-REx on its quest to return a sample of asteroid Bennu."

OSIRIS-REx will visit a primitive, carbonaceous asteroid named Bennu in 2018, obtain a sample from its surface, and return the material to the Earth in 2023.

"999 days seems a long time to get the spacecraft on the pad, but we know that time will pass quickly. There is a lot of work to do before our spacecraft begins its journey, and we have to be very disciplined to get everything done in time," said Mike Donnelly, OSIRIS-REx project manager at NASA's Goddard Space Flight Center (GSFC) in Greenbelt, MD.



This artist's concept shows the OSIRIS REx instrument deck which includes instruments that will measure anomalies in the asteroid's movement and gravity.

Image Credit: NASA

The world will be able to follow along on the mission website and receive daily updates about the mission and asteroid science on Facebook. Twitter followers will get a special treat, when the spacecraft begins to report on its progress as it comes together at the Lockheed Martin facility in Littleton, CO. Follow the tweets @ OSIRISREx.

The OSIRIS-REx mission promises to help scientists address some basic questions about the composition of the very early solar system, the source of organic materials and water that made life possible on Earth, and to better predict the orbits of asteroids that represent collision threats to the Earth.

In November the mission conducted an Integrated Baseline Review (IBR) at Lockheed Martin, Denver, against major spacecraft subsystems, select major assemblies, operations capability, and programmatic areas. In December the New Frontiers Program Office conducted the project-level IBR with GSFC, examining project management and the GSFC-managed instruments OTES (OSIRIS-REx Thermal Emission Spectrometer) and OVIRS (OSIRIS-REx Visible and IR Spectrometer).

The first of the four instrument Critical Design Reviews took place in December for the OTES at Arizona State University. The others will take place over the next five months. The OSIRIS-REx Camera Suite (OCAMS) and the Science Processing and Operations Center (SPOC) successfully completed their first end-to-end test — image capture, transmit, and receive.

Education and Public Outreach Highlights

Dolores Hill, co-lead of the OSIRIS-REx Target Asteroids! program with Carl Hergenrother, was recognized as one of 12 White House Champions of Change for citizen science on June 25, 2013. The program honors people and organizations that have demonstrated exemplary leadership in engaging the broader, non-expert community in science, technology, engineering, or mathematics (STEM) research.

"It is such an honor to be selected and go to the White House for the ceremony," Hill said. "I am especially thrilled that Target Asteroids! combines my lifelong interests in amateur astronomy and meteorites, and brings me in touch with longtime amateur astronomer friends and former colleagues."

Dolores Hill, shown with OSIRIS-REx Principal Investigator Dante Lauretta, carefully handles a meteorite during an outreach event.

The program involves amateur astronomers observing near-Earth asteroids to provide important information to mission scientists as well as providing significant data for future missions to asteroids and leading to a greater understanding of potentially hazardous asteroids. In the program's first year, 138 amateurs registered from 25 states and 26 countries and provided 87 sets of data on 17 near-Earth asteroids. These observations fill gaps in current knowledge and make an important contribution to our understanding of these objects.

999 Day Countdown – as countdown to launch began on December 9, the project team started its roll out of new opportunities to follow along with the mission:

- host a Reddit "Ask Me Anything" session
- initiate a PI blog
- offer Ask an Expert opportunity for questions about the mission
- produce a series of short 3-2-1Science videos highlighting key science themes. Watch the first one, Asteroids Fact vs. Fiction.

ASPERA-3 and Strofio Updates

ASPERA-3 and Strofio are Discovery Program Missions of Opportunity, NASA funded instruments flying onboard non-NASA missions that give the U.S. scientific community the chance to participate in foreign space missions. Both ASPERA-3 and Strofio are part of European Space Agency (ESA) missions.

The Analyzer of Space Plasma and Energetic Atoms, or ASPERA-3, is an instrument to study the interaction between the solar wind and the Martian atmosphere flying aboard ESA's Mars Express spacecraft. It carries two sensors built by Southwest Research Institute (SwRI) and funded by the Discovery Program: an electron spectrometer and ion mass analyzer.

The ASPERA-3 project team continues to analyze, process, & validate data and to prepare data and documentation for delivery to and archiving in the NASA Planetary Data System/European Space Agency Planetary Science Archive. ASPERA-3 and Mars Express Orbit/Attitude data are being processed and archived on the SwRI ground data system.

The Mars Express mission has been approved by ESA for another extension through 2014. NASA has approved a fourth extension for ASPERA-3, which includes operation of the instrument through 2014 and data analysis through 2015

Strofio is a unique mass spectrometer that is part of the SERENA (Search for Exospheric Refilling and Emitted Natural Abundances) suite of instruments that will fly on board ESA's BepiColombo/ Mercury Planetary Orbiter spacecraft. Strofio will determine the chemical composition of Mercury's surface, providing a powerful tool to study the planet's geological history.

Strofio Flight Configuration

In January 2013 it was announced that the BepiColombo spacecraft Critical Design Review failed due to 9 major issues. Problems on the SERENA suite of instruments continue to be addressed. The Strofio proto-flight model (PFM) failed a functional performance test in Milan, Italy, on November 6, but with additional testing the problem was isolated and corrected. The project hand delivered the Strofio PFM to the European Space Research and Technology Centre on November 19, and the unit passed visual and performance tests. It was then shipped back to Milan with the rest of the SERENA suite-level hardware.

Facing a variety of ongoing issues, the BepiColumbo launch date continues to slip and will be no earlier than summer 2016.

Discovery and New Frontiers NEWS

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Acknowledgement: Thanks to Marc Rayman for information about Dawn from his Nov. 2013 *Dawn Journal.*