



Welcome!

to the

Thrill of Discovery

Celebrating

NASA's Year of the Solar System:

New Worlds, New Discoveries



Year of the Solar System

- ✧ Between Oct. 2010 and Aug. 2012, NASA spacecraft are heading for many key locations – an unprecedented array of activity over a 23-month period - a Martian year!
- ✧ These amazing robots will take us from Mercury to Jupiter and many space rocks in between – revealing these familiar objects to us as **New Worlds** through the **New Discoveries** they will make
- ✧ Six of these NASA missions are in the Discovery and New Frontiers Programs – our focus today



NASA's Discovery Program



- ✧ Started in 1992 - an experimental new strategy for space exploration intended to fly missions that cost less and address focused scientific questions in a relatively short time
- ✧ Projects use smaller spacecraft, have limited scope, are proposed by scientists, called principal investigators, who assemble teams to carry out robotic planetary investigations
- ✧ This radical approach = huge success! Ground-breaking science has greatly enhanced our body of planetary knowledge
- ✧ The new 2013-22 decadal study recommends "vigorously continuing the highly successful Discovery Program," noting the program has made important and fundamental contributions to planetary exploration



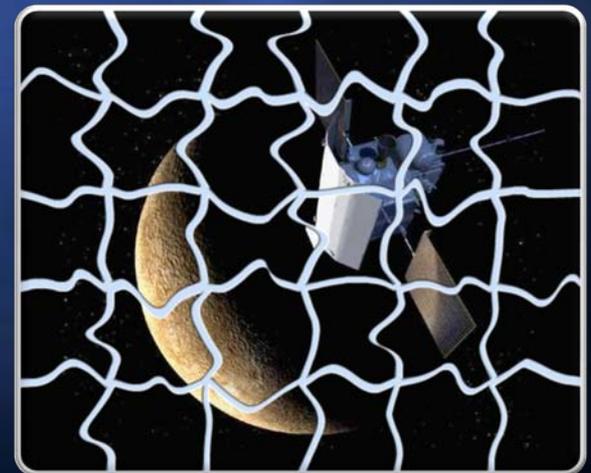


New Frontiers Program



- ✧ New Frontiers was added in 2004 to expand the scope with larger investigations that offer high science return
- ✧ These missions target specific planetary science goals based on recommendations of the science community's decadal survey
- ✧ Discovery, New Frontiers and flagship missions form the basis for NASA's science exploration strategy
- ✧ All of these missions are searching for answers to three fundamental questions to help us understand:
 - ✧ Where do we come from?
 - ✧ Where are we going?
 - ✧ Are we alone?

Each mission adds another piece of knowledge to help solve our cosmic puzzle by exploring planets, comets, asteroids, and the Moon





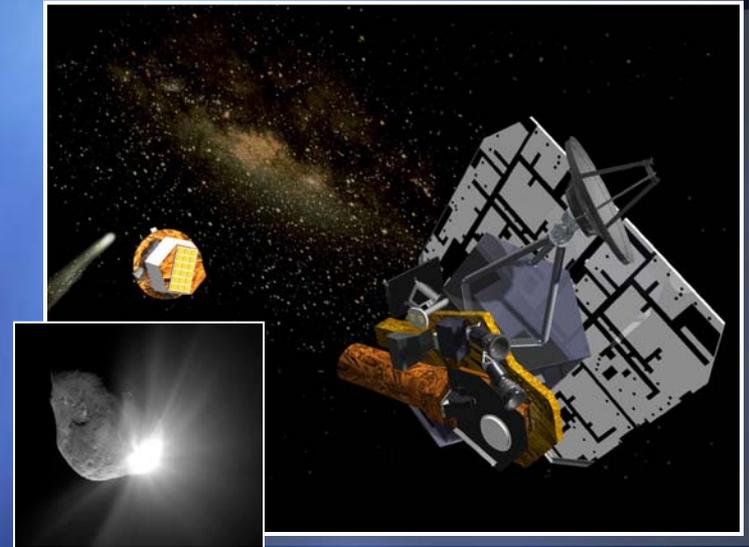
Comet Encounters: Two for (Almost) the Price of One



Deep Impact / EPOXI

Propelled a large projectile into the path of comet Tempel 1 in 2005 to excavate the interior while a flyby spacecraft observed, returning a wealth of new information

Sent on a new mission in 2007 to search for planets around other stars and fly by comet Hartley 2. Earth and Moon observations provided bonus science, while the Nov. 4 Hartley flyby returned spectacular images that shed new light on the nature of comets



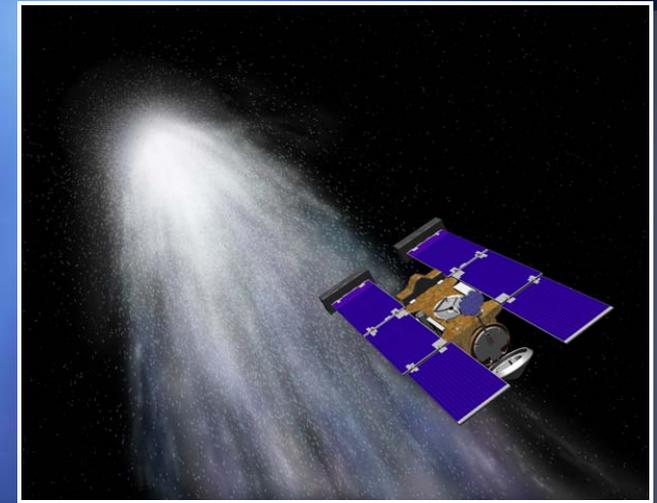


Comet Encounters: Another 2 for 1 Bargain

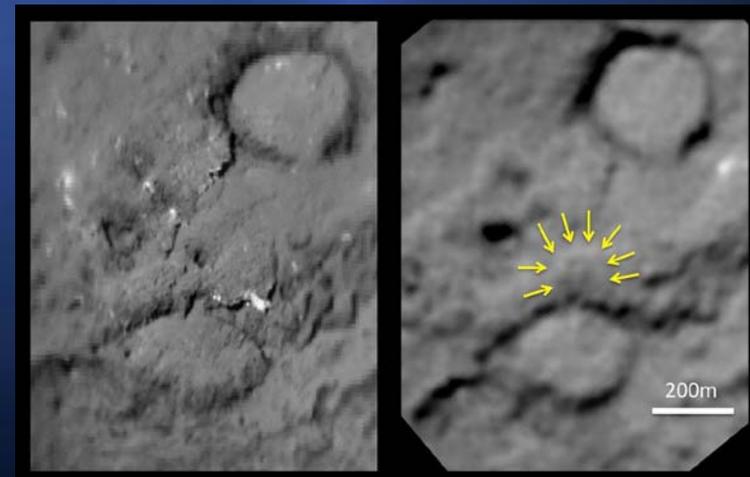


Stardust / Stardust-NExT

Captured the first-ever samples from a comet and returned them to Earth in 2006. Found organics in comet dust and minerals that came from the warmer inner solar system, carried to the icy region where comets form



New assignment: flyby comet Tempel 1 on Feb. 14 - an unprecedented return to observe changes since 2005, new terrain, and - finally - the crater made by Deep Impact. The subdued 500' in diameter crater indicates a weak, fragile nucleus





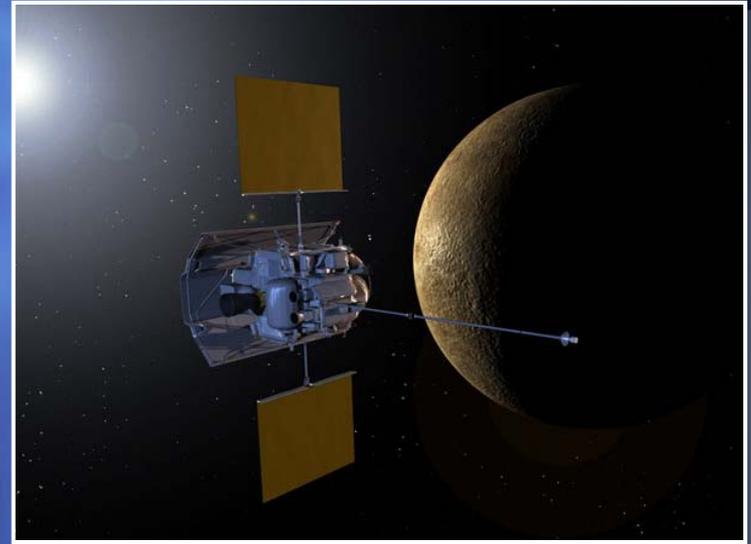
Mercury Orbiter



MESSENGER

Launched in August 2004, just began its year-long orbit of Mercury, after 1 Earth flyby, 2 Venus flybys, and 3 Mercury flybys to refine the trajectory on its 4.9 billion mile journey

Images and data so far reveal a unique, geologically diverse world a lot less like the Moon than many previously thought. Important findings include widespread volcanism and huge cliffs winding hundreds of miles across the planet's face





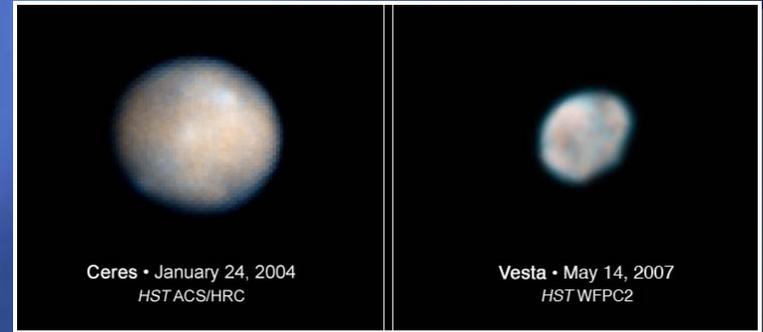
Orbiter to the Asteroid Belt



Dawn

Will orbit Vesta and Ceres, the oldest and most massive objects in the asteroid belt to remain intact since their formation 4.5 billion years ago. Using ion propulsion to orbit 2 targets in one mission for the first time, Dawn will give us a better understanding of the conditions and processes at the beginning of the solar system.

Dawn arrives at Vesta in July - get ready for the Vesta Fiesta in August!





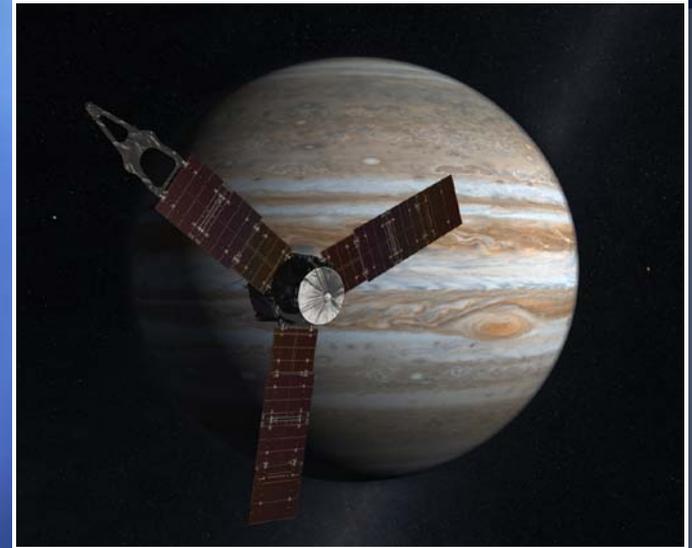
Jupiter Orbiter



Juno

Will peer through the clouds to reveal hidden secrets from the formation and early evolution of the our solar system, including how and where the giant planet formed. Juno will investigate Jupiter's solid core, map the gravity and magnetic fields, measure water and ammonia content, and observe auroras

Planned for launch in August, arrival at Jupiter in 2016





Lunar Orbiter

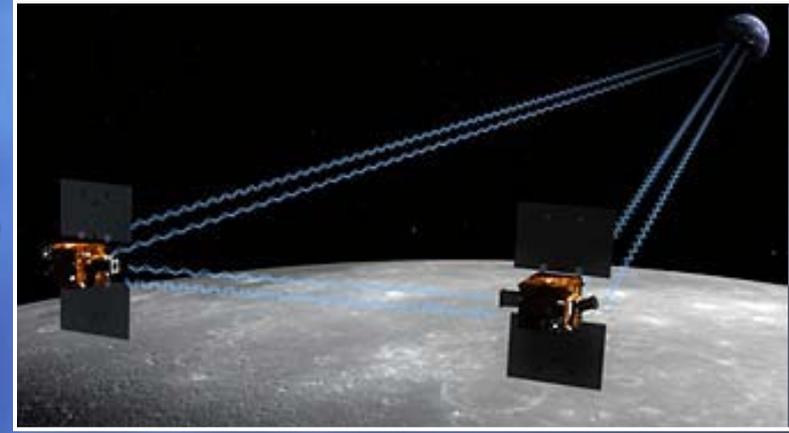


GRAIL

Will put twin satellites into orbit around the Moon to precisely measure and map variations in the gravitational field so future Moon missions can safely navigate anywhere on the surface.

Knowledge about the structure of the lunar interior and thermal evolution will also be advanced

Launch is planned for Sept. 2011. GRAIL MoonKAM brings students along, taking pictures of the surface from cameras onboard





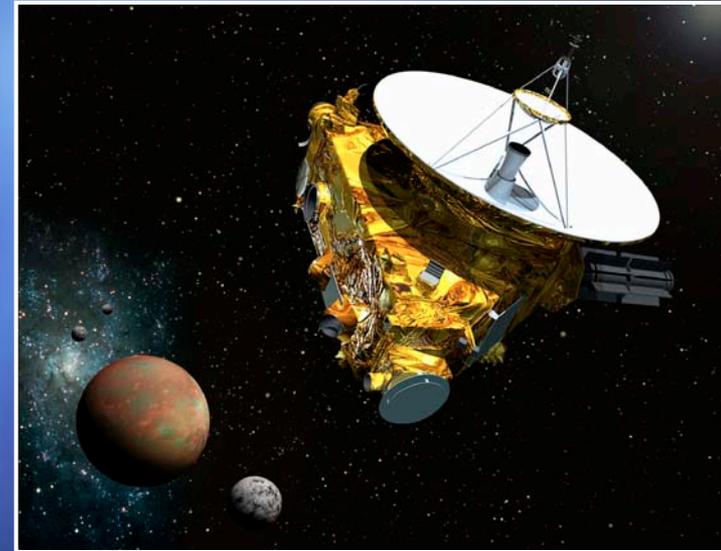
Pluto Flyby...on the way



New Horizons

Launched in Jan. 2006, New Horizons will arrive at Pluto in 2015 for the first ever close-up look at this distant dwarf planet and its 3 moons. Its goals are to help answer questions about the surface properties, geology, interior makeup, and atmospheres on these bodies.

If an extended mission is approved, the spacecraft would head deeper into the Kuiper Belt to study one or more of the icy mini-worlds in that vast region, a billion miles beyond Neptune's orbit.





Learn More



Find out much more about all these missions that are visiting **New Worlds** and making **New Discoveries** during the **Year of the Solar System**

discovery.nasa.gov
newfrontiers.nasa.gov

Visit the YSS website for monthly topics, involvement opportunities, resources and more

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