



Global Friendship Through Space Education

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ASTRO

The Partner School Science Program Newsletter

Dear PSSP Students:

This is the last issue of Astro newsletter in 2009-2010 school year. We hope you learned a lot and enjoyed reading Astro and being a part of our international family. We would like to say goodbye to you with the latest news.

We welcome HAYABUSA back to Earth after overcoming various difficulties!

HAYABUSA, the world's first space probe to travel to an asteroid and return with



collected surface material, will land on Earth on Sunday, according to the [Japan Aerospace Exploration Agency](#)

[\(JAXA\).](#)

Reentry images to the earth atmosphere and landing.



The Asteroid Explorer HAYABUSA successfully separated from its capsule at 7:51 p.m. on June 13 (Japan Standard Time - the following times and dates are all JST) and re-entered the atmosphere to complete its mission operation at 10:51 p.m.

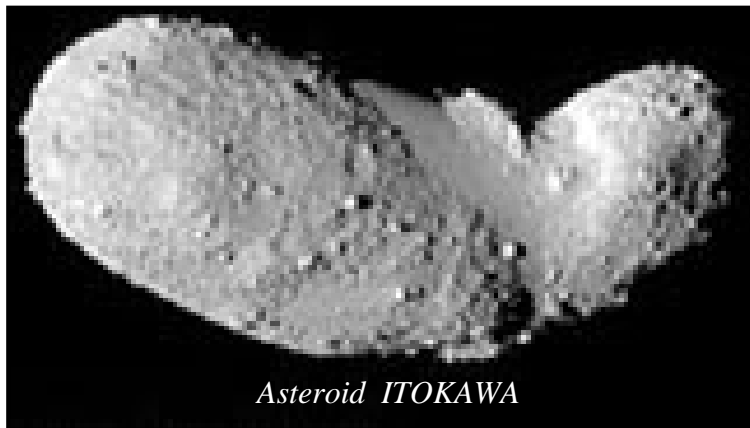


After the landing, a helicopter searched for the capsule in the Woomera Prohibited Area, and at around 11:56 p.m. on the 13th, its location was confirmed.

During the seven years since its launch by an M-V Launch Vehicle in May 2003, the HAYABUSA has successfully landed on the asteroid Itokawa, gathered rocks there, and returned to the Earth with them while overcoming various troubles.



Outline of HAYABUSA



Asteroids are thought to be celestial bodies that preserve information from the time of the Solar System's formation. If we collect a sample from an asteroid and bring it back to Earth to carry out precise research on it, we can gain some precious clues to understand the origin and evolution of the Solar System.

Bringing back a sample from a celestial body in the Solar System is called "sample return." HAYABUSA is a probe to verify the practicality of acquired technology developed to archive future full-scale sample return missions.

HAYABUSA was launched aboard the M-V Launch Vehicle on May 9, 2003. It was accelerated by a swing-by of the Earth in May 2004 and reached its target asteroid Itokawa on September 12, 2005, after traveling about 2 billion kilometers. In September and October of that year, HAYABUSA completed the most remote-sensing and measurement of the geometry of Itokawa and made two landings in November to collect a sample from Itokawa.

Through scientific observations performed during HAYABUSA's stay on Itokawa, various knowledge was obtained, including information on Itokawa's gravity and surface condition.

Overview Asteroid Explorer Information about HAYABUSA

May 9, 2003	<u>Launched by the M-V-5 Rocket from Kagoshima Space Center.</u>
May 27, 2003	<u>Ion Engine operation started.</u>
May 19, 2004	<u>Orbit transfer using the Electric Propelled Delta-V Earth Gravity Assist</u>
July 29, 2005	<u>Performed the Star Tracker imaging of Itokawa.</u>
September 12, 2005	<u>Arrived at Itokawa. (about 20km away)</u>
September 30, 2005	<u>Arrived at the Home Position (about 7km away).</u>
November 12, 2005	<u>Released the probing robot "Minerva".</u>
November 20, 2005	<u>Performed the first touch down and release of the target marker with 880,000 autographs inside.</u>
November 26, 2005	<u>Performed the second touchdown.</u>
December 8, 2005	<u>Lost communication with the earth due to operation rupture by fuel leakage.</u>
January 26, 2006	<u>Resumed communication and operation.</u>
January 18, 2007	<u>Sample-catcher was actually transferred into the recovery capsule, and latched and sealed.</u>
February, 2007	<u>The ion engines ignited and operated again.</u>

April 25, 2007	<u>The homeward journey with an ion engine drive was started.</u>
October 18, 2007	<u>Finished first phase orbit maneuver toward Earth.</u>
End of May, 2008	<u>Reached the farthest deep space from the Earth.</u>
February 4, 2009	<u>Firing ion engine and starting second phase orbit maneuver to return to Earth.</u>
November 4, 2009	<u>Ion engine anomaly.</u>
November 19, 2009	<u>Resumed cruise by combining two partially working ion engines.</u>
March 27, 2010	Finished second phase orbit maneuver toward Earth.
April to June, 2010	Trajectory Correction Maneuvers (TCMs)
June, 2010	Back to the Earth , capsule recovered.

In two weeks you will receive your last Astro for the 2009-2010 school year. This will be your last chance to submit photos of your school and your projects. Send information to tyildirim@gftse.org.