

## ASTRONOMY

### Asteroid mission may provide clues to Earth's composition

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A robotic spacecraft, built by scientists and engineers in Japan, landed last month on a small asteroid 180 million miles from Earth and snatched up some of the surface dirt.

If all goes well, it will return to Earth in 2007.

The Hayabusa spacecraft is the latest in a string of daring new missions to poke, prod and scrape the leftover building blocks of the planets. Think of it as a kinder, gentler version of NASA's Deep Impact, whose spectacular bludgeoning of comet Tempel 1 was front-page news in July.

Hayabusa's extraterrestrial soil sample will be the first brought back to Earth since moon rocks were returned in 1972 by the Apollo 17 astronauts.

And it will be the first sample of an asteroid.

Asteroids and comets are remnants from the formation of our solar system more than 4 billion years ago. By luck, these leftover chunks of solid material neither fell into the sun nor ended up incorporated into a planet. Today, they orbit the sun, just like Earth, Mars and the other planets.

We can't drill far enough into the Earth to sample what our planet is made of.

However, asteroids such as Hayabusa's target, Itokawa, are examples of the same kind of chunks that built the Earth. So analyzing asteroid soil in the laboratory gives us a way to look into Earth's distant past.

While some scientists are fascinated by what asteroids tell us about our past, others are concerned about how they may shape our future.

Without a doubt, asteroids have struck Earth. And they'll continue to do so. On a human scale, these impacts are rare. A truly destructive asteroid hasn't hit Earth at any time in human history.

But it's a sobering thought that the odds of a catastrophic asteroid impact are about the same as those of being in a commercial airliner crash: about 1 in 20 million.

We are on the verge of having the technological ability to prevent some of these impacts. Understanding what asteroids are made of is a crucial step toward reducing the chances of an astronomical disaster.

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