JAXA's NEO related work

SMPAG

ESOC, Darmstadt

6 February 2014

Makoto Yoshikawa (JAXA)

Japan's Contribution to Spaceguard

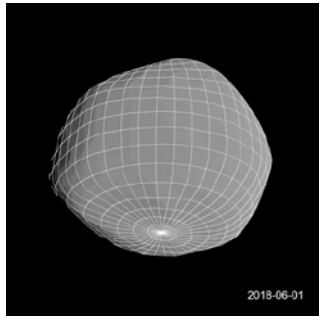
■ Asteroid mission

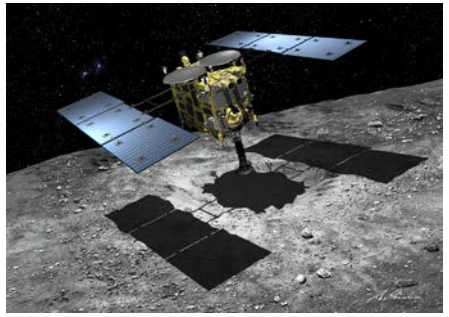
- **Hayabusa**

  Explored a small S-type NEO (25143) Itokawa

- **Hayabusa2**

  Will explore a small C-type NEO (162173) 1999 JU3





■ Observation

- Bisei Spaceguard Center

  Observations of space debris and asteroids (for asteroids, follow-up observation mainly) by Japan Spaceguard Association (JSGA)

- Other telescopes (such as Subaru, etc)

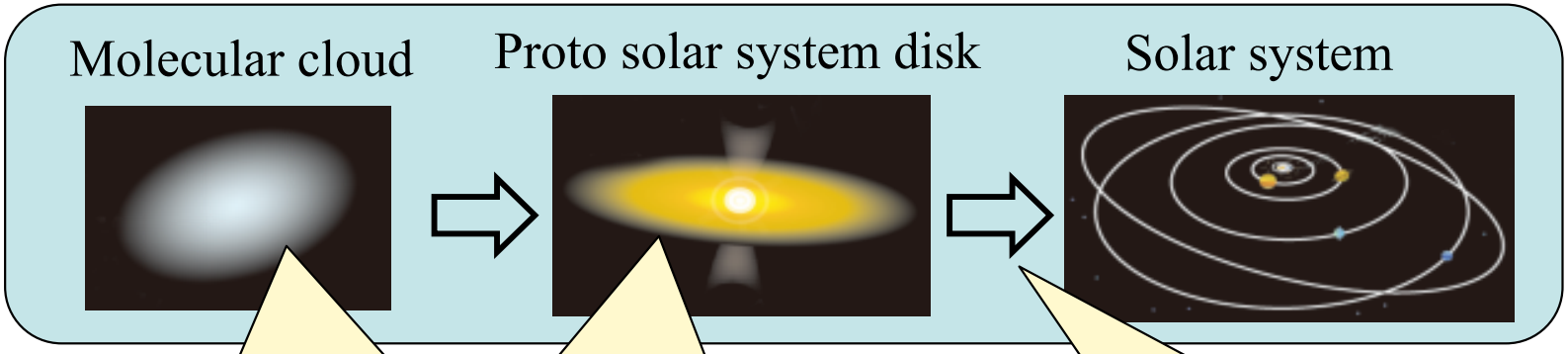
Hayabusa and Hayabusa2

JAXA developed the technology for asteroid sample return

•Ion engine
•Autonomous navigation
•Sample collection system
•Reentry capsule

Impactor system *

We study of the origin and evolution of the solar system



(*Hayabusa2)

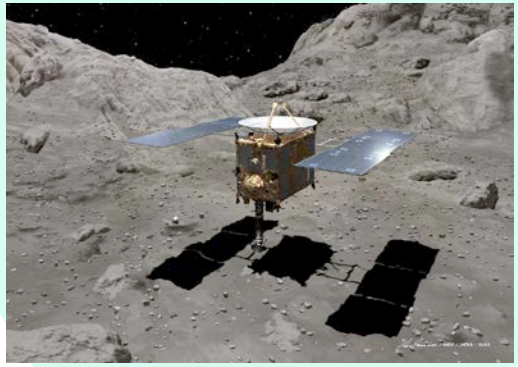
Mission Scenario of Hayabusa

Launch
9 May 2003

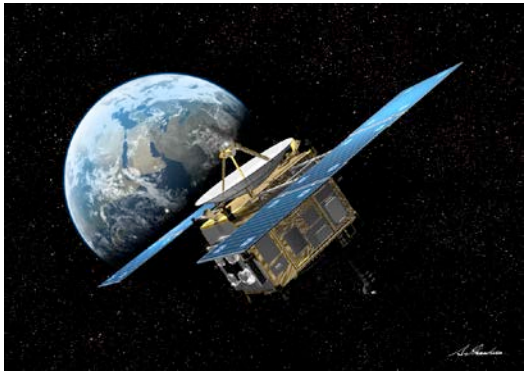
Earth Swingby
19 May 2004

Asteroid Arrival
12 Sept. 2005

Observations, sampling



Serious
troubles



Earth Return
13 June 2010

Mission Scenario of Hayabusa2

Launch

2014

June 2018 : Arrival at 1999 JU3

The spacecraft observes the asteroid, releases the small rovers and the lander, and executes multiple samplings.

Sample analysis

Earth Return

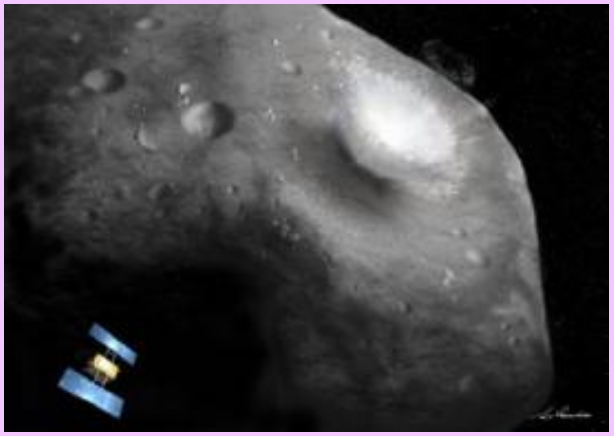
Dec. 2020

Dec. 2019 : Departure

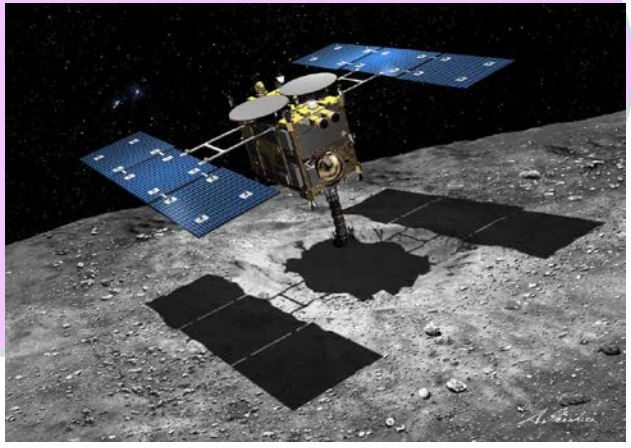
New Experiment

The spacecraft carries an impactor.

2019



The impactor collides with the surface of the asteroid.



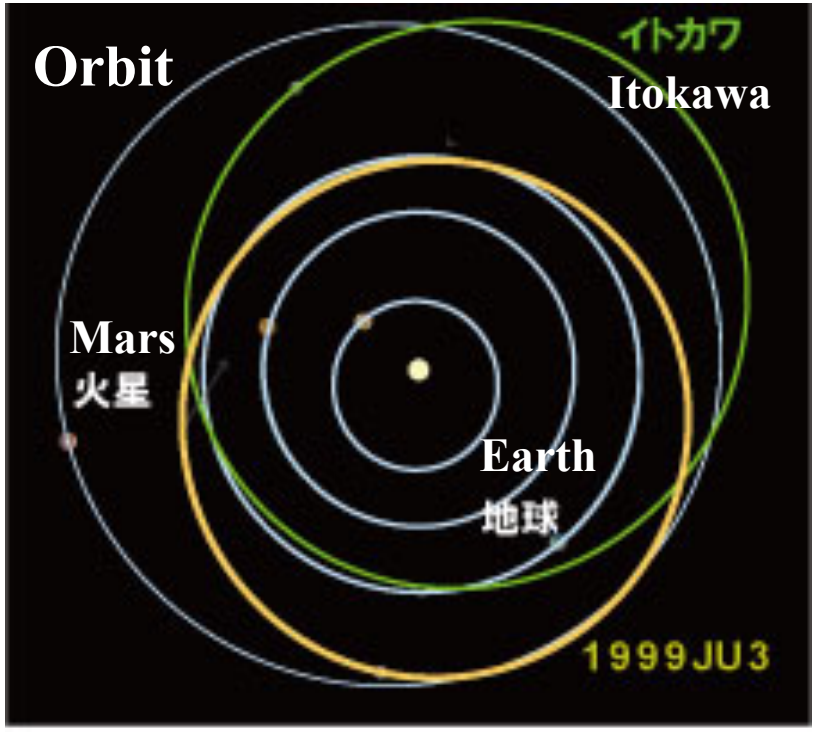
Samples will be obtained from the newly created crater.

Target Asteroids

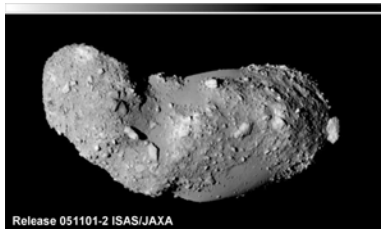
NEO

Hayabusa : (25143) Itokawa

Hayabusa2 : (162173) 1999 JU3

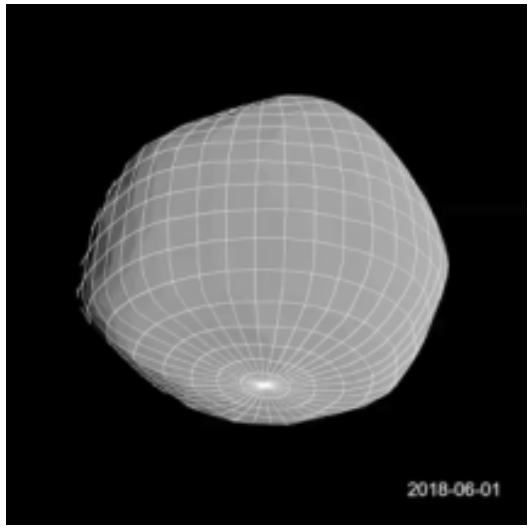


530 m



S-type

900 m



C-type

Images of Itokawa

Eastern Side

Release 051101-1 ISAS/JAXA

Western Side

Release 051101-2 ISAS/JAXA

Release 051101-3 ISAS/JAXA

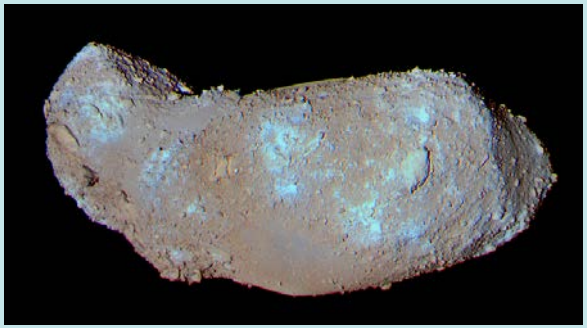
Head

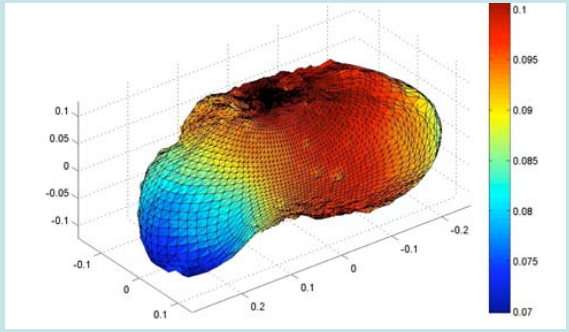
Bottom

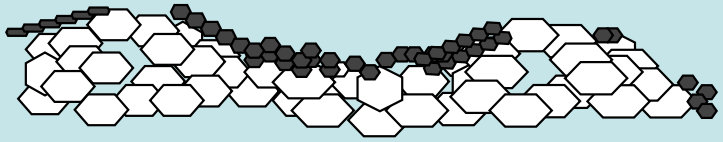
Release 051101-4 ISAS/JAXA

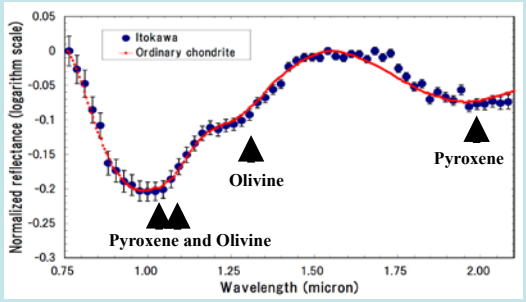
Scientific Results

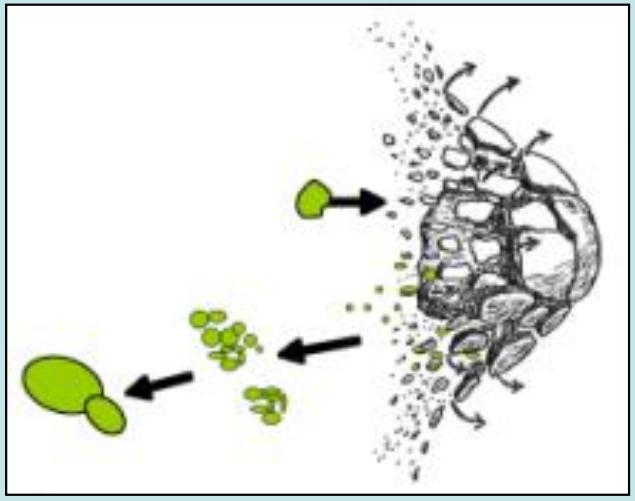
Itokawa





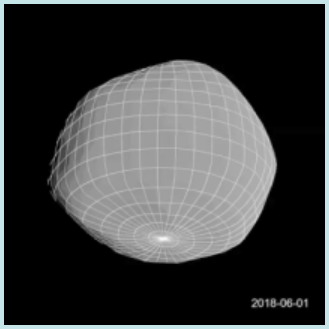






- Mass
  - Shape => volume
    - Density

1999 JU3



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These results will be useful for spaceguard