

## What will we expect from Ryugu and Bennu samples?

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JAXA's Hayabusa2 and NASA's OSIRIS-REx are the sample return missions from near-Earth carbonaceous asteroids Ryugu and Bennu, and the surface samples will be delivered to the Earth in 2020 and 2023. Both Ryugu and Bennu are expected to be pristine asteroids that records the origin and early evolution of the Solar System. Hayabusa2 explored near-Earth C-type asteroid Ryugu for 17 months (June 2018–November 2019) including two landing operations for sample collection and is now on the way back home. OSIRIS-Rex has been investigating near-Earth B-type asteroid Bennu since its arrival in December 2018. The spacecraft will make a touch-and-go landing operation for sample collection in August 2020.

Hayabusa2 and OSIRIS-Rex found that both Ryugu and Bennu are dark rubble pile bodies with spinning top shapes. The two asteroids have an almost identical bulk density of 1.19 g/cm<sup>3</sup>, and their macro porosities are ~50 % assuming they consist of carbonaceous chondrite-like materials. Both asteroids have hydrated silicates at the surfaces although Ryugu likely has less abundant hydrous phases than Bennu, a hypothesis that we will test through analysis of the returned samples.

In the open colloquium, we will review what the spacecrafts found at Ryugu and Bennu especially from the cosmochemical point of view, discuss the similarities and differences between two, and discuss with the audience our expectations of what will learn from Ryugu and Bennu samples after Earth return.

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