Asteroid explorer, Hayabusa2
Press Conference

December 15, 2020

JAXA Hayabusa2 Project

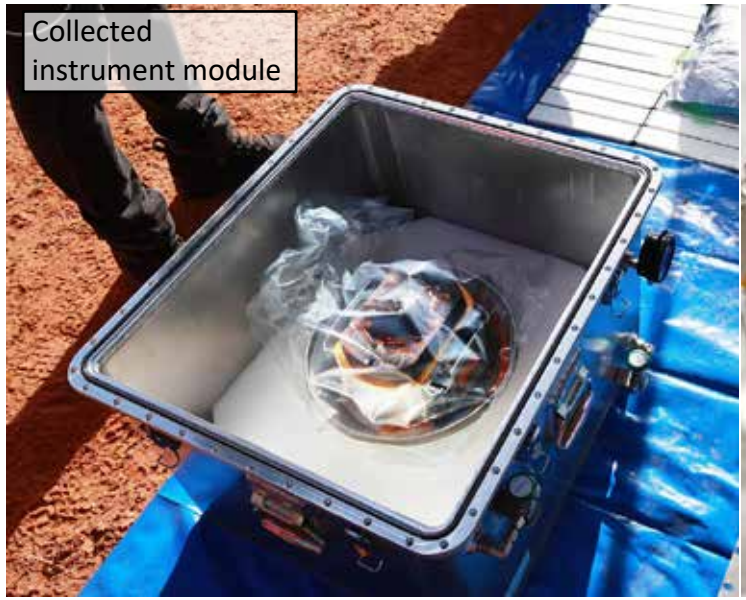
Topics

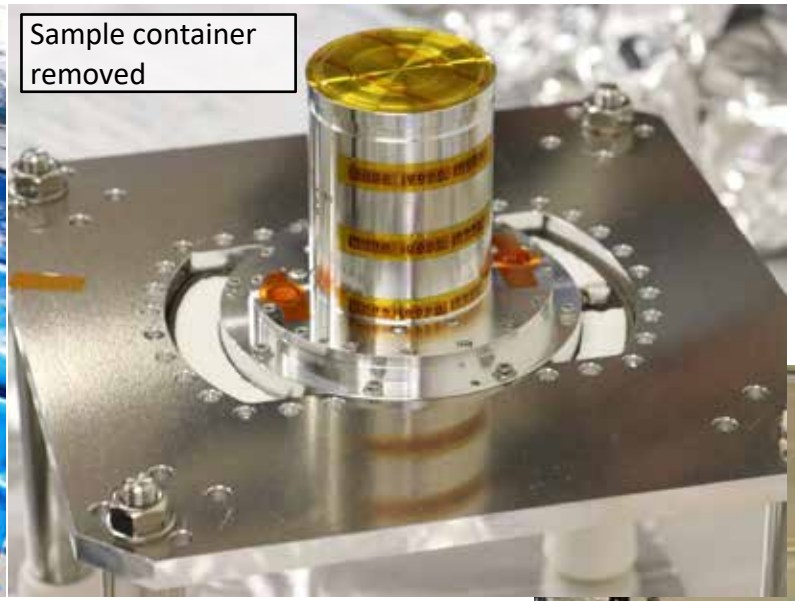
Regarding Hayabusa2,

- Gas sampling
- Confirmation of the Ryugu sample

Gas sampling at the QLF

～From capsule collection through to airlift to Japan～





- The collected instrument module (I/M) is transported to the QLF (Quick Look Facility) and disassembled after safety checks.
- Remove the sample container and connect it to the gas sampling equipment.
- Collect gas from the sample container and perform mass spectrometry.

（credit：collected instrument module: JAXA
Sample container removed, collecting the gas：JAXA/University of Tokyo/Kyushu University/JAMSTEC）

Gas sampling at the QLF

～Gas analysis in the sample container～

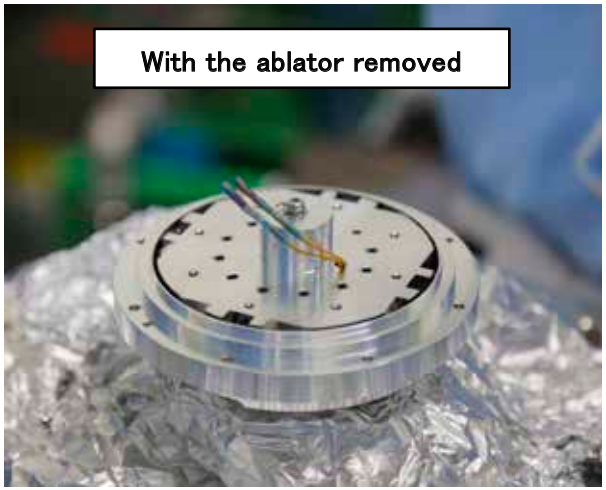
- On December 7, 2020, mass spectrometry of the gas collected from the sample container was performed at the QLF (Quick Look Facility).
- For confirmation, a similar analysis was performed at the JAXA Sagamihara Campus Extraterrestrial Sample Curation Center on December 10 – 11.
- The gas in the sample container is judged to originate from Ryugu based on the following points:
  - The results of the analysis at the Extraterrestrial Sample Curation Center are the same as the results of the gas analysis conducted at the Woomera Local Headquarters in Australia.
  - According to the analysis results, the condition of the sample container was sealed as designed, with an aluminum metal seal, such that the contamination from the Earth's atmosphere is sufficiently suppressed to below the permissible level for the mission.
  - The gas analysed on the Sagamihara campus was generated in the sample container after the recovery of the gas in Australia. Since it is of the same composition, the collected gas is considered to be generated by the degassing of the sample.

World's first gas sample returned from deep space

Opening the container in the curation clean room

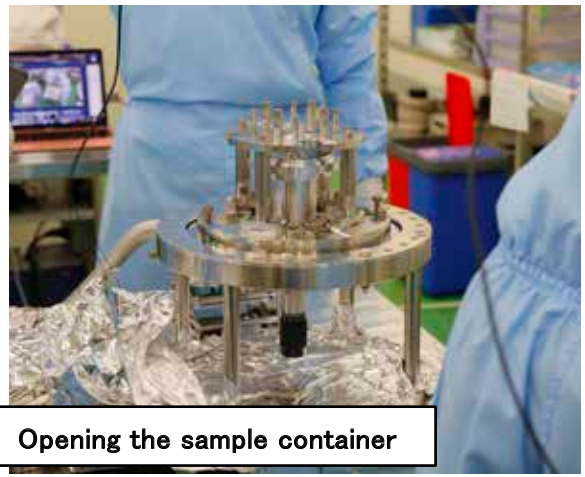
～Removal of the ablator from the sample container, and the work to open the container～

Removing from the transport box



With the ablator removed

Preparing to open the sample container



Opening the sample container

CC3-1 before connection

Image credit:
JAXA
University of Tokyo
Kyushu University
JAMSTEC

Opening the container in the curation clean room

～Clean chamber CC3-1 connection, sample container opened～

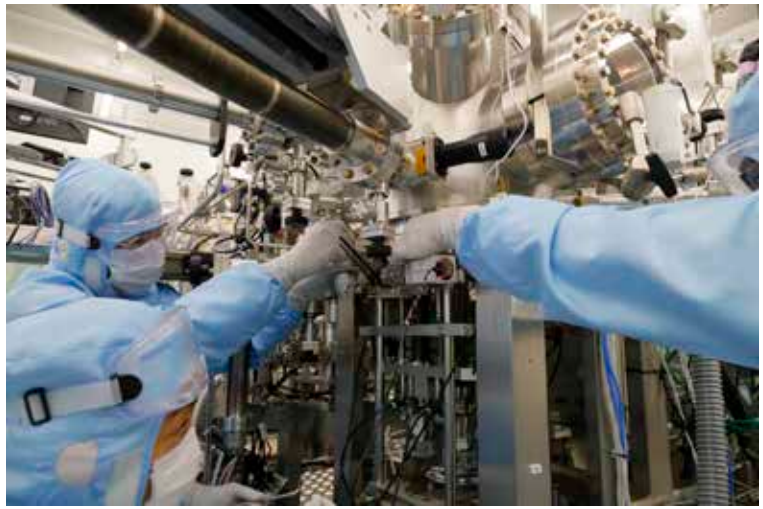


Image credit:
JAXA
University of Tokyo
Kyushu University
JAMSTEC

Sample container connected to CC3-1

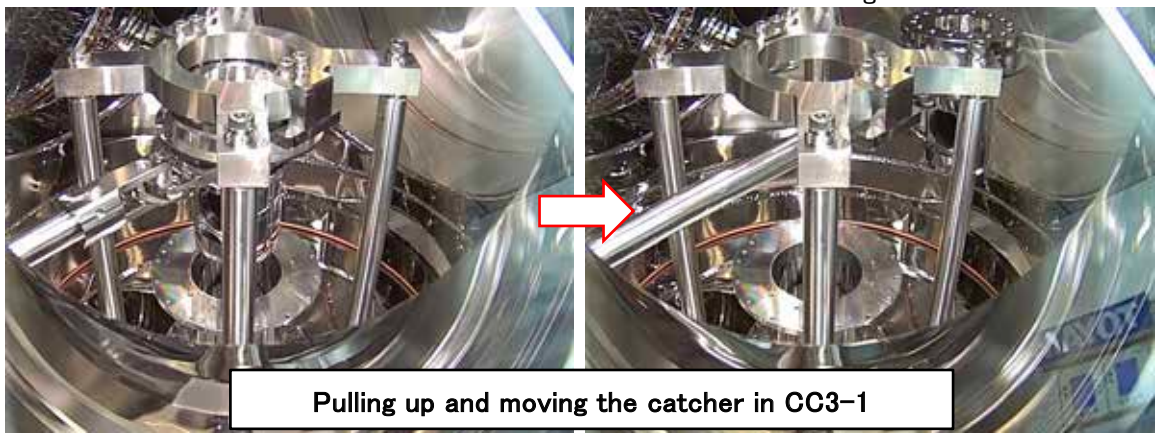


Image credit: JAXA

Pulling up and moving the catcher in CC3-1

Schematic of pulling up the sample catcher from the sample container in CC3-1

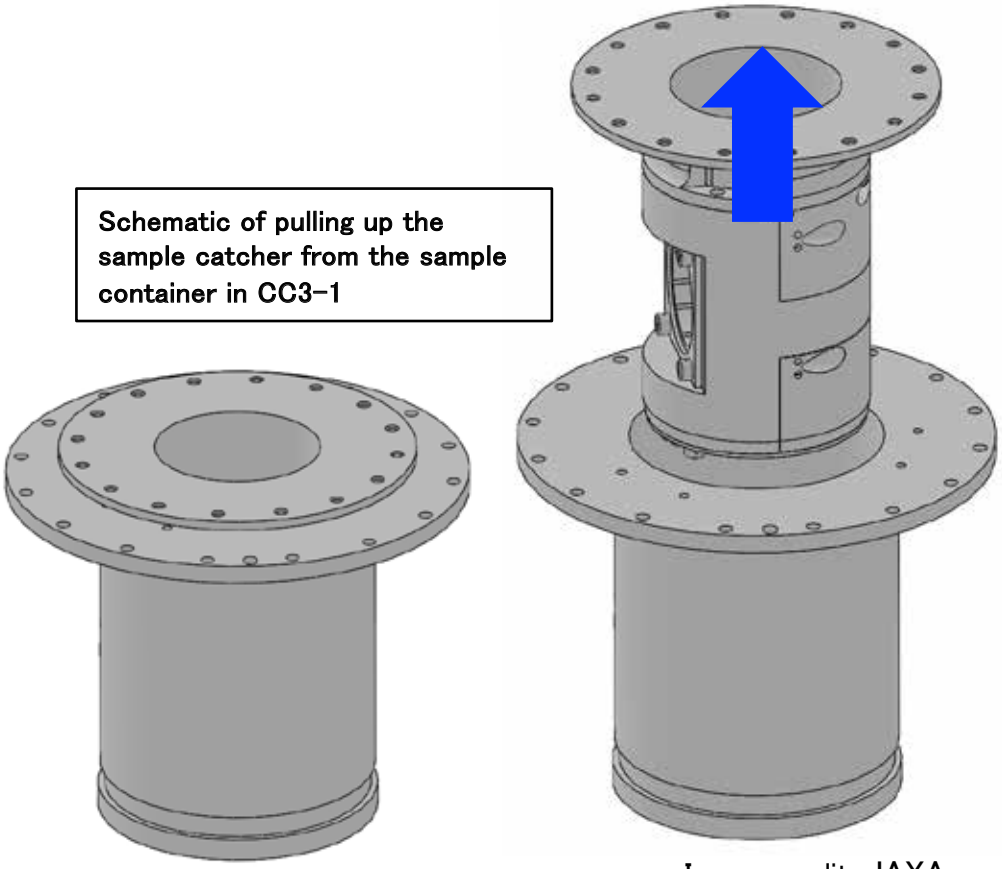
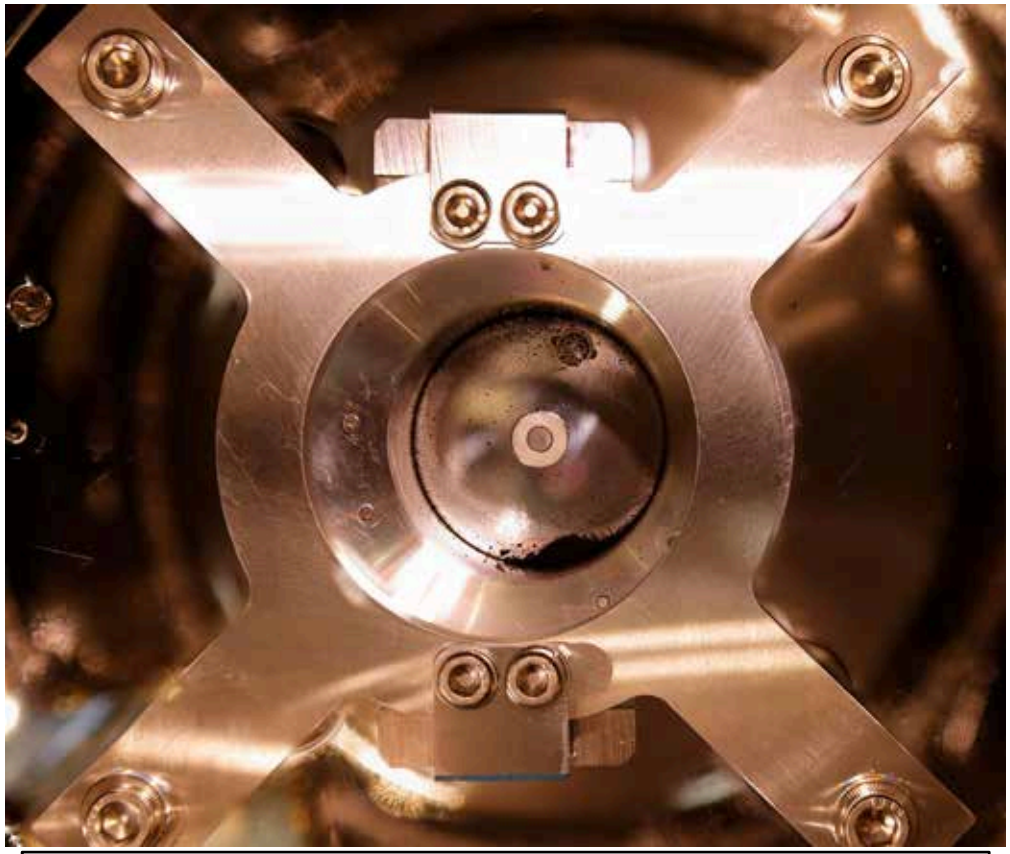


Image credit: JAXA

Opening the container in the curation clean room

～Clean chamber CC3-1 connection, sample container opened～



After moving the catcher, the bottom of the sample container is viewed from above.

- Open the sample container in CC3-1 and pull out the sample catcher from inside.
- After moving the catcher to CC3-2 in order to remove the sample catcher lid, observe the bottom of the sample container.
- Black particles that appear to be Ryugu material are confirmed to be at the bottom of the sample container.

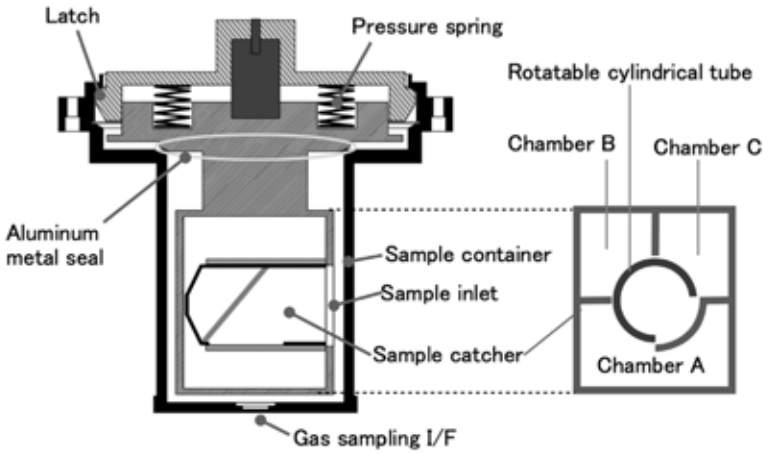
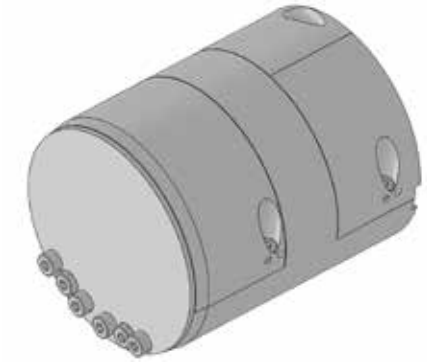
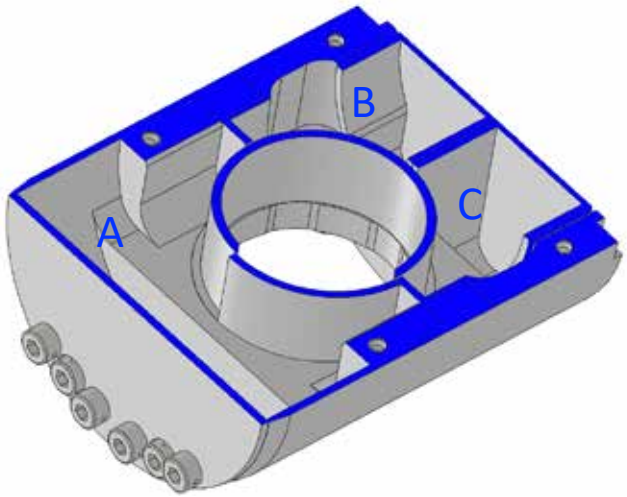


Image credit : JAXA

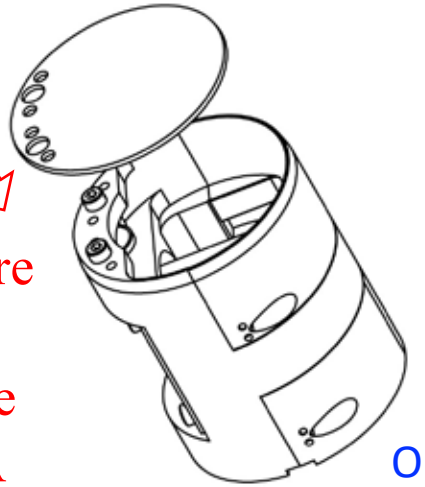
Opening Chamber A

～Removing the lid of chamber A～





Particles are confirmed from above chamber A



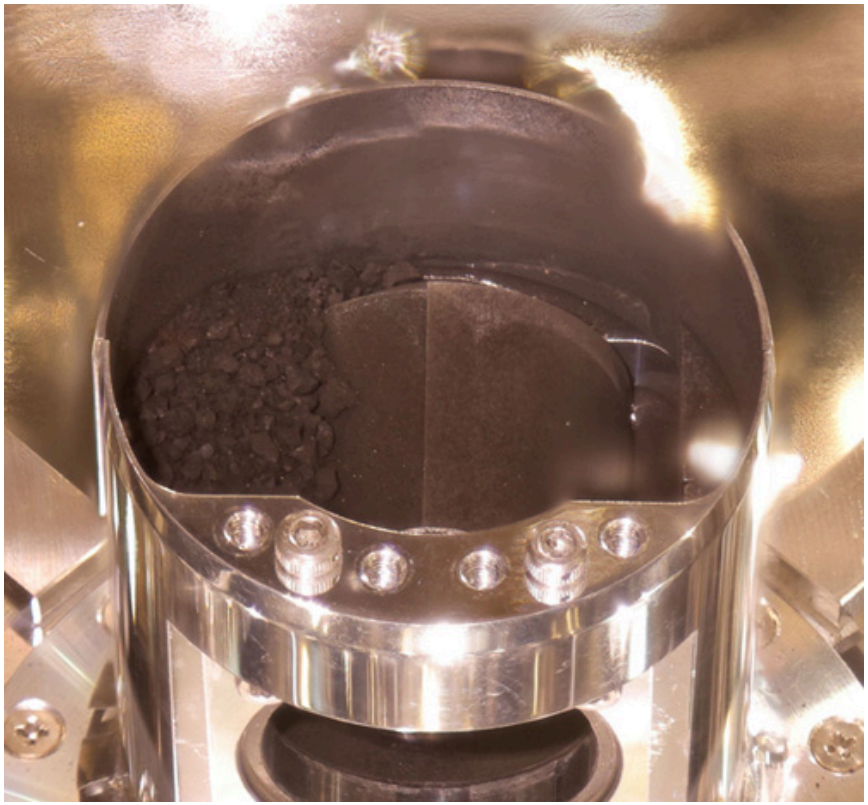
Open the lid of chamber A

- The sample catcher was moved to clean chamber CC3-2, and the lid of sample catcher chamber A was opened in vacuum conditions.
- Many particles are confirmed to be in chamber A. This is thought to be the sample collected during Touchdown #1 on Ryugu.
- Part of the sample was picked up in Chamber A to be stored in vacuum in its present condition.
- From here, we will move to chamber CC3-3, remove the samples from chamber A in a nitrogen environment, and open chambers B and C.

Image credit：JAXA

Particle confirmation in chamber A

～Particles confirmed in chamber A～

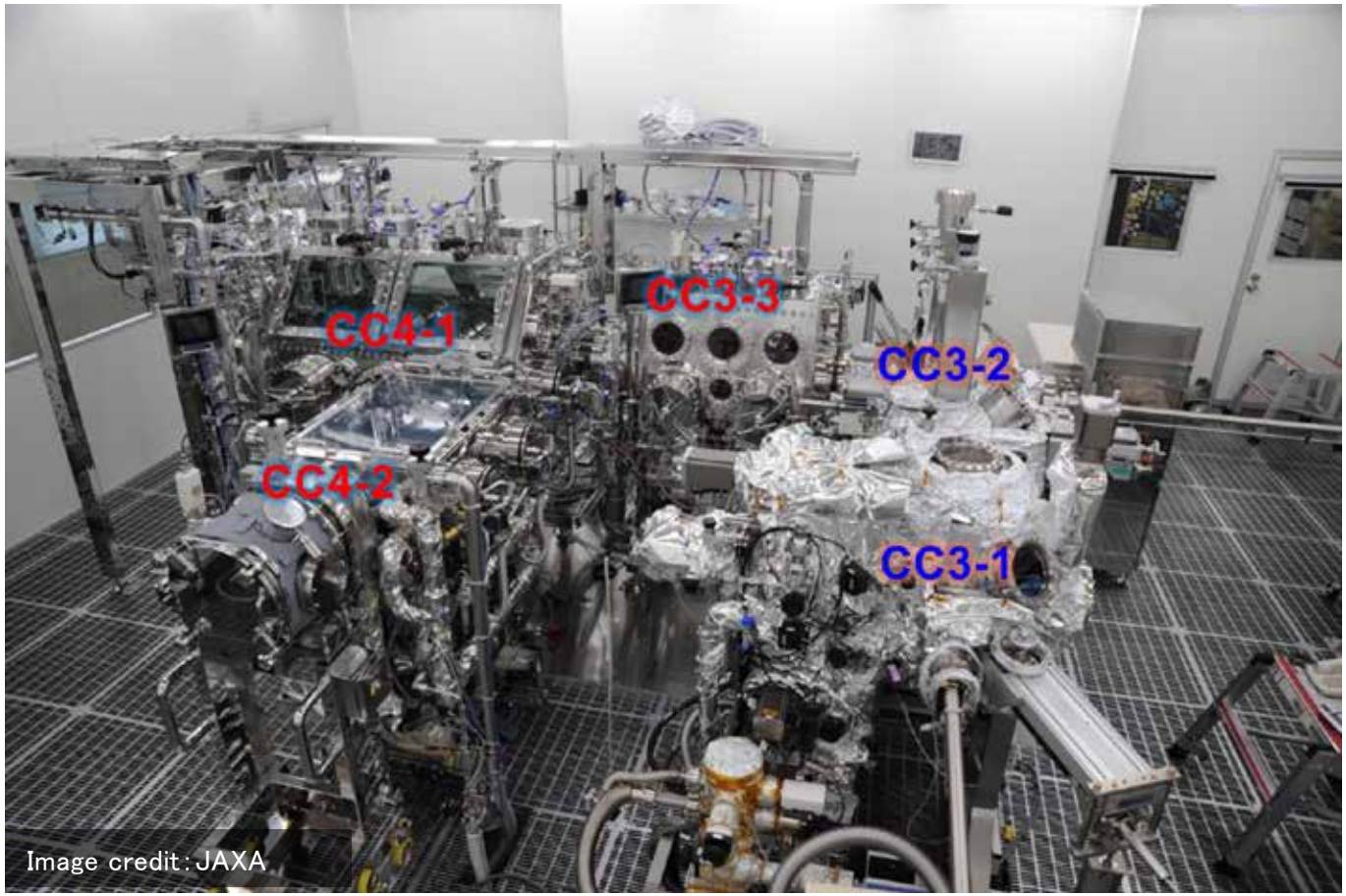


- The lid of chamber A was removed, and particles within chamber A were confirmed. 12/15 at around 11:10 JST.

Image credit：JAXA

Reference

Clean chamber



CC3-1 :
Opening the sample container under vacuum environment

CC3-2 :
Sample collection under vacuum

CC3-3 :
Transition from vacuum to nitrogen environment

CC4-1 :
Handling of submillimeter-sized particles

CC4-2 :
Handling / observation / sorting of relatively large particles (> mm)