

To the Members of the Press:

September 26, 2022

Analysis using beams of muons to find elemental makeup of the asteroid Ryugu stone samples without damaging them was successful

Professor Kenya Kubo (Major: Chemistry, Environmental Studies) of International Christian University (ICU; President: Shoichiro Iwakiri; Mitaka-shi, Tokyo;) was one of the researchers in "Stone Analysis Team" to analyze the elemental composition of stone samples brought back to Earth from asteroid Ryugu by the Hayabusa2 spacecraft. The analysis was done without damaging the stone samples, using an artificially generated muon beam from the particle accelerator in J-PARC. The research result of this successful analysis has been published in the US scientific journal "Science" on September 23, 2022.

Title: Formation and evolution of carbonaceous asteroid Ryugu: Direct evidence from return samples

Journal: Science

<https://www.science.org/doi/10.1126/science.abn8671>

JAXA Press Release: https://global.jaxa.jp/press/2022/09/20220923-1_e.html

KEK Press Release: <https://www.kek.jp/en/press-en/202209230930ryugu-e/>

Comments from Professor Kenya Kubo

My specialization is analyses using radiation and unstable particles like muons. Since we proposed using muons to analyze valuable asteroid samples twenty years ago, we have continued to develop the method. When we started the research, analyzing asteroid samples was a "dream," we honestly did not believe that the day would ever come to analyze asteroid samples. With the cooperation of many people, we were able to achieve scientifically significant research results and make one of our "dreams" come true. This method is expanding to other fields, such as the analysis of cultural heritage and lithium batteries, and we are looking forward to its future development.

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