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Reinterpreting reflectance spectra of water-rich meteorites and asteroids

Kana Amano (IMPMC, MNHN)

The composition of asteroids has been estimated based on the spectral comparison between meteorites and asteroids, providing insight into the compositional distribution in the solar system. However, meteorites and the asteroidal surfaces are weathered due to the terrestrial atmosphere and harsh space environments, respectively. Recently, the fresh materials directly collected from the asteroid Ryugu have demonstrated the actual nature of primitive bodies, highlighting the effects of terrestrial and space weathering on reflectance spectra. In this talk, I will introduce a mission summary, and compare the mineralogical and spectral properties of Ryugu sample, its analog meteorite, and the asteroidal surface materials. Reinterpreting the asteroid spectra with our results, the parent bodies of the most volatile-rich meteorites (i.e., CI chondrites) are probably more abundant than previously estimated.