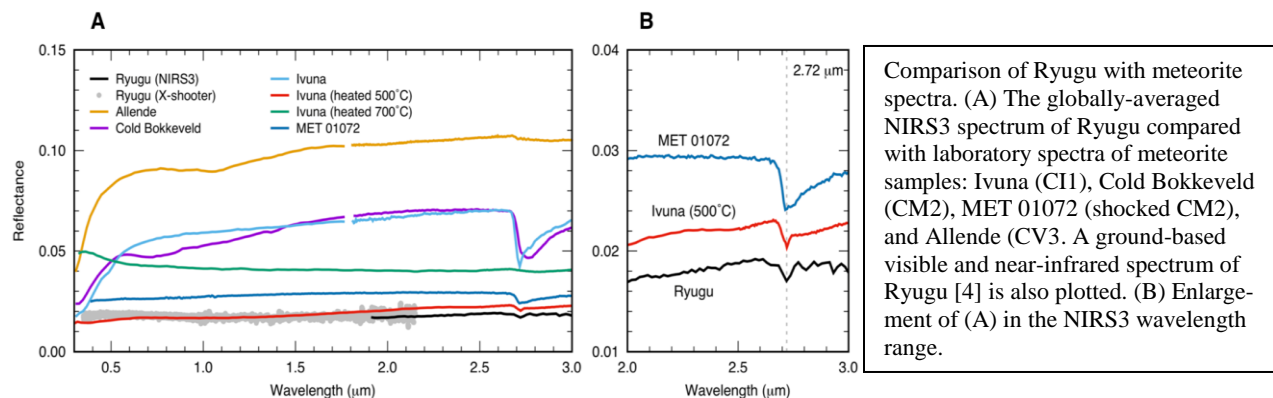


SPECTRAL CHARACTERISTICS OF ASTEROID (162173) RYUGU WITH HAYABUSA2 NIRS3

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The Japanese Aerospace Exploration Agency (JAXA) spacecraft and sample return mission Hayabusa2 has arrived at the near-Earth asteroid 162173 Ryugu, which is classified a primitive carbonaceous object [1]. Here we report recent results of near-infrared spectrometer (NIRS3) on the Hayabusa2 spacecraft. NIRS3 is a point spectrometer with a 0.1° FOV that acquire continuous point target spectra over effective wavelength range 1.9–3.2 μm [2]. These observations provide direct measurements of the surface composition of Ryugu and context for the returned samples. NIRS3 has detected a weak and narrow absorption feature centered at 2.72 μm across entire observed surface. This absorption feature is attributed to the presence of hydroxyl (OH)-bearing minerals [3]. The NIRS3 observations also revealed that Ryugu is the darkest object to be observed up-close by a visiting spacecraft. The intensity of the OH feature and low albedo are consistent with thermally-and/or shock-metamorphosed, and/or carbon-rich space-weathered primitive and hydrated carbonaceous chondrites [3].



Comparison of Ryugu with meteorite spectra. (A) The globally-averaged NIRS3 spectrum of Ryugu compared with laboratory spectra of meteorite samples: Ivuna (CI1), Cold Bokkeveld (CM2), MET 01072 (shocked CM2), and Allende (CV3). A ground-based visible and near-infrared spectrum of Ryugu [4] is also plotted. (B) Enlargement of (A) in the NIRS3 wavelength range.

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