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SAMIS: The OSIRIS-REx Sample Analysis Micro-Information System

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Background

The OSIRIS-REx spacecraft spent nearly two years analyzing the properties of asteroid (101955) Bennu using remote sensing instruments before successfully acquiring a surface sample on October 20, 2020. Upon the spacecraft's return to Earth, the OSIRIS-REx sample analysis team will perform detailed and coordinated laboratory analyses of material from Bennu for which the geological context is well-characterized thanks to OSIRIS-REx observations [1].

To help facilitate the efforts of the OSIRIS-REx scientists, we are developing the Sample Analysis Micro-Information System (SAMIS), a comprehensive data management system specifically designed for planetary science sample return missions.

What is a Micro-Information System?

Like a traditional information system (IS), the SAMIS is a collection of components that includes hardware, software, and sociotechnical elements designed to collect, process, store, and distribute information. The origin of the name “Micro-Information System” is a play on the term Geographic Information System (GIS), a specific type of IS designed to work with spatial data [2].

By converting data products produced by the OSIRIS-REx sample scientists into well-established spatial data types and customizing off-the-shelf GIS tools, we will be able to spatially co-register data from the same sample, across a wide range of formats, from different analytical techniques and instruments, that span a wide range of spatial resolutions. This will allow OSIRIS-REx sample scientists to apply GIS visualization programs, spatial search capabilities, and spatial analysis tools, which will make the analysis of data across labs and instrument teams easier and more intuitive.

Figure 1: Diagram illustrating the range of data products and spatial resolutions that can be converted into spatial data types.

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