On 30 September 2016, Rosetta completed its incredible mission by landing on the surface of Comet 67P/Churyumov-Gerasimenko. Although this marked an end to the spacecraft’s active operations, intensive work is still ongoing with instrument teams preparing their final science data increments for delivery and ingestion into ESA’s Planetary Science Archive (PSA) [1].

In addition to this, ESA is working with a number of instrument teams to enhance and improve their data and documentation in an effort to provide the best long-term archive possible for the Rosetta mission.

All science data from the Rosetta mission are hosted both by the Planetary Science Archive (PSA) at ESA [http://psa.esa.int] [1], and by NASA’s PDS Small Bodies Node (SBN). The long duration of the Rosetta mission, along with its diverse suite of instrumentation and the range of targets observed throughout its lifetime combine to make this an extremely challenging mission to archive [2].

A number of independent data reviews have taken place over the course of the mission in an attempt to track the evolution of the data pipelines from mission to archive [2]. The last of these was held in spring 2016, based on the first science data received from the comet phase. Many issues were raised by the reviewers, and the instrument teams have been working very hard to implement the fixes requested. In some cases this work is ongoing, and for all instruments, the review process has understandably resulted in a slow down of the standard delivery schedule. Apart from these external scientific reviews, ESA and PDS Archive Scientists review all datasets from a more technical perspective before being released publicly. The main focus of this review is to ensure compliance to the PDS standard and ensure homogeneity across all instruments of Rosetta.

Currently, the majority of teams have delivered all of their data from the entire mission including the Extension phase.

This Rosetta science archive in ESA’s PSA and in NASA’s PDS, is in good shape. With the support of the instrument teams and the completion of the archive enhancement in 2019, the Rosetta archive can become an immensely valuable resource for scientists in years to come, and the full scientific potential of the mission can be realized.

The Rosetta ESA archiving team is also working on providing a centralized solution to the problem of geometry on the comet for implementation within the final Rosetta data holdings.

Most instrument teams will work on providing a Science User Guide for their data, as well as updating calibrations. Several teams will also be generating and delivering higher level processed data and derived products. For example, the VIRTIS team will be working to update both their spectral and geometrical calibrations, and will aim to deliver mapping products to the final archive. Similarly, the OSIRIS team will be improving their calibrations and delivering data additionally in FITS format.

The GIADA team will be producing higher level products in the form of dust environment maps.

Dataset(s) containing supporting ground-based observations from amateur astronomers will also be produced. These data were taken simultaneously with Rosetta operations and could provide some important contextual information.

The MIDAS team will similarly be working on instrument cross-calibrations, the production of a dust particle catalog from the comet coma and the deconvolution of the tip shape.

The Giada team will be working on providing calibrated data sets for the NAVCAM instrument, and will be working to include the latest shape models from the comet into the final archive.

Enhanced Archiving and Closeout Peer Review is expected in 2018 for the US instruments and for 2019 for the European instruments. This review will cover the entire mission (including the Cruise, asteroids, flybys, Comet and Extension phases). The goal will be to assess the deliverables from the archive enhancement phase, the completeness and correctness of the full mission archive and ensure that the final Rosetta archive within the PSA is as good as it can be to allow for scientists to fully exploit the data holdings for decades to come.

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References