New MEX-HRSC Radiometrically Calibrated Data in the ESA's Planetary Science Archive GIS-based Map View. E. Grotheer[1], M. Breitfellner[1], J. Godfrey[2], D. Heather[3], P. Martin[4], C. Wilson[3], A. Cardesin-Moinelo[5], P. Esquej[6], J. Marin-Yaseli[5], D. Merritt[7], M. Sierra[7], D. Coia[7], T. Lim[7], C. Arviset[4], M. S. Bentley[4], G. De Marchi[3], B. Merin[4], R. Docasal[5], F. Felix-Redondo[6], J. Oliveira[5], J. Osinde[6], F. Raga[6], J. Saiz[6], R. Valles[6], and the Mars Express Science Ground Segment and Flight Control Teams, [1]Serco for ESA (Camino Bajo del Castillo s/n, 28692 Villanueva de la Canada, Madrid, Spain), [2]ESA/ESOC (Robert-Bosch-Str. 5, 64293 Darmstadt, Germany), [3]ESA/ESTEC (Postbus 299, 2200 AG Noordwijk, The Netherlands), [4]ESA/ESAC (Camino Bajo del Castillo s/n, 28692 Villanueva de la Canada, Madrid, Spain), [5]Aurora Technology BV for ESA (Camino Bajo del Castillo s/n, 28692 Villanueva de la Canada, Madrid, Spain), [6]Rhea for ESA (Camino Bajo del Castillo s/n, 28692 Villanueva de la Canada, Madrid, Spain), [7]Telespazio UK Ltd for ESA (Camino Bajo del Castillo s/n, 28692 Villanueva de la Canada, Madrid, Spain).

Heading Styles: The European Space Agency's (ESA) Mars Express (MEX) mission to Mars has been returning valuable scientific data for ~19 years. This data is available to the public for free via the Planetary Science Archive (PSA), which houses the raw, calibrated, and higher-level data returned by the ESA's planetary missions, including data provided by the various MEX instrument teams. The High Resolution Stereo Camera (HRSC) has provided several types of datasets throughout the mission, and its images have proven popular not only among scientists but also the public for the spectacular images of the red planet. A new version (version 4.0) of the radiometrically calibrated HRSC data has been made available which covers the entirety of the mission's operation up to now.

This new version utilizes an updated calibration, which is especially important for later images as it improves the adjustments for the aging of the instrument [1]. In addition to the new calibration, the data is now split into mission phases. Previous versions of the radiometrically calibrated data incorporated all observations into a single dataset, which led to increasing lag in some access methods as the dataset continued to grow in size and number of files. All this data and more can be accessed at the PSA, including via the GIS-based Map View, at:
https://archives.esac.esa.int/psa/

Mars Express: MEX was inserted into Mars orbit in December 2003, though several instrument test observations also exist from the cruise phase of the mission, prior to arrival at Mars. Thus, this long-lived Mars mission covers 19+ years of data with its 7 instruments. Later in the mission's lifetime, the camera used for the Beagle 2 lander separation was reactivated and used for public outreach. Over time, the camera began to be used for scientific observations as well, making MEX an unusual mission in that it now has more scientific instruments in operation than it was launched with.

The PSA user interface: The ESA's PSA uses the Planetary Data System (PDS) format developed by NASA to store the data from its various planetary missions. In the case of MEX, the data is stored in the PDS3 format, which primarily uses ASCII files to store and describe the data. Newer missions, from ExoMars onward use the PDS4 data standard, which uses XML files.

There are three primary ways in which to find the data. One is the FTP area, which houses all the public data in the PSA. Here, there are no advanced search capabilities, but it does provide access to all the supporting files and documentation for the various datasets. When first searching for new data, users would benefit from using the Table View search interface [2]. Here the user can search using various parameters, such as mission name, target, instrument name, processing level, observation times, etc. The Table View is also linked to the Image View, where users can view the browse images provided by the PI teams. The Table View interface also has a section for "Free Search", allowing one to use Contextual Query Language (CQL) to search over additional parameters. These various search methods rely in part on the metadata provided by the instrument teams in the labels associated with each of the data products.

Finally, there is also a Map View for viewing the footprints of data from those instruments where such calculations can be of some utility. This Map View is built using GIS tools, and the geometry data is generated using the same Geogen tool for all missions, although for some missions the adaptation of this tool is still a work in progress. Thus the Map View benefits from a homogenized approach to calculating geometrical parameters for all data across various missions.

Conclusion: The redelivery of the HRSC data provides an improved dataset with newer calibration factors applied. This data can be freely accessed at the ESA's PSA, at https://archives.esac.esa.int/psa/. There are multiple ways of browsing the HRSC and other instrument teams' data, including from other planetary missions, which will be explained in this poster. The development of the PSA's user interface is an ongoing

project, and we welcome feedback from the community for suggestions on new ways to search this wealth of data. Feedback and suggestions can be sent via our Help Desk system at:
https://support.cosmos.esa.int/psa/

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References: [1] Gwinner K. et al. (2016) *Planetary and Space Science*, 126, 93-138. [2] Besse S. et al. (2018) *Planetary and Space Science*, 150, 131-140.