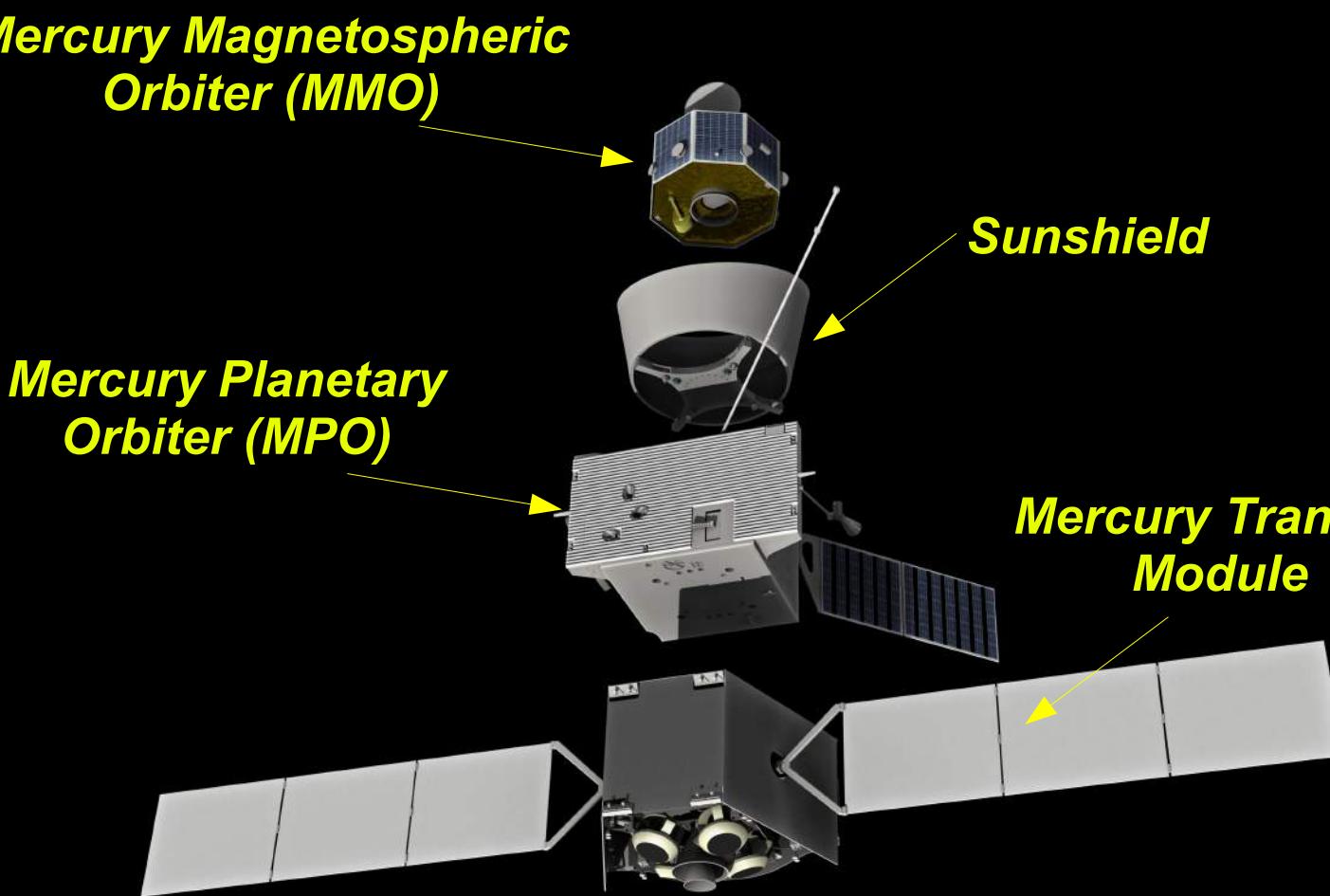


The Stereo Imaging Channel of SIMBIOSYS for the BepiColombo ESA Mission

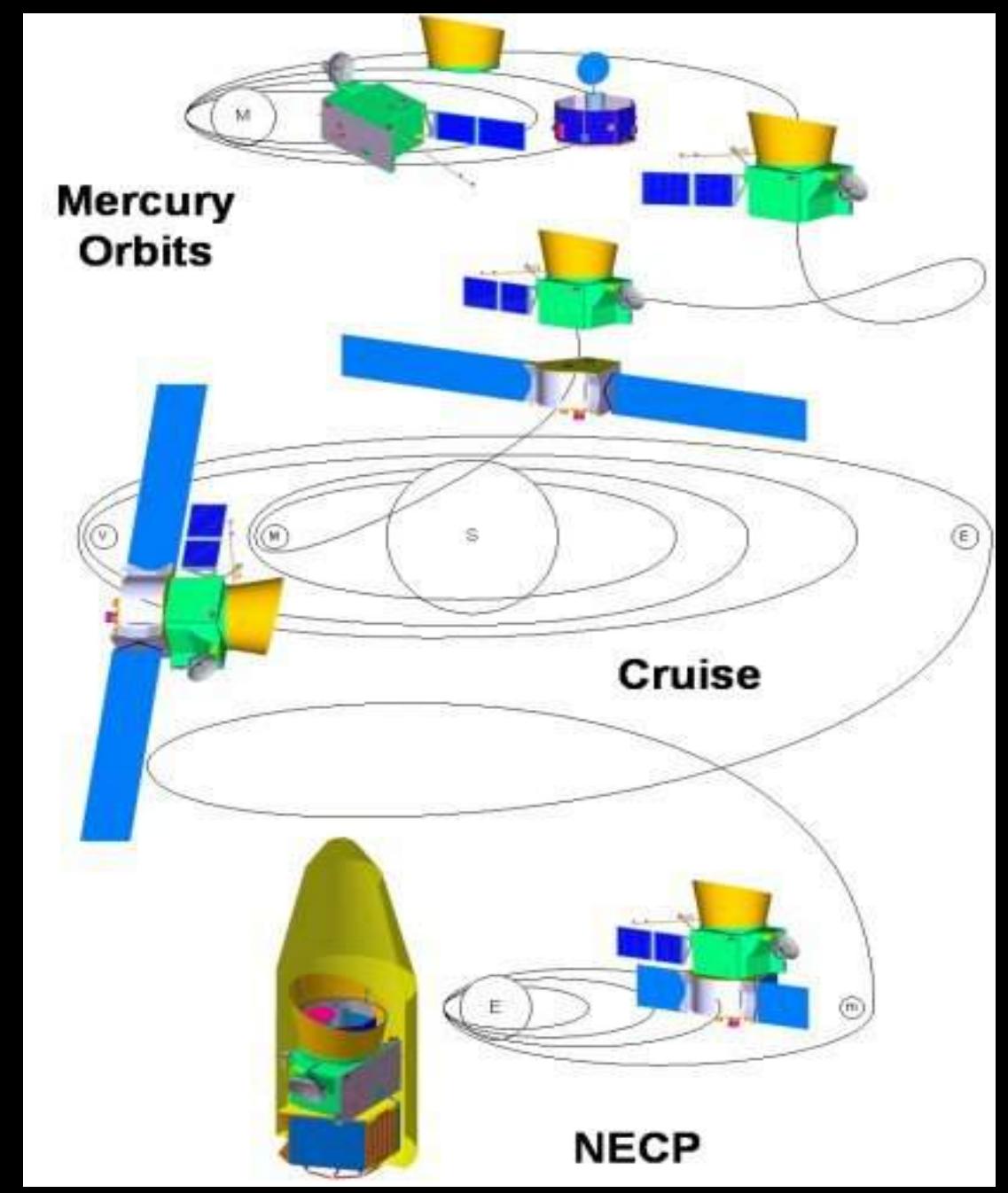
G. Cremonese¹, V. Da Deppo², G. Naletto³, E. Martellato⁴, S. Debei⁴, C. Bettanini⁴, M. T. Capria⁵, G. Forlani⁶, M. Massironi⁷, E. Simioni⁴, M. Zaccariotto⁴ and the SIMBIOSYS Team

BepiColombo mission

The BepiColombo (BC) spacecraft



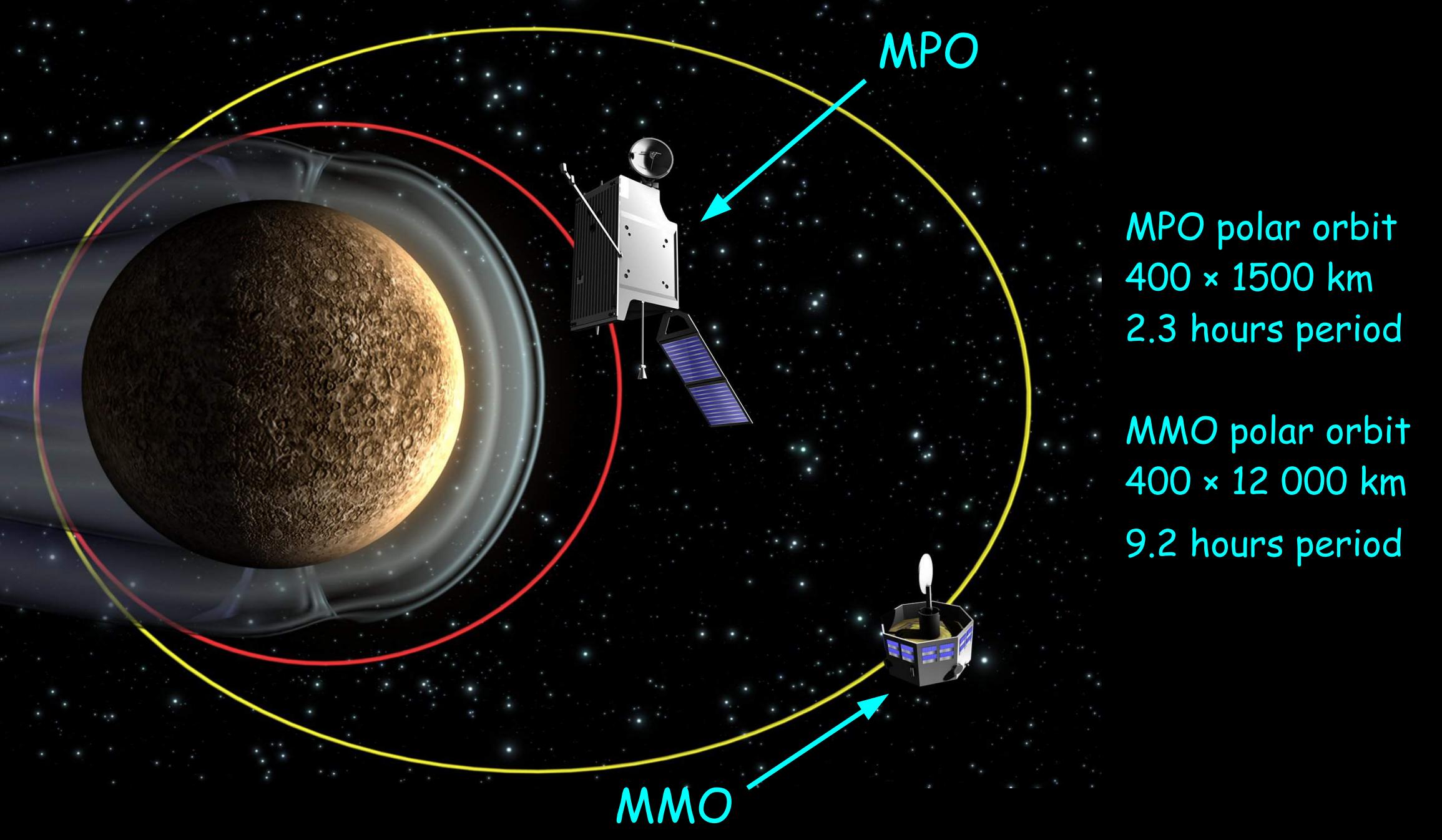
Mission design and deployment sequence



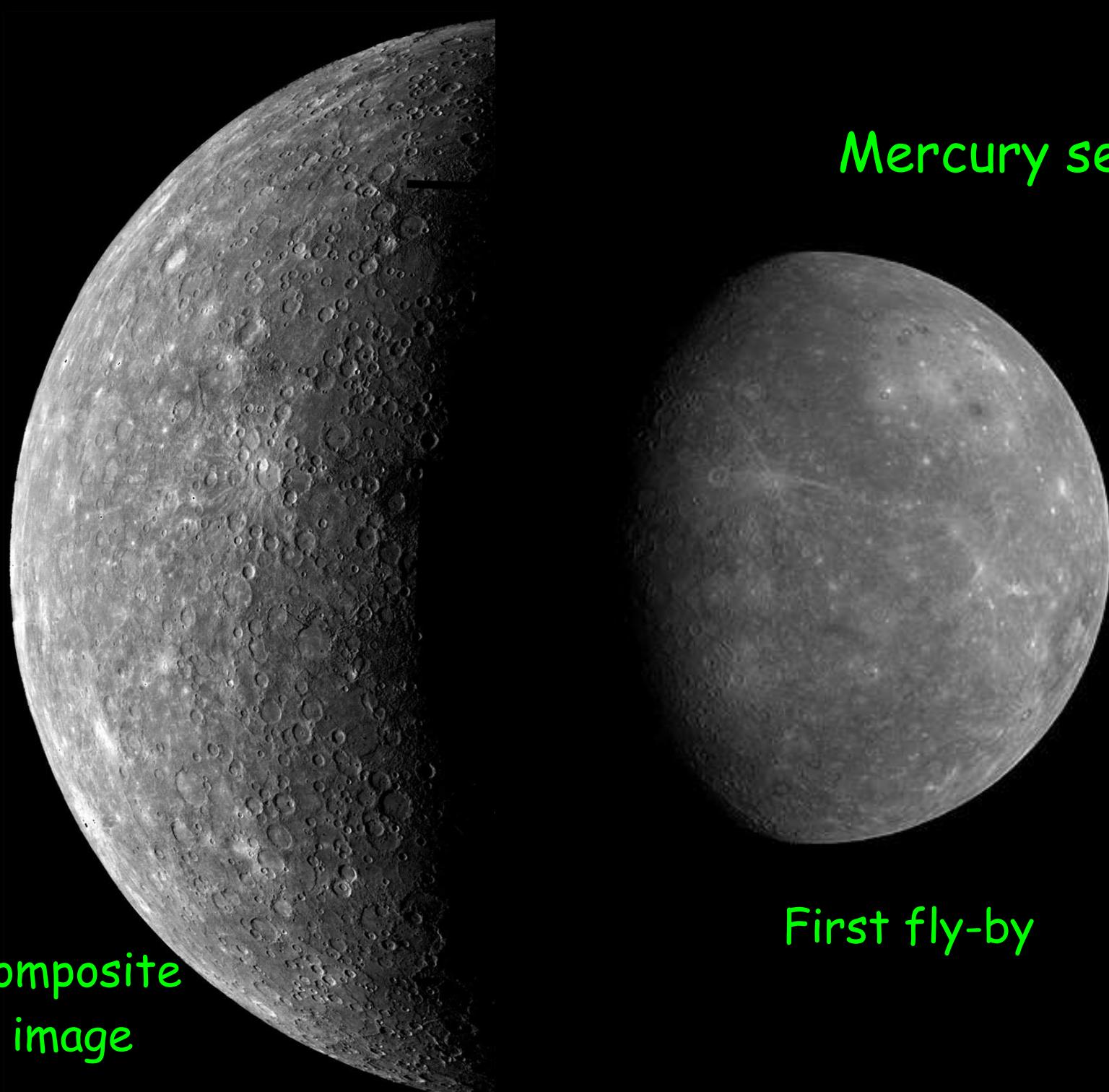
Important events
2014: BC will be launched
2020: BC will arrive at Mercury
2021: END nominal mission



MMO and MPO orbits around Mercury

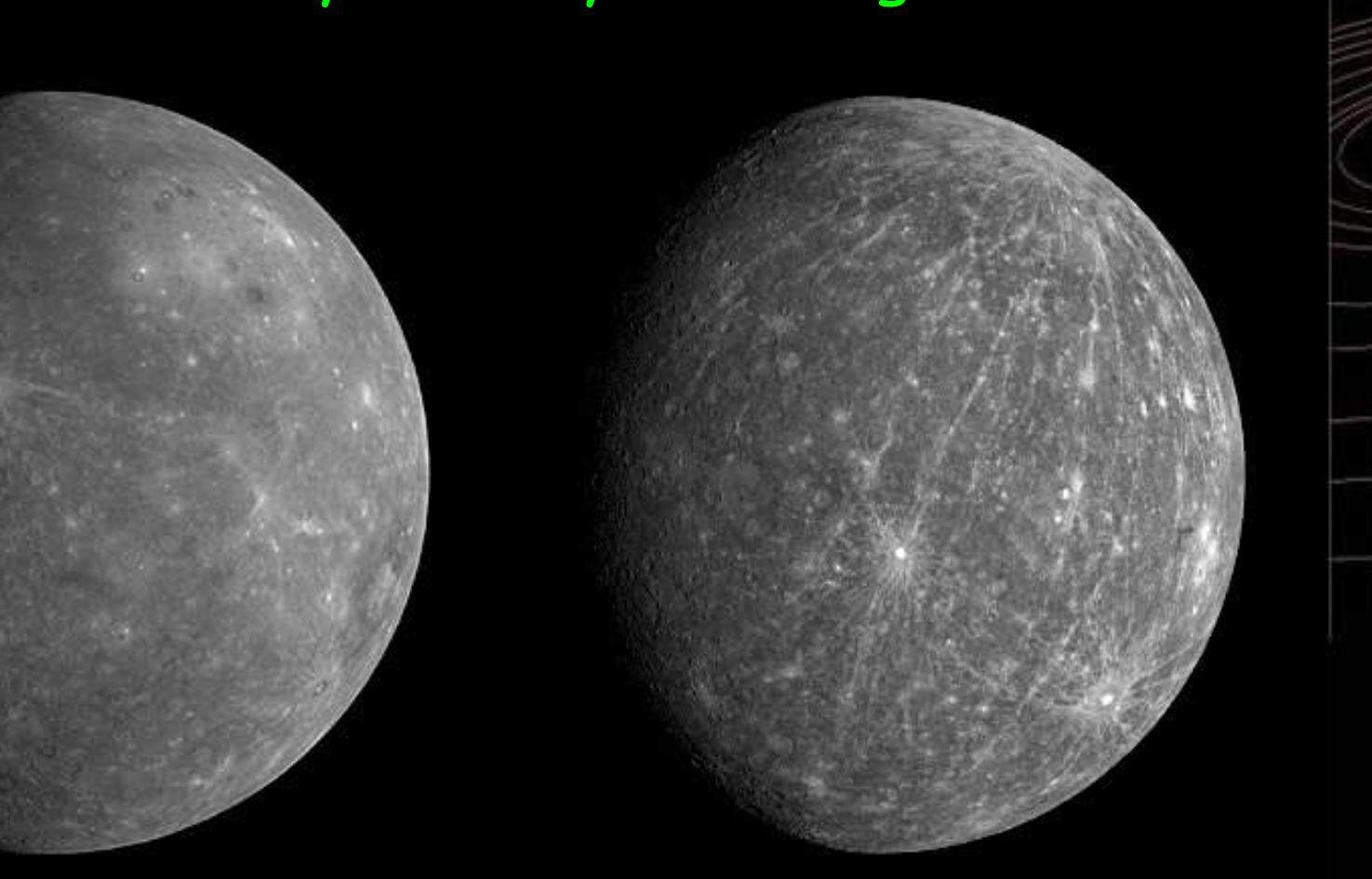


Mercury seen by Mariner 10

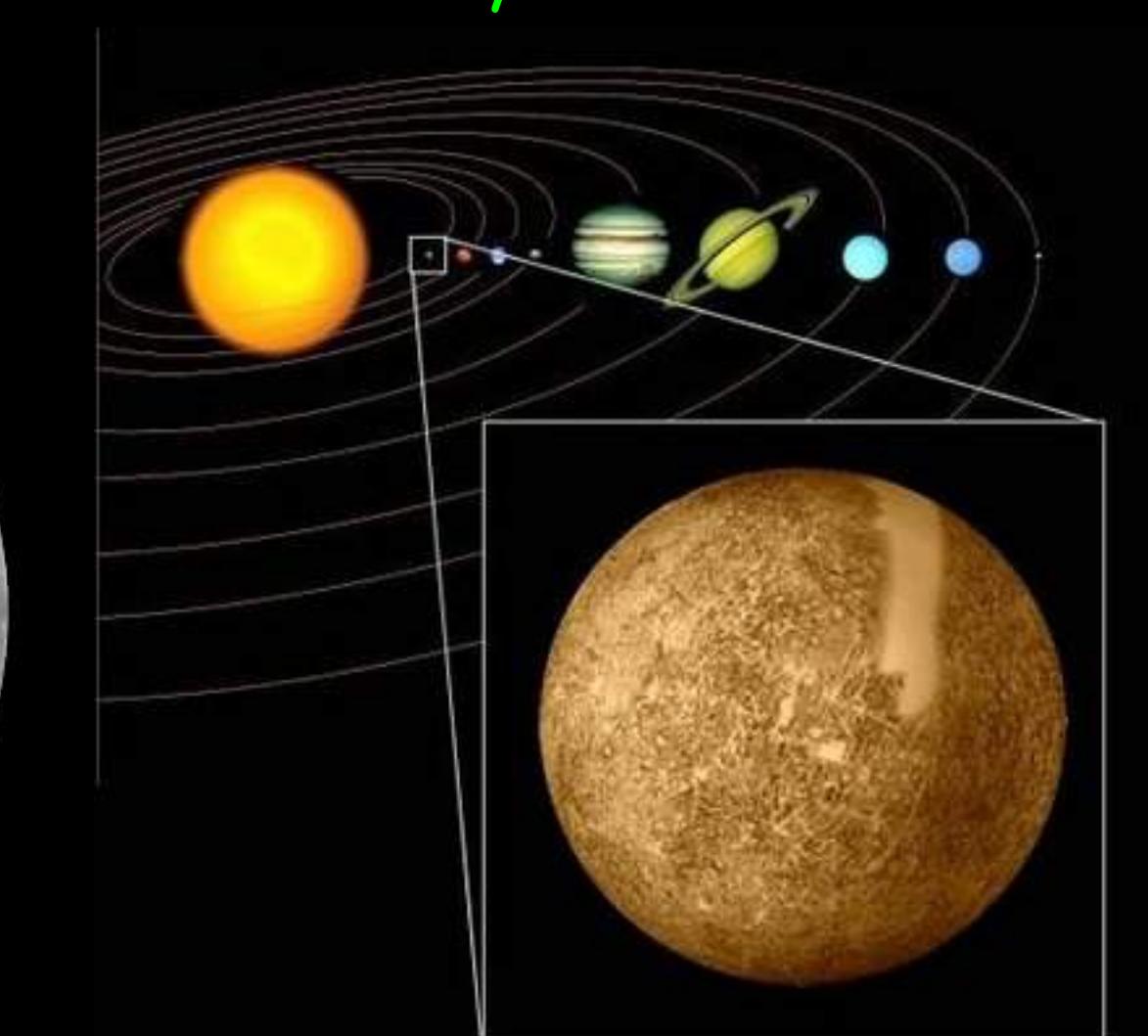


Mercury planet

Mercury seen by Messenger



Mercury in the solar system



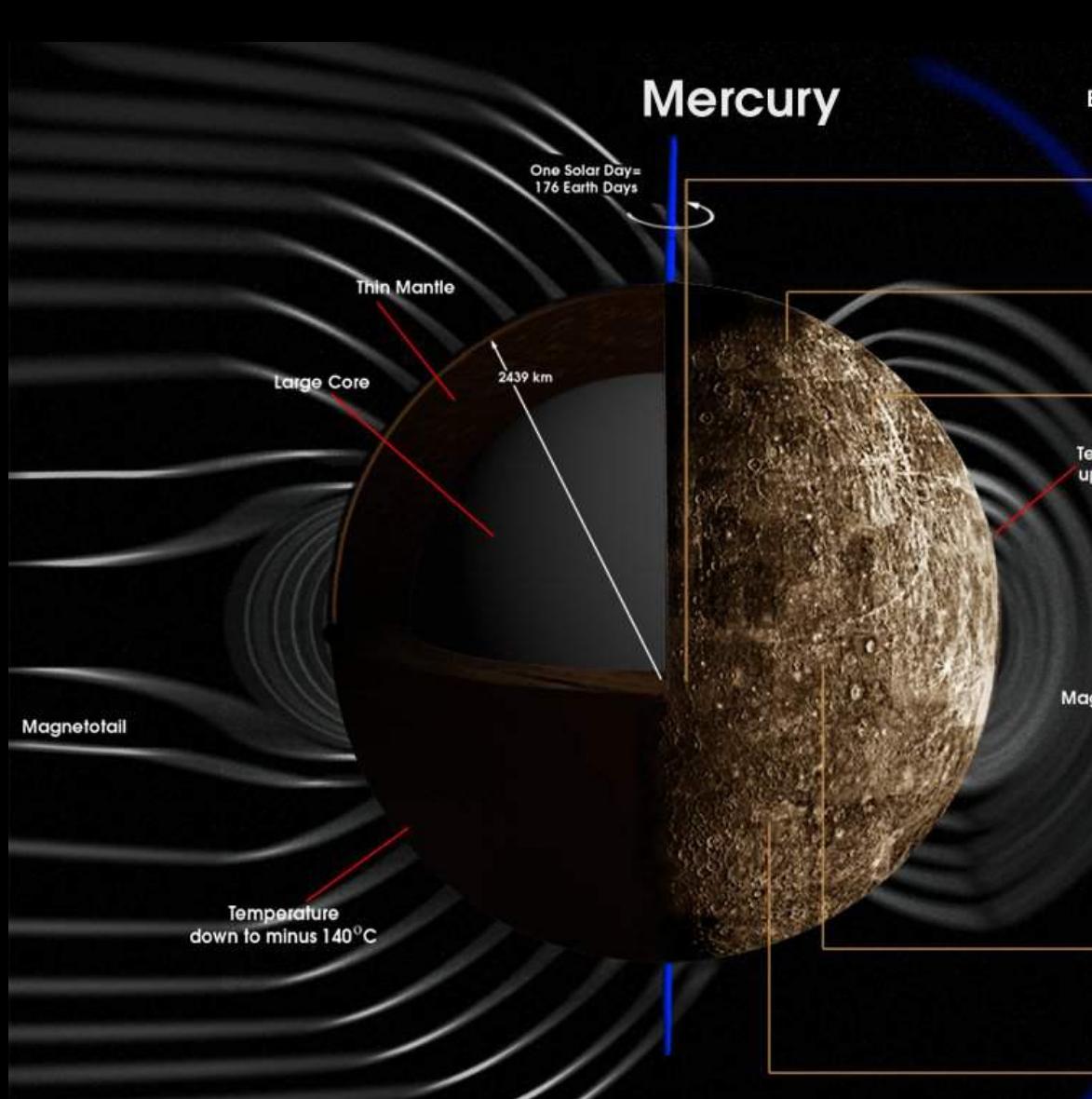
Composite image



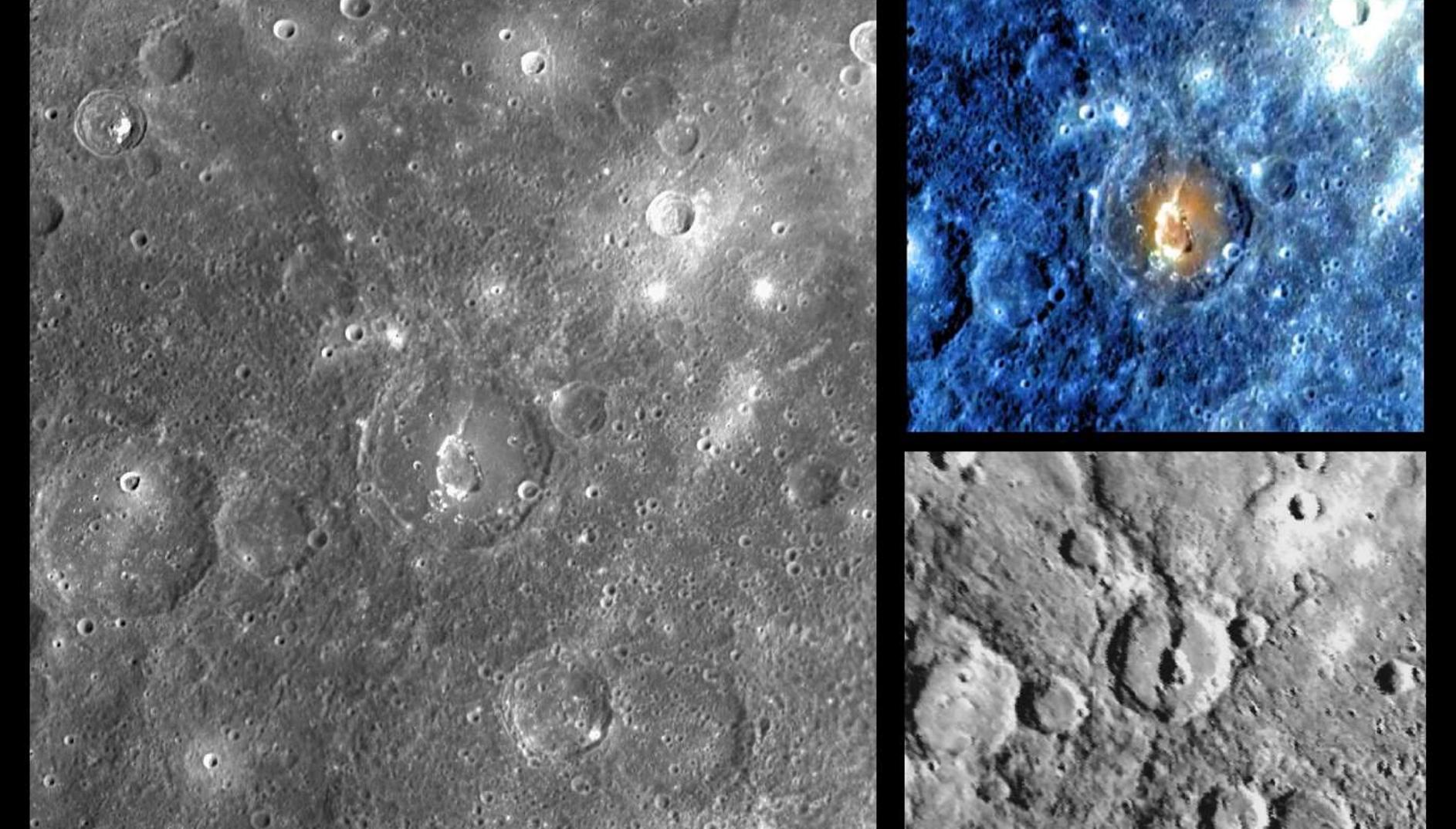
First fly-by

Second fly-by

Mercury geology and magnetosphere



The Complex Geology of Geddes Crater - Messenger second fly-by



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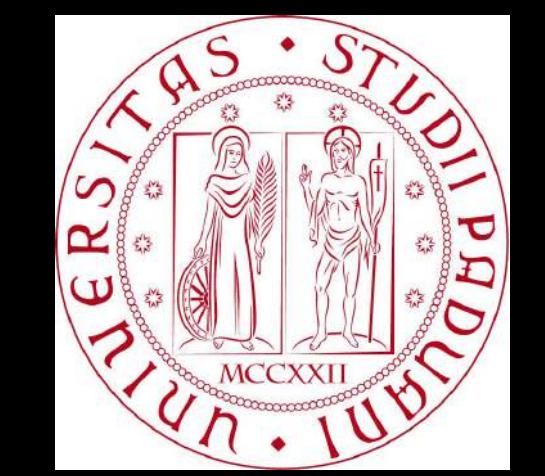
⁴CISAS, University of Padova, Via Venezia 15, 35131 Padova

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⁶Dept. of Civil Engineering, University of Parma, Viale G.P. Usberti 181/A, 43124 Parma

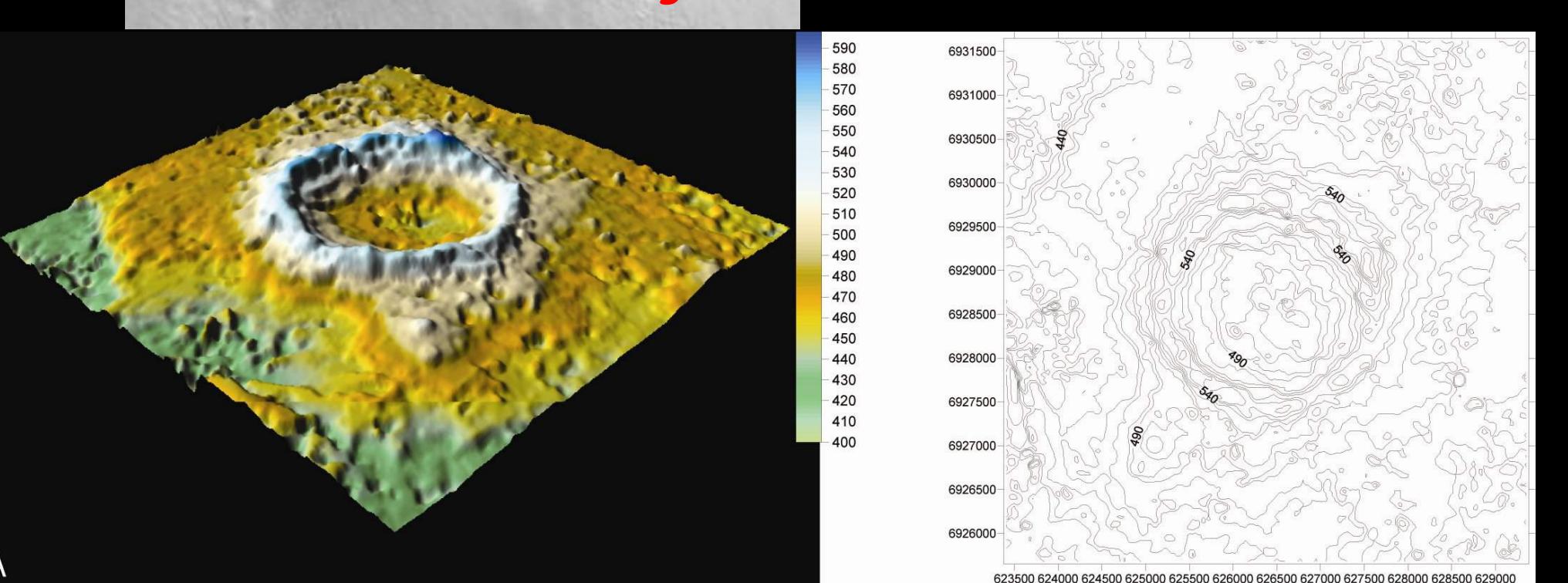
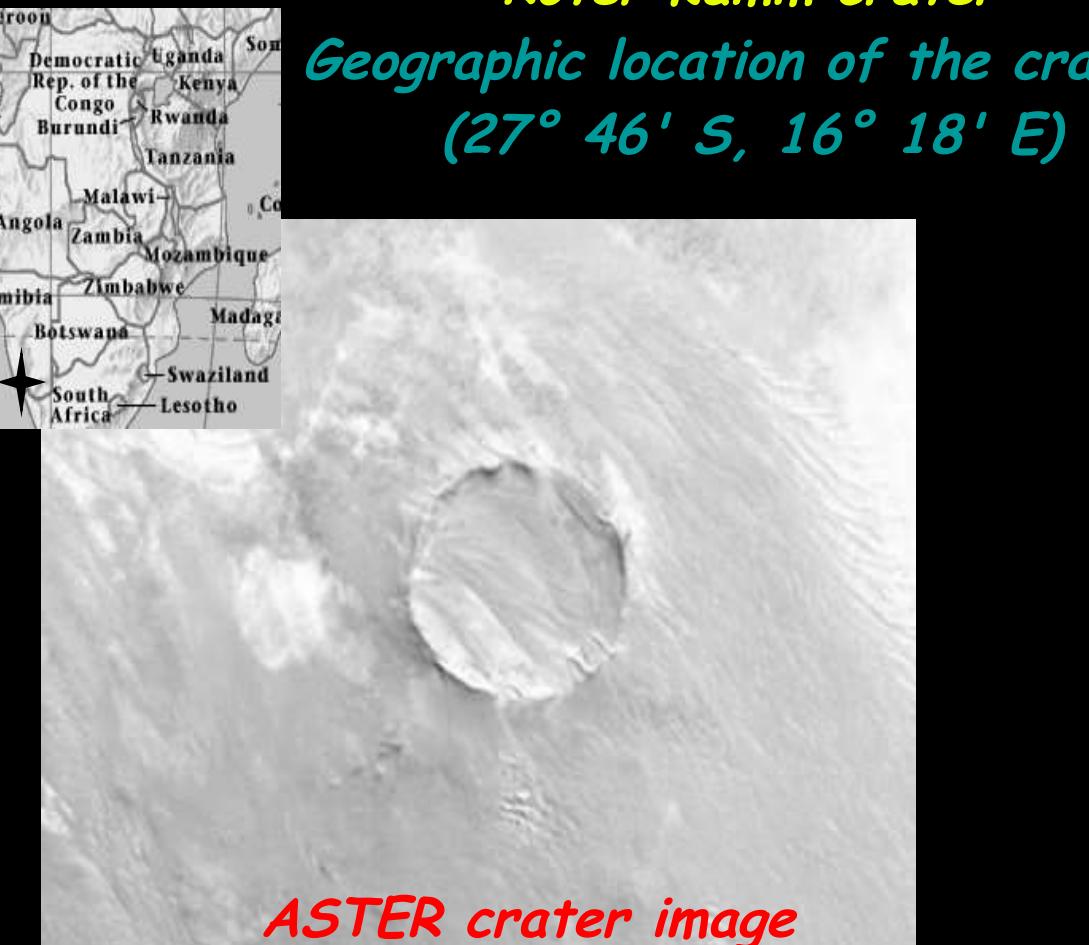
⁷Dept. of Geosciences, University of Padova, Via Giotto 1, 35137 Padova

Corresponding author's email address: vania.dadeppo@fnr.cnr.it

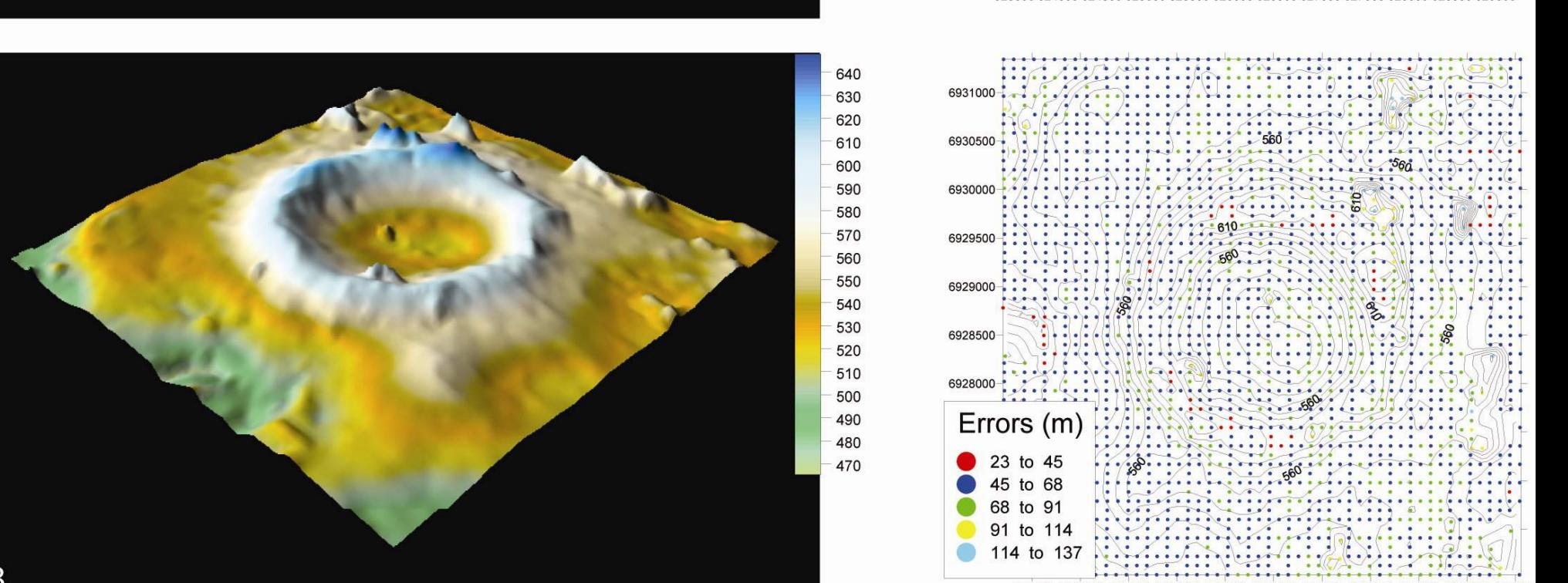


3D reconstruction from synthetic images derived from an Earth crater analogue

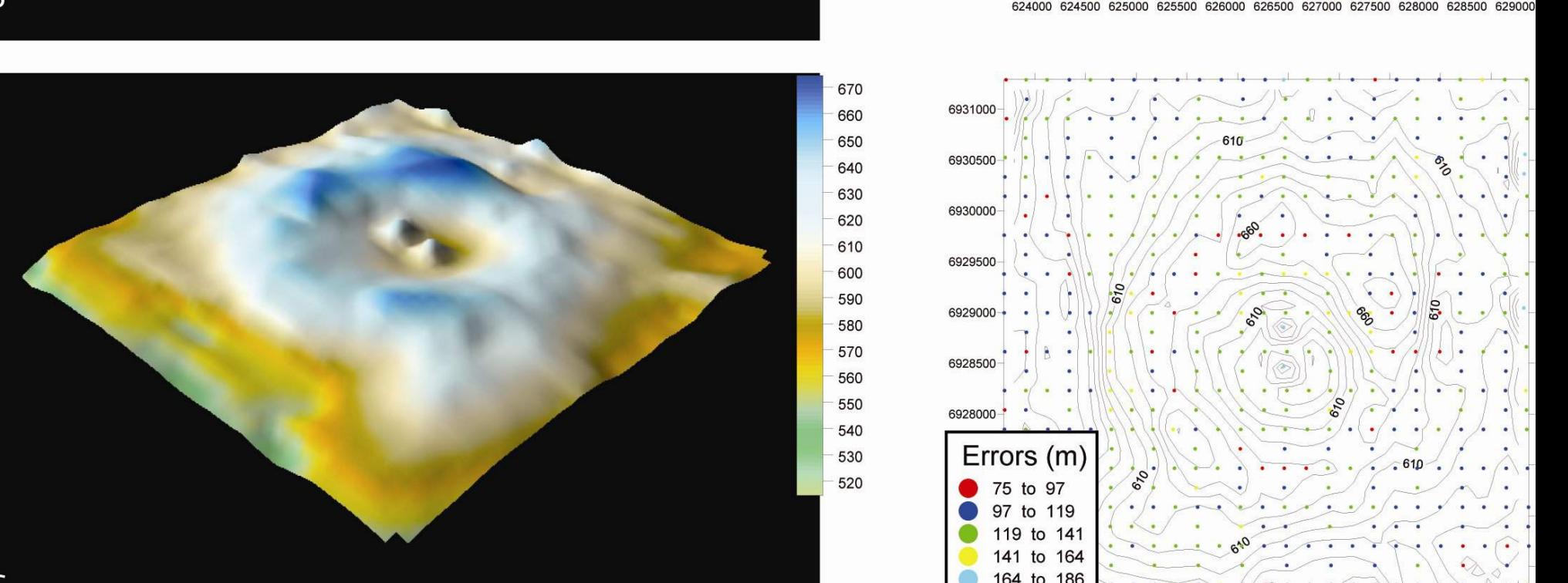
Roter Kamm crater
Geographic location of the crater
(27° 46' S, 16° 18' E)



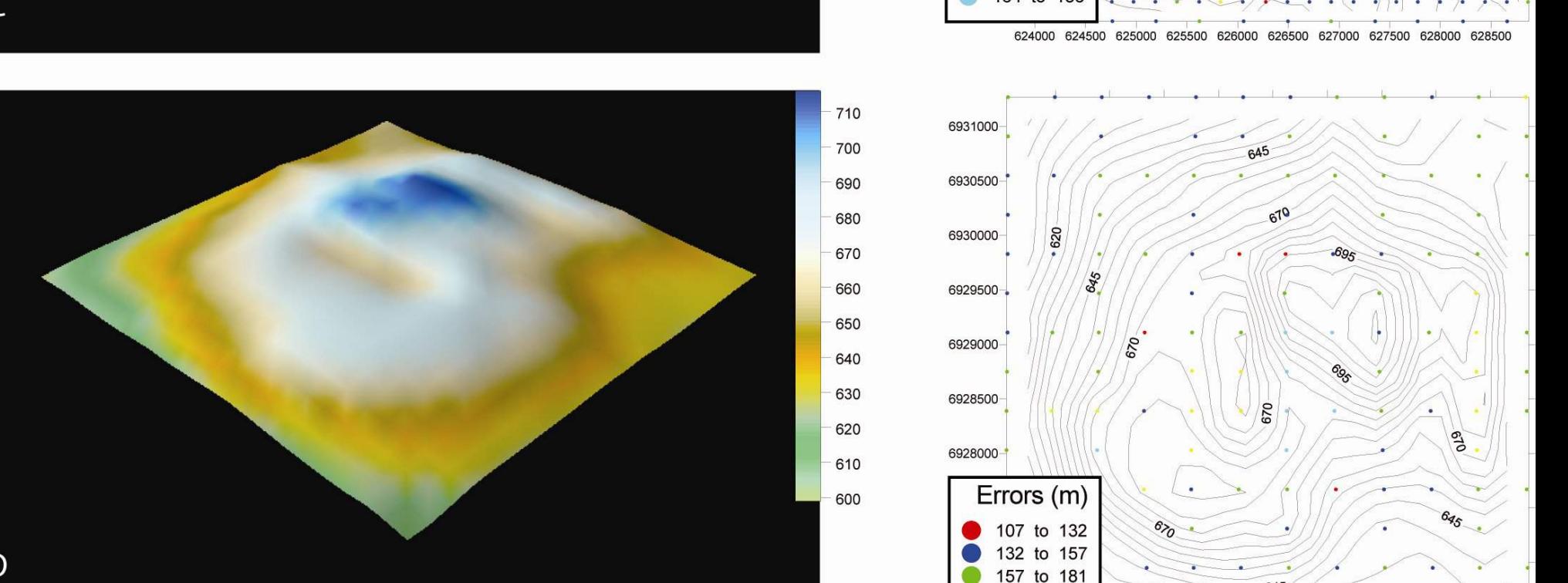
ASTER derived DTM and contour map



3D reconstruction with STC at periherm and contour map with deviation of the matching points



3D reconstruction with STC at poles and contour map with deviation of the matching points



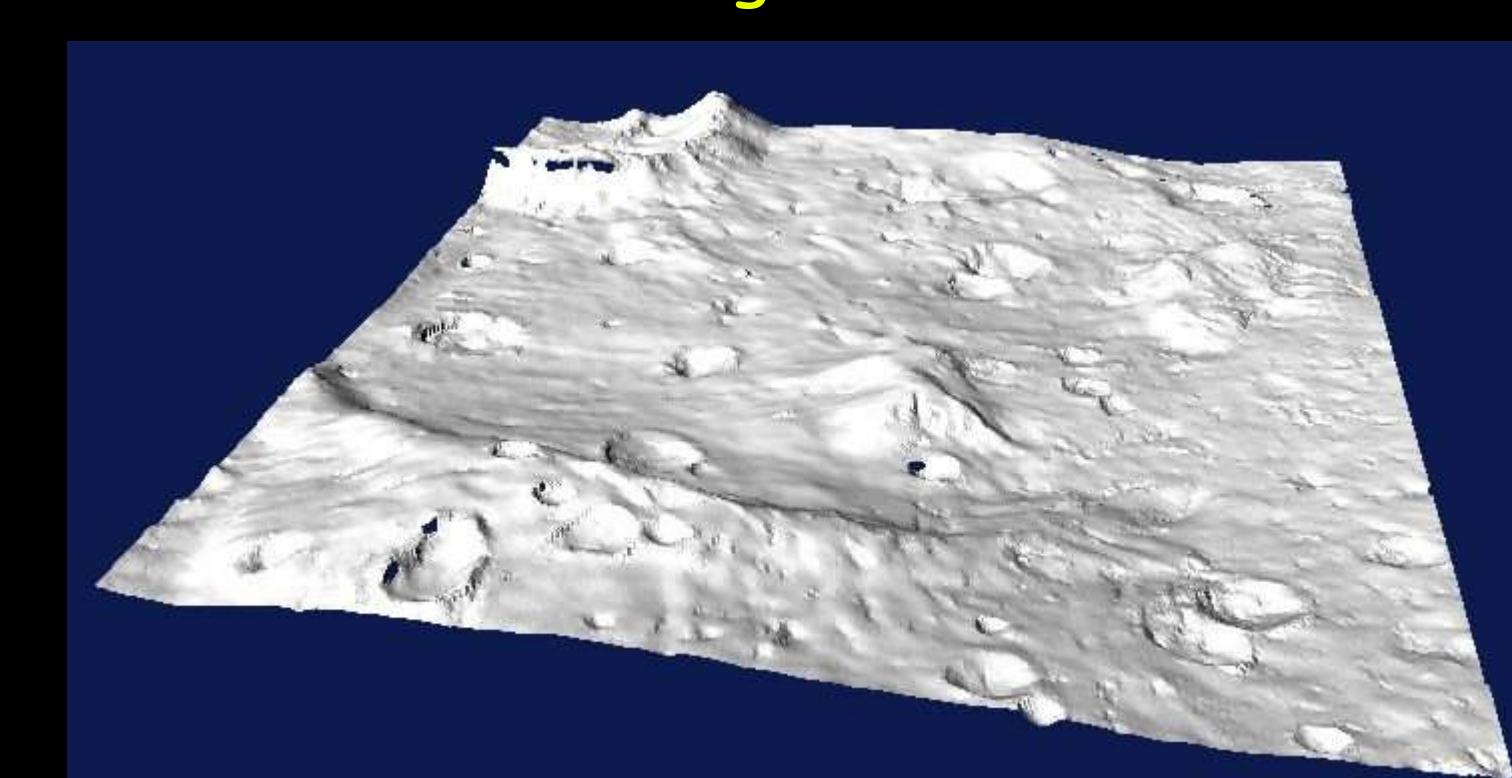
3D reconstruction with STC at apoherm and contour map with deviation of the matching points

Reconstruction simulation on a Mercury surface model made by paste

Laboratory paste model

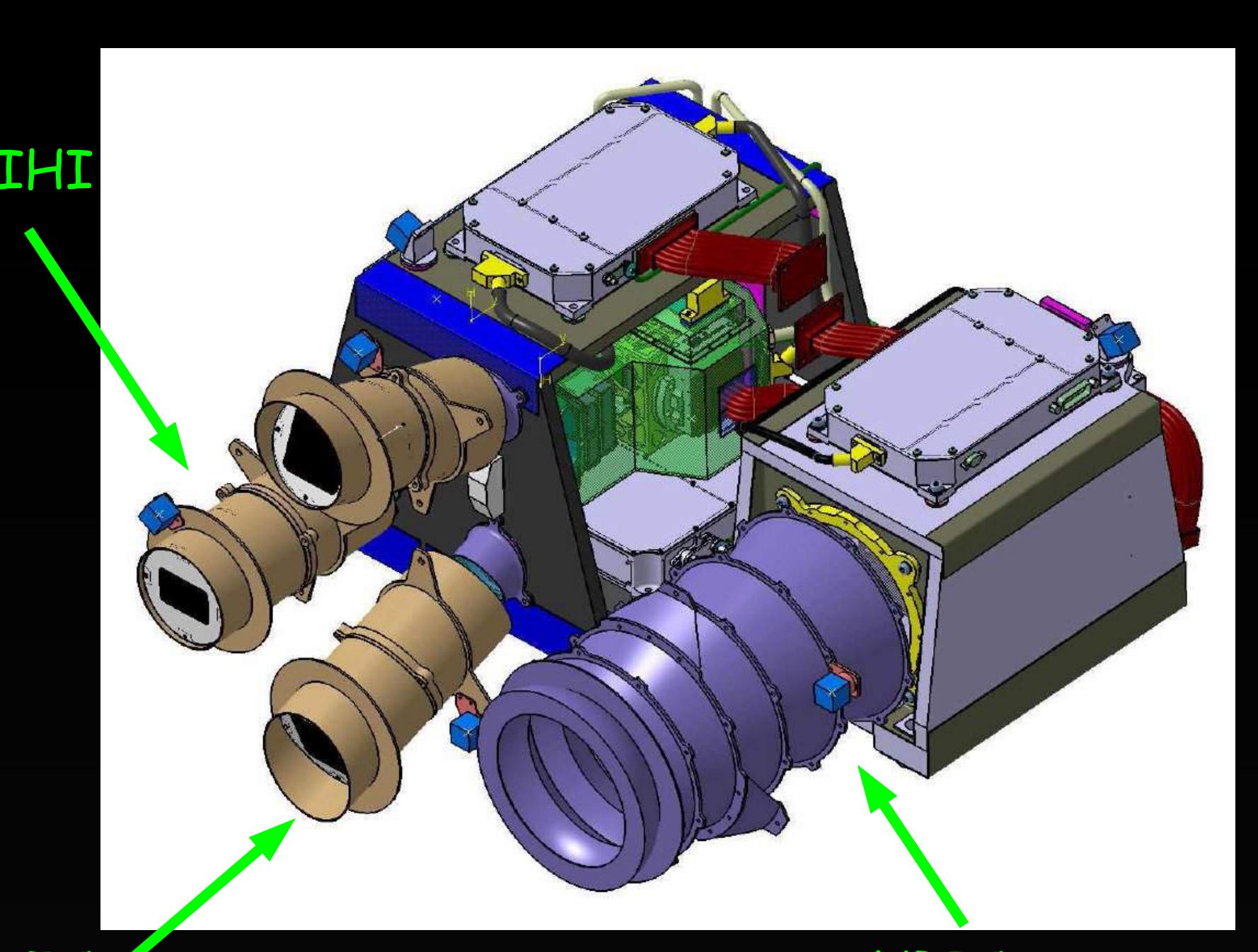


Stereo reconstruction of the paste model using our 3D model based on snake stereo algorithm



The Stereo Imaging Channel (STC) design

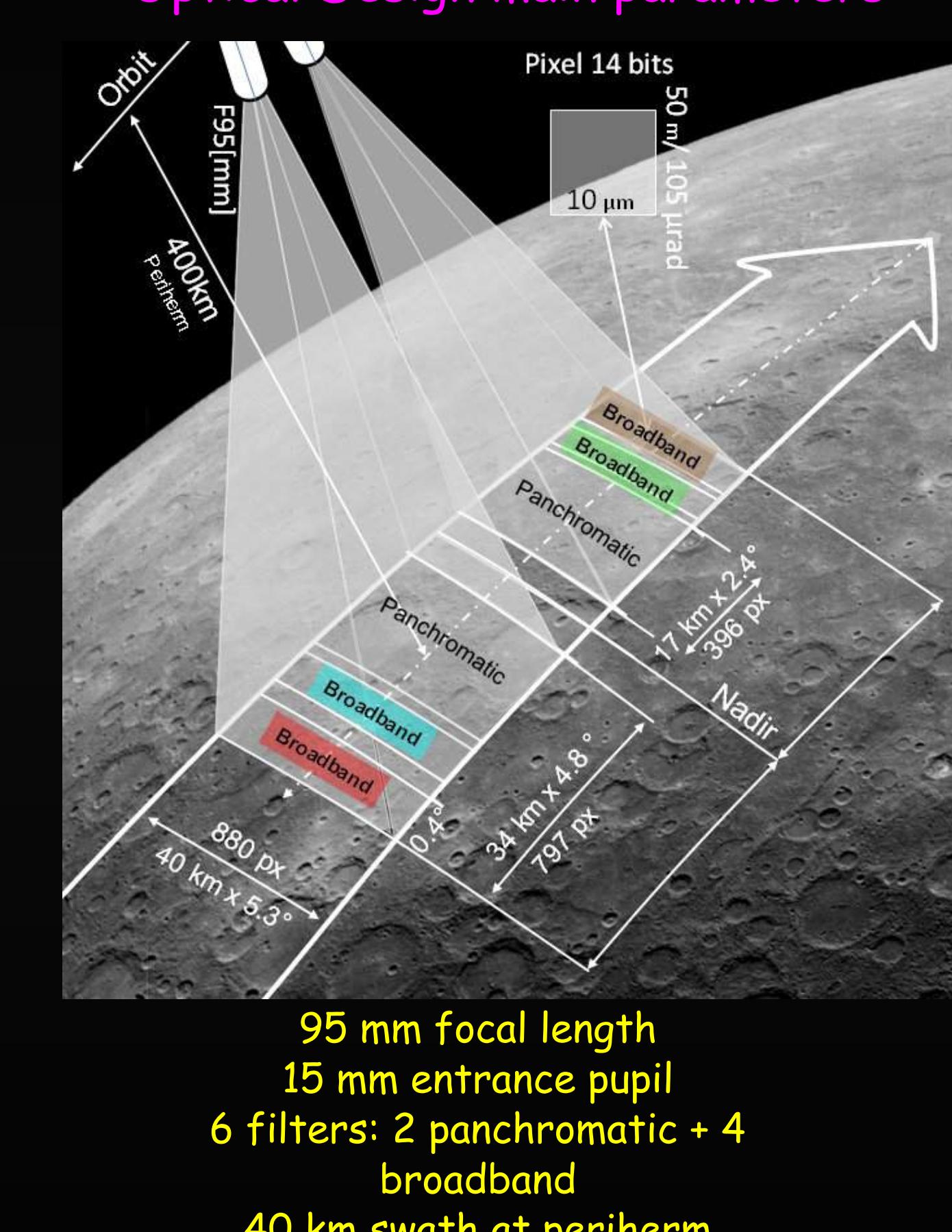
The SIMBIOSYS suite



Stereo concept

2 identical optical sub-channels, detector and most of the optical elements common to both sub-channels
Useful areas position on the detector

Optical Design main parameters



95 mm focal length
15 mm entrance pupil
6 filters: 2 panchromatic + 4 broadband
40 km swath at periherm

STC Optical Design layout

