CARTOGRAPHY OF THE MEDIUM-SIZED SATURNIAN SATELLITES BASED ON CASSINI-ISS IMAGES

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Introduction: The Cassini Imaging Science Subsystem (ISS) consists of two framing cameras. The narrow angle camera is a reflecting telescope with a focal length of 2000 mm and a field of view of 0.35 degrees. The wide angle camera is a refractor with a focal length of 200 mm and a field of view of 3.5 degrees. The stated objective of the ISS is to obtain global coverage for all medium-sized icy satellites with a resolution better than 1 km/pixel and high-resolution images of selected areas [1]. This goal was achieved with image sequences obtained during close flybys supplemented by images from greater distances to complete the coverage. The only exception so far is Mimas which will be imaged again during a close flyby in January 2017.

Basemaps: The processing of the Cassini images follows the typical processing chain for framing cameras: radiometric correction, geometric correction and map projection, and mosaicking [2]. Digital global mosaics that are also called basemaps were prepared in simple cylindrical projection, a special case of equirectangular projection. The prime meridian is in the center of the map. All basemaps were calculated using Cassini images. Voyager images were used to fill remaining gaps.

High-resolution atlases: High-resolution atlases were produced to conform to the design and standards of the USGS airbrush maps and photomosaics, established by Greeley and Batson [1990], widely used in planetary cartography. The selection of the atlas format depends on the resolution of the mosaics and the size of the satellites.

Three different formats were used for the generation of the atlases [3,4]:

- Synoptic format for making planetwide maps on a single sheet used for Phoebe
- Subdivision of the synoptic format for making planetwide maps with four quadrangles on three sheets, used for Mimas and Iapetus
- 15 quadrangles format for medium-sized bodies and high-resolution imaging, used for Enceladus, Tethys, Dione, and Rhea

Many new feature names were suggested by the Cassini Imaging Team and approved by the IAU. In naming the features on the Saturnian satellites, the Working Group for Planetary System Nomenclature within the International Astronomical Union (IAU) has expanded the mythological theme first used on the Jovian satellites. On the Saturnian satellites, however, the features bear names derived from the great epics and legends of the world [5,6]. All feature names were applied to the atlases. Fig. 1 shows a basemap of Enceladus with nomenclature. All maps and atlasses are available to the public through the Imaging Team's website [7]. The map tiles are also archived as standard products in the Planetary Data System (PDS) [8].

References: [1] Porco, C.C. (2004) *Space Science Review 115*, 363-497, [2] Roatsch, T. (2006) *Plan. Space Sciences 54*, 1137 -1145, [3] Roatsch et al., in: *M. Dougherty et al. (eds.), Saturn from Cassini-Huygens, Springer,* 761-778, [4] Roatsch et al. (2012) *Plan. Space Sciences 61,* 135-141, [5] Batson, R. (1984) Voyager 1 and 2 Atlas of Six Saturnian Satellites, http://history.nasa.gov/SP-474/sp474.htm, [6] http://planetarynames.wr.usgs.gov/, [7] http://ciclops.org/maps, [8] http://pds.jpl.nasa.gov/

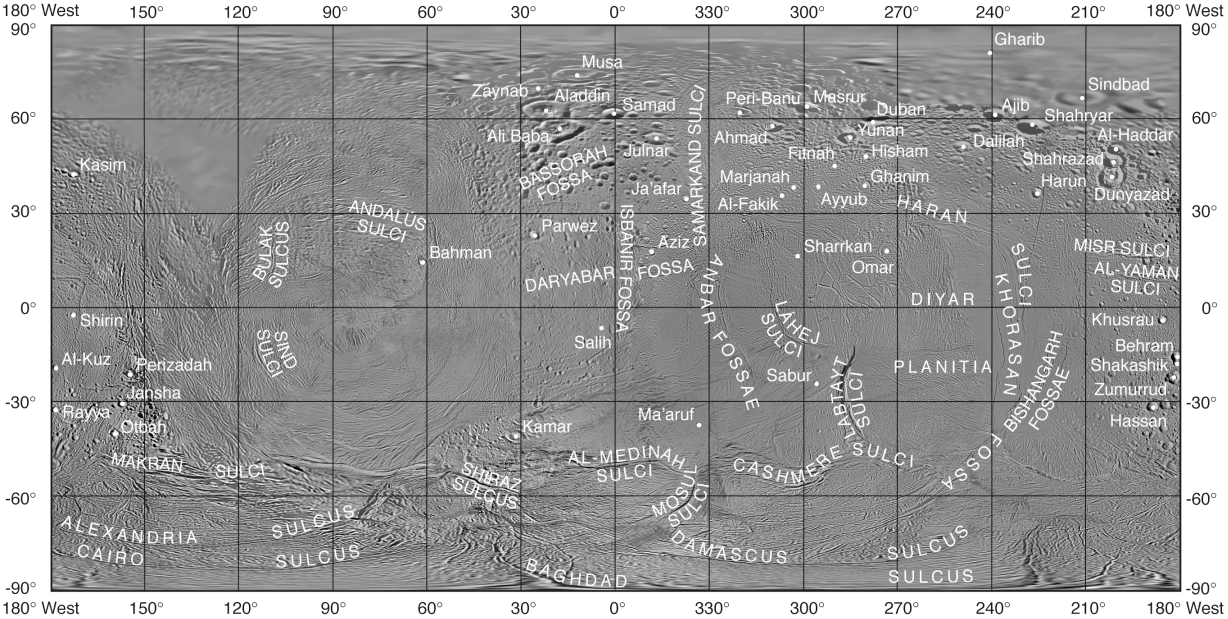

Figure 1: Global Cassini image basemap of Enceladus from 2010 with nomenclature.