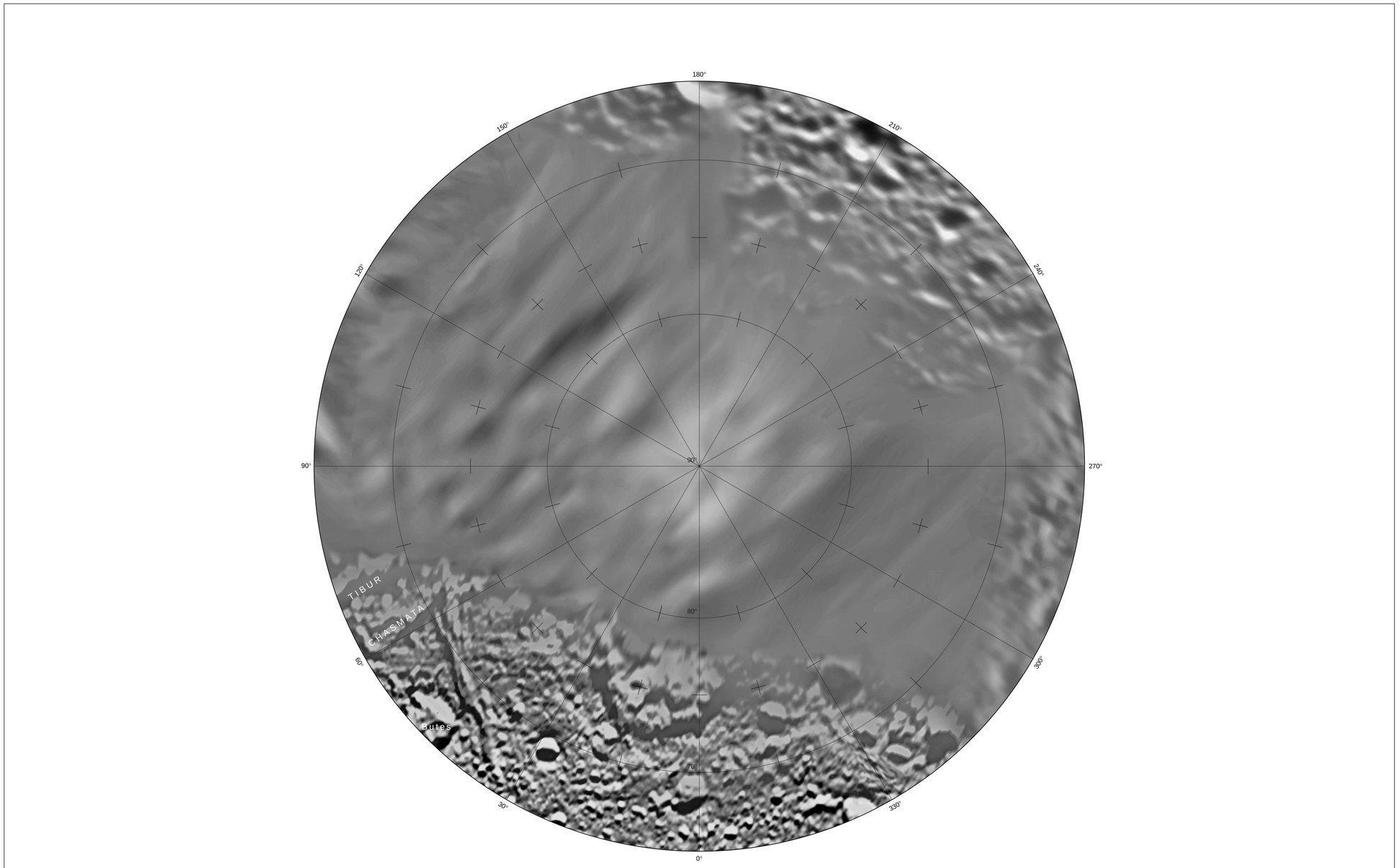


Scale 1 : 1 000 000

0 25 50 75 km

GENERAL NOTES

This map sheet is the 1st of a 15-quadrangle series covering the entire surface of Dione at a nominal scale of 1: 1 000 000. The source of map data was the Cassini imaging experiment (Porco et al., 2004)[1].

Cassini-Huygens is a joint NASA/ESA/ASI mission to explore the Saturnian system. The Cassini spacecraft is the first spacecraft studying the Saturnian system of rings and moons from orbit; it entered Saturnian orbit on July 1st, 2004.
The Cassini orbiter has 12 instruments. One of them is the Cassini Imaging Science Subsystem (ISS), consisting 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. Each camera is equipped with a large number of spectral filters which, taken together, span the electromagnetic spectrum from 0.2 to 1.1 micrometers. At the heart of each camera is a charged coupled device (CCD) detector consisting of a 1024 square array of pixels, each 12 microns on a side.

MAP SHEET DESIGNATION

Sd	Dione (Saturnian satellite)
1M	Scale 1 : 1 000 000
90/0	Center point in degrees consisting of latitude/west longitude
SMN	Semi-controlled Mosaic with Nomenclature
2008	Year of publication

IMAGE PROCESSING [2]

- Radiometric correction
- Geometric correction
- Photogrammetric adjustment using limb-fitting techniques
- Map projection
- Photometric correction using the Hapke bidirectional reflectance function
- Processing of the mosaic

CONTROL

For the Cassini mission, spacecraft position and camera pointing data are available in the form of SPICE kernels. SPICE is a data system providing ancillary data such as spacecraft and target positions, target body size/shape/orientation, spacecraft-orientation, instrument pointing used for planning space science mission and recovering the full value of science instrument data returned from missions (http://naif.jpl.nasa.gov/). While the orbit information was sufficiently accurate to be used directly for mapping purposes, the pointing information was improved using limb-fit techniques. Newly derived tri-axial ellipsoid models were used to calculate the surface intersection points. A spherical reference surface is used for map projections. The longitude system by Davies and Katayama (1983)[3] and adopted by the IAU/IAG (International Astronomical Union/International Association of Geodesy) Working Group on Cartographic Coordinates and Rotational Elements as standard (Seidelmann et al., 2007)[4] is defined by crater Palinurus; this crater defines the 63° meridian. To be consistent with this definition, the final semi-controlled atlas was shifted by 0.6° to the west[5].

MAP PROJECTION

Polar Stereographic projection
Scale is true at 90°N
Adopted figure: sphere
Mean radius: 562.53 km [6]
Grid system: planetographic latitude, west longitude

NOMENCLATURE

Names are approved by the ISS-Camera-Team to the International Astronomical Union (IAU). For a complete list of IAU-approved names on Dione, see the Gazetteer of Planetary Nomenclature at http://planetarynames.wr.usgs.gov/.

REFERENCES

[1] Porco, C.C., West, R.A., Squyres, S., McEwen, A., Thomas, P.C., Murray, C.D., DelGenio, J.A., Ingersoll, A.P., Johnson, T.V., Neukum, G., Veverka, J., Dones, L., Brahic, A., Burns, J.A., Haemmerle, V., Knowles, B., Dawson, D., Roatsch, Th., Beurle, K. and Owen, W., 2004, Cassini Imaging Science: Instrument Characteristics and Anticipated Scientific Investigations at Saturn, Space Science Review 115, 363-497.

[2] Roatsch, Th., Wählisch, M., Giese, B., Hoffmeister, A., Matz, K.-D., Scholten, F., Wagner, R., Neukum, G., Helfenstein and P., Porco, C.C., 2006, Mapping of the icy Saturian satellites: First results from Cassini-ISS, Planetary Space Sciences 54, 1137-1145.

[3] Davies, M.E. and Katayama, F.Y., 1983, The Control Networks of Tethys and Dione, Journal of Geophysical Research 88A, 8729-8735.

[4] Seidelmann, P.K., Archinal, B.A., A'hearn, M.F., Conrad, A., Consolmagno, G.J., Hestroffer, D., Hilton, J.L., Krasinsky, G.A., Neumann, G., Oberst, J., Stooke, P., Tedesco, E.F., Tholen, D.J., Thomas, P.C. and Williams, I.P., 2007, Report of the IAU/IAG Working Group on cartographic coordinates and rotational elements: 2006, Celestial Mechanics and Dynamical Astronomy 98, 155-180.

[5] Roatsch, Th., Wählisch, M. , Hoffmeister, A., Matz, K.-D., Scholten, F., Kersten, E., Wagner, R., Neukum, G. and Porco, C.C., 2008, High Resolution Dione Atlas derived from Cassini-ISS images, Planetary Space Sciences, submitted.

[6] Thomas, P.C., Burns, J.A., Helfenstein, P., Squyres, S., Veverka, J., Porco, C.C., Turtle, E.P., McEwen, A., Denk, T., Giese, B., Roatsch, Th., Johnson, T.V. and Jacobson, R.A., 2007, Shapes of the Saturnian Icy Satellites and their Significance, Icarus 179, 573-584.

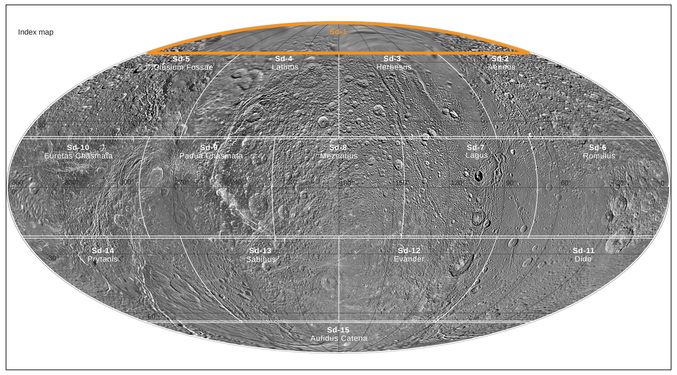
Image processing: Hoffmeister, A., Roatsch, Th., Scholten, F., Matz, K.-D. Cartographic production and design: Kersten, E., Semm, S., Wählisch, M.

We greatly appreciate helpful discussions with Blue, J. and Kirk, R. (USGS).

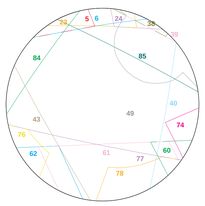
EDITOR

German Aerospace Center (DLR), Institute of Planetary Research, Roatsch, Th. Please send comments, suggestions, and questions to Thomas.Roatsch@dlr.de.

Index map

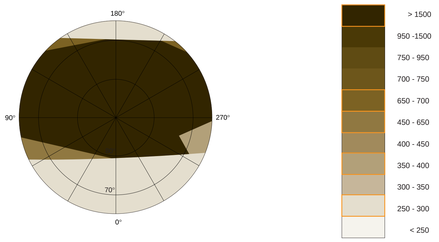


Index of Cassini images



5	N1507733604
6	N1507733748
23	N1507740839
24	N1507740982
38	N1481738371
39	N1481738274
40	N1532405126
43	N1540775893
49	C4399616 (Voyager)
60	N1569828025
61	N1569828131
62	N1569828238
74	N1569815593
76	N1569837046
77	N1569837162
78	N1569837277
84	N1514090211
85	N1544893295

Resolution of the images



DLR German Aerospace Center