



MAPPING THE MOONS OF SATURN
PART TWO

ENCELADUS

Map of Enceladus (diameter 500 km), second innermost of Saturn's major satellites, was prepared from photos taken primarily by the Voyager 2 spacecraft, with some Voyager 1 images used for albedo information. Drawn at 1:5,000,000 scale by Patricia M. Bridges of the U. S. Geological Survey's Branch of Astrogeologic Studies, it is reproduced here at 1:6,000,000 (1 cm = 6 km at the equator). The 0° meridian of longitude always faces Saturn, and the 0°-180° hemisphere faces ahead as Enceladus moves around the planet. The placement of surface features shown (still being refined) is estimated to be accurate to within ± 20 km over 66 percent of the mapped area. The photos used in preparing the map range in resolution from about 4 to 40 km per line pair, with lower-resolution and unphotographed areas left blank.

The surface appearance of Enceladus, like that of Jupiter's moon Io, is believed to have been affected by tidal heating, produced because the cyclic passage of another satellite (in this case Dione) forces Enceladus into an elliptical orbit that varies in distance from Saturn. Icy Enceladus is presumably too small and low in density for its surface to have been significantly modified by the heat of radioactive elements at its core, yet it shows smooth plains (from which the cratering visible elsewhere has apparently been erased), as well as widespread patterns of ridges and grooves. The tidal heating is far weaker than that of Io, but some researchers believe that its effect could be enhanced either if the heating is confined to discrete episodes, or by the presence of lower-melting-point ices such as ammonia.

—JONATHAN EBERHART

