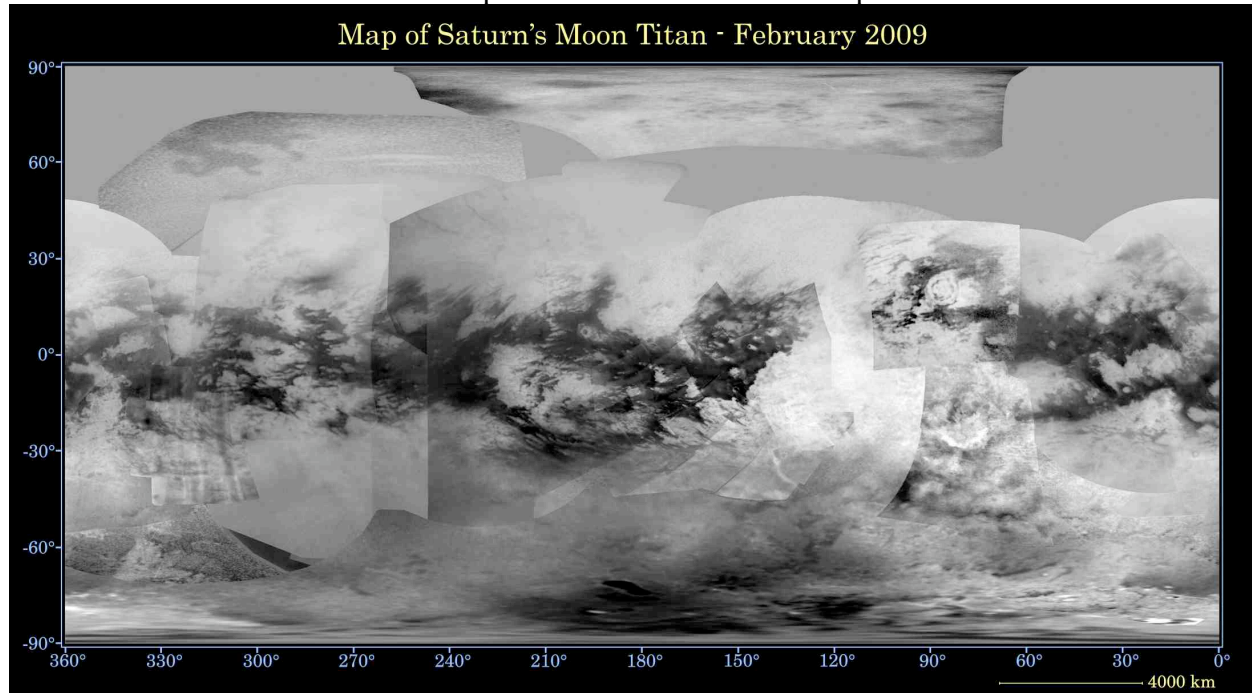


Titan: The View from Cassini ISS. E.P. Turtle¹, J.E. Perry², A.S. McEwen², R.A. West³, A.D. DelGenio⁴, J. Barbara⁴, D.D. Dawson², C.C. Porco⁵, ¹JHU Applied Physics Lab., Laurel, MD 20723, Elizabeth.Turtle@jhuapl.edu; ²Univ. Arizona, Tucson, AZ 85721; ³JPL, Pasadena, CA 91109; ⁴NASA GISS, New York, NY 10025; ⁵Space Science Inst., Boulder, CO 80301.

Cassini's Imaging Science Subsystem (ISS) has been observing Titan since Spring 2004, continuing through the 63 close Titan encounters that have been performed through mid-December 2009. Titan's atmosphere obscures its surface almost completely at visible wavelengths [1], so the ISS cameras include narrow 938-nm filters and IR polarizer filters [2] to take advantage of a window in methane's absorption spectrum in the near-infrared where the optical depth of Titan's complex organic atmospheric haze is lower and the fact that the haze is highly polarized near phase angle 90° [3]. Even with these filters, scattering by haze particles limits the best resolution that can be achieved to ~1 km [2]. To date ISS has imaged most of the surface at ~10 km resolution and has substantial coverage at significantly better resolution. These observations have been combined to produce a 938-nm albedo map of the surface.



The morphologies observed on Titan's surface reflect a wide variety of geological features: roughly east-west streamlined shapes, suggesting aeolian processes, consistent with RADAR observations that expanses of dunes cover the equatorial regions [4]; narrow, curvilinear channels; dark lakes and seas at high latitudes [e.g., 5]; rare impact structures, providing further evidence for a geologically young surface; and hints of tectonism and possibly cryovolcanism.

ISS is also documenting seasonal changes in Titan's weather patterns and related surface changes [5]. Since Cassini's arrival, the season has progressed from northern mid-winter to early northern spring. Early on, large convective cloud systems were common over the South Pole. Since 2005, such storms have been less common and elongated streaks of clouds have been observed further and further to the north, becoming common at high northern latitudes by 2007.

References: [1] Richardson *et al.* (2004) *Icarus* **170**, 113-124 [2] Porco *et al.* (2004) *Space Sci. Rev.* **115**, 363-497 [3] West and Smith (1991) *Icarus* **90**, 330-333 [4] Lorenz *et al.* (2006) *Science* **312**, 724-727 [5] Turtle *et al.* (2009) *GRL* **36**, DOI 10.1029/2008GL036186