



Cleveland Astronomical Society

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Thursday, April 7, 2011 Meeting Announcement

Leonard Krieger CanalWay Center

4524 East 49th Street (turn onto Whittlesey Way to reach Center), Cuyahoga Heights
(216-206-1000)

Speaker: Charles Wood

Titan Radar Mapper Team Member

Wheeling Jesuit University, Wheeling, WV, and Planetary Science Center,
Tucson, AZ

Titan: The Moon with a Planetary Complex

Most moons are relatively small, and because of that had little internally-driven geologic development. The Cassini spacecraft's exploration of the Saturn system is revealing the moon Titan to be far from that boring typicality. Titan is nearly the largest moon in the solar system; at 5,150 km in diameter, it is bigger than the planet Mercury and is only 112 km smaller than Jupiter's Ganymede. In 1944 Gerard Kuiper discovered that Titan has a significant atmosphere, but we learned very little additionally about the moon, other than a brief fling with Voyager in 1980, until Cassini went into orbit around Saturn in 2004. The density of Titan suggests that it is a mixture of water and silicate rock, with the rocks probably near the core. A paucity of impact craters implies that Titan has a young surface that is renewed by various processes. The Cassini Radar instrument has detected a number of the surface changing processes. There is a vibrant hydrologic cycle with rainfall, rivers, lakes and seas, but the liquid is methane, not H₂O. Erosion from river cutting is evident, and liquids cover significant parts of the north polar region. Within 30° of the equator are huge fields of dunes, apparently made of carbon-rich material rather than silicate sand. Many other landforms are difficult to interpret unambiguously. There is one probable volcano, with other possible ones. Linear arrays of ancient-looking mountains occur. A major question is whether Titan is a geologically dynamic world with active volcanism and tectonics, or one whose richness of surface detail is entirely due to atmospheric processes – a geologically dead world.

High School Teachers interested in bringing two students, as our guests, please contact Bob Sledz, President, at 440-333-7827 or isledz@yahoo.com by the Friday prior to the scheduled meeting date.