

Saturn rings found clumpier, heavier than thought

by Bend_Weekly_News_Sources

Saturn's largest, most compact ring consists of tightly packed clumps of particles separated by nearly empty gaps, according to new findings from NASA's Cassini spacecraft.

These clumps in Saturn's B ring are neatly organized and constantly colliding, which surprised scientists, they said. "We originally thought we would see a uniform cloud of particles," said Larry Esposito, principal investigator for the Cassini ultraviolet-imaging spectrograph at the University of Colorado, Boulder.

This false-color image of Saturn's rings was made using a Cassini instrument called the ultraviolet-imaging spectrograph. Scientists used it to record occultations, in which a star's brightness changes as the rings pass in front of it, revealing the amount of ring material between the craft and the star. Cassini gave scientists the most detailed view yet of the B ring and found that this part of the rings is densely packed with constantly colliding clumps called self-gravity wakes, separated by gaps. The clumps, 30 to 50 meters (100 to 160 feet) across, are too small to be seen directly, but researchers can map their distribution, shape and orientation. Colors here indicate their orientation; brightness indicates density of ring particles. Those in the yellow zone are too densely packed for starlight to pass through. (Credit: NASA/JPL/University of Colorado)

"Instead we find that the particles are clumped together with empty spaces in between. If you were flying under Saturn's rings in an airplane, you would see these flashes of sunlight come through the gaps, followed by dark and so forth. This is different from flying under a uniform cloud of particles." Because previous interpretations assumed the ring particles were distributed uniformly, scientists underestimated the total mass of Saturn's rings, researchers said: the mass may actually be two or more times previous estimates. "These results will help us understand the overall question of the age and hence the origin of Saturn's rings," said Josh Colwell of the University of Central Florida, Orlando, and a team member of the Cassini ultraviolet-imaging spectrograph. A paper detailing the results appears in the April 13 early online issue of the research journal *Icarus*.

Courtesy NASA and World Science staff