DPS 35th Meeting abstract submission

Please proofread this information

The following is a LaTeX to HTML translation of the abstract information you entered for the DPS 35th Meeting. The LaTeX in your abstract will be fully translated in The Bulletin of the American Astronomical Society (BAAS).

Please proof your abstract and press the COMMIT button on the bottom of this form.

The dark side of Iapetus: A model that finally works?

B. J. Buratti, M. D. Hicks (Jet Propulsion Laboratory, California Inst. of Technology)

Within weeks of his discovery of Iapetus, Cassini noted that the satellite exhibited periods of "apparent augmentation and diminution". Three centuries of subsequent work have revealed Iapetus to be the coexistence of opposites: a trailing hemisphere typical of a bright icy satellite and a leading hemisphere covered with some of the lowest albedo material in the Solar System. The models that have been offered to explain this dichotomy range from endogenously placed material (Smith et al., 1982, Science 215, 504), to material exogenously placed from Phoebe (Soter, 1974, IAU Colloq. 28), from putative D-type bodies (Buratti et al., 2002, Icarus 155, 375) or from Titan (Owen et al., 2001, Icarus 149, 160). No mechanism is entirely satisfactory. One model places the source of the dark material on outer retrograde satellites (Buratti et al., op. cit.). The dozen recently discovered small satellites of Saturn exist in four distinct dynamical families, including two retrograde groups (Gladman et al., 2001, Nature 412, 163). Broadband visual photometry of the newly discovered satellites obtained on the 200-inch Hale Telescope on Palomar Mountain suggests they are reddish in color. At least one retrograde satellite has colors that are similar to Iapetus. Material ejected by impacts from the low-gravity small retrograde satellites is a plausible source for the low-albedo material on the leading hemisphere of Iapetus. Contamination by small outer retrograde satellites may be a more general satellite surficial alteration process, working on the leading side of Callisto (Bell et al., 1985, Icarus 61, 192), and on the Uranian satellites (Buratti and Mosher, 1991, Icarus 90, 1). A serendipitous encounter by Cassini (the spacecraft) will occur on New Year's Eve 2005 and should reveal more about this enigmatic body.

Work funded by NASA and performed at JPL/Caltech

Presentation Type: Strongly Prefer ORAL - Contributed
Category: 25. Other Planetary Satellites
Membership Type: member of DPS

Submitter's Given Name: Bonnie
Submitter's Surname: Buratti
Correspondent Member ID: 11135
Correspondent Email: bonnie.buratti@jpl.nasa.gov
Correspondent Phone: 818-354-7427
Correspondent Address: Jet Propulsion Laboratory 4800 Oak Grove Dr. 183-501