IAU Symposium 261
27 April - 1 May 2009
Virginia Beach, Virginia, USA
DDA 40th Meeting
2-5 May 2009

Print this Page for Your Records
Close Window

**Control/Tracking Number:** 09-A-174-DDA40
**Activity:** DDA Abstract
**Current Date/Time:** 3/20/2009 1:33:30 PM

# The Brightening of Saturn's F Ring

**Author Block:**
**: Mark R. Showalter**[1], R. S. French[1], R. Sfair[2], C. Argüelles[3], M. Pajuelo[3], P. Becerra[3], M. M. Hedman[4], P. D. Nicholson[4]
*[1]SETI Institute, [2]Sao Paulo State University, Brazil, [3]Pontifica University Catolica del Peru, Peru, [4]Cornell University.*

*Abstract:* A substantial secular increase in the brightness of Saturn's F ring has occurred in the last 25 years. The ring is twice as bright in the Cassini data as it was in the Voyager data from 1980 and 1981. This conclusion is based on the photometric analysis of 3500 Cassini images taken primarily through clear filters, as compared to a similar analysis of 67 Voyager images by Showalter et al. (Icarus 100, 394-411, 1992). Analysis of the large number of images enabled us to average out the intrinsic longitudinal variations in the ring. The shapes of the phase curves from Cassini and Voyager are similar, suggesting that although the number of ring particles has increased, the overall distribution of sizes is unchanged. The color of the ring is neutral, and photometric models point to a power law size distribution with differential slope in the range 3 to 4.Eleven stellar occultation profiles from Cassini VIMS are consistent with the above factor-of-two change. They show consistently higher integrated optical depths than were measured by Voyager during its single stellar occultation.The F ring's peculiar dynamics are dominated by perturbations from Prometheus and Pandora, plus impacts from smaller clumps orbiting nearby. This work indicates that the amount of ring dust is highly variable on time scales of at least years and perhaps decades. This suggests that dust production is dominated by infrequent, large impacts rather than by the more frequent, smaller impacts that one might expect. The population of potential high-speeed impactors is therefore probably very limited. The impact rate is consistent with the time scale for mutual precession of nearby orbits relative to the F ring. It implies a "seasonal" aspect to the collisions, in which they occur whenever a particular clump rotates into a ring-intersecting orbit.
*:*

**Presentation Preference (Complete)**: &nbspOral
**Additional Info (Complete)**:
**Status:** Complete

American Astronomical Society
2000 Florida Ave., NW
Suite 400
Washington, DC 20009

Powered by OASIS, The Online Abstract Submission and Invitation System SM
© 1996 - 2009 Coe-Truman Technologies, Inc. All rights reserved.