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S/2008 S 1

C. C. Porco, on behalf of the Cassini Imaging Science Team, reports the discovery of S/2008 S 1, an object orbiting within Saturn's G ring in the region between Saturn X/XI (Janus/Epimetheus) and Saturn I (Mimas), in two images of the G ring obtained with Cassini's narrow-angle camera taken on 2008 Aug. 15 and separated by $\approx$ 30 min. Subsequent observations, and a search of earlier images based on a preliminary orbit fit, have provided additional detections of this object, yielding 21 total detections during 2007 June 15–2009 Feb. 20. A high-precision orbit fit based on a numerical integration of the equations of motion shows that the object is being influenced by a 7:6 mean-motion resonance with Mimas; averaged orbital elements for S/2008 S 1: a = 167500 km; e = 0.0002, $i = 0^{\circ}.001$, revolution period = 0.80812 day. The integrated orbit shows that the resonance with Mimas causes a long-period ($\sim$ 4 yr) oscillation of $\sim$ 4 km in the semi-major axis of S/2008 S 1, with a corresponding oscillation of a few degrees in its mean longitude. S/2008 S 1 is located within a bright arc in the G ring, so this body likely represents a significant source of the small particles found in this ring. If S/2008 S 1 has the same disk-integrated reflectivity as Saturn XXXIII (Pallene), preliminary estimates of the object's total brightness suggest a physical radius for S/2008 S 1 of $\sim$ 250 m.

COMET C/2007 N3 (LULIN)

D. E. Harker, University of California, San Diego; and C. E. Woodward, University of Minnesota, report on spectrophotometric observations of comet C/2007 N3 using the NASA Infrared Telescope Facilty (IRTF) telescope (+ MIRSI) on Feb. 22.6 UT. The coma was spatially extended at mid-infrared wavelengths, with a circularly symmetric extent of $\approx 6''$ in diameter (3σ surface brightness). Photometry in a $3''.18$-diameter circular aperture, centered on the peak in the coma surface brightness coincident with the nucleus position, yields fluxes of within the narrow-band IRTF comet-silicate filters of [8.7 μm] = 3.58 $\pm$ 0.06 Jy, [9.8 μm] = 4.98 $\pm$ 0.09 Jy, [10.6 μm] = 5.99 $\pm$ 0.03 Jy, [11.6 μm] = 6.82 $\pm$ 0.04 Jy, and [12.3 μm] = 7.54 $\pm$ 0.06 Jy. A Planck-function fit to the photometry yields a color temperature of 267 $\pm$ 10 K, which is 14 percent higher than that of a blackbody at an equivalent heliocentric distance (1.38 AU). Both the photometric spectral energy distribution and a low-resolution 10-μm spectrum indicate that C/2007 N3 has no silicate emission feature, implying a deficiency of small, submicron-sized silicate grains in the coma.

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