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Central Bureau for Astronomical Telegrams
INTERNATIONAL ASTRONOMICAL UNION
Mailstop 18, Smithsonian Astrophysical Observatory, Cambridge, MA 02138, U.S.A.
IAUSUBS@CFA.HARVARD.EDU or FAX 617-495-7231 (subscriptions)
CBAT@CFA.HARVARD.EDU (science)
URL http://www.cfa.harvard.edu/iau/cbat.html ISSN 0081-0304
Phone 617-495-7440/7244/7444 (for emergency use only)

COMET C/2007 N3 (LULIN)

An apparently asteroidal object discovered by Quanzhi Ye, a student at Sun Yat-sen University (Guangzhou, China), on images acquired by Chi Sheng Lin (Institute of Astronomy, National Central University, Jung-Li, Taiwan) with the 0.41-m *f*/8.8 Ritchey-Chretien reflector in the course of the Lulin Sky Survey (discovery observation tabulated below), has been found to show marginal cometary appearance by J. Young, who reports that CCD images taken with the Table Mountain 0.61-m reflector on July 17.4 UT in 1″ seeing shows a small coma of diameter 2″–3″ of total mag 18.8 surrounding a bright central core.

2007 UT	α_{2000}	δ_{2000}	Mag.
July 11.77867	$22^h33^m35^s.14$	$-8^\circ46'38''.8$	18.9

The available astrometry, preliminary parabolic orbital elements (T = 2009 Jan. 7.354 TT, q = 1.18775 AU, $i = 178^\circ.380$, $\omega = 137^\circ.379$, $\Omega = 338^\circ.515$, equinox 2000.0), and an ephemeris appear on *MPEC* 2007-O05.

S/2007 S 4

C. C. Porco, CICLOPS, Space Science Institute, Boulder; and the Cassini Imaging Science Team report the discovery of S/2007 S 4, a satellite orbiting in the region between Saturn XXXII (Methone) and Saturn XXXIII (Pallene). The satellite was first discovered in a series of fifteen pairs of Cassini wide-angle camera images with exposure times of 10 and 15 s, taken through the clear filter on 2007 May 30, spanning 6 hr. Following a preliminary orbit fit, an exhaustive search of other Cassini images generated a number of additional detections. The current observation arc, comprising 47 detections, spans 3.03 years between June 2004 and June 2007. Numerical integration of the equations of motion shows that the object is being influenced by a 10:11 mean-motion resonance with Mimas. A precessing-ellipse model fitted to the integrated orbit for S/2007 S 4 over the month of May 2007 yields a = 197700 km, e = 0.001, $i = 0^\circ.1$, and P = 1.03650 days. S/2007 S 4 is located ≈ 3400 km beyond Saturn XXXII, but still interior to the orbit of Saturn XXXIII, suggesting that the three may be part of a larger group of satellites in this region. Saturn XXXIII was also observed in some of the S/2007 S 4 discovery frames. If S/2007 S 4 has the same disk-integrated reflectivity as Saturn XXXIII, preliminary estimates suggest a physical radius for S/2007 S 4 of ∼ 1 km.

2007 July 18 *Daniel W. E. Green*