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COMET P/2010 A2 (LINEAR)

Further to *IAUC* 9105, the following improved orbital elements (from *MPEC* 2010-A78) for this comet are like those of a minor planet in the inner part of the main belt: T = 2009 Nov. 17.248 TT, q = 1.97580 AU, e = 0.13178, $\omega = 125^\circ.600$, $\Omega = 321^\circ.073$, $i = 5^\circ.099$ (equinox 2000.0), P = 3.43 years.

J. V. Scotti, Lunar and Planetary Laboratory, reports that there is no distinct nuclear condensation on CCD images of this comet taken by R. S. McMillan with the Spacewatch 1.8-m *f*/2.7 reflector on Jan. 8.2 and 12.4 UT; on Jan. 8, the coma size was $\sim 8'' \times 11''$, with a sharper edge on the northern boundary, and a long, narrow tail at least $4'.6$ long in p.a. 279°; a faint spike extended $0'.34$ in p.a. 137°.

D. Jewitt, University of California at Los Angeles; and J. Annis and M. Soares-Santos, Fermilab, report observations of P/2010 A2 from Jan. 11 and 12 UT with the WYNN 3.5-m telescope on Kitt Peak. The object appears as a point-like body of red mag 23.0 ± 0.5 located $2''.5 \pm 0''.5$ east of the apex of a broad, low-surface-brightness dust tail; the latter lacks strong condensation and is more than $5'$ in length (see website URL http://www2.ess.ucla.edu/~jewitt/MBC5.html). The detected nucleus is ≈ 150–200 m in diameter (assuming albedo 0.1), connected to the tail by an unresolved light bridge. With semimajor axis less than Jupiter's, and Tisserand parameter 3.6, P/2010 A2 is the fifth recognized example of a main-belt comet (MBC), differing from other MBCs in being an inner-belt object (orbit consistent with membership in the Flora family). The location of the nucleus outside the tail suggests a recent impulsive origin for P/2010 A2, perhaps from a recent collision between two previously unseen minor planets, with radiation pressure driving the separation between the nucleus and the tail. In this scenario, the bridge consists of large impact-produced particles slowly separating from the nucleus under radiation pressure and Kepler shear. Future observations are encouraged to test this hypothesis.

J. Licandro, Instituto de Astrofísica de Canarias; G. P. Tozzi, Istituto Nazionale di Astrofisica, Arcetri; and T. Liimets, Nordic Optical Telescope (NOT) and Tatru Observatory, report that 5-min R- and V-band exposures obtained on Jan. 14.945–14.985 UT with the 2.5-m NOT (+ ALFOSC) shows the presence of an asteroidal object $2''$ east of (and moving at the same rate as) the uncondensed "dust swarm" of P/2010 A2, which itself is $4'$ long (177000 km at the comet's distance) and $\sim 5''$ wide in p.a. 277°. Similar reports of the comet's appearance have been received from other observers, including R. Haver and L. Buzzi.

2010 January 19 *Daniel W. E. Green*