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2004 MN_4

On 2004 Dec. 20, K. E. Smalley (cf. *MPEC* 2004-Y25) identified an object placed on the 'NEO Confirmation Page' on Dec. 18 (following its discovery by G. J. Garradd via the Siding Spring Survey) with 2004 MN_4 (which had been recorded at Kitt Peak on June 19 and 20; cf. *MPS* 109613). Although the recognition of further prediscovery observations by Spacewatch on Mar. 15 (*MPEC* 2004-Y70) precluded the possible 2029 Apr. 13 earth impact discussed extensively in the WWW during 2004 Dec. 23–27 [notably on the Jet Propulsion Laboratory (JPL) and Pisa NEODys "risk pages"], it was clear that the object would then make an unusually close approach. L. A. M. Benner, JPL; M. C. Nolan, National Astronomy and Ionosphere Center, Arecibo Observatory; J. D. Giorgini, S. R. Chesley, and S. J. Ostro, JPL; and D. J. Scheeres, University of Michigan, report: "Arecibo delay-Doppler radar astrometry obtained on 2005 Jan. 27, 29, and 30 significantly refines the 2004 MN_4 orbit. On Jan. 29.0 UT, the range was 294 km closer to the earth than the pre-radar orbit solution predicted. This correction results in a 2029 approach to the geocenter of only 0.000245 $\pm$ 0.000060 AU (36700 $\pm$ 9000 km or 5.7 $\pm$ 1.4 earth radii, 3σ uncertainties), which is just below geosynchronous orbit and 28000 km closer than predicted by the pre-radar ephemeris. During its close approach, it is likely that tidal torques will significantly alter the object's spin state."

ARP 299

Further to *IAUC* 8473, S. Mattila, R. Greimel, C. Gerardy, and W. P. S. Meikle, together with D. L. Clements and K. Nandra (Imperial College, London), report the discovery on a K_s-band image obtained on Jan. 30.3 UT of a strong outburst in the B1 nucleus (Wynn-Williams *et al.* 1991, *Ap.J.* **377**, 426) of the galaxy Arp 299. The nucleus was not in outburst in their previous such image taken on 2004 June 6.0, and the difference in brightness yields a magnitude for the new source of $K_s = +12.6 \pm 0.1$; at a distance of 45 Mpc, this translates to $M(K_s) \sim -20.7$, which is about a magnitude brighter than would be expected for the brightest supernovae (cf. Mattila and Meikle 2001, *MNRAS* **324**, 325). The new source is located at $\alpha = 11^{\mathrm{h}}28^{\mathrm{m}}31^{\mathrm{s}}.02$, $\delta = +58°33'40''.7$ (equinox 2000.0), which is $< 0''.1$ from the K_s-band nucleus B1 and $< 0''.5$ from the location of the x-ray-determined active galactic nucleus (AGN) in Arp 299 (Ballo *et al.* 2004, *Ap.J.* **600**, 634). The source is therefore most likely associated with an AGN outburst in the nucleus B1.

2005 February 4 *Daniel W. E. Green*