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The Long Term Motion of Comet P/Swift-Tuttle

Kevin Yau, Donald Yeomans and Paul Weissman
(Jet Propulsion Laboratory)

The orbit of P/Swift-Tuttle is investigated by way of a long term integration forward to +2392 and backward to -702. The initial conditions used in the integration are determined from observations obtained at the 1992-93, 1862 and 1737 returns. Two of its previous apparitions in +188 and -68 prior to the telescopic period are identified in Chinese records. No other early observations of P/Swift-Tuttle have been found. Our successful integration is consistent with all the observed returns of the comet. The unobserved returns between 188 and 1737 are easily explained as the comet did not approach the Earth closely enough to allow naked eye visibility. Our integration and the observing conditions at each return suggest that the comet has maintained about the same intrinsic brightness for more than two millennia. Our prediction of the comet's return in 2126 places it well away from the Earth's position at the nodal crossing. The minimum Earth distance in 2126 will be 0.153 AU. This work was supported by NASA Planetary Geology and Geophysics Program.

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