Abstract IT-1-1

ORBIT DETERMINATION AND EVOLUTION OF COMET C/1995 O1 (HALE-BOPP)

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This invited review is in three parts. The first deals with the special problem of the initial determination of the orbit of a comet that was obviously at an unusually large distance, where neither diurnal nor annual parallax is of much value in making that determination; soon after the comet's discovery, it could be estimated that it would take more than a week, until 1995 Aug. 1, before the orbit was tolerably known, and this is precisely what happened, the perihelion date of 1997 Apr. 1 then being assured. The identification soon afterwards of a single prediscovery observation on 1993 Apr. 27 began to be both a boon and a burden; discussion of the consequences of this observation begins the review's second part, which also involves consideration of the comet's total observed arc and the question of whether the motion is or is not detectably influenced by nongravitational forces. The final part of the review addresses the orbital history and evolution, beginning with the fact that the comet was last here some 4200 years ago and that it will return in 2400 years. The comet's orbital evolution was early recognized as of particular interest because of the placement of the orbital nodes on the ecliptic close to the orbits of both the earth and Jupiter. It is well known that, had Hale-Bopp come four months earlier, it would have passed the earth at much the distance of the passage of Comet C/1996 B2 (Hyakutake) and around New Year's Day been surely proclaimed as the "comet of the millennium". Much more ambiguous is what could have happened if Hale-Bopp had come two months later and experienced a near-collision with Jupiter; this point presumably holds some clue to the comet's long-term prospects.

Abstract IT-1-2

EARLY OBSERVATIONS OF COMET HALE-BOPP AT $R_h > 4$ AU

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In the past decade a number of comets have been observed to exhibit outgassing beyond the canonical water cut-off distance at a heliocentric distance of $R_h \sim 3$ AU. Few objects have been observed systematically however, due to low activity levels at large R_h. Comet Hale-Bopp has allowed the evolution of cometary outgassing at these distances to be studied through both photometry and imaging of the dust coma and multi-wavelength spectroscopy of the outgassed molecular species. However a number of questions remain, such as when did Hale-Bopp 'switch-on', and is it realistic to compare the activity of a Great Comet with its smaller, less visible brethren? In this review I will compare and contrast the observed activity of comet Hale-Bopp at large R_h with other comets, and discuss the overall evolution of the activity of the comet during the first year of dedicated observations.