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Visual and Near-IR Spectrophotometry of Asteroids . . . . . L. A. Lebofsky

We have been continuing our studies of the spectral properties of dark asteroids in the solar system. From these studies we expect to learn about the distribution of volatile materials, such as water in clay minerals (water of hydration) and how the asteroids may relate to the comets. Our previous work has shown that dark asteroids in the middle of the main belt generally have water of hydration, but that the outer belt asteroids and Trojans do not. This appears to imply that these asteroids were originally composed of anhydrous silicates and ice and that the main belt asteroids have been heated in early solar phase, melting the ice and hydrating the silicates, while the outer asteroids have never been heated.

Our most recent work has been concentrating on simultaneous visual and near IR photometry near earth, main belt, and trojan asteroids. This preliminary work is shown in Figure 1. We have also made observations of some unusual "asteroids" such as Chiron which is in an orbit between Saturn and Uranus and has recently shown cometary activity, and 944 Hidalgo which has a cometary-like orbit. We have also begun studies of the small dark satellites of Mars and Jupiter in order to understand better how they may relate to the asteroids: could they actually be captured asteroids or comets?

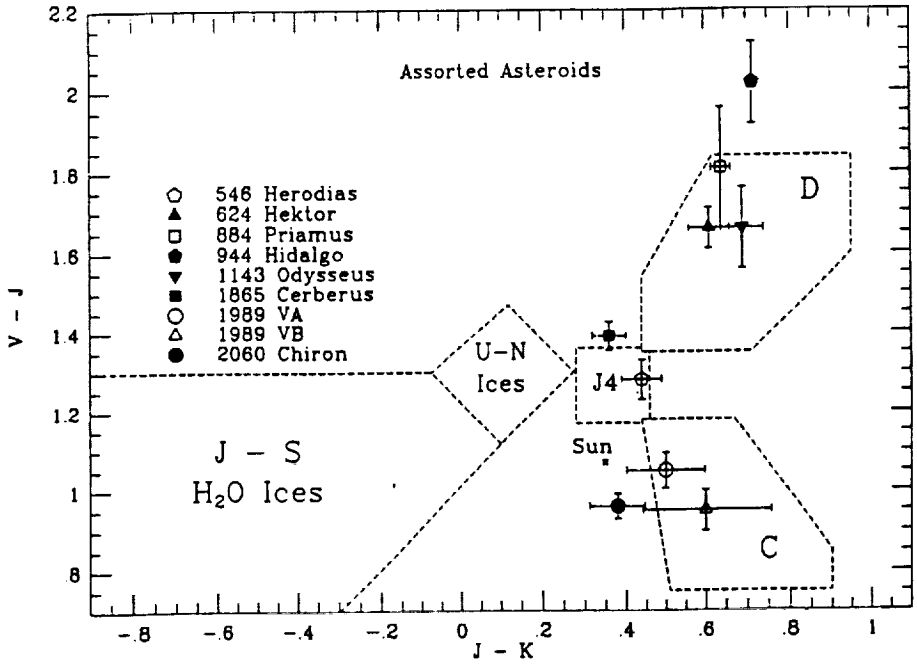

Figure 1. Color-color plot of selected outer solar system and Earth-crossing asteroids together with fields occupied by other solar system satellites and asteroids.