

Discovery of the Main-Belt Comets

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We are conducting an optical search for objects exhibiting comet-like behavior (comae or dust trails) in the main asteroid belt. We will describe this survey, conducted using telescopes in Hawaii, Chile, and Taiwan, and report on new results, including the identification of a new cometary class: the main-belt comets. These are dynamically asteroidal objects that have been found to display cometary activity. Lacking a clear dynamical path from the short-period comets to the main asteroid belt, we believe that these objects formed in-place in the main belt, where they are still found today, at a time when the snow-line was closer to the Sun than 3 AU. As such, these newly discovered comets are fundamentally distinct from the short-period and long-period comets which originate in the Kuiper Belt and Oort Cloud, respectively. We will discuss the latest survey results and physical parameters of the main-belt comets.