ICE NEARBY - THE MAIN BELT COMETS. David Jewitt[1], [1]Institute for Astronomy, University of Hawaii, 2680 Woodlawn Drive, Honolulu, HI 96822 USA. jewitt@hawaii.edu.

Three established members of the asteroid belt are known to display transient comet-like physical characteristics, including prolonged periods of dust emission leading to the formation of radiation pressure-swept tails. In the best-studied such object, known both as asteroid 7969 and as comet 133P/Elst-Pizarro, cometary activity has been observed at three consecutive perihelia but not in between. These physical properties are most naturally explained as the result of sublimation of near-surface ice from what are, dynamically, main-belt asteroids (hence the name "main-belt comets" (MBCs) or, equivalently "icy asteroids"). No pausible dynamical path to the asteroid belt from the established cometary reservoirs in the Oort cloud or Kuiper belt has been established and none seems likely. Instead, it is probable that the MBCs represent a new comet class in the Solar system, one located unexpectedly close to the Sun and revealing a previously unsuspected reservoir of ice nearby.

In this talk I will describe the properties of the MBCs, the mechanism behind their activity, their relation to the hydrated meteorites, the long-term stability of ice in the belt, the likely size of their population, and the significance of these bodies for understanding the distribution of volatiles in the protoplanetary disk of the Sun.