

Dynamical evolution of the asteroid belt

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We discuss the properties of the asteroid belt that dynamical evolution models should explain, i.e. mass deficit, orbital excitation, partial mixing of taxonomic types, the short cumulative collisional age of the asteroid belt (10 Gy; Bottke et al., 2005), and the rapid decay of the Ar-Ar shock ages for HEDs 4.5 Gy ago. We start by discussing the early dynamical sculpting of the asteroid belt, reviewing first the canonical model of Wetherill (1992), then the more recent Grand Tack Scenario (Walsh et al., 2011). In the second part of the talk, we describe the late evolution of the asteroid belt, affected by the dynamical instability that brought the giant planets to their current orbits about 4.1 Gy ago. The role of asteroids in the so-called Late Heavy Bombardment of the terrestrial planets will also be discussed.