

In this work, we study the Late Heavy Bombardment (LHB) in the Solar System which took place from 4.1 to 3.8 billion years ago, and represents a period of intense collisions whose traces are observed on the Moon and other bodies mainly in the form of craters or impact melts. The first part of the thesis is a review on the LHB with the focus on observational evidence and recent dynamical models. In the second part, we test a particular dynamical model of the LHB using the observed cratering records on various Solar-System bodies, which was not done previously to such an extent. For this purpose, we use the symplectic integrator SyMBA, the collisional code Boulder, and various projectile-crater scaling laws. We discuss the sources of uncertainties of the observations as well as that of the models. Furthermore, we use our results to constrain the size-frequency distribution of the primordial cometary population.