

The role of comets in the Late Heavy Bombardment

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We have simulated the orbital evolution of icy planetesimals ("comets") in the inner solar system upon dispersal of the primordial planetesimal disk by giant planet migration as prescribed by the Nice Model. Using both the assumption of non-evolving comets and models including erosion by sublimation and splitting, we have estimated the impact rate and crater formation due to these comets on the Moon and terrestrial planets. From these simulations, assuming that this migration and its consequences caused the Late Heavy Bombardment (LHB), we conclude that the largest observed impact basins were likely not formed by comets, the smaller craters may or may not have an important cometary contribution, and the amounts of water delivered to the Earth and Mars by LHB comets were insignificant compared to the estimated total water inventories of those planets. These results are compatible with the suggestion by Bottke et al (2012) that the asteroidal E-belt was the main source of LHB projectiles.

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