

Dating planetary surfaces from cratering processes: formation of the solar system

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This science case was developed by the WG3&5 to promote the dating of planetary surfaces from cratering processes. Indeed, the craterization of planetary bodies, as well as their erosion processes, give clues as to their formation and evolution and can lead to a precise chronology from the distribution of impact densities in the Solar System. This kind of information can constrain models for the formation and evolution of the Solar System. Studying the craterization in the Solar System can also give insights on the impact hazards to the Earth.

To achieve this goal we need to centralize, catalogue and give easy access to all measurements of cratering processes in the solar system by completing space or Earth-bound surface mapping of planetary moons and surfaces with the larger ground-based telescopes offering higher spatial resolution than previously available.

Our understanding of the surface structure and composition of the planetary objects can be improved through new observations that will help complete our maps: with the RADAR for objects with an atmosphere (Titan) and with high-resolution full coverage spectroscopy for icy bodies (Europa). We should then be able to retrieve better lightcurves, higher-resolution mapping, and better spectral coverage that will help identify the observed features. This input is valuable for the interpretation of planetary data, such as images that require identification from Earth or Martian, or Moon analogues (for Titan, etc).