國立中央大學太空科學與工程學系
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專題演講

Using impacts to investigate the lunar surface and crust

Speaker： Dr. Ya Huei Huang

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Time： 111 年 4 月 22 日 星期五 12:00-13:00

Place： 健雄館(科四館) S4-811 教室

摘 要/Abstract：

The Moon serves as a cornerstone for understanding the early evolution of the terrestrial planets, most notably the Archean Earth. Its proximity to Earth means that it has evolved in a similar environment, and that it is particularly easy to collect remote sensing observations and returned samples. And its lack of plate tectonics and significant weathering means that it preserves the one of the most pristine records of many geological processes including planet differentiation, crust formation, magmatic activities, and impact cratering. Studying this record requires constraining the lunar geological chronology; impact craters, calibrated with in-situ returned samples, are a common dating metric that can be derived from remote sensing data. Because impacts vary in a wide range of sizes from meteoroid impacts to basin formation, deciphering the temporal and spatial variation of impacts in the returned sample to calibrate such records is challenging.

In this talk, I first introduce a framework for modeling the composition and age of the lunar surface and in-situ samples using Clementine UV/VIS reflectance data and lunar impact glasses. Then, I present our recent work modeling the evolution of lunar crustal porosity, which provides a novel framework to model the age of a planet's crust, and to investigate the evolution of planetary crusts. A globally increasing number of lunar missions will be revealing more exciting finding and discovery to the origin of the Earth's companion. Our framework can serve a predictive approach to future lunar human exploration to investigate the most ancient history of the Moon. Ultimately, my research goal aims to understand the early evolution of the Moon from its present-day surface and crust.

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