

Preface

With the development of space techniques, more and more curious solar system bodies are being explored by humans. For example, several countries have launched orbiters and landers to the moon recently, focusing on unprecedented resources, origins and evolutions of the moon, including Japan's SELEnological and ENgineering Explorer (SELENE), China's Chang'E-1/2/3 and India's Chandrayaan-1 and US's Lunar Reconnaissance Orbiter (LRO) and Gravity Recovery and Interior Laboratory (GRAIL). These missions provided direct observations on space environments, surface processes, rocks and minerals, water ice, interior structure and the origin of the moon. Furthermore, a number of upcoming lunar missions programmes have been planned, e.g., India's Chandrayaan-2, (2014), Russia's Lunar Glob 1 and 2 (2014/2015), China's Chang'E-4 (2017), and International Lunar Network (2018), which will enable us to answer more unknown questions on lunar exploration and sciences. In addition, with recent Mars Global Surveyor (MGS), Mars Express, Mars Odyssey, Mars Reconnaissance Orbiter (MRO), Venus Express, Phoenix, and so on, the atmosphere, surface processes and interior structure of the Mars, Venus and other planets were well explored and understood. However, the origin, formation and evolution on planets and exoplanets are still unclear, as well as seeking life beyond Earth.

This book will present the recent developments of planetary exploration techniques and the latest results on planetary science as well as future objectives of planetary exploration and science, e.g., lunar surface iron content and Mare Orientale basalts, Earth's gravity field, Martian radar exploration, crater recognition, ionosphere and astrobiology, exoplanetary atmospheres and planet formation in binaries. It will help readers to quickly familiarize themselves with the field of planetary exploration and science. In addition, it is also useful for planetary probe designers, engineers and other users' community, e.g., planetary geologists and geophysicists. This work was supported by the National Basic Research Program of China (973 Program) (Grant No. 2012CB720000) and Main Direction Project

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