

**SCIENTIFIC VISIONS OF LUNAR RESEARCH-STATION FROM CHINA.** Yongliao Zou<sup>1</sup> and Wei Li<sup>1</sup>,<sup>1</sup>National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China, ylzou@nao.cas.cn, liwei@nao.cas.cn.

**Introduction:** In recent years, China has successfully implemented Chang'e-1/2/3 missions, Chang'e-5 will be launched in 2017 to collect up to 2 kg of lunar regolith and transport back to Earth, Chang'e-4 will be launched in 2018 to land and rove on farside of the Moon. In the future, we suggest to set a research-station on the moon with four missions(Chang'e-4, Chang'e-6 and two lunar polar exploration missions.

Chang'e-4, the back-up of Chang'e-3 Probe, will land on the far-side of the moon around in 2018, with the general scientific goals: (1) To detect the lunar surface environment characteristic, including the dust, the surface temperature, the rock magnetic, LET and so on. (2) To survey the local geochemical composition and geological structure. (3) To understand the inner structure of the moon. (4) To observe and identify the "knee" structure of cosmic rays, find the possible original position for these cosmic rays, to observe the independent kilometer wave burst events from the high layer of the solar corona, so as to its radiation characteristics and mechanism, and to explore CME and its transporting, accelerating between SUN-Earth space, With the Radio-Astronomical Observation system.

Chang'e-6, the back-up of Chang'e-5 Probe, may land on the lunar polar to collect lunar samples and rock them back to the earth for further scientific research after 2020, with the general scientific goals: (1) to investigate regional morphology and geological background of the landing site. (2) to analysis lunar polar samples for structure, composition and physical properties of landing lunar material. (3) to deepen the study into the formation and the evolution of the moon.

The first lunar polar exploration mission will carry a lander and a rover, which may land on lunar pole region after 2023, to detect the distribution, abundance, depth of the water resource and the environment of the landing site, to collect and analysis the sample on site, to carry out some on-site experiments about life science, physics, chemistry and so on.

The second lunar polar exploration mission will carry lander, rover and orbiter, which may land on lunar pole region after 2025, to carry out the experiments of water resources utilization, useful material extraction of lunar soil, lunar biosphere and so on.

Through the two missions of Chang'e-4 and Chang'e-6, we can consider the location of lunar research-station with the new information about the moon: geometric light condition, dust, temperature,

magnetic field, radiation environment, geological conditions and other factors.

Through the two lunar polar exploration missions, we can set a simple research-station on the lunar polar region, where we can verify technologies of lunar resource utilization, useful material extraction, we can also to detect the lunar inner structure, geological background, to analysis the age of young volcanic rocks, to carry out lunar based astronomical observation with a series of scientific instruments.

In the future, China may focus on the lunar exploration and Lunar resource utilization more deeply.