THE PROJECT OF 1:2.5 M-SCALE LUNAR GEOLOGICAL MAP-COMPILATION OF CHINA. K. Y. Han[1] and D. Wang[2], [1]Institute of Geology, Chinese Academy of Geological Sciences, Baiwanzhuang Road, Beijing 100037, China, kunyinghan@163.com, [2]Institute of Geology, Chinese Academy of Geological Sciences, Baiwanzhuang Road, Beijing 100037, China, wangdan92y@163.com.

Mankind has been increasingly deepening its knowledge about the Moon though various exploration activities in the past 50 years. During the 18 years from 1958 to 1976, the United States and the former USSR were the first in the world to initiate lunar exploration projects, including the "Luna" and "Apollo" missions. People were sent to the Moon and gathered tremendous amounts of samples, data and information regarding the landform, geological setting, material composition, internal structure and surface environment of the Moon. A series of lunar landform, geological and tectonic maps were produced in succession(Ouyang ziyuan, 2005). The U. S. Geological Surve(USGS) completed a set of lunar geological maps of 44 quadrangles at a scale of 1:1 M, and on this basis completed a series of 1:5 M-scale geological maps, including Geologic Map of the Near Side of the Moon (Wilhelms and McCauley，1971), Geologic Map of the West Side of the Moon (Scott et al., 1977), Geologic Map of the East Side of the Moon (Wilhelms and Elbaz，1977), Geologic Map of the Arctic Region of the Moon (Lucchitta, 1978), Geologic Map of the Antarctic Region of the Moon (Wilhelms, 1979), Geologic Map of the Central Far Side of the Moon (Stuart-Alexander, 1978), and finally the Geologic Atlas of the Moon. Among the lunar maps accomplished by the former USSR are mentioned mainly the sketch map of major tectonic units on lunar surface (1:30 M), tectonic map of the global Moon and lunar landform map. Moreover, during this period the USGS compiled a set of lunar geological maps of some typical regions or Apollo landing sites on 6 kind of large and medium scales----1:250000, 1:100000, 1:50000, 1:25000, 1:10000 and 1:5000(Ulrich,1969; Howard, 1975; Pohn, 1971; Howard, 1971; Titley and Trask, 1969; Rowan, 1971; Cannon and Rowan, 1971). These maps manifest the progress of lunar exploration and related researches of mankind. The period from 1976 to 1994 is a stage for data processing and digestion, analysis and comprehensive study of acquired information and materials. Lunar geological mapping at this stage placed its emphasis on large-range integrated study and compilation of small-scale geological maps. Since 1994, the United States started a new program of returning back to the Moon and launched "Clementine"(1994) and "Lunar Prospector" (1998) probes to explore lunar topography, resources, energy and water ice(Zhang et al., 2007). The USGS proposed another around of 1:2.5 M-scale geological mapping project at the Annual Meeting on Planetary Geological Mapping in 2002 and planed to implement the mapping program based on unified scale, projection, mapping standard and nomenclature. In this program, the global Moon surface was divided into 30 quadrangles(Fig. 1). The program factually began in 2004 and geological mapping of four quadrangles is presently under way, including Marius Quadrangle (LQ-10), Copernicus Quadrangle, (LQ-11), Arctic Region (LQ-29), Antarctic Region (LQ-30), and meanwhile the draft or preliminary results were obtained for some of the quadrangles(Gaddis et al., 2006).

Based on CCD image, Imaging Interferometer(IIM) data, DEM data, contents of minerals and elements obtained by the Chang'E-1 lunar exploration project of China in 2007(Ping, 2010; Wu et al., 2010; Li et al., 2010), and the data of Chang'E-2 of China in 2010, a study project for 1:2.5M-scale digital geological mapping was conducting from 2015. The purpose of the study is to apply these data and information and analytic results to carrying out tentative geological mapping (1:2.5 M) of the Sinus Iridum quadrangle (LQ-4) , setting up a spatial database and preliminarily formulate the technical specification, procedure and method for lunar geological mapping through the division of stratigraphic and tectonic units, classification of rock types, integrated analysis of chronology and lunar evolution history, so as to lay a foundation for digital geological mapping of the global Moon and future compilation of geological maps of other planets. This study also provide data and materials for selecting the landing site of Chang'E-3 and Chang'E-4 in the 3rd-phase lunar exploration project of China. This is of great significance for the future manned Moon mission, site-selection and construction of working bases on the Moon surface.

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