

LUNAR TECTONICS CHAPTER IN THE UPDATED NEW VIEWS OF THE MOON 2 VOLUME. A. L. Nahm¹ and C. L. Johnson², ¹German Aerospace Center (DLR), Rutherfordstr. 2, 12489 Berlin, Germany. Amanda.Nahm@dlr.de; ²University of British Columbia, Vancouver, BC Canada V6T 1Z4, cjohnson@eos.ubc.ca.

Introduction: An updated version of the New Views of the Moon (NVM) volume from 2006 [1] is planned, in which our understanding of the Moon since the beginning of the 21st century will be synthesized. While the original NVM volume did not include a chapter on lunar tectonics, the best reference for the state of knowledge of lunar tectonics pre-Lunar Reconnaissance Orbiter (LRO) was published in the Planetary Tectonics book [2], authored by Watters and Johnson [3].

In our updated chapter regarding lunar tectonics, we will discuss tectonic features on the Moon and their implications for lunar tectonic evolution. The chapter will extend the work of [2], emphasizing new findings that resulted from the most recent lunar missions (since 2006), including the ongoing LRO mission, the Kaguya/SELENE mission, and the Gravity Recovery and Interior Laboratory (GRAIL) mission. The chapter will begin with descriptions of the tectonic structures on the Moon, i.e., graben, wrinkle ridges, lobate scarps, and the newly discovered small-scale normal faults. Each section on structure type will include maps of their global distribution (e.g., Figs. 1 and 2) as well as GIS-compatible files, morphological descriptions, and hypothesized formation mechanisms. Much recent work has focused on the timing of these tectonic structures, and a section of the chapter will focus on this aspect of lunar tectonics. Because the Moon is the only other planetary body to have had seismometers on its surface, any connections between lunar seismicity recorded by the Apollo-era seismometers and faults will be discussed. We will discuss the relationship of observed tectonic features to volcanic features and their implications for the stress fields during and postdating major magmatic periods in lunar history. Similarly, we will discuss any constraints that tectonic features place on regional and global thermal evolution models. We will conclude the chapter with outstanding questions, hopefully to be addressed in the next version of the chapter.

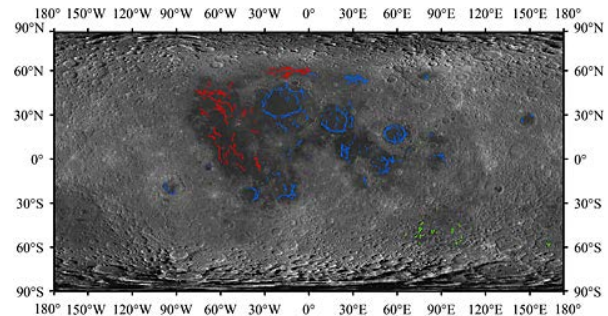


Figure 1. Global distribution of lunar wrinkle ridges, with different wrinkle ridge types color coded: concentric (blue), parallel (red), and isolated (green) ridges. From [4].

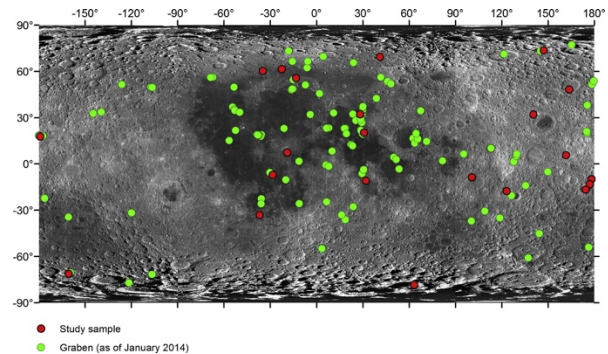


Figure 2. Distribution of small-scale graben discovered since January 2014 (green dots) and the sample analyzed in this study (red dots). From [5].

References: [1] Jolliff, B. L., et al. (editors) (2006), *New Views of the Moon*, Reviews in Mineralogy and Geochemistry, Vol. 60. Mineralogical Society of America, Chantilly, VA. [2] Watters, T. R. and R. A. Schultz (editors) (2010), *Planetary Tectonics*, Cambridge University Press. [3] Watters, T. R. and C. L. Johnson (2010), Lunar tectonics, in *Planetary Tectonics*, Watters and Schultz (editors), Cambridge University Press, pp. 121-182. [4] Yue, Z. et al. (2015), *JGR-Planets*, 120, 978–994. [5] French, R. A. et al. (2015), *Icarus*, 25, 95-106.