

Fresh Transitional Lunar Impact Craters

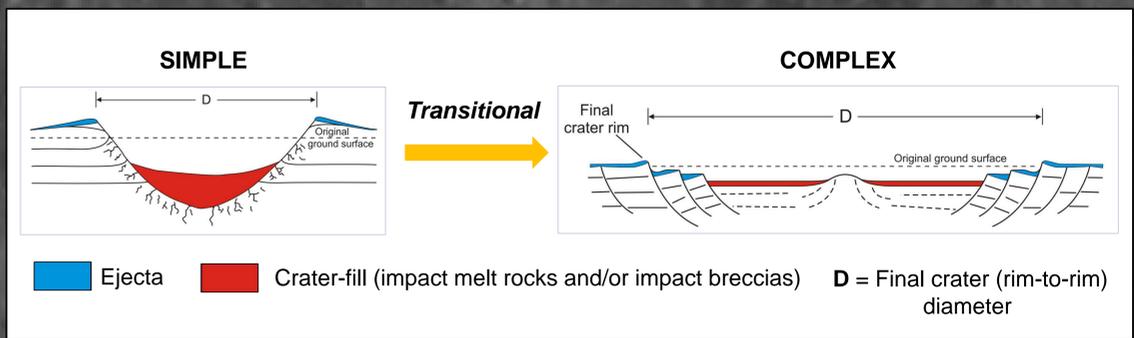
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INTRODUCTION AND PURPOSE

- Impact cratering is an important geological process occurring throughout the solar system
- The Moon possesses well-preserved craters with minimal post-impact modification
- There are a significant group of craters that cannot be defined as simple or complex and are termed “transitional”
- Mechanisms by which these transitional craters form and their relationships to simple and complex craters are poorly understood



RESULTS AND DISCUSSION

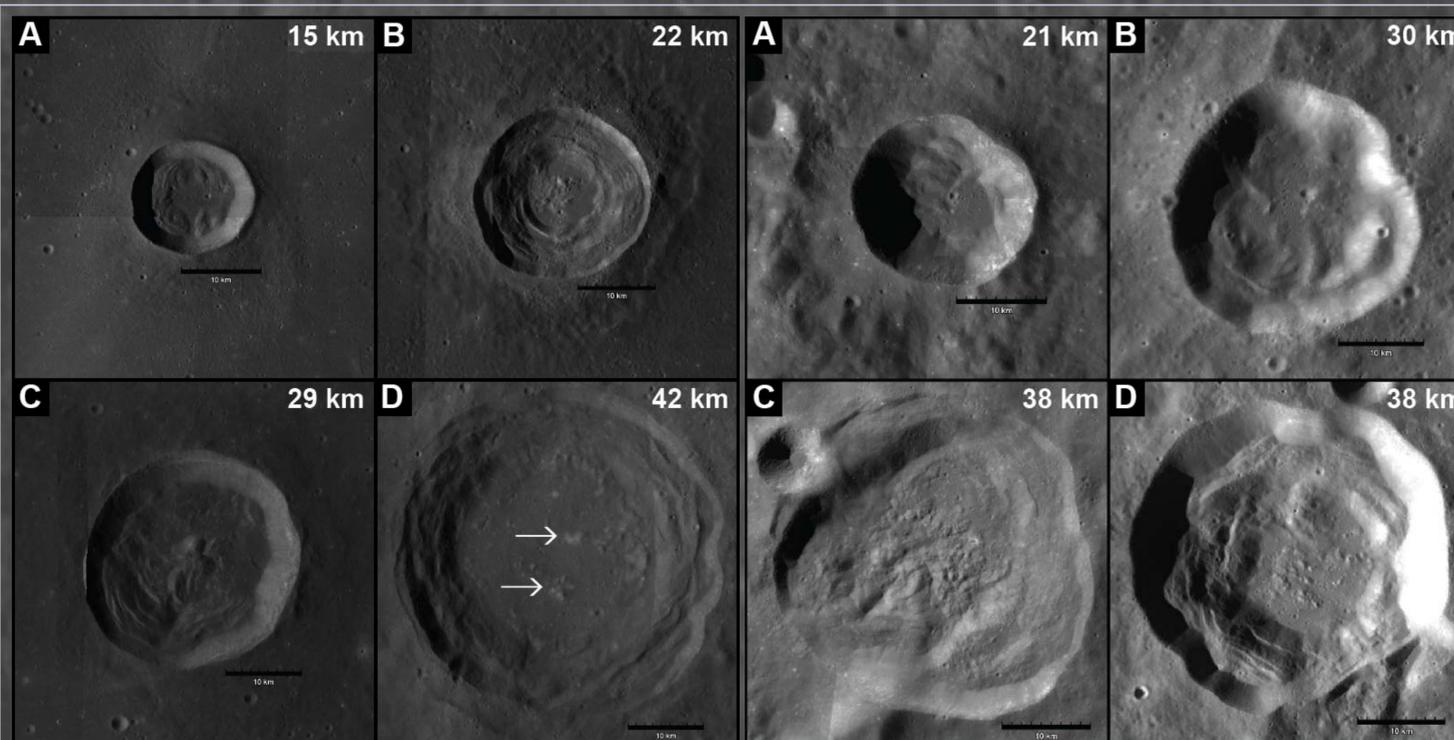


Figure 1: Comparison of transitional craters in Mare target. (A) Bessel (15 km, 21.80N, 17.9E); (B) Picard (22 km, 14.60N, 54.7E); (C) Reiner (29 km, 7.00N, 305.1E); (D) Reinhold (42 km, 3.30N, 337.2E). (LROC WAC Mosaic).

Figure 2: Comparison of transitional craters in Highlands target. (A) Conon (21 km, 21.60N, 2.0E); (B) Keeler S (30 km, 158.00N, 11.4W); (C) Nicholson (38 km, 85.10S, 26.2W); (D) Van Gent X (38 km, 159.70N, 16.4E). (LROC WAC Mosaic).

Variation within Mare: (A) Bessel is the smallest crater of the study and has no terraces present. The relatively flat floor is made up of melt and crater-fill deposits with partially coherent slumped material along the walls. (B) Picard has a slightly larger diameter, yet the changes in morphology are dramatic. Picard displays concentric terracing with a relatively flat floor consisting of crater-fill and melt deposits. (C) Reiner, diameter 29 km, has very irregular terracing that dominates the southern floor of the crater. There does not appear to be a dramatic increase in terracing compared to Picard. (D) Reinhold is the largest crater of this study with a diameter of 42 km. It has several well developed terraces and two small “mounds” (arrows) present off the centre of the crater, which may represent an almost emergent central peak.

Variation within Highlands: (A) Conon is the smallest transitional crater for this study in the highlands target. Both terracing and slump blocks are apparent. (B) With a slightly larger diameter of 30 km, Keeler S exhibits an irregular shaped rim with a relatively flat floor. (C) Nicholson and (D) Van Gent X are the largest transitional craters within the highlands, both with a diameter of 38 km. Nicholson appears to have concentric terracing, while Van Gent X has less continuous terraces.

