Crater Chains on the Lunar South Pole

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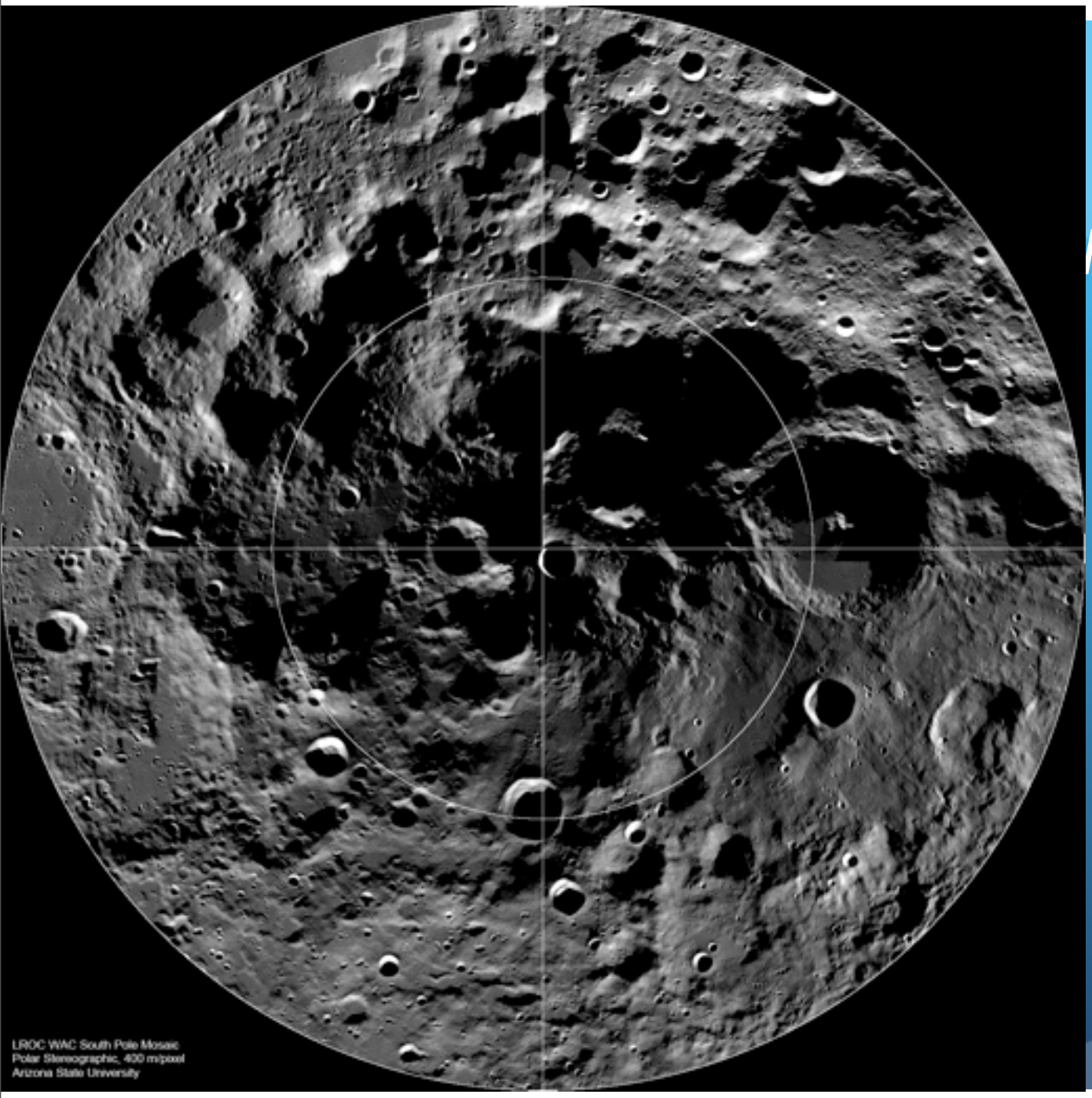
Research Goal

To identify crater chains in lunar South Polar region.

Action Plan!

1. Analyze the mosaic photograph from the LROC WAC (Wide Angle Camera) and identify any and all possible crater chains in the Lunar South Pole region depicted in the photograph.
2. Carefully examine the identified *possible* crater chains and weed out any sites that fail to actually qualify as crater chains.



LROC WAC South Pole Mosaic Image

We looked at a very detailed and up close version of this image in order to identify our crater chains.

We broke the picture up into four quadrants and analyzed them individually

1.

Top Left

2.

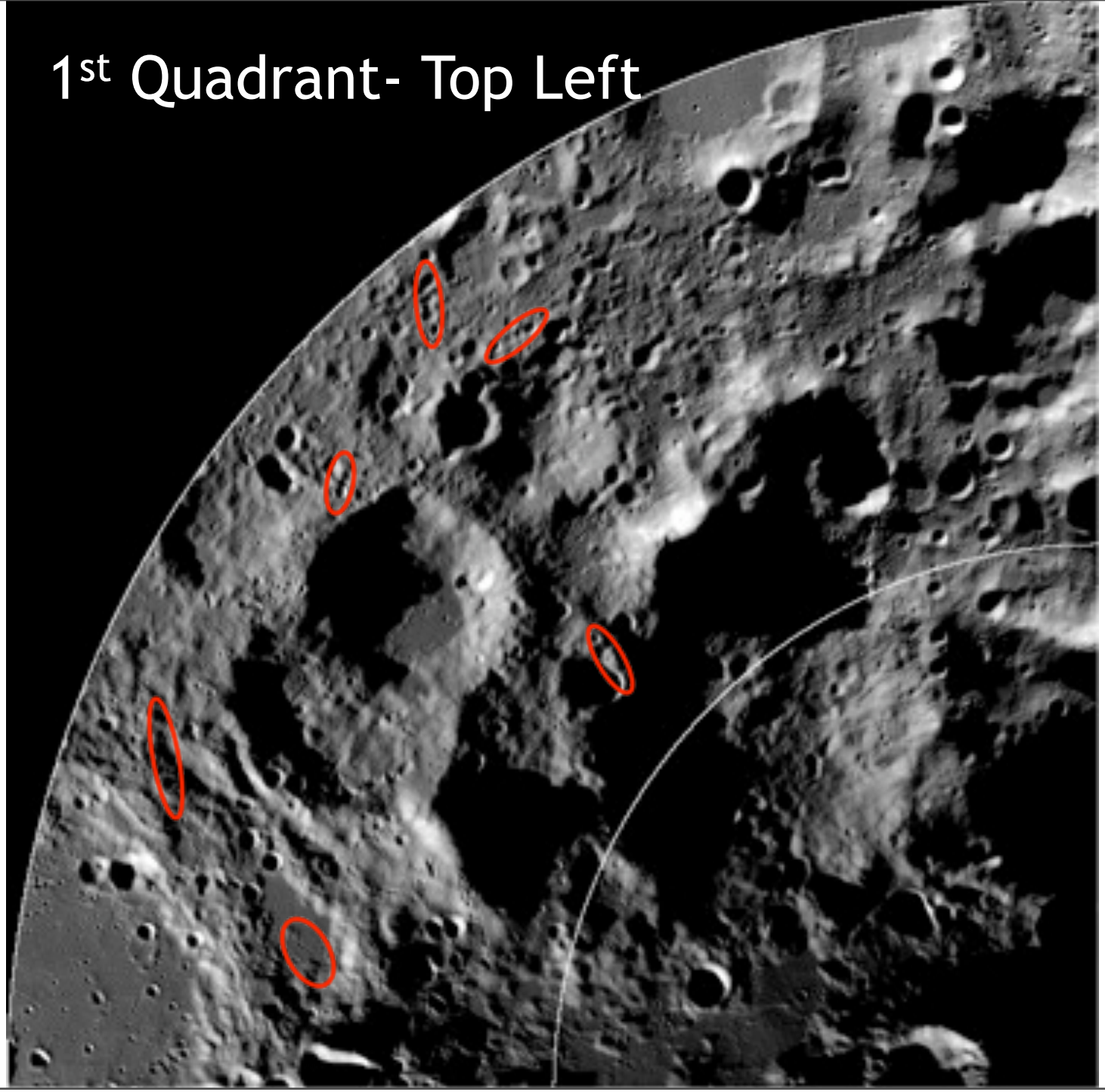
Top Right

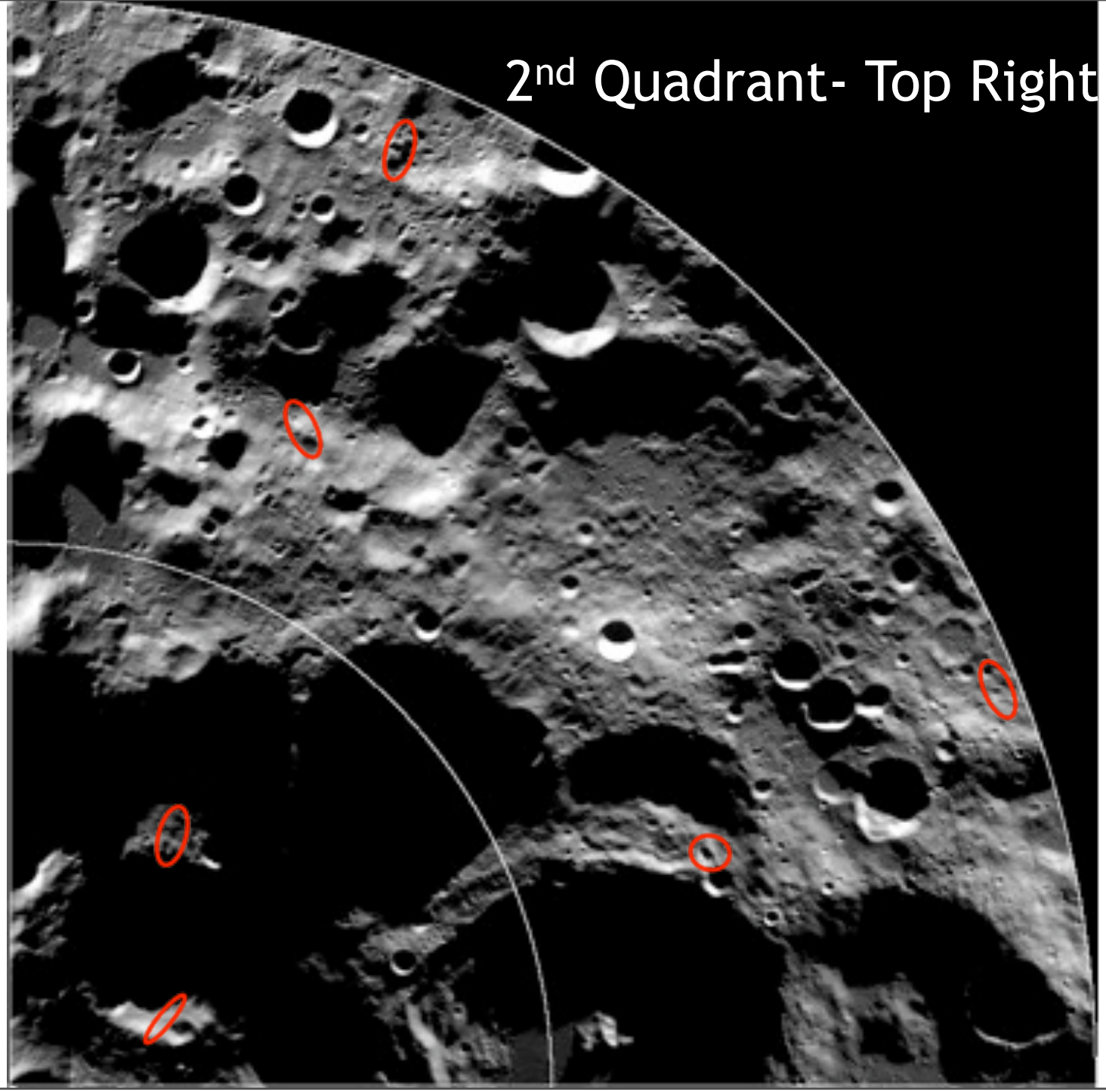
Bottom Left

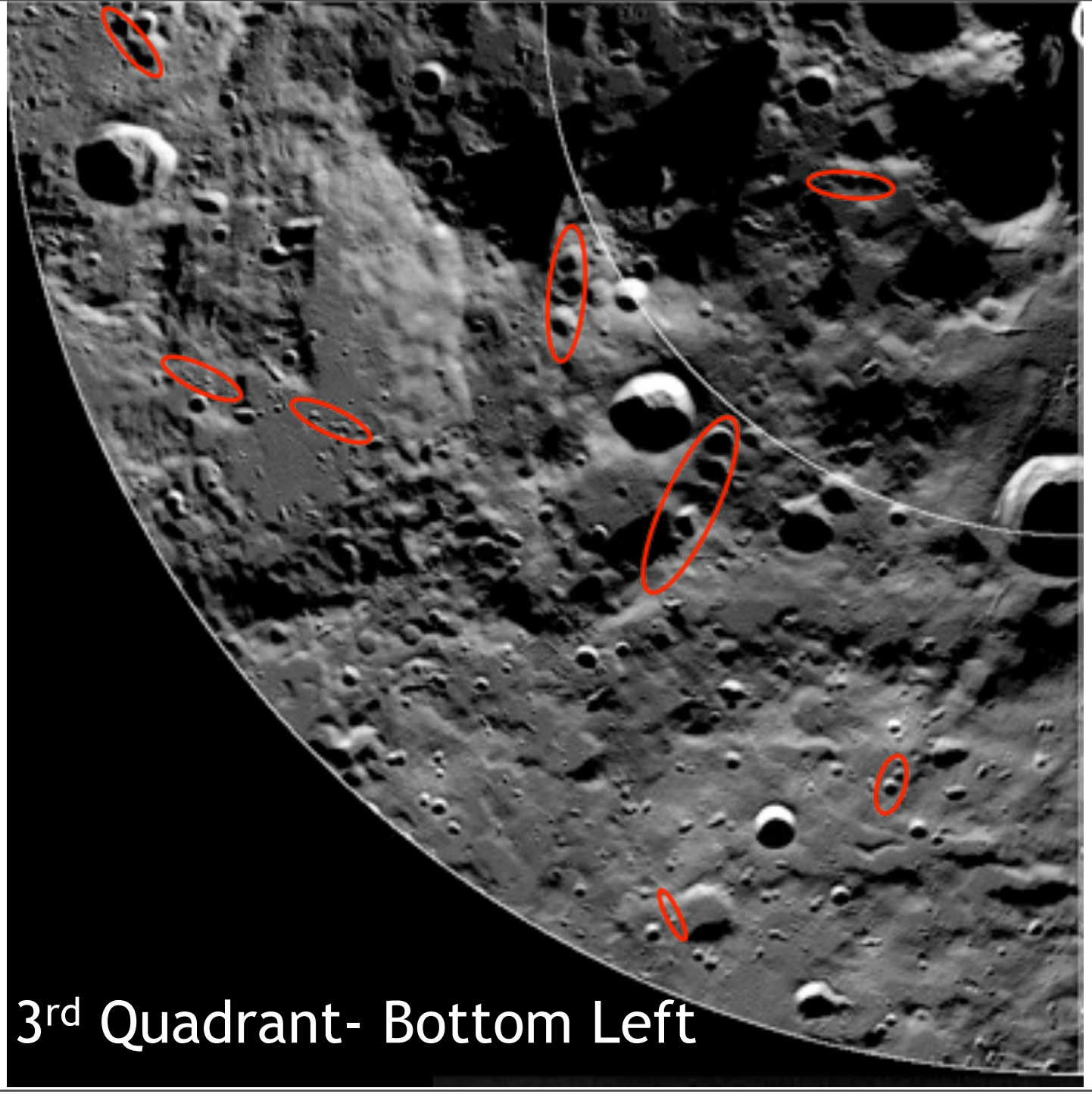
3.

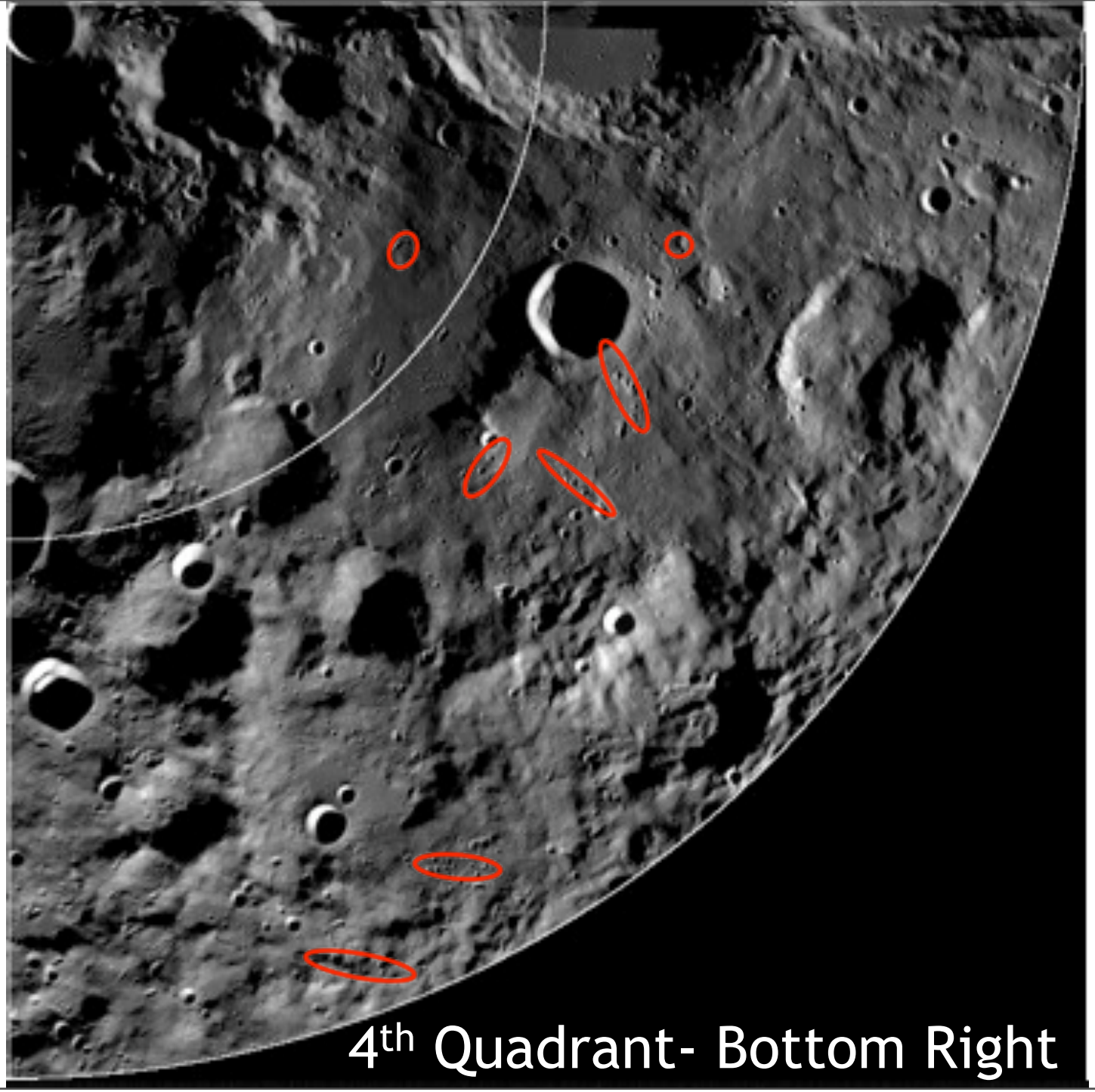
Bottom Right

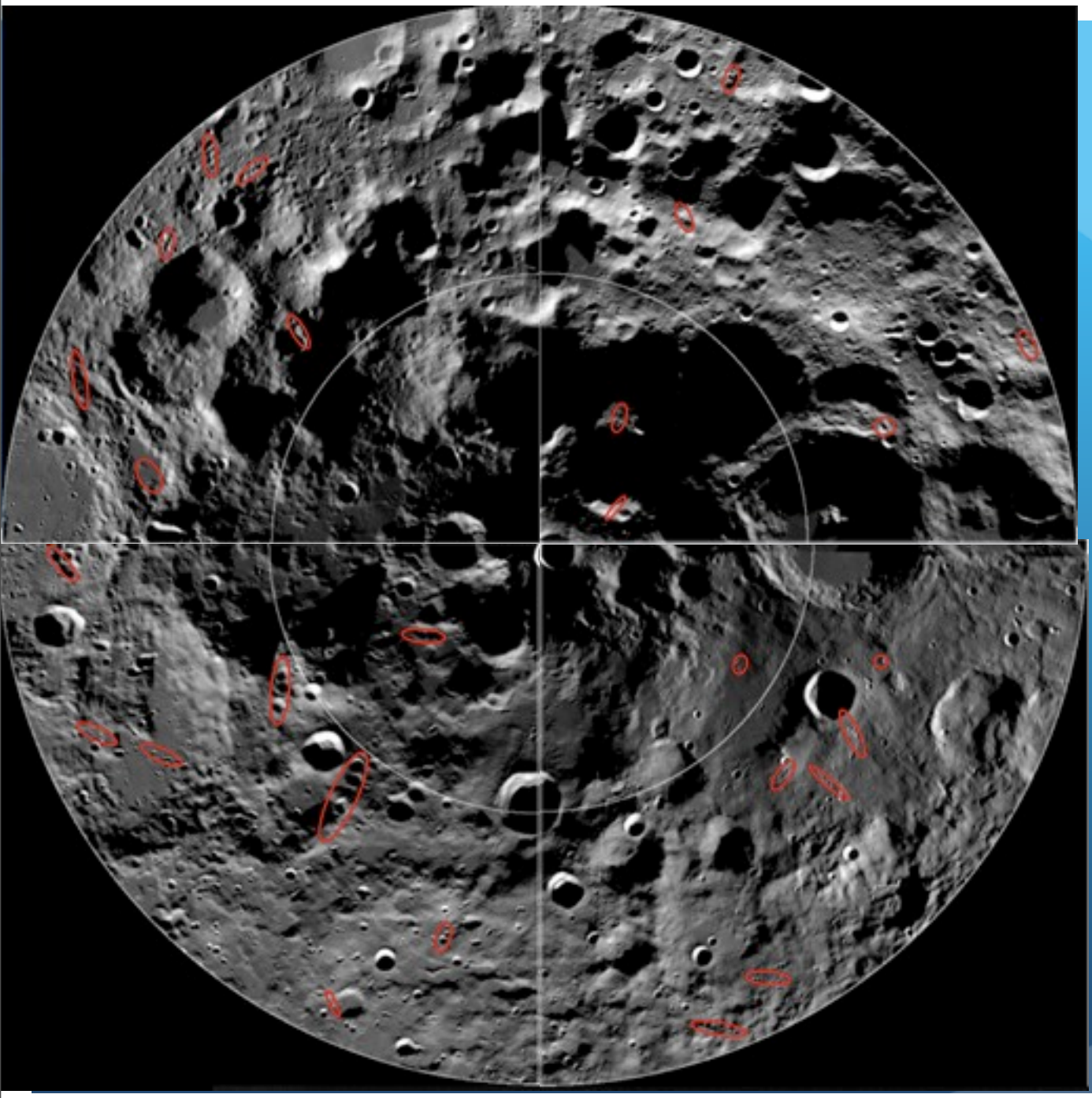
4.


1st Quadrant- Top Left


2nd Quadrant- Top Right


3rd Quadrant- Bottom Left


4th Quadrant- Bottom Right



Complete Image

Crater Chain Criteria

1. Proximity: the individual craters in crater chains are close together. If there was a group of very spread out craters we determined that they were not part of a crater chain.

2. Age: age was a major factor in crater chain determination. Craters in a crater chain would have all been made at the same time, so we looked carefully for any discrepancies between the features of the different craters in a possible chain. We specifically determined relative age based on the amount of regolith covering the craters, any other craters that had been superimposed on the craters in the chains, and the level of visible decay of the craters.

3. Size: crater chains are generally smaller in size, so we ruled out most of the very large chains of craters, reasoning that they were not actually crater chains.

   Arrangement: crater chains are for the most part linear or near linear in shape/design. Any irregular arrangements of the craters were not crater chains.

Sources

- Davy Crater Chain: Implications for Tidal Disruptions in the Earth-Moon System by R.W. Wichman and C.A. Wood.
- Can Tidal Disruption of Asteroids Make Crater Chains on the Earth and Moon? by William Bottke, Derek Richardson and Stanley Love.
- Gravitational Aggregates: Evidence and Evolution by D. C. Richardson, Z. M. Leinhardt, H. J. Melosh, W. F. Bottke Jr., and E. Asphaug.
- Crater Chains on Callisto and Ganymede by P. Schenk.