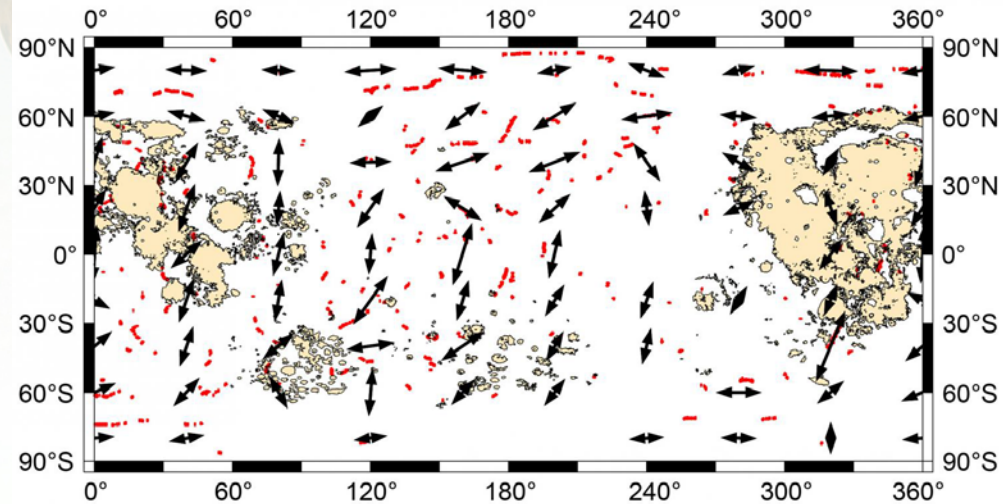


Massaging the Moon: Earth's Gravity Controls Lunar Fault Distribution

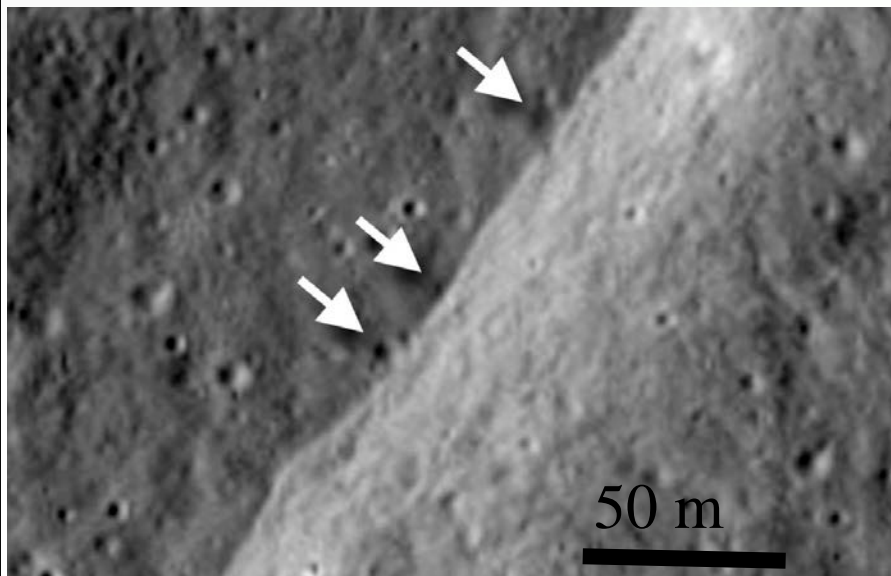
A much more comprehensive mapping of faults on the lunar surface indicate that the Earth's gravity field is reshaping the Moon today.

- For the first time, the global distribution of over 3,200 lunar thrust faults has been mapped using high-resolution images from the Lunar Reconnaissance Orbiter Camera (LROC) – making these the most common tectonic features observed on the moon.



Map of lobate scarps (red lines), with the median orientations of lobate scarps (black arrows). Mare basalt units are shown in tan.

- The distribution and orientation of the faults (above) suggests that tidal stresses contribute to the current stress state of the Moon, in much the same way that the Moon's gravitational force on the Earth pulls our ocean causing tides. The observed features are not consistent with global contraction from continued lunar cooling as the only source.
- The stresses that occur when the Moon is furthest from the Earth (apogee) may trigger ongoing fault activity, many faults may be geologically young or even currently active (left). Watters, T., et al. (2015) *Geology*.



Segment of a lobate scarp, showing small fresh craters cut by the scarp, suggesting the fault is less than 800 million years old.