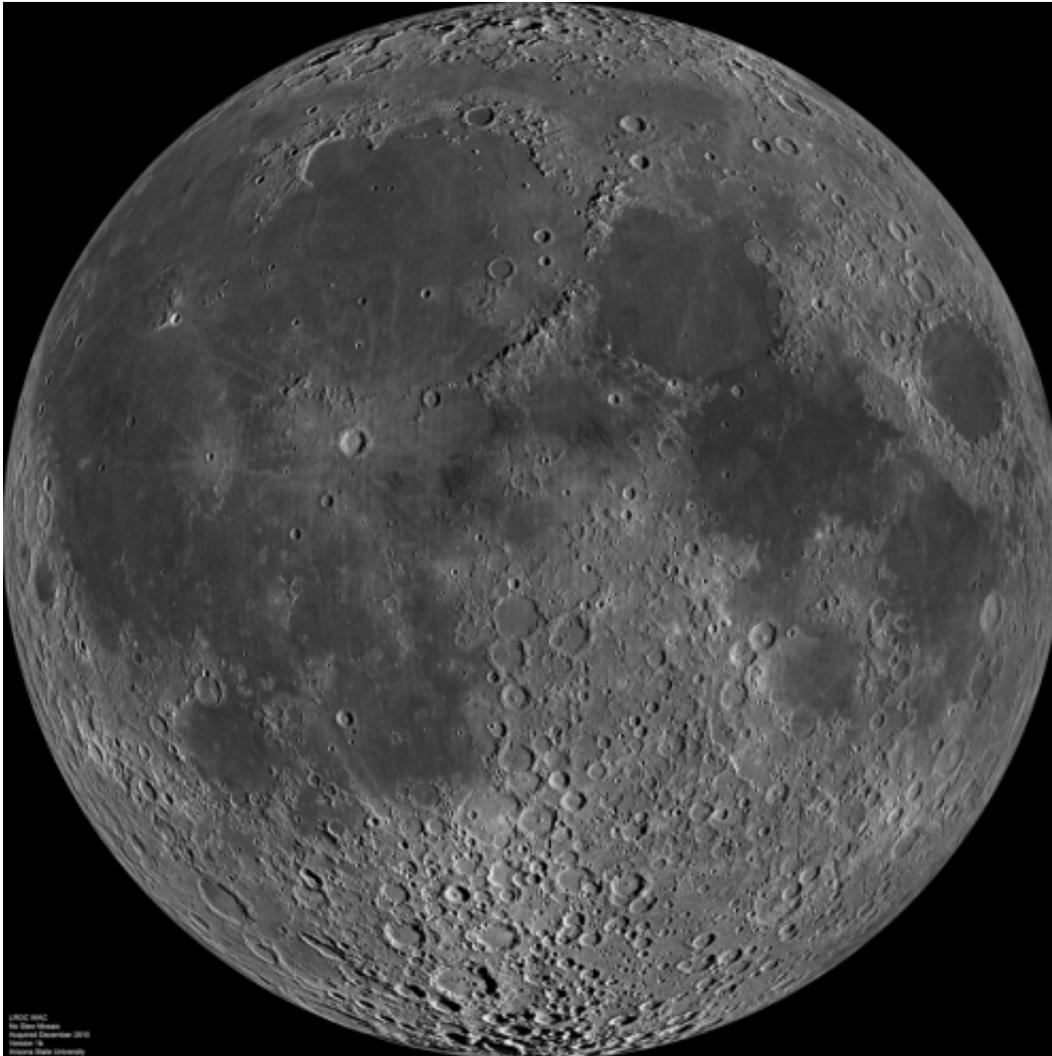


Local model better describes lunar gravity

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This is a composite image of the lunar nearside taken by the Lunar Reconnaissance Orbiter in June 2009, note the presence of dark areas of maria on this side of the moon. Credit: NASA

Two satellites orbiting the Moon as a part of NASA's Gravity Recovery and Interior Laboratory (GRAIL) mission have been mapping its inner structure by measuring subtle shifts in the pull of gravity on the satellites from points on the ground below. The stronger the shift, the greater is the mass of structures below the surface.

While the Moon-wide models produced by this mission are highly precise and have improved, Goossens et al. note that having to rely on many parameters could make the estimation of the models unstable. The authors instead created a local model of the Moon's south pole that can serve as a basis for higher-precision global models.

To do this, the authors took raw data from the GRAIL mission and tweaked the [mathematical formulas](#) so that they could extract more information than typically found from formulas used in global models. They created a highly precise model that represents structures under the Moon's south pole more accurately than the global models. The authors note that their model has the potential to improve observations of small-scale features on and in the Moon.

More information: Goossens, S., T. J. Sabaka, J. B. Nicholas, F. G. Lemoine, D. D. Rowlands, E. Mazarico, G. A. Neumann, D. E. Smith, and M. T. Zuber (2014), High-resolution local gravity model of the south pole of the Moon from GRAIL extended mission data, *Geophys. Res. Lett.*, 41, 3367–3374, [DOI: 10.1002/2014GL060178](https://doi.org/10.1002/2014GL060178)

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