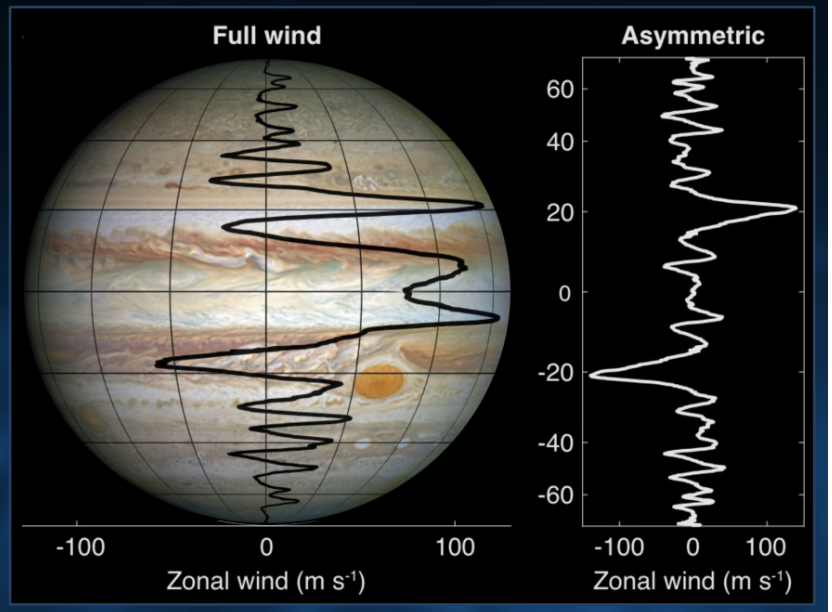
Juno Reveals the Depth of Jupiter's Zones and Belts

Understanding the jet streams on Jupiter is a primary goal of the Juno spacecraft, and new data helps clarify this puzzle.

- The well-known belts and zones on Jupiter represent east-west jet streams and show a clear asymmetry across the equator. Measurements by Juno show that Jupiter's gravity field has a similar asymmetry, and indicate that these jet streams penetrate 3000 km into Jupiter.
- This implies that the dynamical atmosphere of Jupiter is equivalent to about 1% of Jupiter's mass, or the equivalent of 3 Earth masses.
- The gravity results were unexpected and indicate the origin of Jupiter's zone and belt structure may lie deep inside of Jupiter rather than being purely meteorological.

Kaspi et al. (2018) *Nature*



Above: Jupiter's asymmetric zonal velocity field.
Below: Jupiter's optimized vertical profile of the zonal wind when allowing for its latitudinal variation.