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Discovering Jupiter's interior with Juno

Yamila Miguel (1), Tristan Guillot (2) and the Interiors Working Group of Juno Mission
(1)Leiden Observatory, Netherlands (2)Observatoire de la Cote dÁzur, France (ymiguel@strw.leidenuniv.nl)

Abstract

The process of satellite formation is directly linked to the formation of the giant planet that host them. In particular, the formation of Galilean satellites is still not fully understood [1] and therefore a deeper understanding of Jupiter's formation is needed.

In orbit since July 2016, Juno mission had led to a remarkable improving of Jupiter gravity data [2, 3, 4], changing our knowledge of the planetary interior and leading to a much better comprehension of the big giant and its role in the solar system [5, 6, 7].

We use this outstanding gravity data to perform models of Jupiter's internal structure and test different parameters to get a better understanding of Jupiter's interior, including an estimation of the extent of the differential rotation in the deep atmosphere, a long standing question in planetary science and highly relevant to reach a deeper knowledge of Jupiter's internal structure.

References

[1] Miguel, Y. and Ida, S.: A semi-analytical model for exploring Galilean satellites formation from a massive disk, Icarus, Vol. 266, pp. 1-14, 2016.

[2] Bolton, S., et al.: Jupiter's interior and deep atmosphere: The initial pole-to-pole passes with the Juno spacecraft, Science, Vol. 356, pp. 821-825, 2017.

[3] Folkner, W. M. et al.: Jupiter gravity field estimated from the first two Juno orbits, Geophys. Res. Lett., Vol 44, 4694-4700, 2017.

[4] Iess, L. et al.: Measurement of Jupiter's asymmetric gravity field, Nature, Vol 555, pp. 220-222, 2018.

[5] Wahl, S. M. et al.: Comparing Jupiter interior structure models to Juno gravity measurements and the role of an expanded core: Geophys. Res. Lett., Vol 44, pp. 4649-4659, 2017.

[6] Guillot, T., Miguel, Y., et al.: A suppression of differential rotation in Jupiter's deep interior, Nature, Vol 555, pp. 227-230, 2018.

[7] Kaspi, Y. et al.: Jupiter's atmospheric jet streams extend thousands of kilometres deep, Nature, Vol 555, pp. 223-226, 2018.