

Probing Jupiter and Saturn: The prospects

T. Guillot
Laboratoire Lagrange, Observatoire de la Côte d'Azur, CNRS, Université de Nice-Sophia Antipolis, France

Abstract

In 2016 and 2017, the interiors of Jupiter and Saturn will be probed by the Juno and Cassini missions, respectively. Both will measure the planetary gravity and magnetic fields with unprecedented accuracy. In addition, Juno will probe Jupiter's deep atmosphere by radiometry in search of its elusive water. Altogether, the observational constraints used to construct interiors models will be improved extremely significantly. In parallel, the complexity of these models has been increasing steadily, due to the realization that their central core could erode over time, that double diffusive convection could set in and that the region in which helium separates from hydrogen is probably extended. Deriving much better constraints on the central core masses and global compositions of these planets will therefore require efforts to better examine the interplay between thermal cooling, mixing of elements, interior rotation, equations of state and dynamo generation. I will review the work in this direction. I will also show how seismology can ideally complement the constraints derived from the gravity field measurements.