

Internal structure of Jupiter

Upper atmosphere:

90% H₂
 10% He
 0.2% CH₄, ammonia, water

Lower atmosphere:

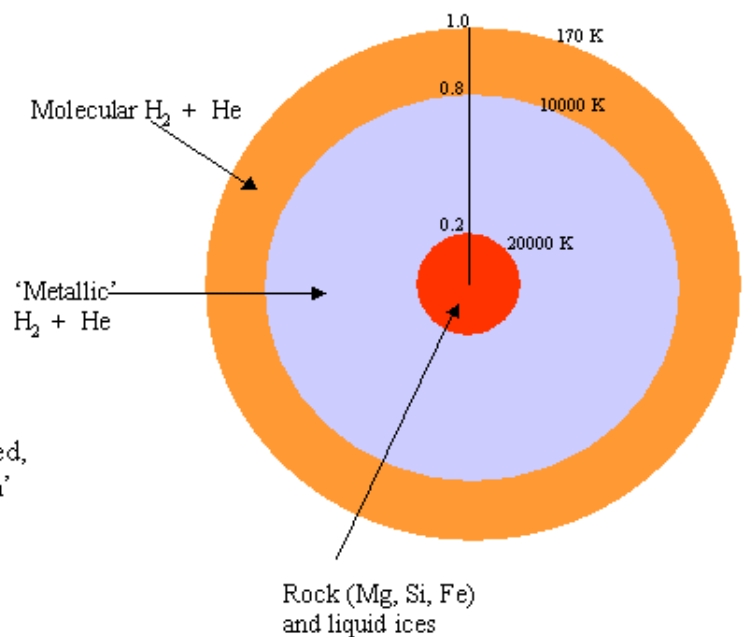
High pressure, density 'squeezes' H₂
 Molecular bonds broken; electrons shared,
 as in a metal – 'liquid metallic hydrogen'

Core:

Dense, 'soup' of rock and liquid 'ices'
 (water, methane ammonia) of about 15
 Earth masses

Evidence of internal heating – gravitational
 P.E. released during planetary formation
 (collapse of gas cloud)

[see SSP2 and A1Y Stellar Astrophysics]



Metallic hydrogen gives Jupiter a
 strong magnetic field
 (19000 times that of the Earth)

Internal structure of Saturn

Upper atmosphere:

97% H₂
 3% He
 0.2% CH₄, ammonia, water

Lower atmosphere:

'liquid metallic hydrogen' (but at much
 greater depth than in Jupiter – due to lower
 mass and density)

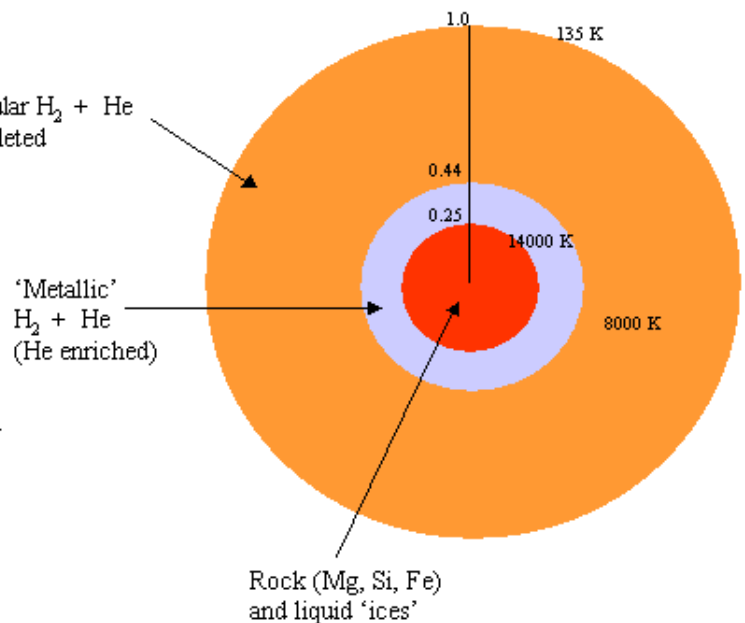
Core:

Dense, 'soup' of rock and 'ices' (water,
 methane ammonia) of about 13 Earth
 masses

Internal heating not entirely explained by
 planetary formation; extra heating from
 release of P.E. as heavier He sinks.

Effect more pronounced for Saturn, as
 outer atmosphere cooler to begin with

Molecular H₂ + He
 He depleted



Metallic hydrogen gives Saturn a
 strong magnetic field (but weaker
 than Jupiter's)