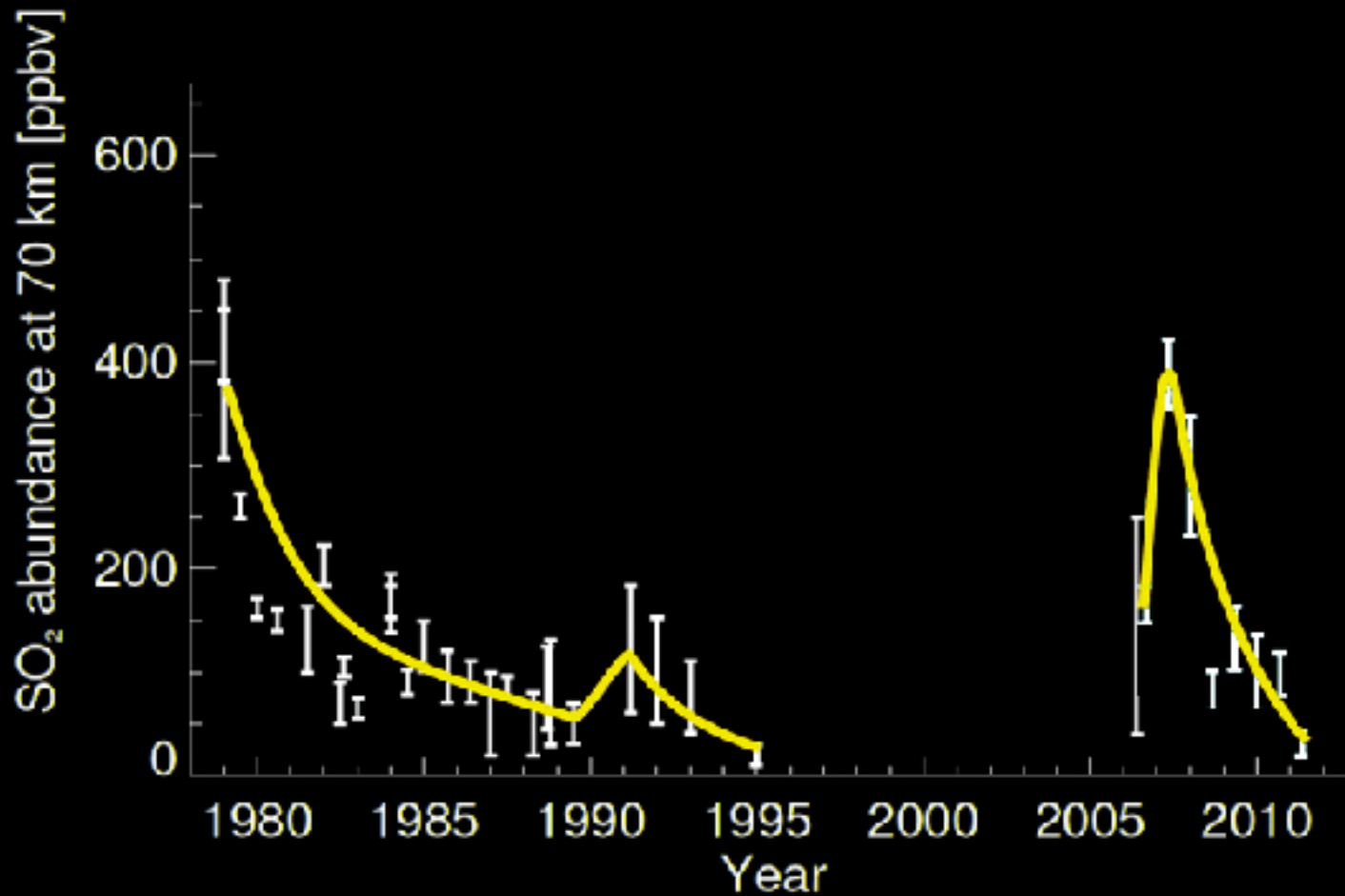
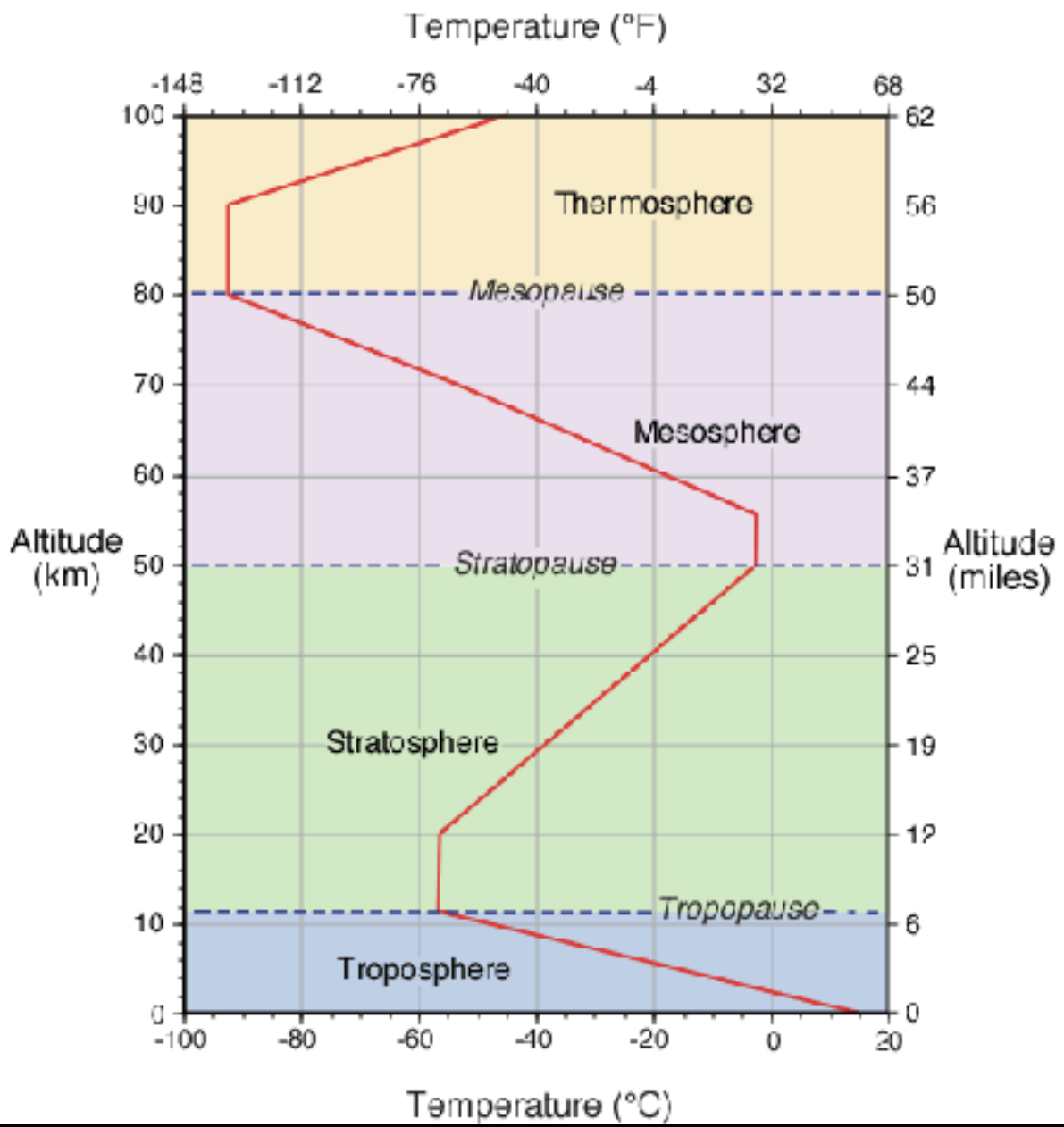
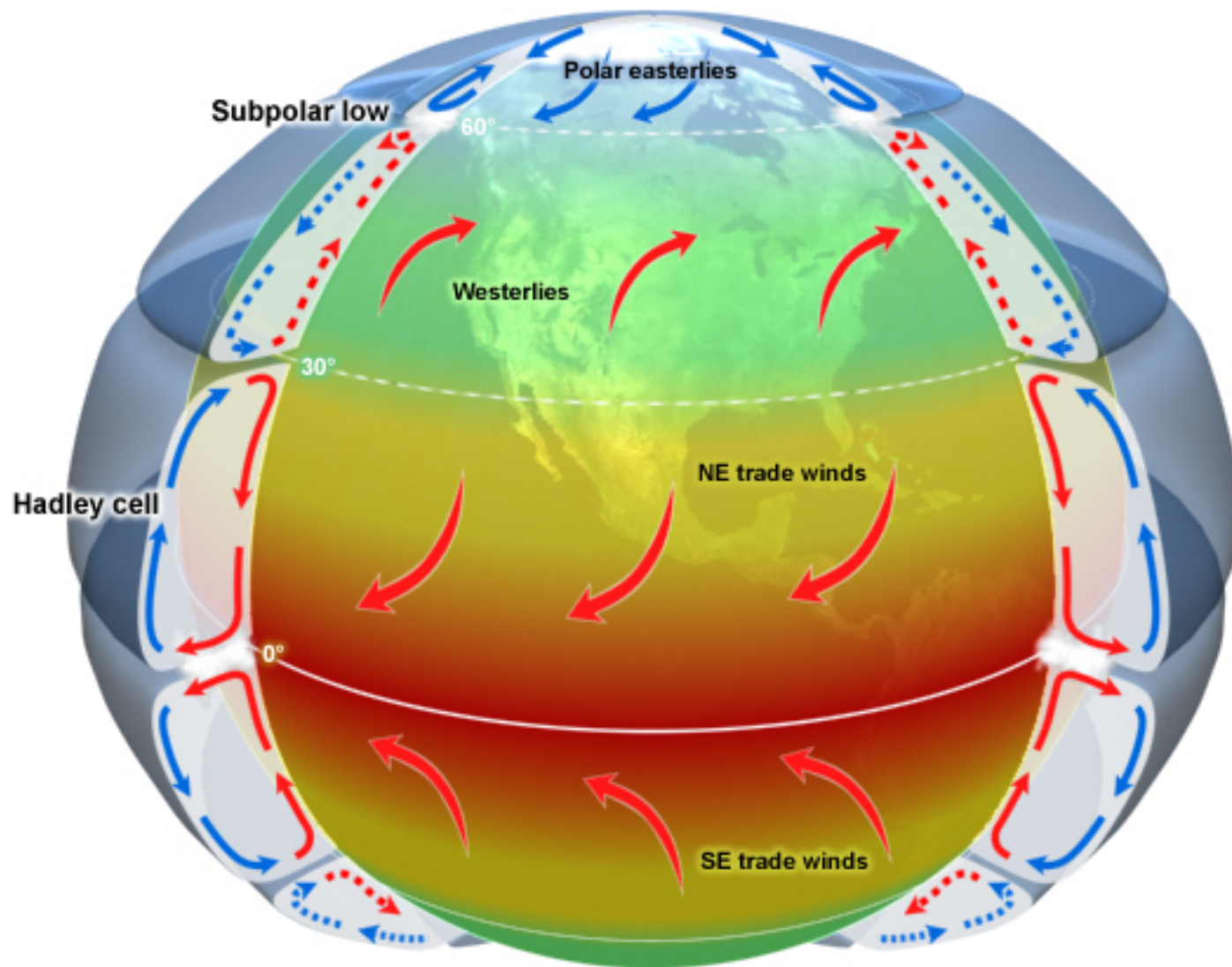


<http://sci.esa.int/venus-express/50886-venus-terminator/>

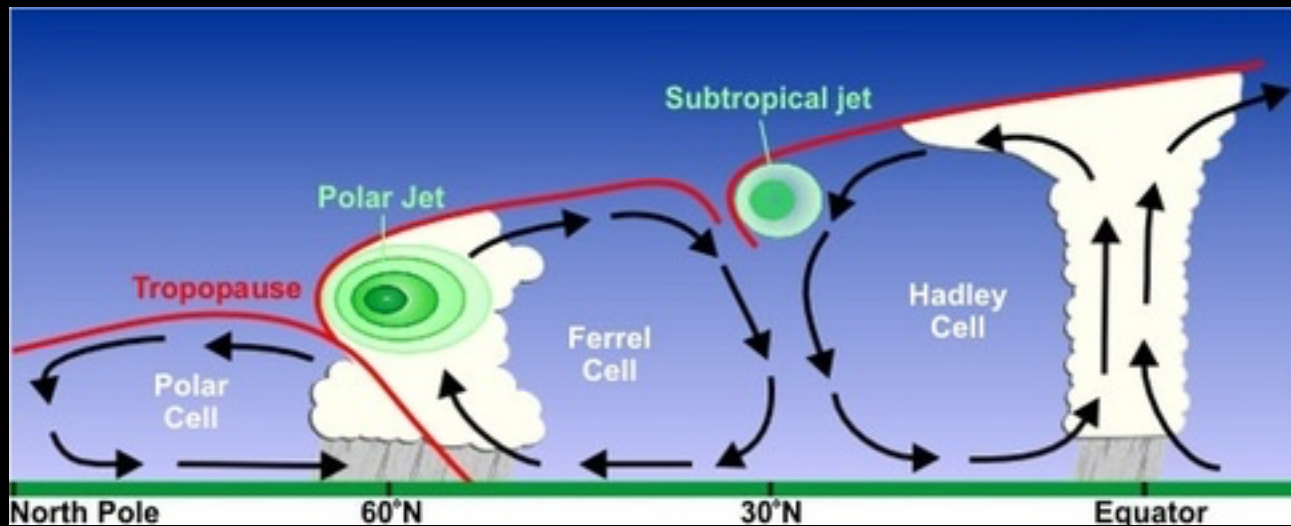
<http://sci.esa.int/venus-express/47234-the-southern-polar-cap-of-venus/>







©The COMET Program



<https://www.quora.com/Is-the-thermal-wind-responsible-for-the-formation-of-the-jet-streams>

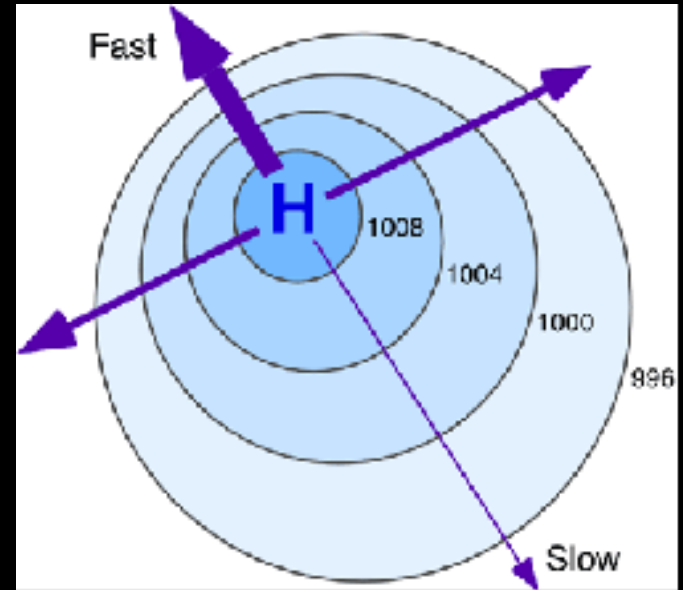
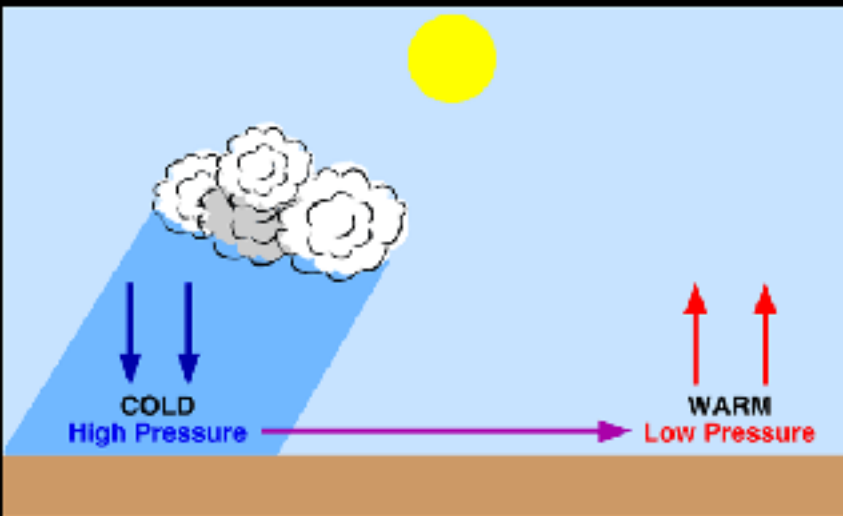
Wind.

pressure gradient force

Coriolis force

centripetal force

friction



pressure difference

$$\text{Pressure gradient} = \Delta P / \Delta r$$

$$\text{force} = \text{pressure} \times \text{area} = (P/r) \times \text{vol}$$

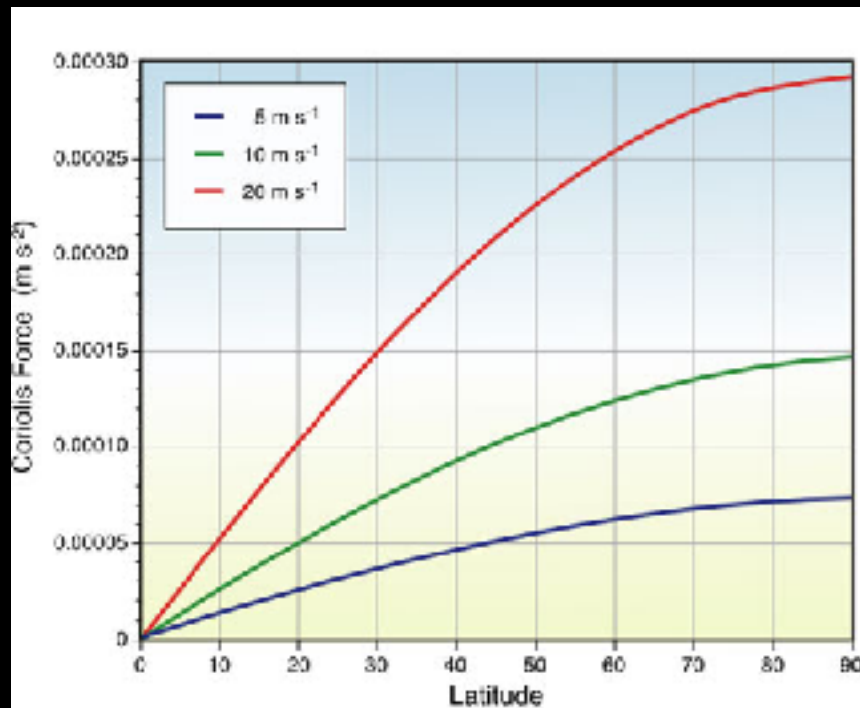
$$F = m a, \text{ density} = \text{mass} / \text{vol}$$

$$\text{pressure gradient acceleration} = (1/\rho) \times \Delta P / \Delta r$$

isobars

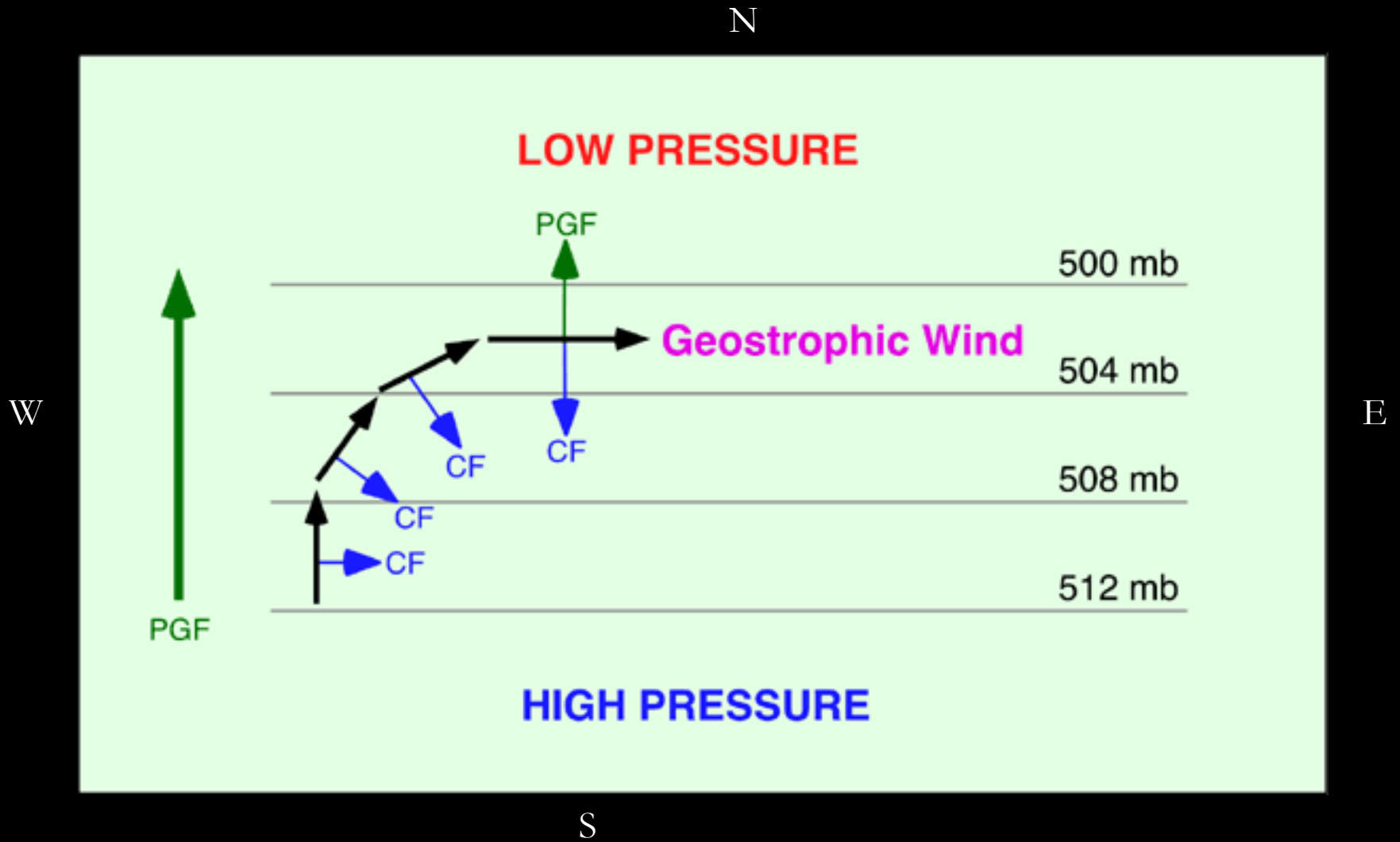
Coriolis effect – in northern hemisphere, winds are deflected to the right.

Coriolis “force” =  $2 m \Omega v \sin (\text{latitude})$   
and Coriolis acceleration =  $2 \Omega v \sin (\phi)$

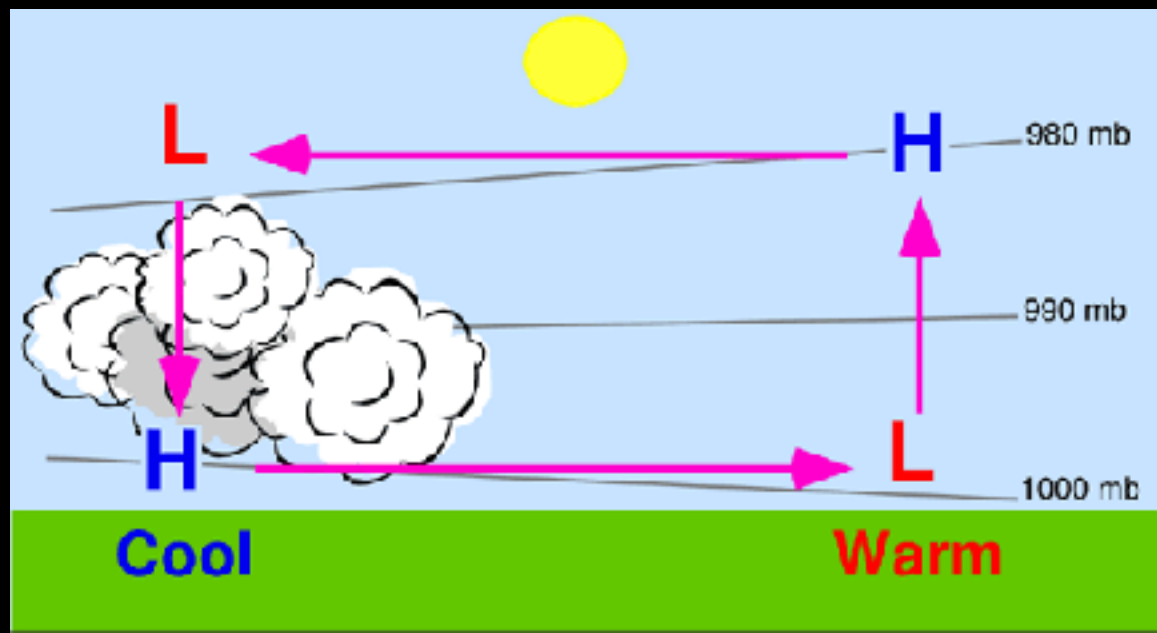
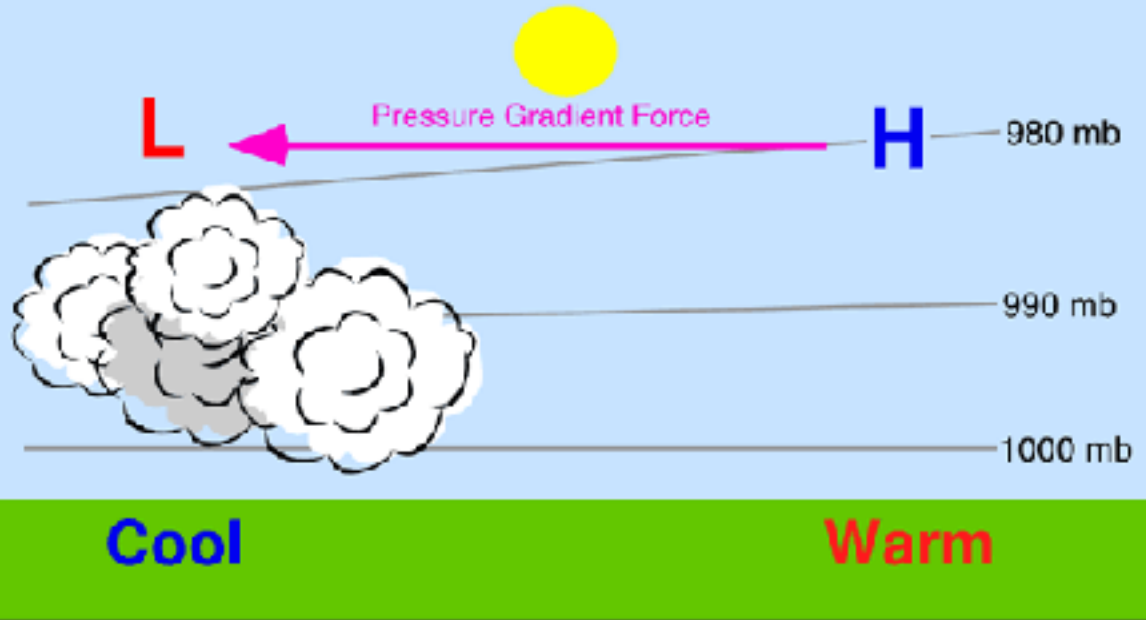


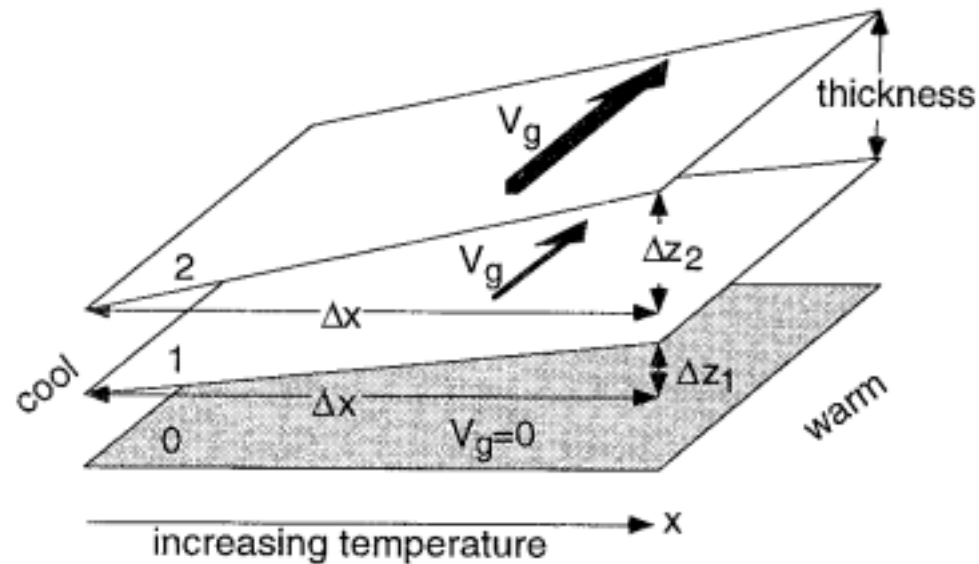


Geostrophic wind: above the level of friction, balance pressure gradient and Coriolis.



$$v = \Delta P / (\Delta r \rho 2 \Omega v \sin(\phi))$$

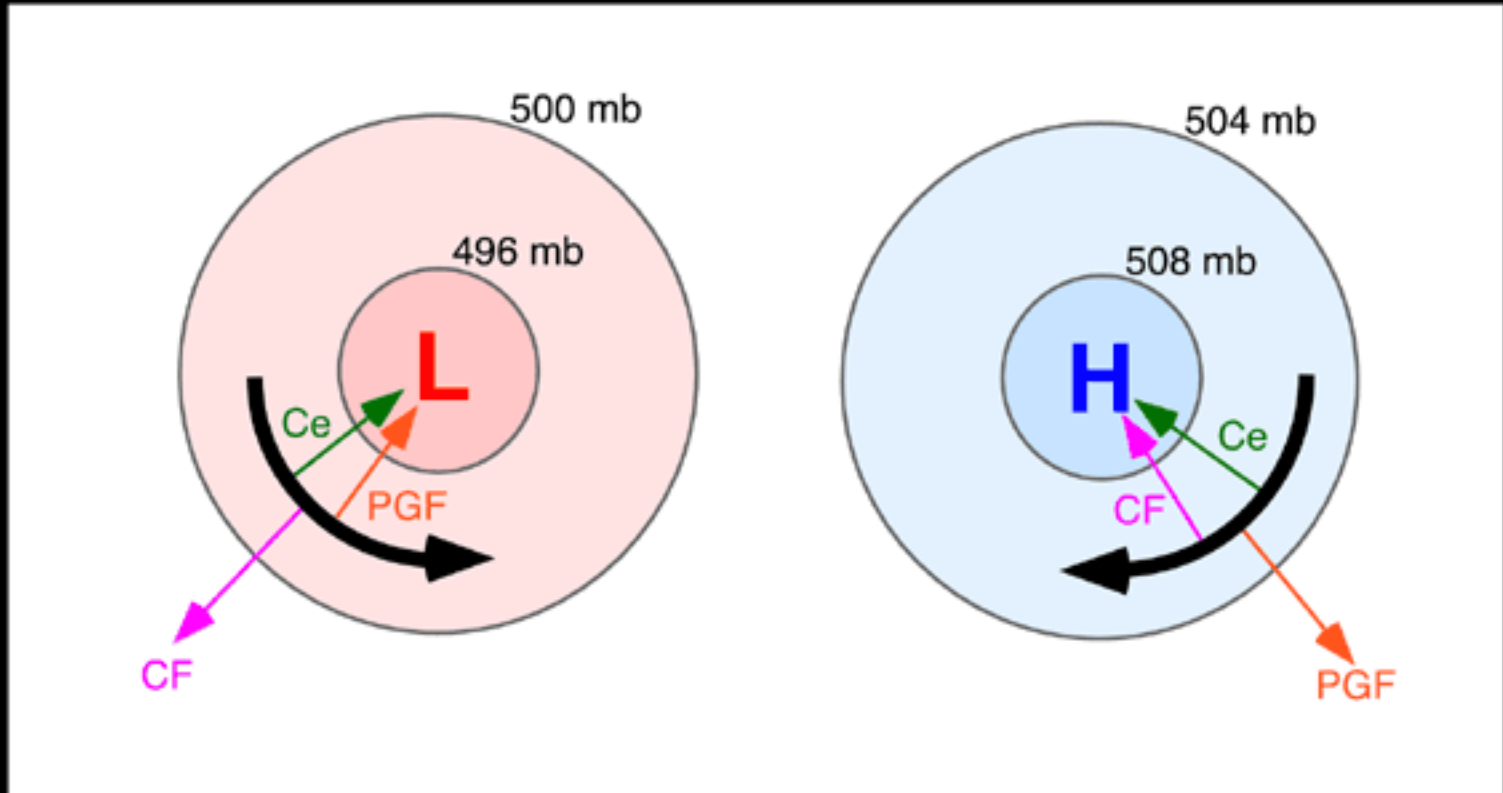




**Figure 11.7**

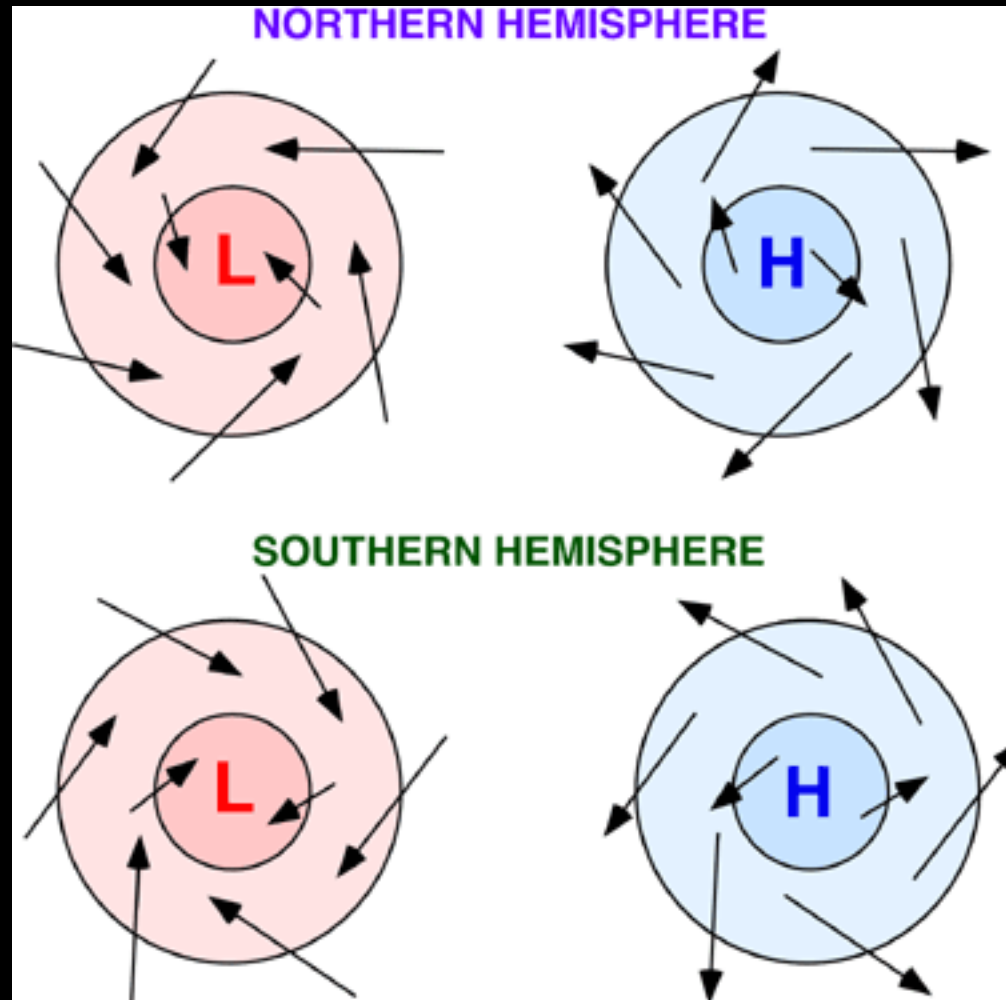
*The three planes are surfaces of constant pressure (i.e., isobaric surfaces). Surface #2 has lower pressure than surface #1, etc. A horizontal temperature gradient tilts the pressure surfaces and causes the geostrophic wind to increase with height.*

Gradient wind: geostrophic + centripetal

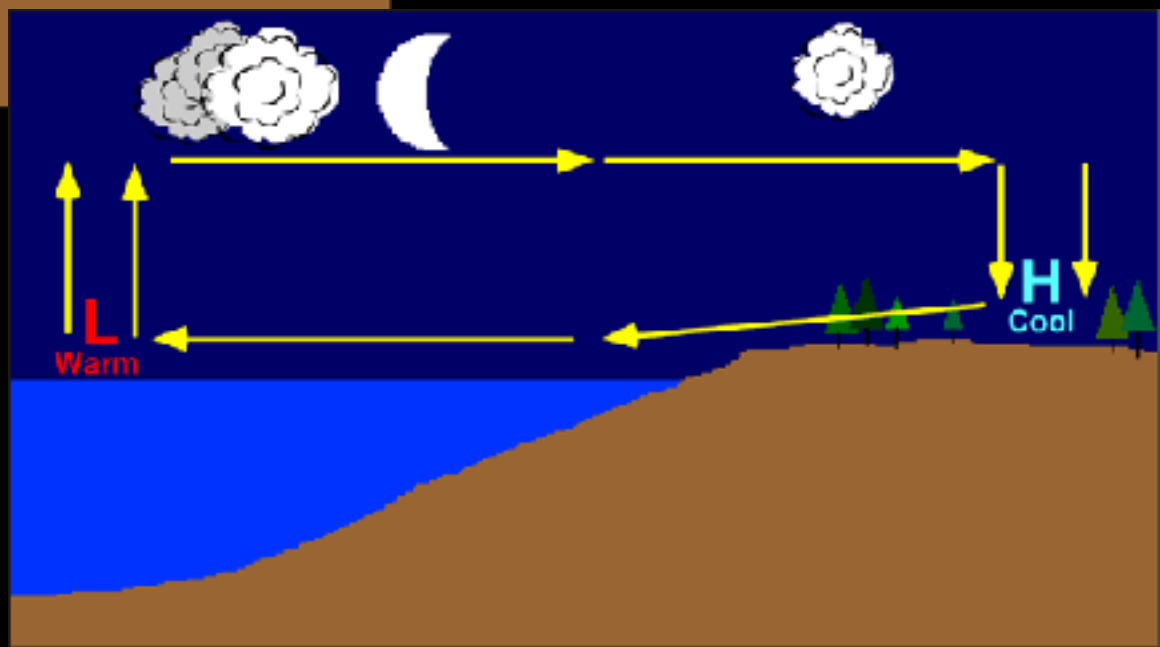
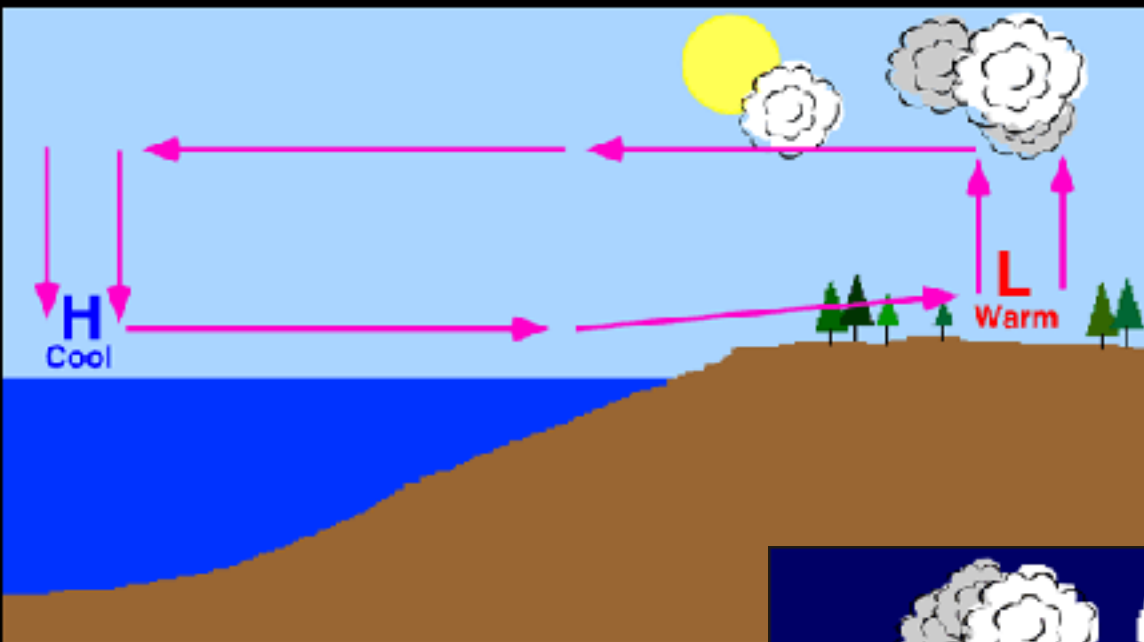


$$\text{centripetal acceleration} = v^2 / r$$

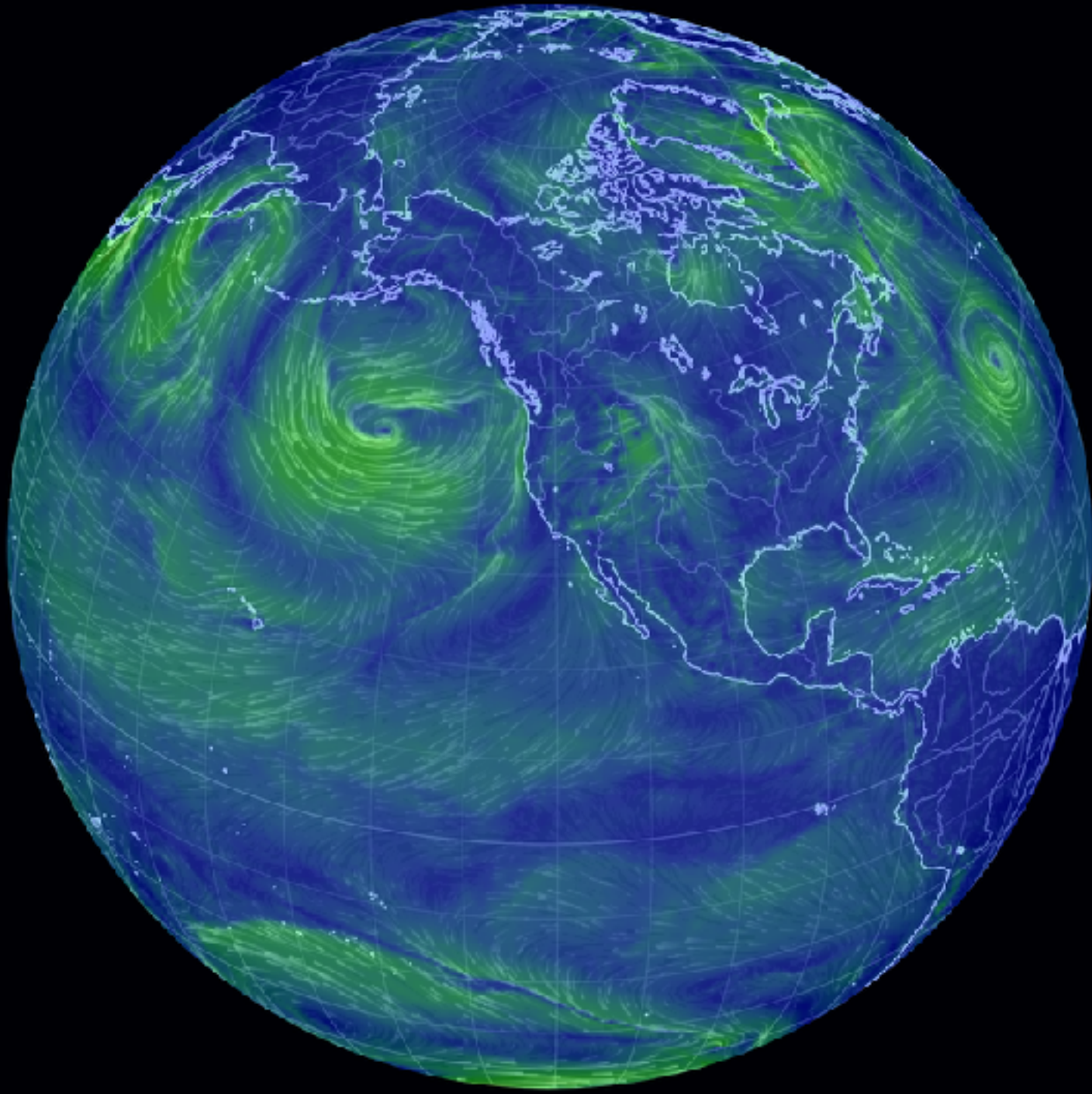
Friction: reduces wind speed which reduces Coriolis which no longer balances pressure gradient which means winds at ground level often blow across isobars.

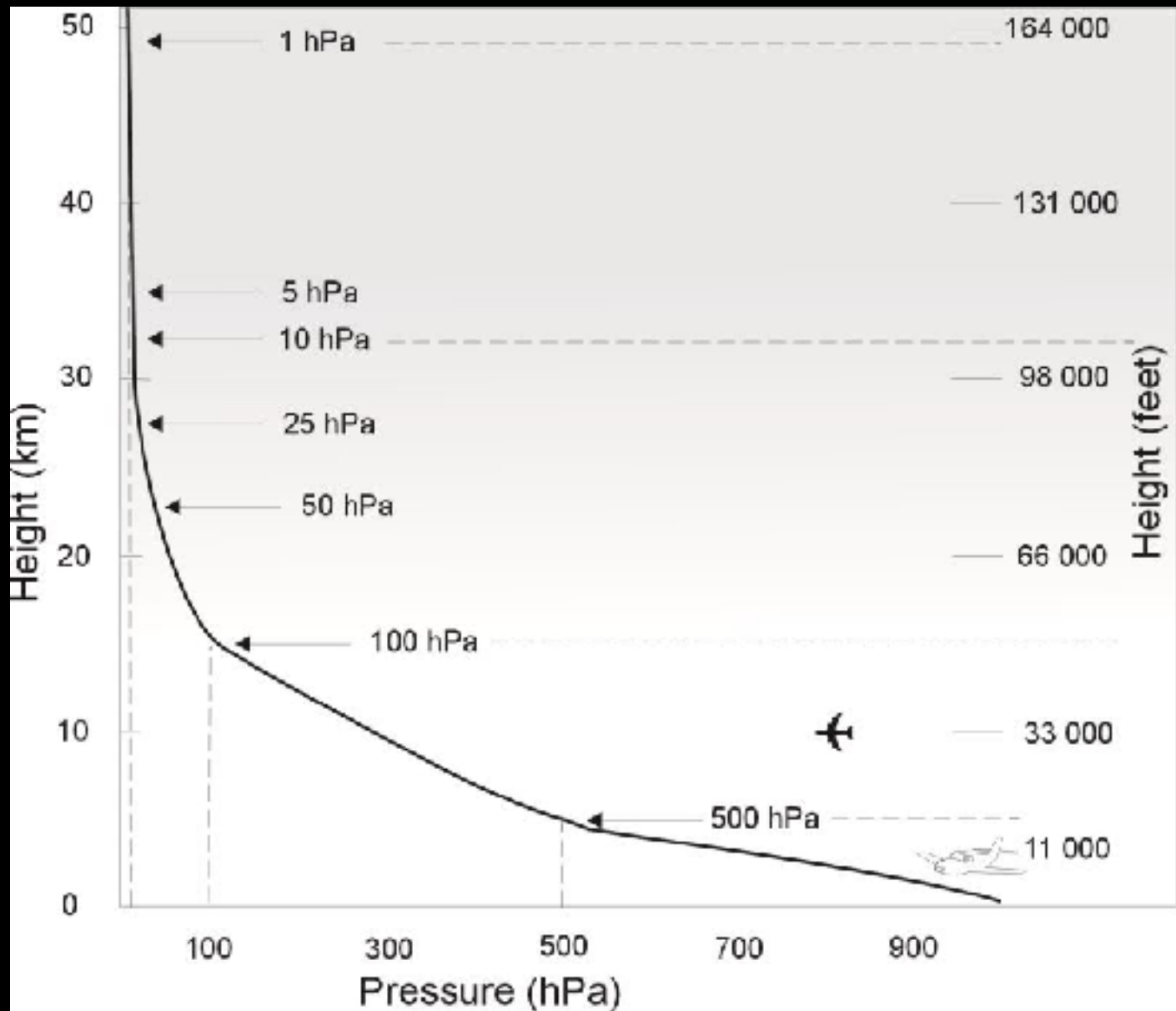


# Diurnal changes: sea and land breezes

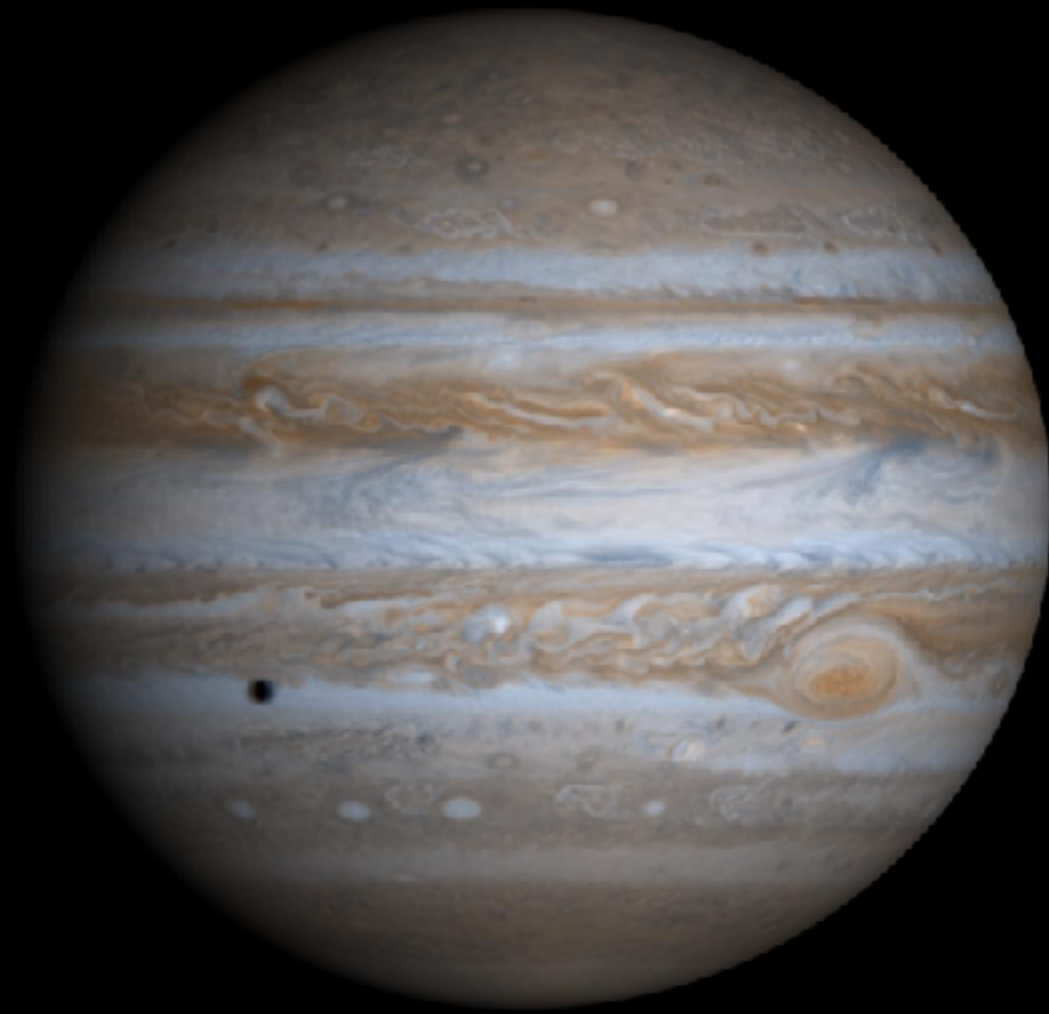


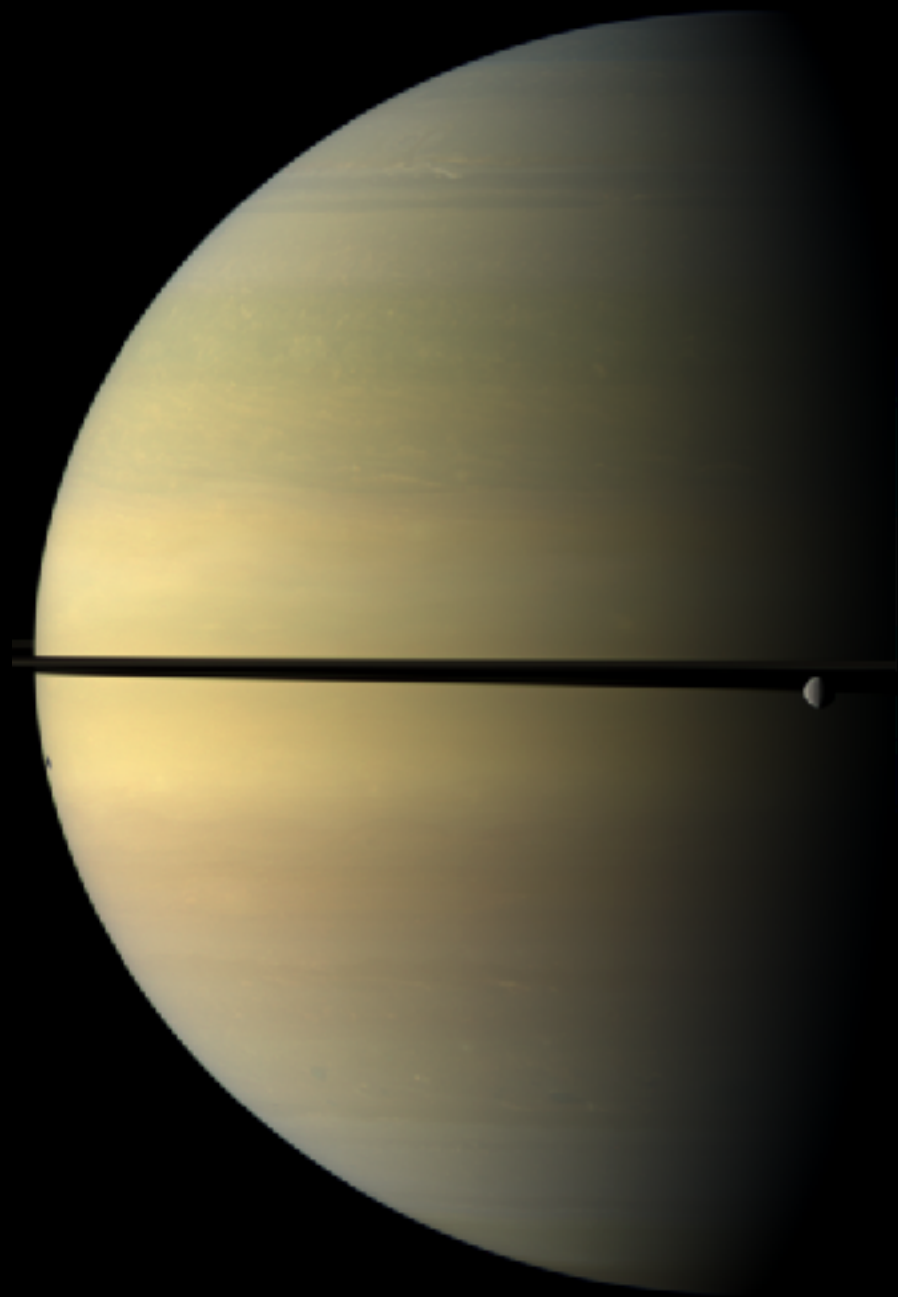
<http://earth.nullschool.net/#current/wind/surface/level/orthographic=-34.22,43.04,307>

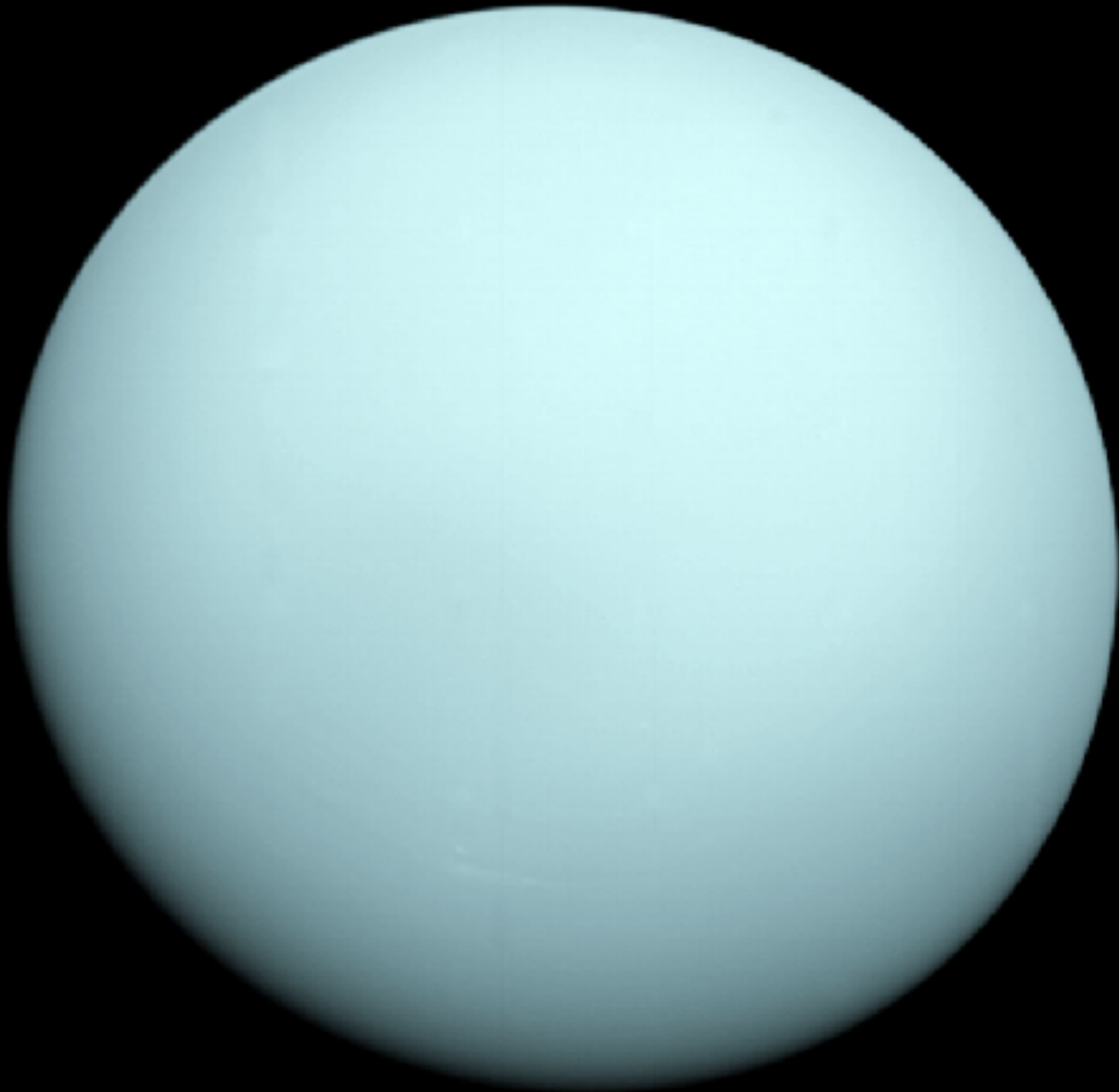


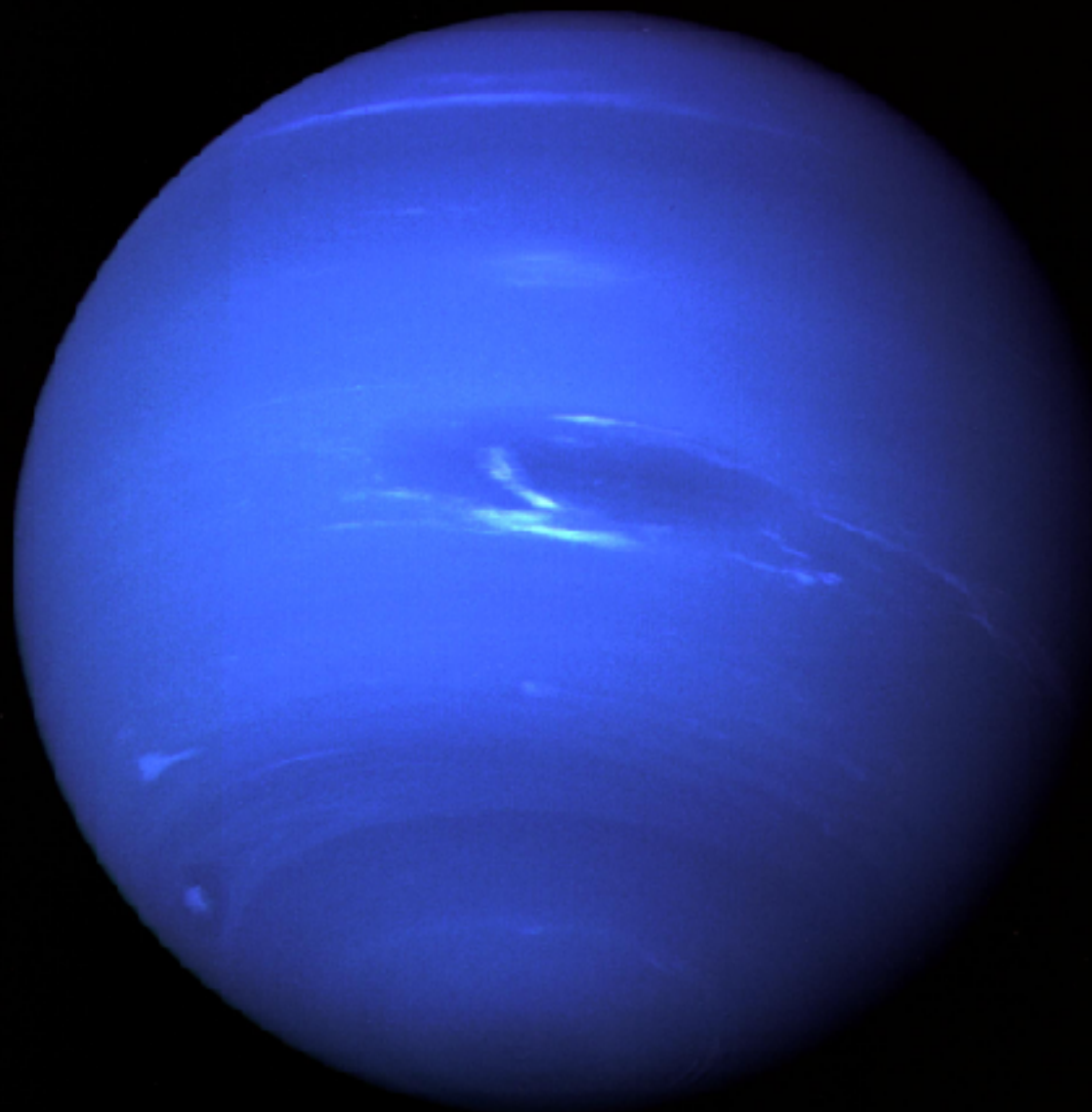


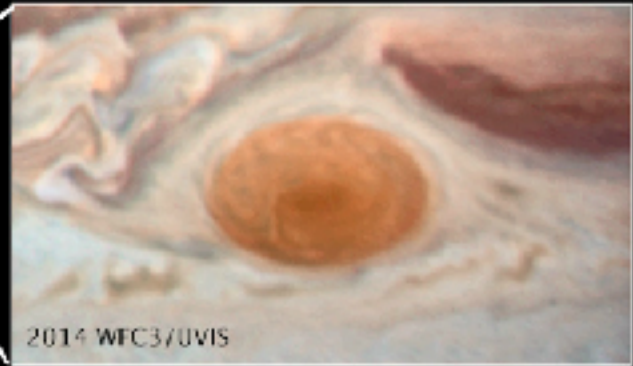
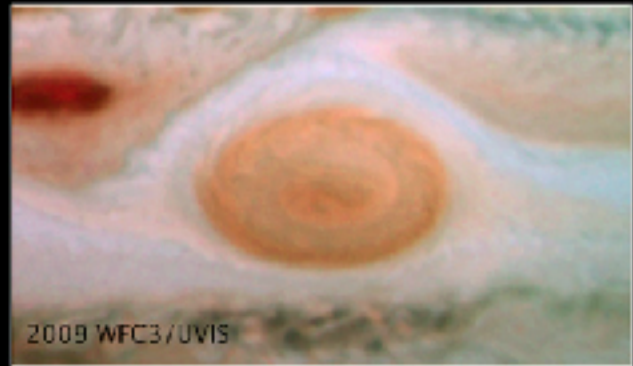
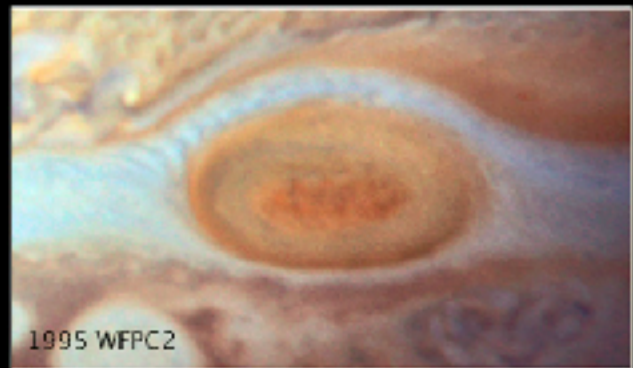
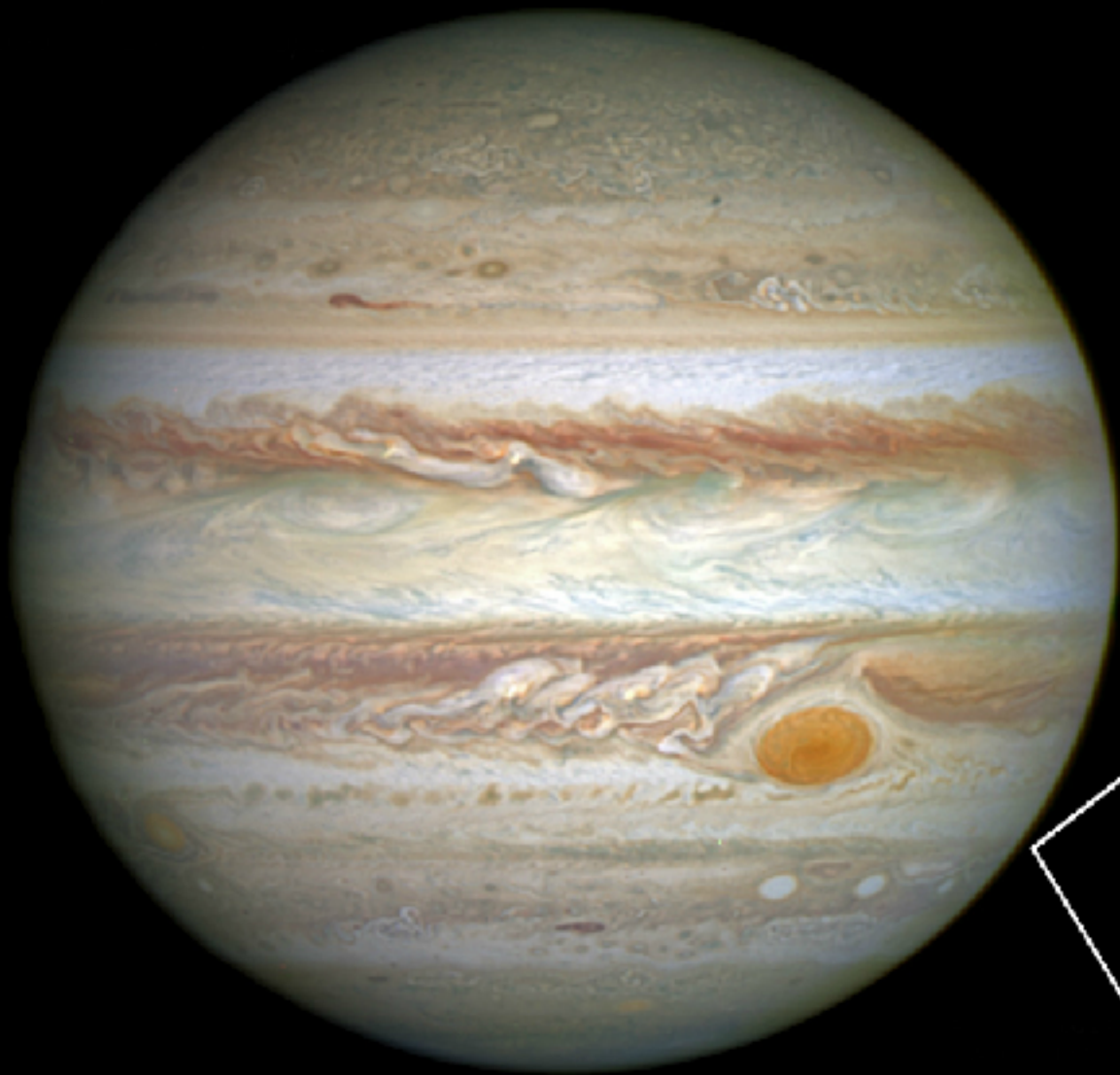


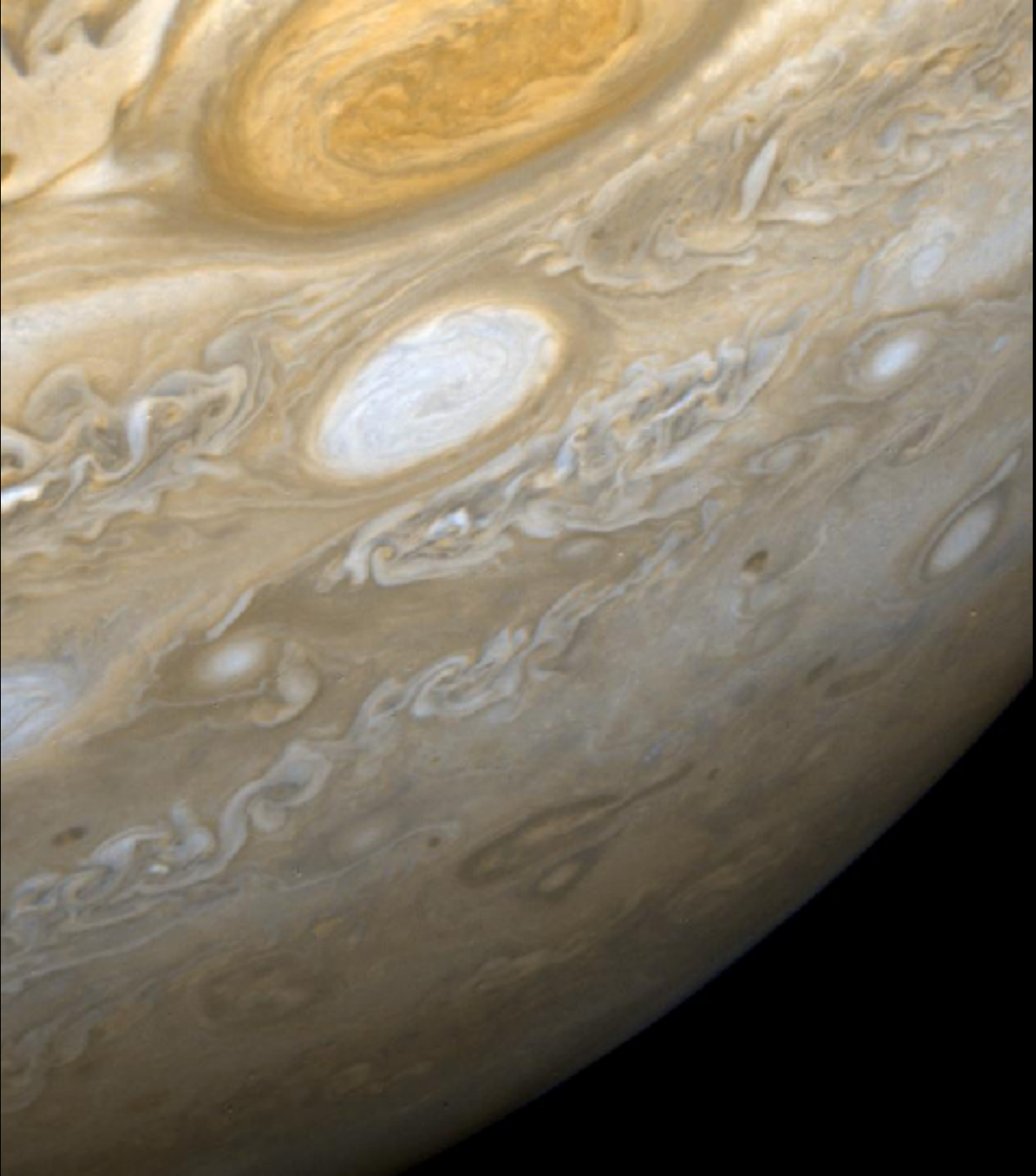




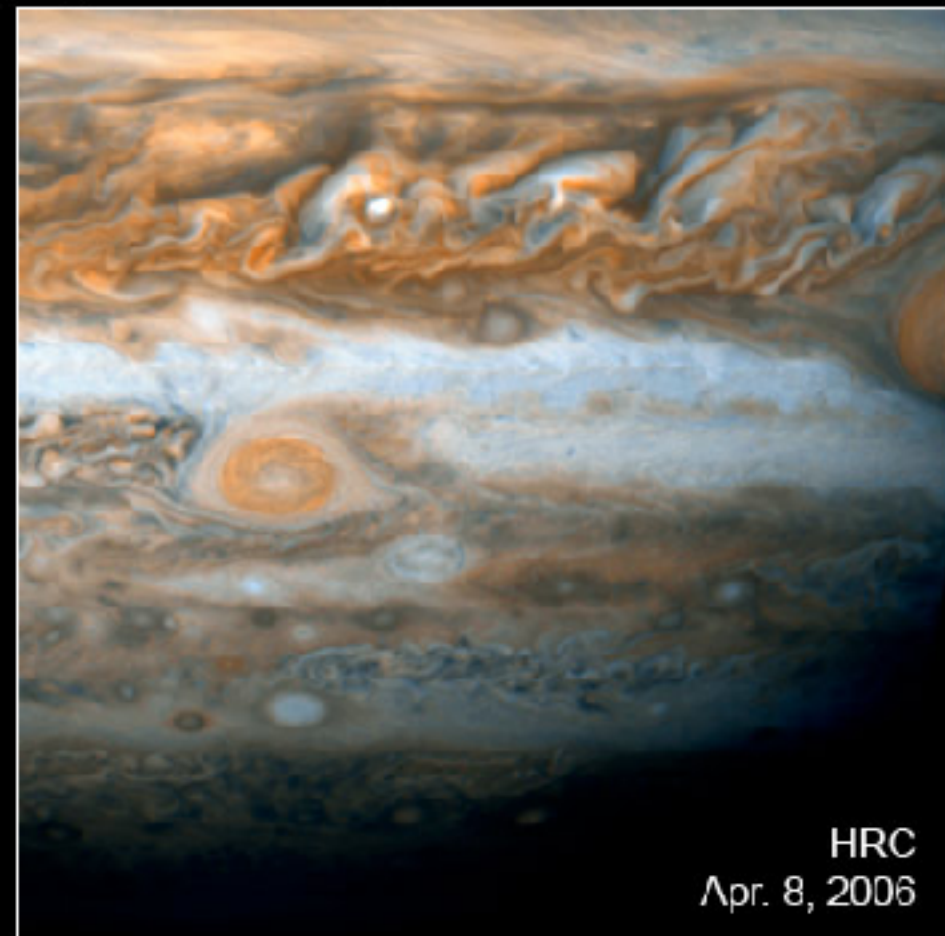




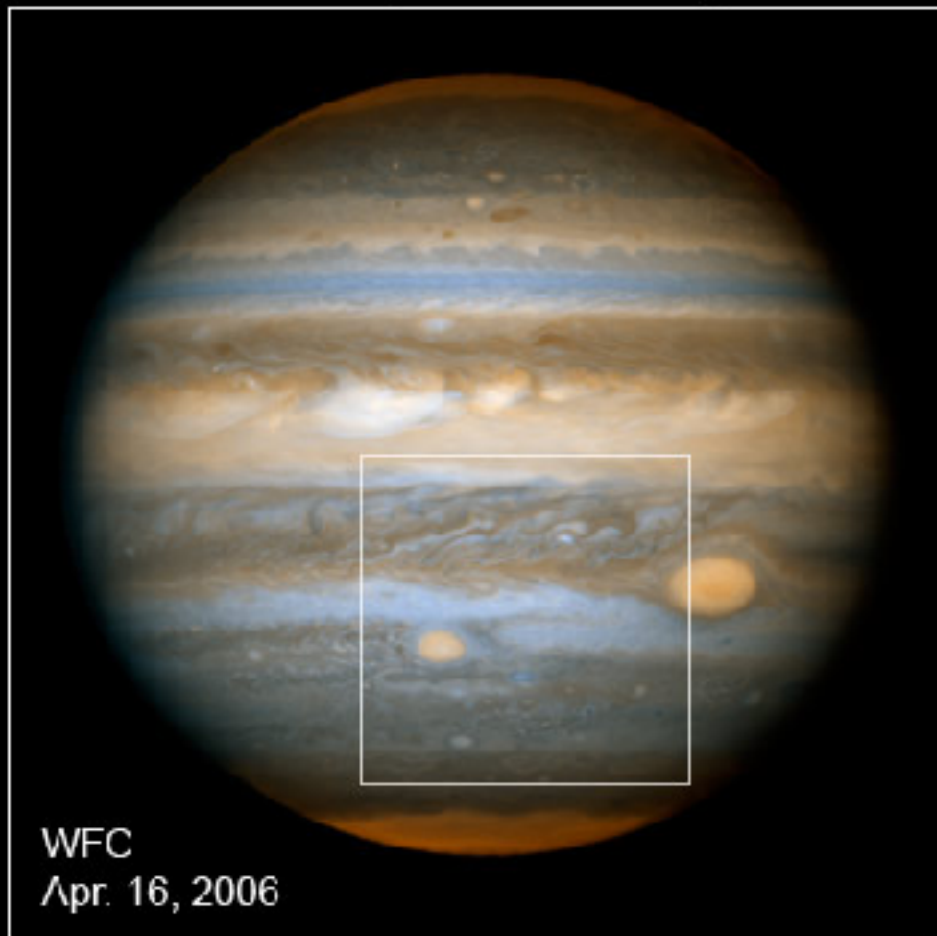




## Jupiter's Red Spots

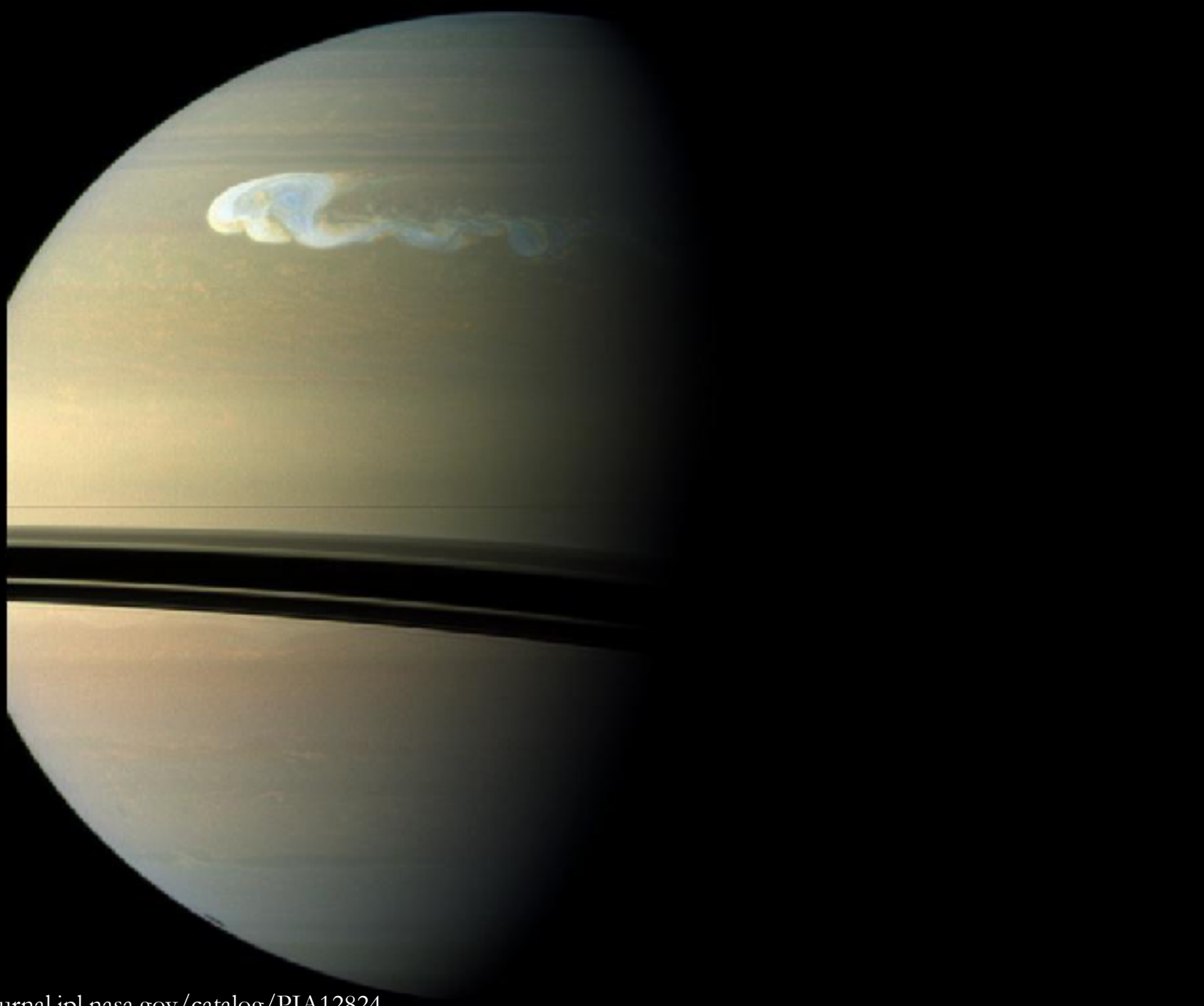


## Hubble Space Telescope ■ ACS

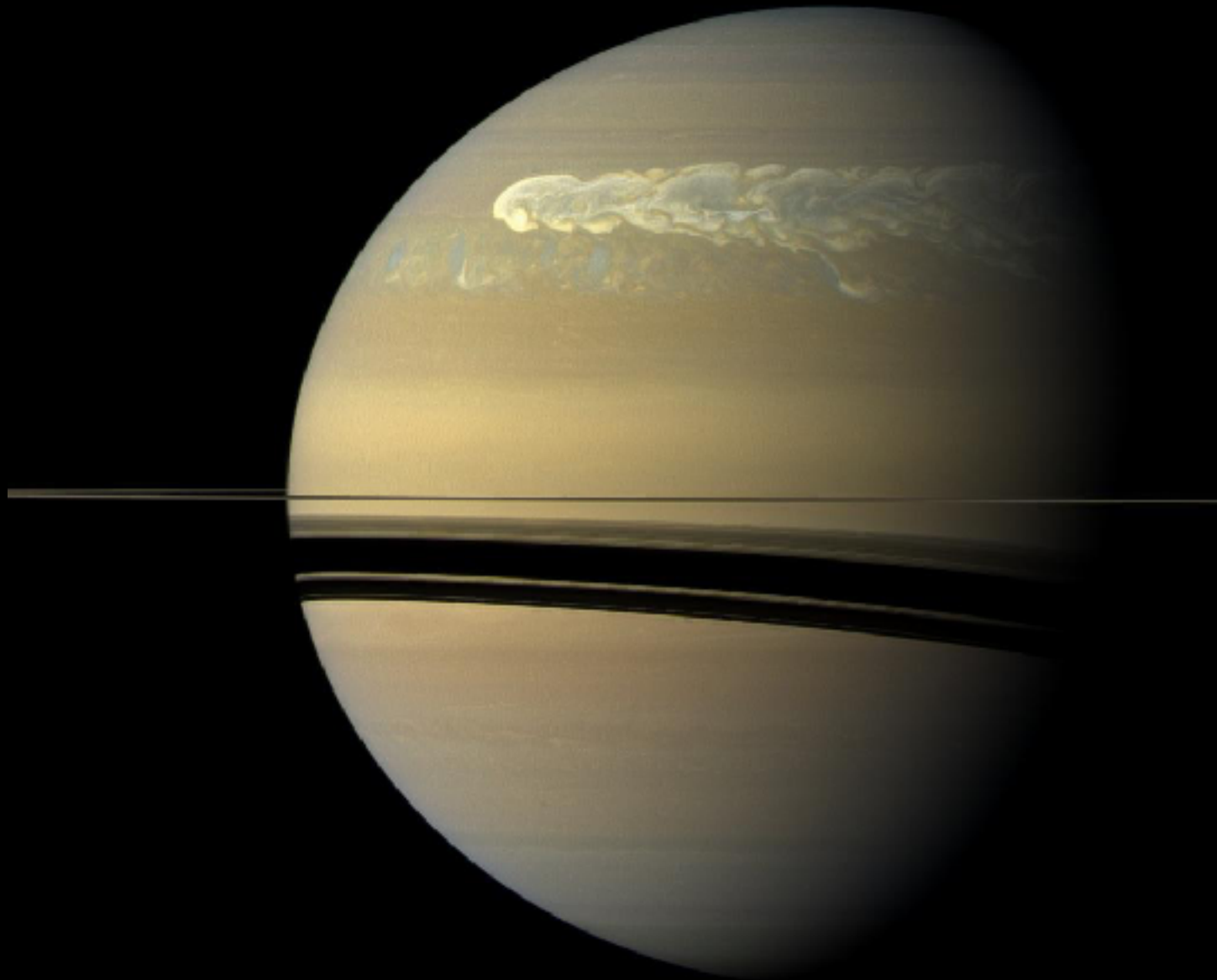


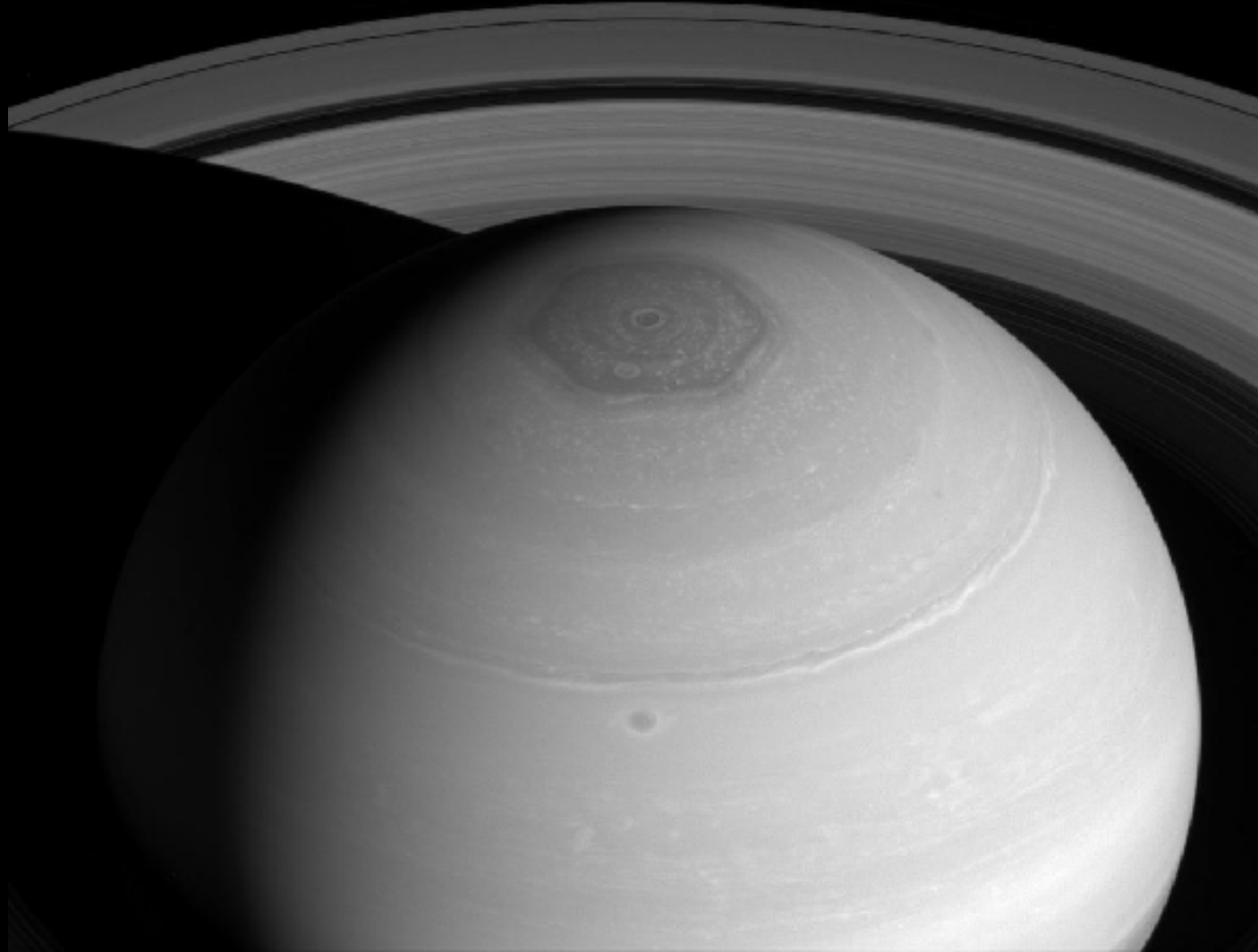
NASA, ESA, A. Simon-Miller (NASA/CSGC), I. de Pater, and M. Wong (UC Berkeley)

STScI-PRC06-19

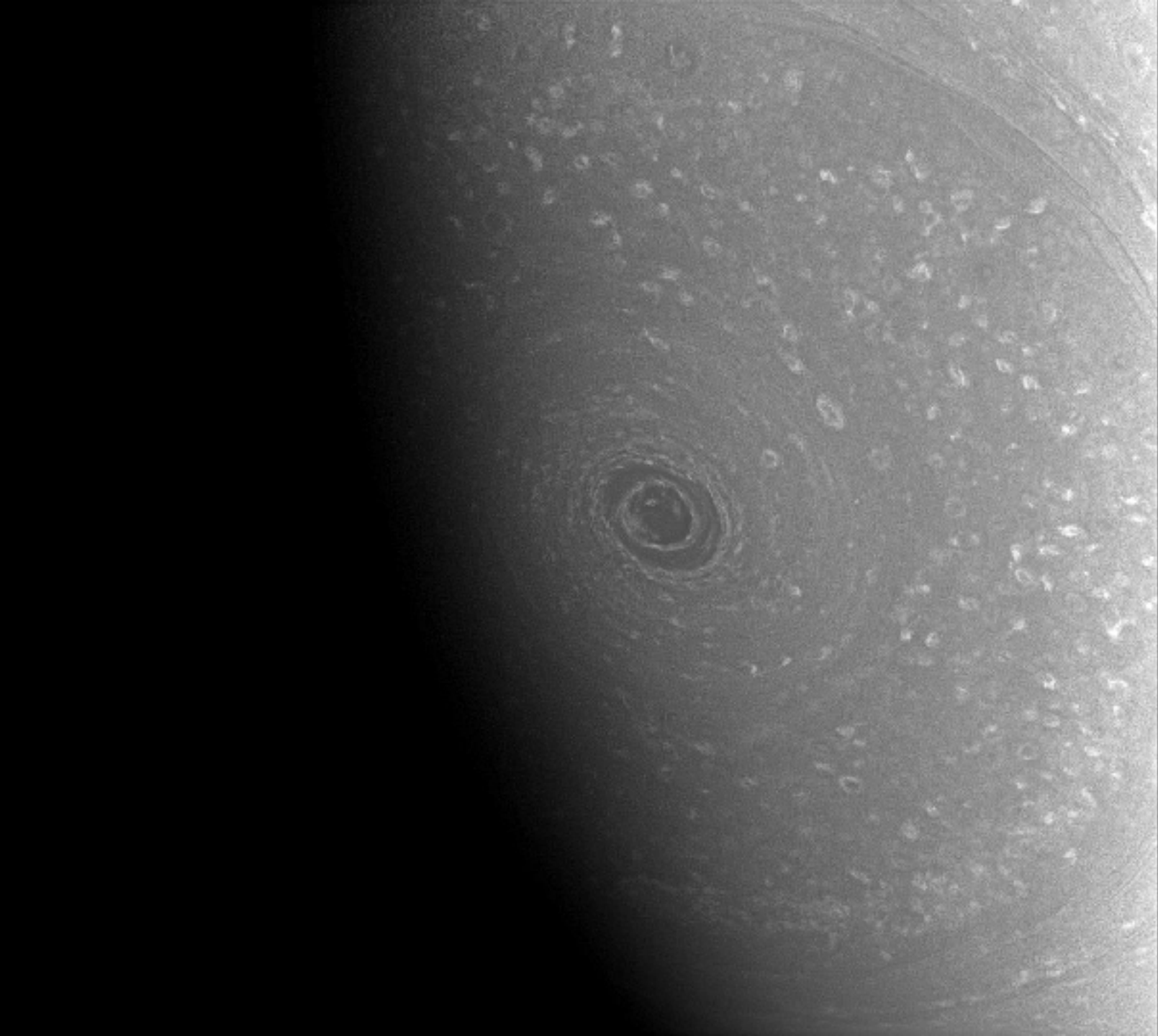


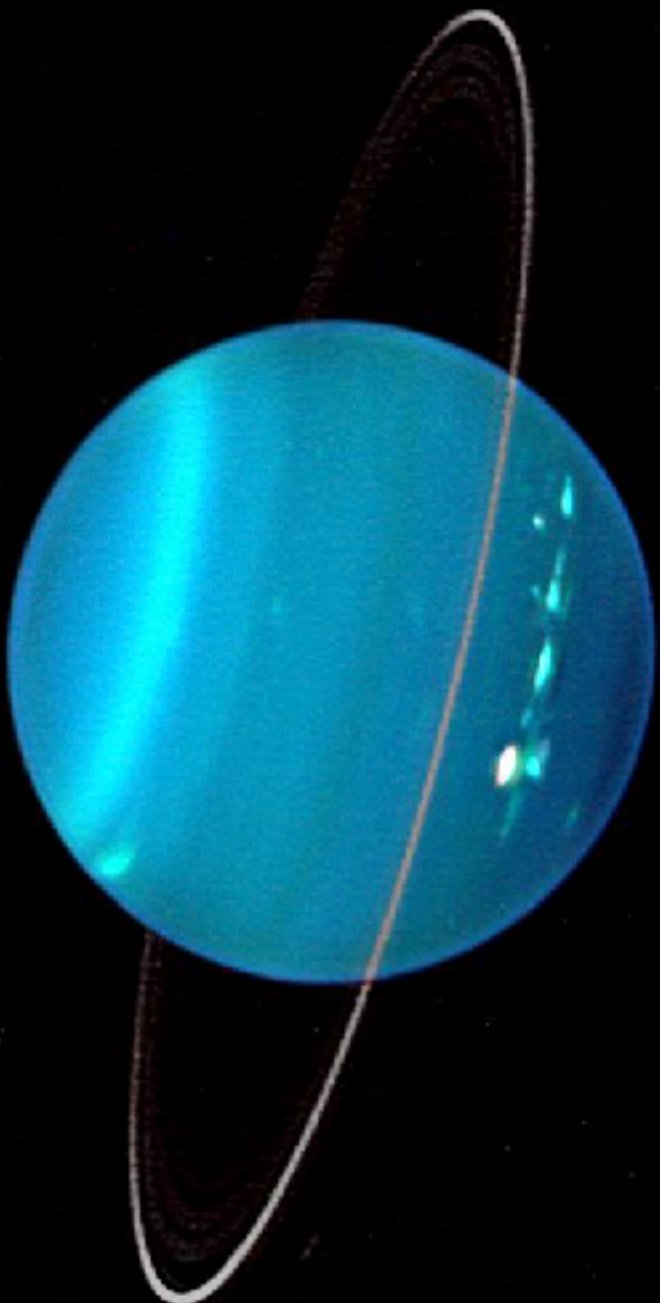
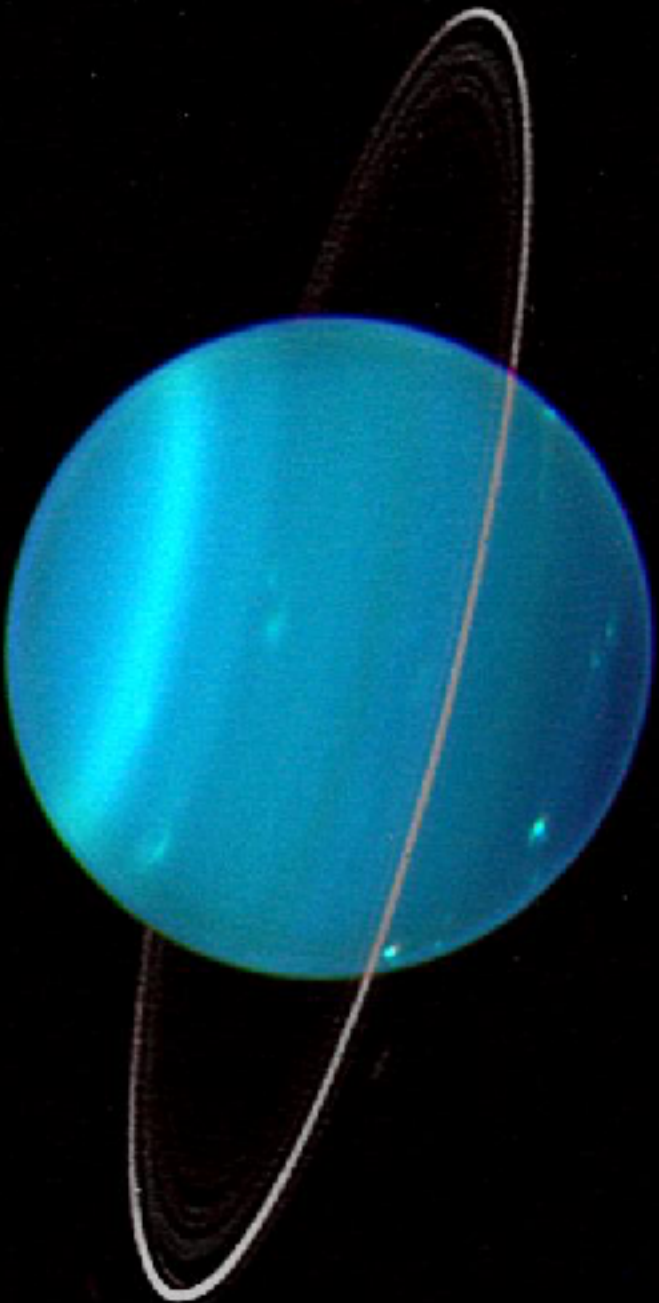


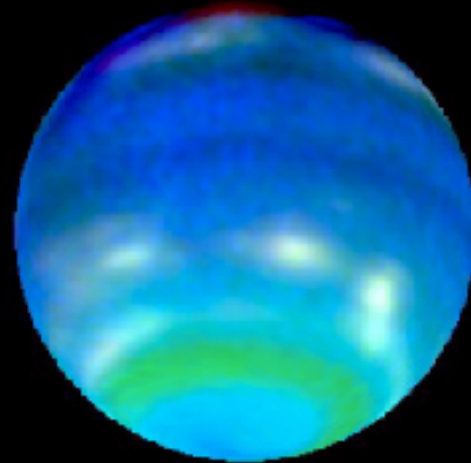
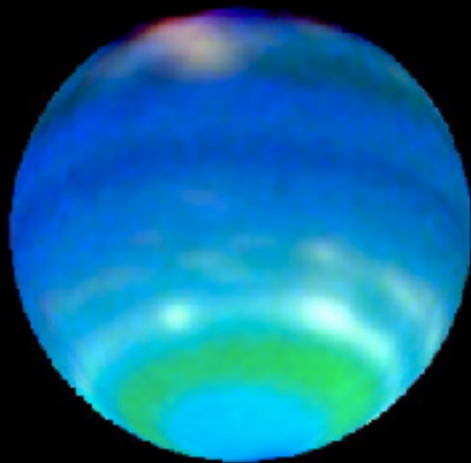




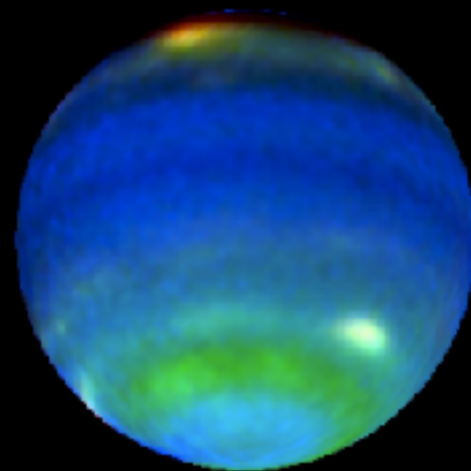
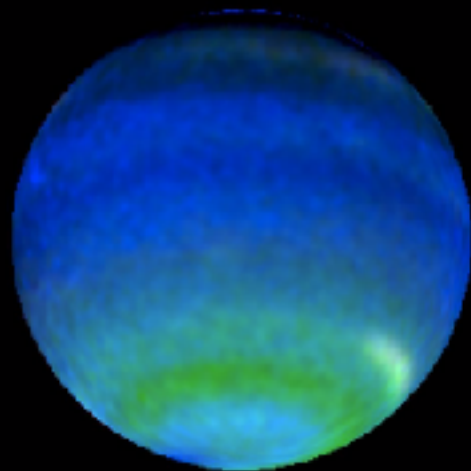
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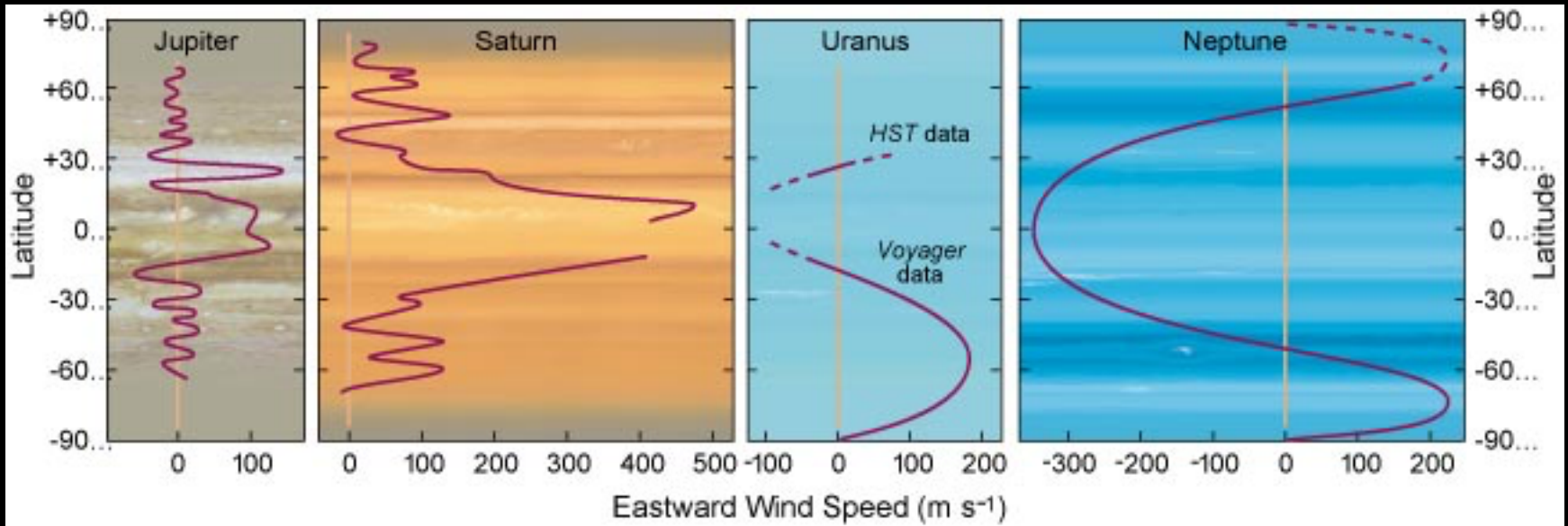




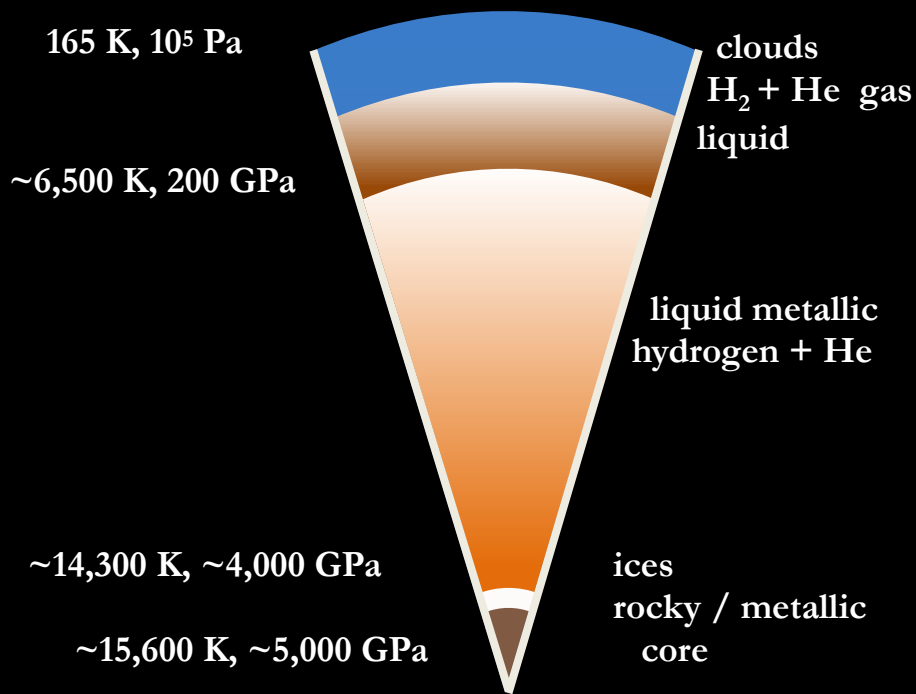
August 11, 1998



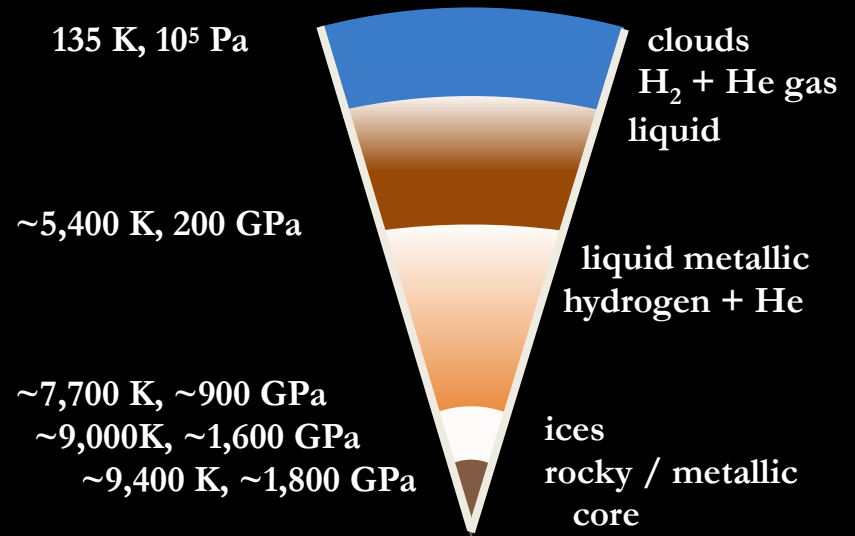
August 13, 1996



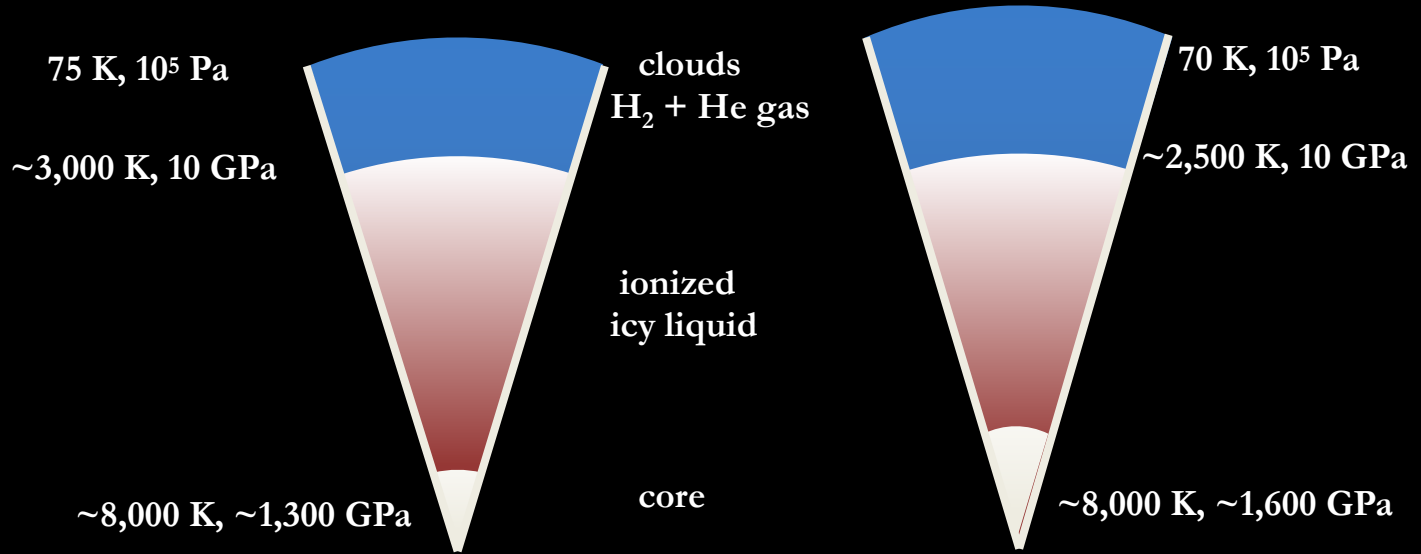
units comparison. . .10 mph = 4.4 m/s



Jupiter



Saturn



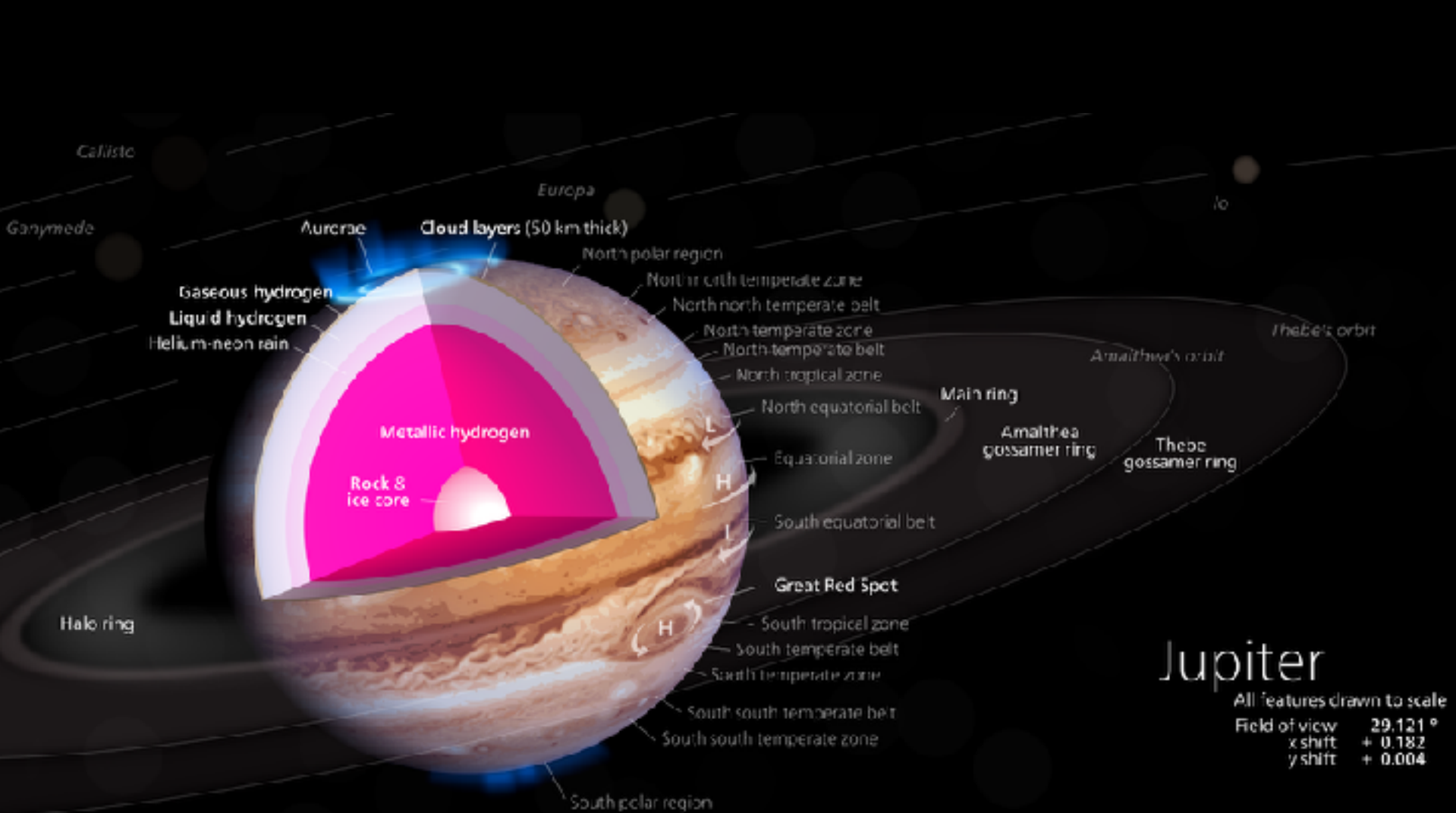
Uranus

Neptune

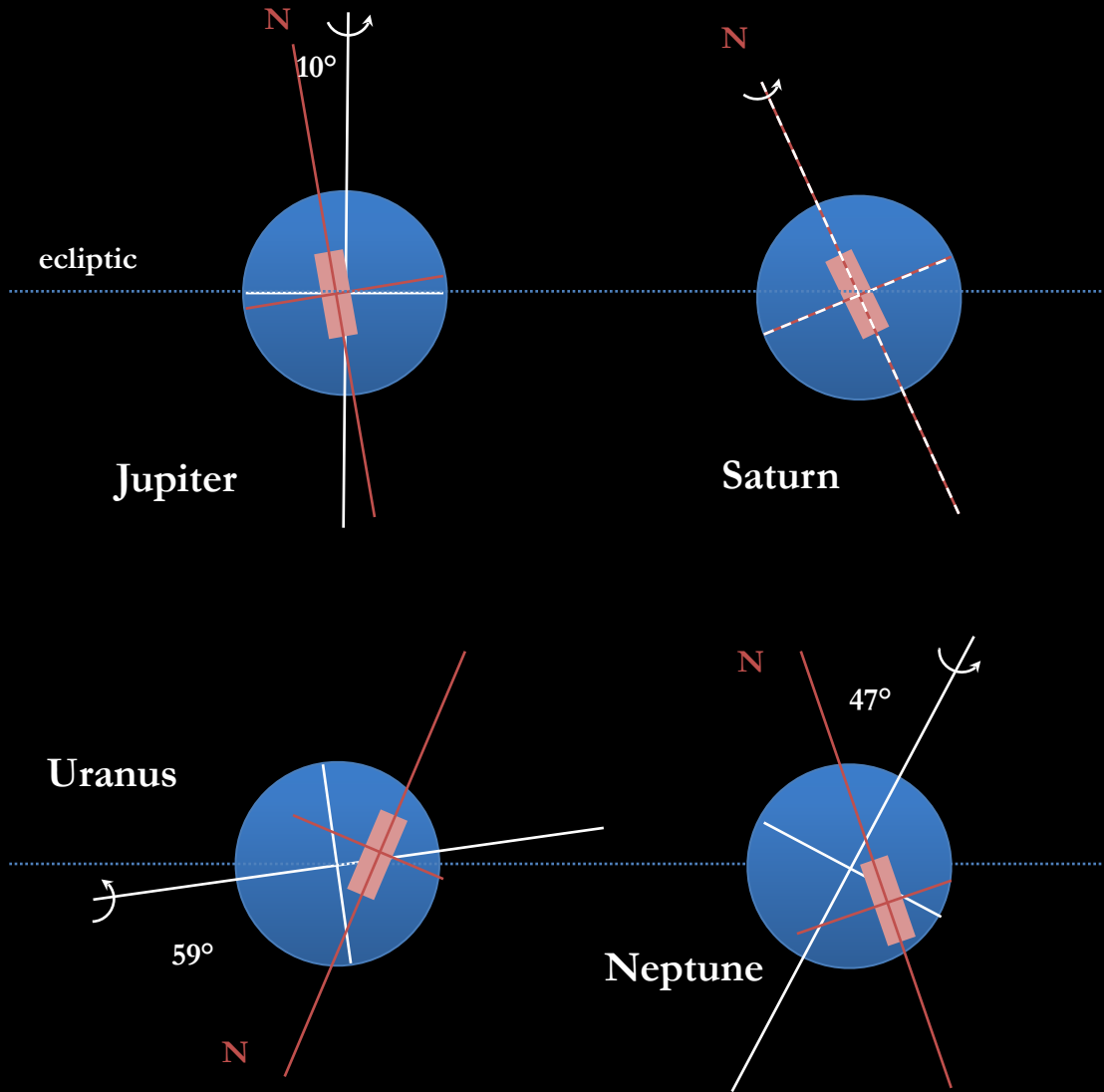


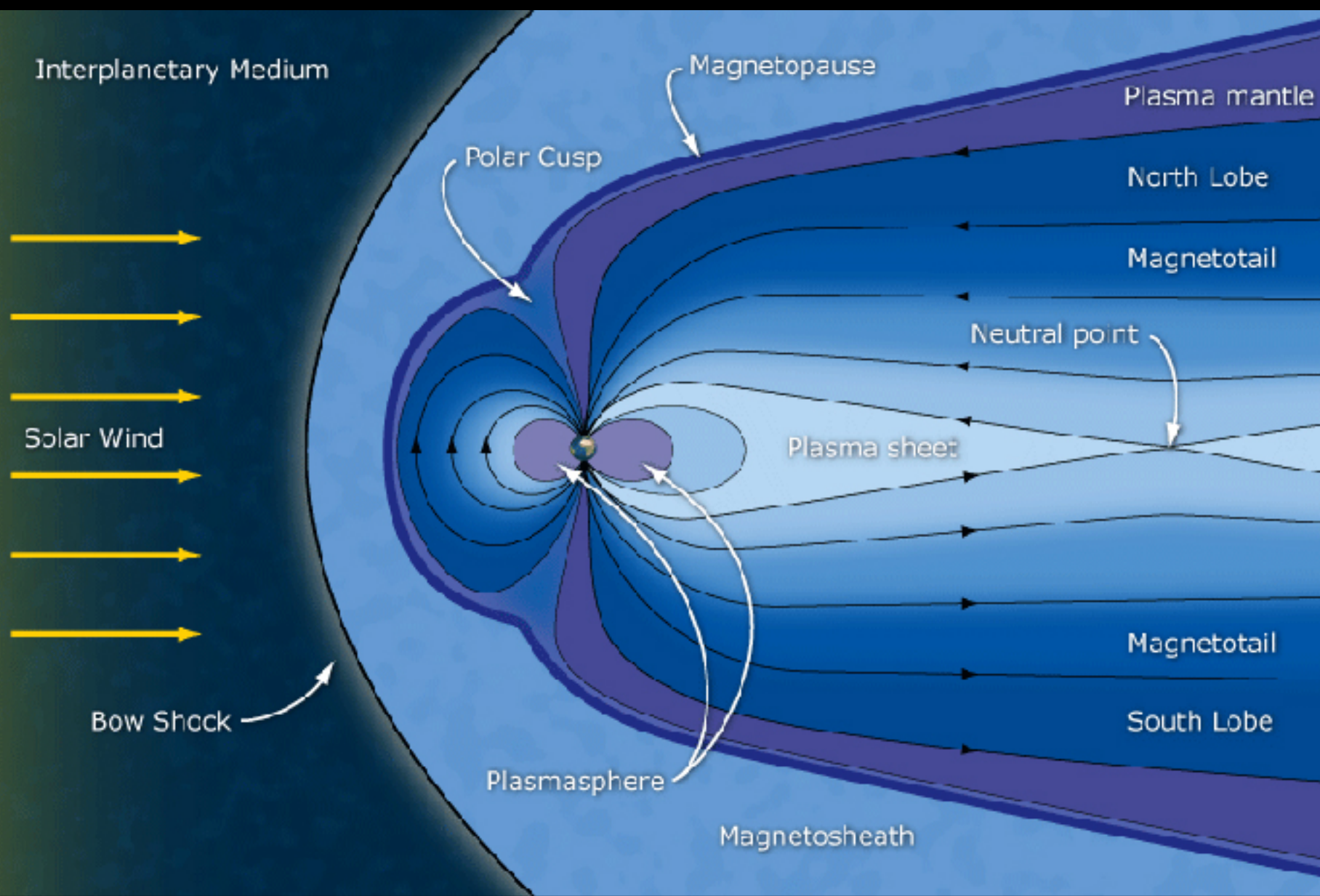
	Jupiter	Saturn	Uranus	Neptune
Mass (Earth masses)	318	95	14.5	17.1
Average radius (Earth radii)	11.0	9.1	4.0	3.9
Flattening ( $1 - R_{\text{polar}}/R_{\text{equator}}$ )	0.065	0.098	0.023	0.017
Moment of inertia factor	0.254	0.210	0.225	~0.25
Density ( $\text{g/cm}^3$ )	1.33	0.69	1.27	1.64

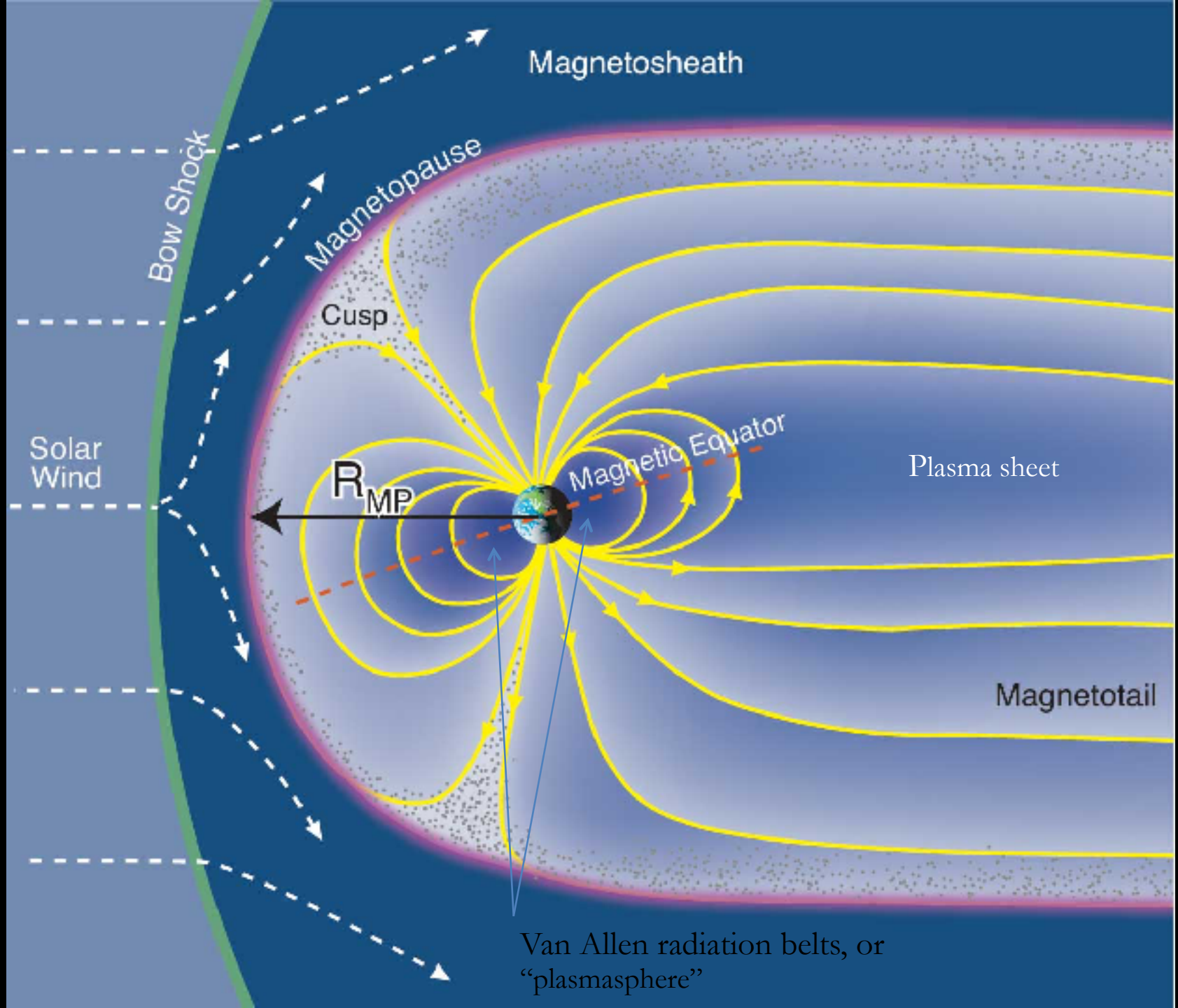
Radiating excess energy. . .



Jupiter diagram from Wikipedia







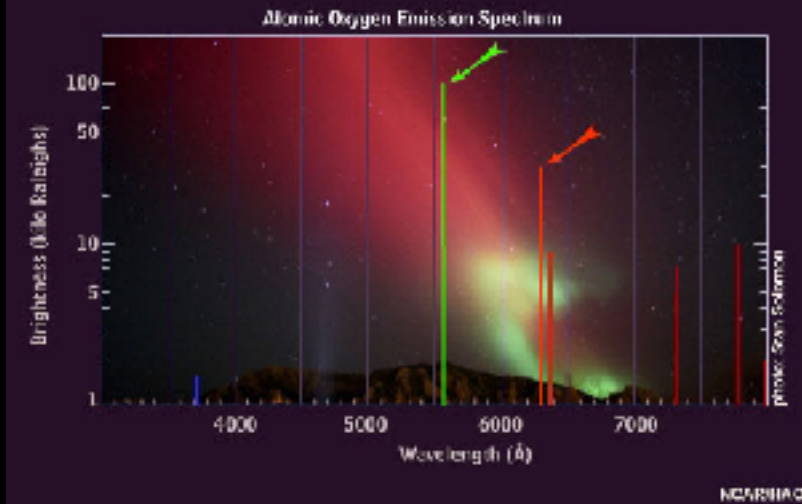
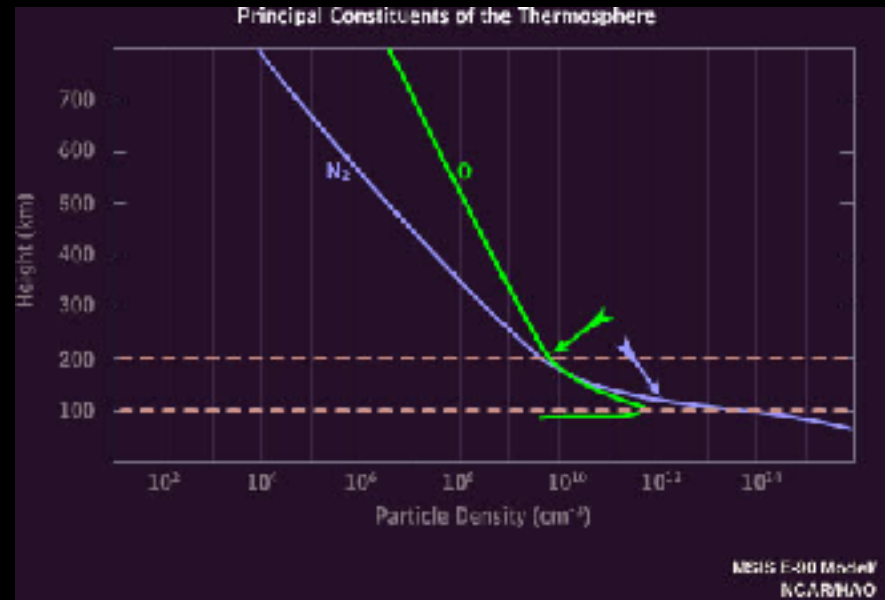
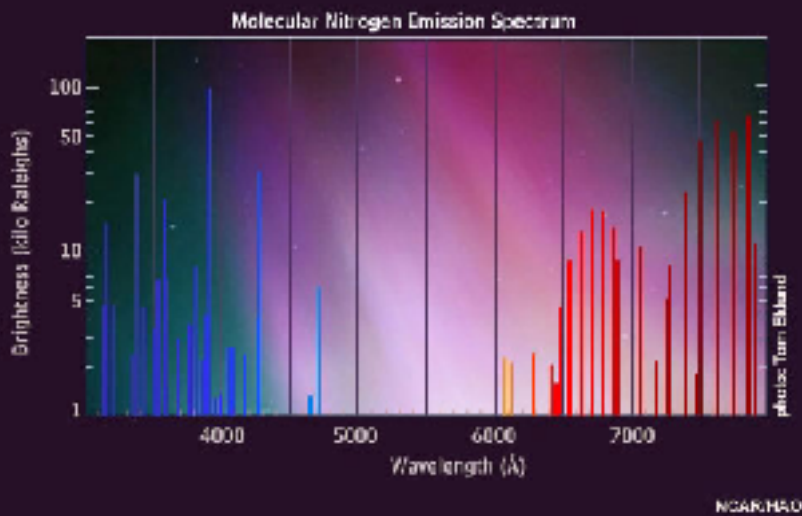
Taken by Layton Findlater on March 27, 2017 @ Invercargill, New Zealand



*Findlater*  
PHOTOGRAPHY  

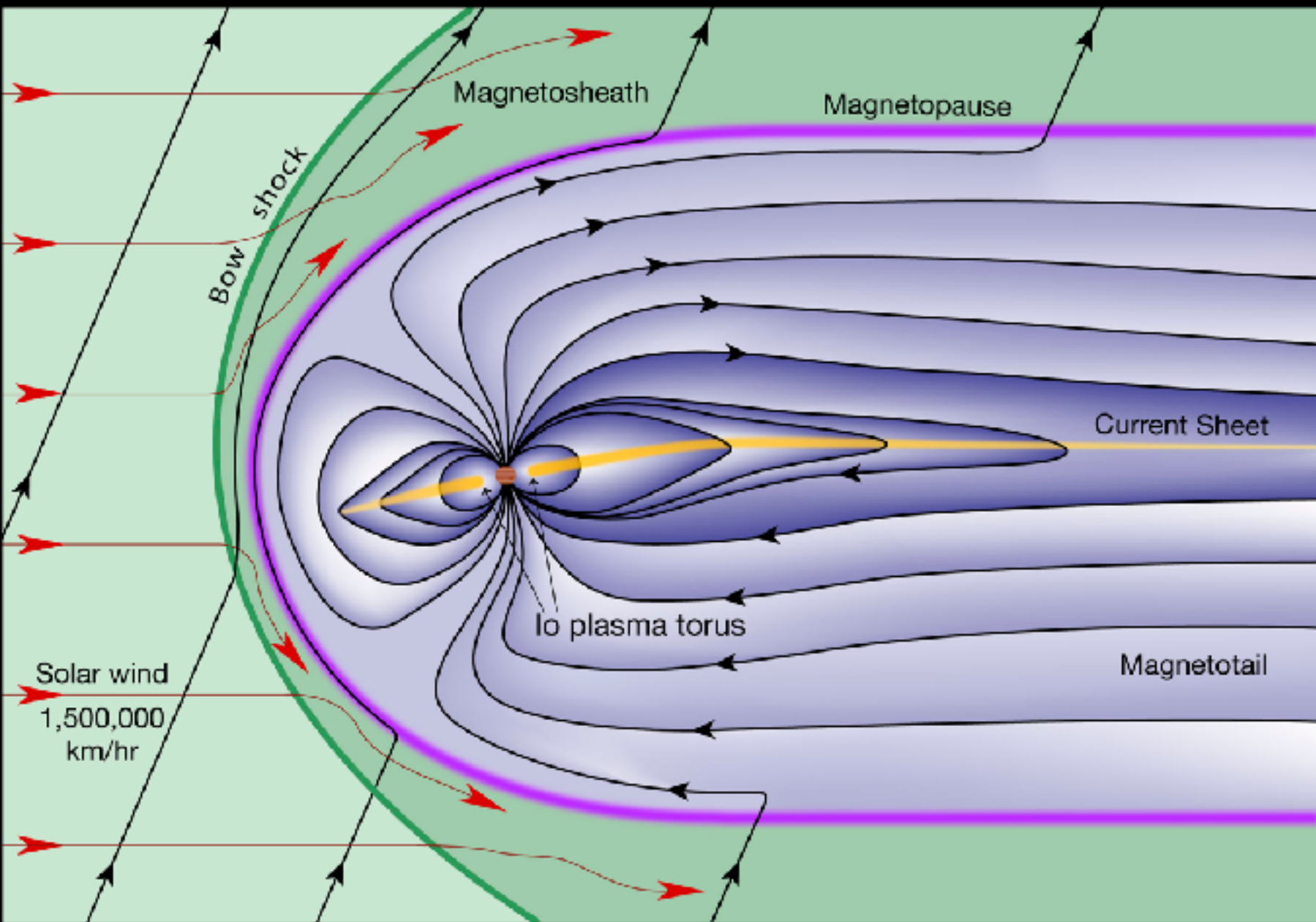

[http://spaceweathergallery.com/indiv\\_upload.php?upload\\_id=134196](http://spaceweathergallery.com/indiv_upload.php?upload_id=134196)

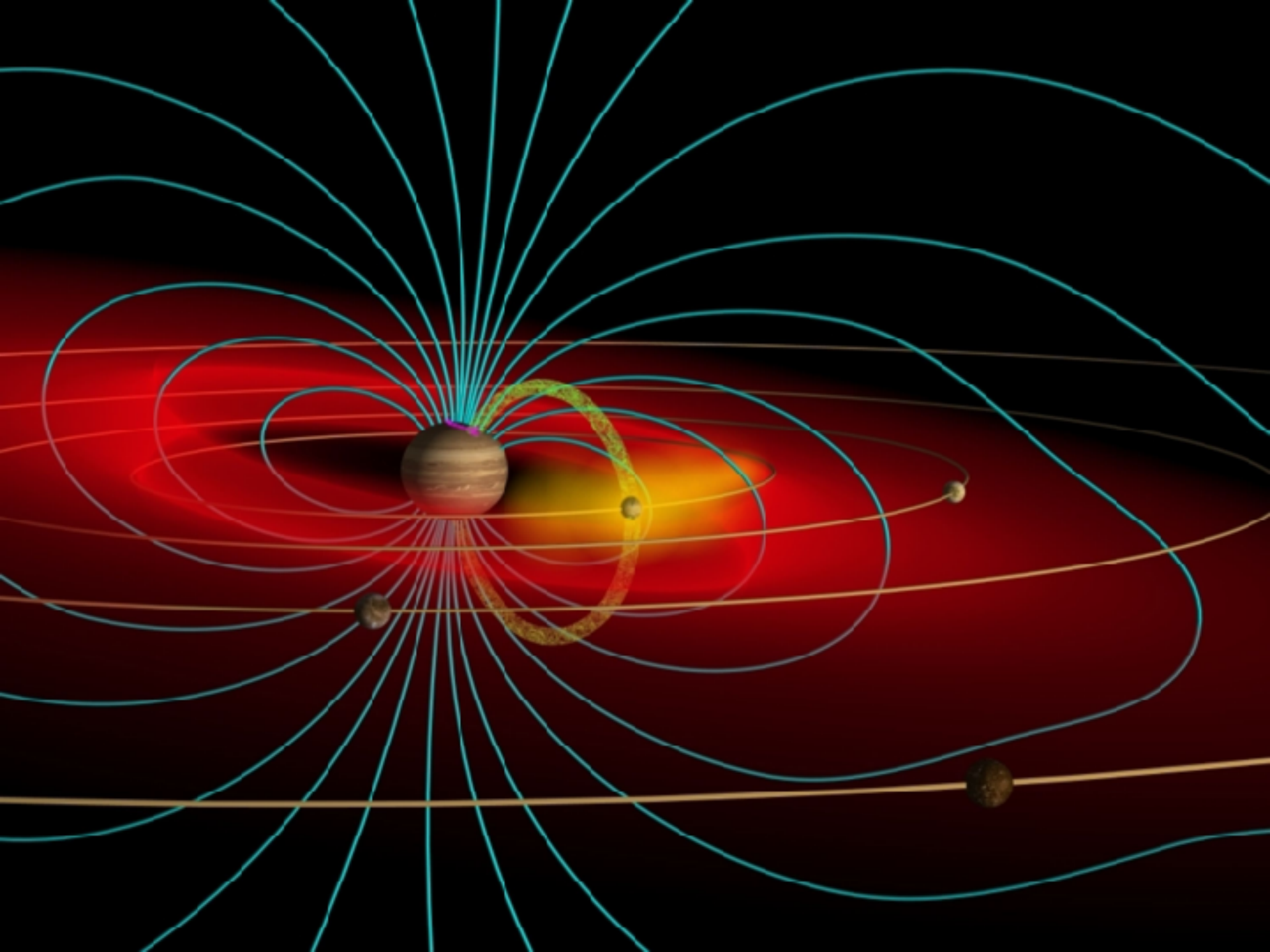
Night of the northern lights

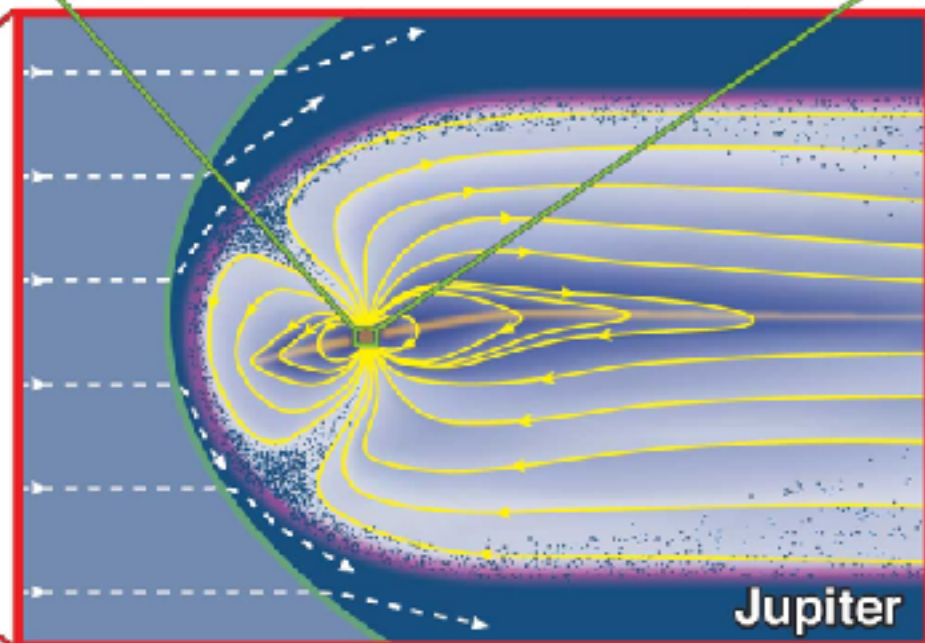
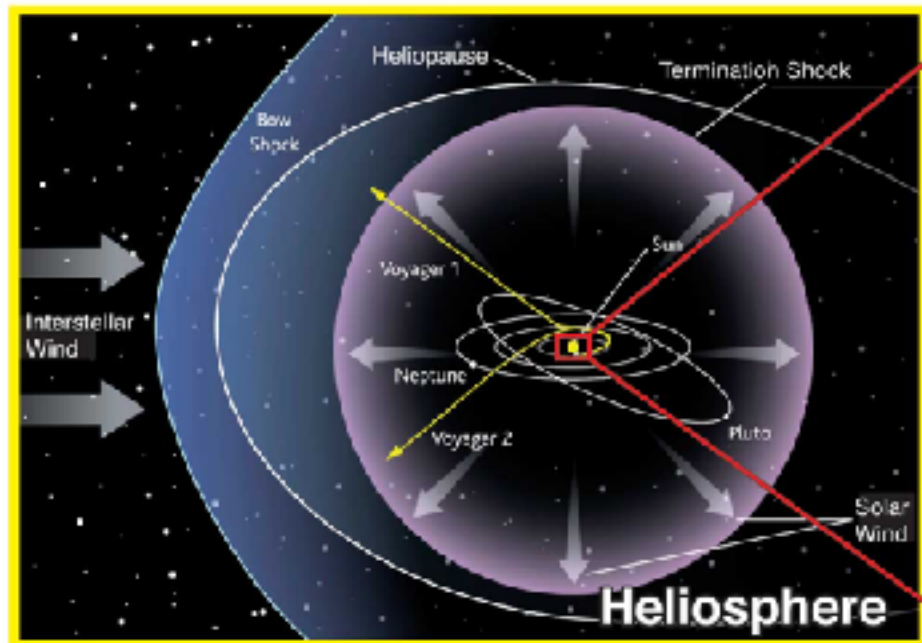
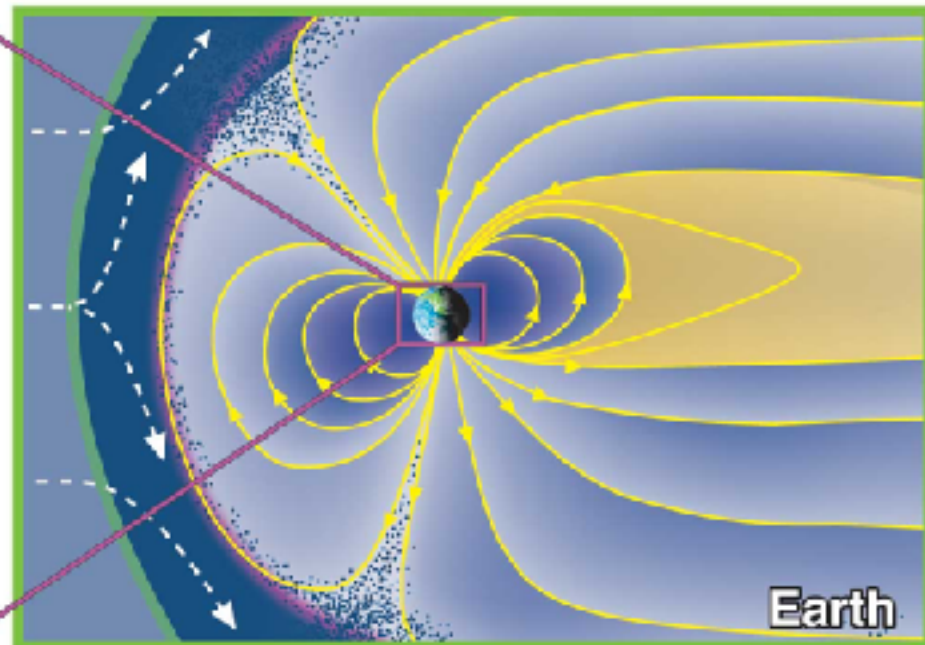
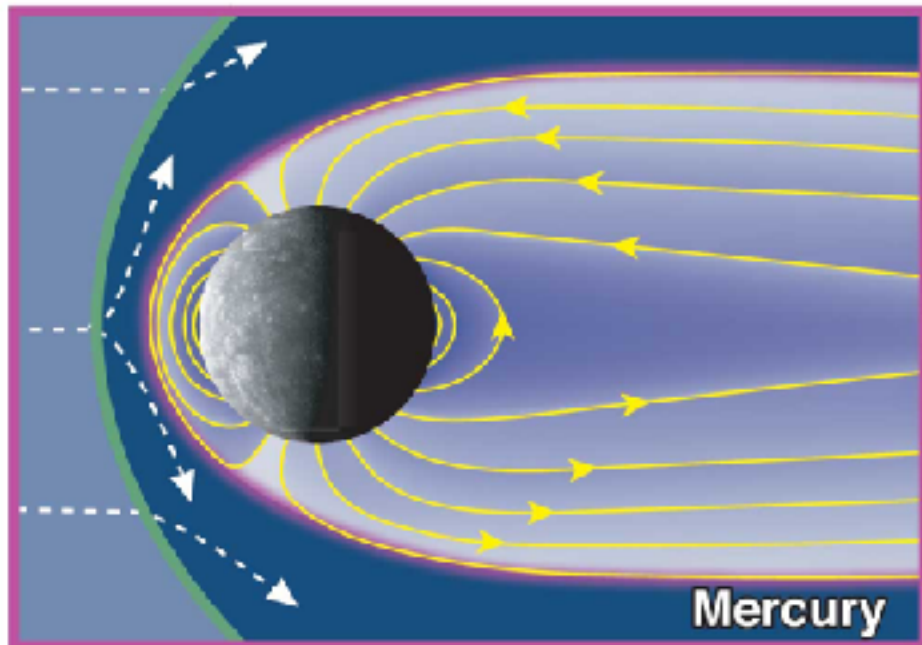


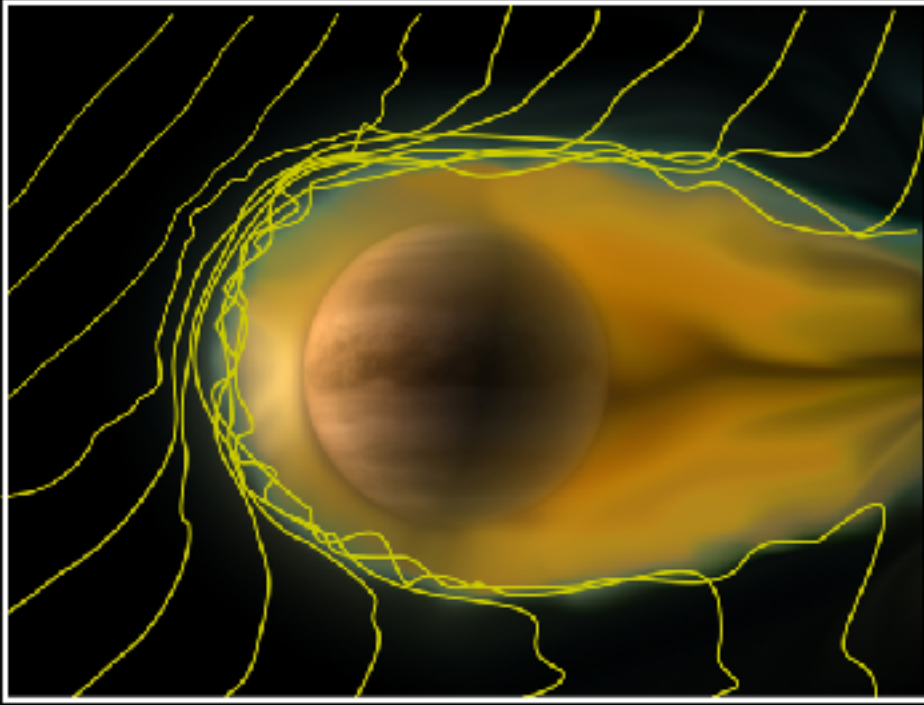
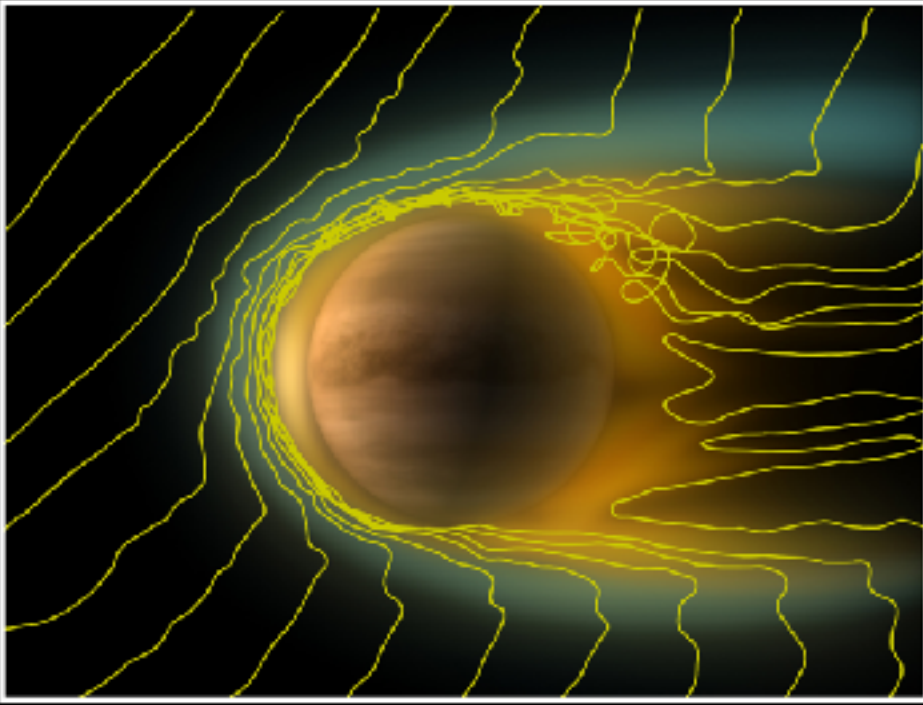
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<http://sci.esa.int/venus-express/51323-the-ionosphere-of-venus-under-different-solar-wind-conditions/>