

# Saturn's Lopsided Magnetosphere: Mystery Solved?

Cassini has observed puzzling asymmetries in Saturn's equatorial magnetosphere. Plasma wakes of moons are shifted radially outward at dawn and radially inward at dusk.

Saturn has a strong magnetic field and spins rapidly around its axis, and there is a strong interplay between the distribution of charged particles and the magnetic field. Charged particles move easily along the magnetic field in response to both *rotational stresses* and *changing pressure*.

Simulations show that the particle distribution changes the shape of field lines. The field lines are more 'stretched out' on the dawn side, where the *rotational stresses* are dominant, and less 'stretched out' on the dusk side, where *pressure gradients* dominate. This lopsidedness produces local-time dependent inward and outward flows similar to what is observed by Cassini.

Cassini continues to shed light on mysterious physical processes that may be common to other planets within our solar system.

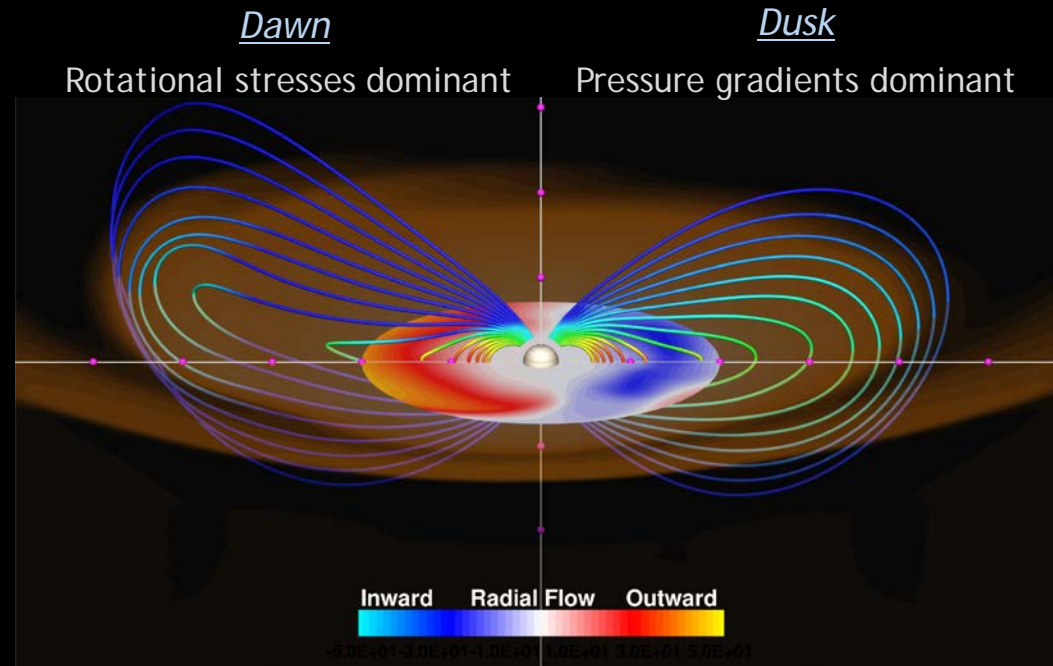


Illustration of Saturn's asymmetric (lopsided) magnetic field. Color code applies to the equatorial circular disk and indicates the flow direction of plasma. Brown background illustrates magnetospheric plasma.