

Coriolis Force Encyclopedia Article

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The Coriolis force is not really a force in the true sense, but the effect of the Earth's rotation on the circulation of air and water at or near the Earth's surface.

This apparent force was first observed by French physicist Gaspard Gustave de Coriolis (1792-1843) in 1835. The Earth's rotational speed decreases with latitude, from about 1,038 miles per hour (1,670 kph) at the Equator to zero at the poles. Anything traveling above the ground at a constant speed toward the poles appears to veer to the right in the Northern Hemisphere and to the left in the Southern Hemisphere.

This effect creates the circular motions of winds and ocean currents and can result in the development of hurricanes and tornadoes. It also affects any object that is launched or shot from the Earth's surface. An artillery shell, for instance, will miss its intended target if the Coriolis force is not taken into account, and the error will increase with distance.

Gustave de Coriolis spent most of his life in Paris. His interest in the effect of the Earth's rotation came while he was a professor of mechanics at the Ecole Polytechnique. He arrived at his conclusions mathematically, calculating the distance any point on the Earth must travel during a 24-hour period. He then did physical demonstrations of the effect this had on atmospheric and oceanic movements.

Twenty years later, American physicist William Ferrel quantified this principle in what was to become known as Ferrel's law.