

Crookes' Radiometer



Purpose: To demonstrate an interesting effect due to molecular motion in a dilute gas

Location: room 136, shelf P3

Get students to predict which way it will spin when illuminated. When illuminated with sunlight (or the yellow work light on P2) this timeless curiosity rotates exactly opposite to the direction which was predicted in the late nineteenth century by Crookes' when it was designed to detect the pressure of light predicted by Maxwell's equations. This caused much consternation and debate until it was realized that the vessel had not been completely evacuated of air, and that the effect was due to the greater recoil of molecules incident on the hotter black sides than those incident on the cooler white sides of the vanes. It wasn't until 1931 that a sufficient vacuum was obtained to demonstrate rotation in the opposite direction due to the greater recoil of light reflecting from the white sides.