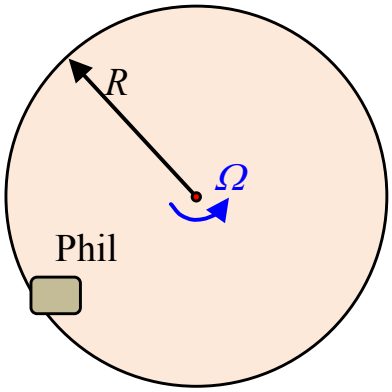
Today, we will:

- Continue our discussion of **Coriolis force** and **global wind patterns** on the earth
- Discuss **lapse rate** and how it affects **atmospheric stability**

Example: Coriolis Force

Given: A merry-go-round of radius R = 15 m rotates at Ω = 10 rpm. Phil (m = 90 kg) is riding the merry-go-round. He stands at the edge of the ride ($r = R$) and holds on to a rail to keep from flying off.



(a) To do: Calculate the magnitude of the Coriolis acceleration in g's experienced by Phil ["g" = a_c/g, where g = 9.807 m/s^2].

Solution: The Coriolis force is $\vec{F}_c = m\vec{a}_c - 2m\left(\vec{\Omega}\times\vec{U}\right)$.

(b) To do: Calculate the radial force Phil needs to exert on the rail to keep from flying off.

Solution:

(c) To do: If Phil throws a baseball horizontally at 67.11 mph (30 m/s), calculate the initial value of the magnitude of the Coriolis acceleration acting on the ball from Phil's perspective, in g's.

Solution: The Coriolis force is $\vec{F}_c = m\vec{a}_c - 2m\left(\vec{\Omega}\times\vec{U}\right)$.