

Angular Momentum



Purpose: Demonstrates the conservation of angular momentum.

If there is no net external torque, a system's angular momentum is conserved. One can show this in a variety of ways using an assistant on a rotatable platform. Here are the two classic examples:

- 1) Hand a spinning bicycle wheel (axis up – angular momentum $+L$) to the assistant at rest ($L = 0$). She, the platform, and the wheel will begin to rotate counterclockwise ($-L$) to keep the total angular momentum zero. If she then flips the wheel's axis, she will stop.
- 2) Give the assistant two bags of rice to hold at arm's length (which makes I large). Give her a gentle spin. While spinning, if she brings in her arms (making I smaller) she will speed up (keeping $L = I\omega$ constant).

Note: We have two rotating platforms: the blue rotating chair and the (heavy) stand-on platform. Although it's heavy, the stand-on platform works much better. Also, use the large-diameter bike wheel pictured. My favorite bike wheel (shown) is equipped with a drum: winding some red cord (G.P.) around it three or four times and pulling (an assistant holds the wheel) really gets it spinning.

Extra Equipment: An assistant not prone to nausea.

Location: Platform (and rice weights) is on shelf A5, while our selection of bike wheels are hung over cabinet A.