

# Right Hand Rules in Magnetism

## #1 Cross Product RHR

1. Put your arm in the direction of the first vector.
2. Bend your fingers to point in the direction of the second vector.
3. Your thumb points in the direction of the cross product.

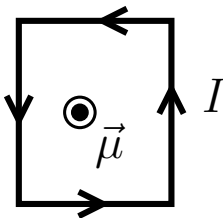
This applies to:

- Magnetic force on a moving charge:  $\vec{F}_q = q\vec{v} \times \vec{B}$
- Magnetic force on a current:  $\vec{F}_{\text{wire}} = I\vec{L} \times \vec{B}$ .
- Torque on a current loop:  $\vec{\tau} = \vec{\mu} \times \vec{B}$
- Biot-Savart law:  $d\vec{B} = \frac{\mu_0}{4\pi} \frac{Id\vec{\ell} \times \hat{r}}{r^2}$ .

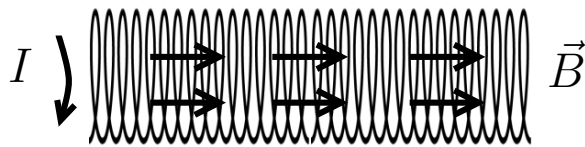
## #2 Curl-Straight RHR

Fingers curl around and thumb points straight. This applies to:

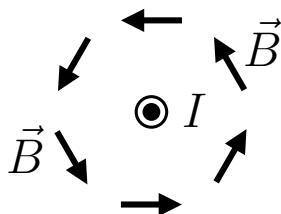
magnetic moment  $\vec{\mu}$



B-field of a solenoid



B-field of a long, straight wire



B-field at center  
of a current loop

