Coulomb Opal on stand with weight out in.

Usual explanation - Force from non rotate frame.

\[ F = \frac{dp}{dt} \quad \rho = mv \leftrightarrow F \]

Newton's law

Tate moment about Origin

Torque = moment of force

\[ \tau = r \times F \]

\[ L = r \times p \]

\[ = r \times \frac{dp}{dt} \]

\[ \tau = \frac{d}{dt} (r \times p) \]

\[ \tau = \frac{dL}{dt} \]

Torque = rate of change of angular momentum.

But all quantities are vectors.

Replace above still true.

\[ \tau = 0 \] when one arm becomes zero for centre, \( \tau \times \tau = 0 \)
Generally, for varying \( R \), pull string through hole in centre.

Pull string to move body from \( R \to r \):

\[ V \to \dot{r} \]

Torque is zero since r is apple along \( \tau = r \times f \)

Since \( \tau = 0 \):

\[ \frac{dL}{dt} = 0 \implies L = \text{const.} \]

If \( L = \text{const.} \):

\[ \Rightarrow R m \dot{V} = m \dot{r} \]

\[ \dot{V} = \frac{R}{r} \]

\[ V \Rightarrow R \times V \]

Introduce any vel. \( \dot{V} = \omega \dot{r} \)

\[ \frac{W_r}{W_r} = \left( \frac{R}{r} \right)^2 \]

Cons. expl. \( L \) is conserved since no ext torque - see \( \dot{r} \) increases but this is no real explanation.

Let's try an explanation terms of forces acting on \( R \) mass.
Right hand rule used to define vector force.

Inside mass $m$ moving along rod in slot.

0. groove in
1. pull
2. will my 10 inc speed.
3. push against rod.
4. reactions on man to disc.
5. reacting man to disc.

Disc pushes back on exterior mass $m$ by $N_3$.

Einstein says all reference frames have momenta.

Now I must show you a disc.

Mass $m$ is moving on star disc into centre, along $k$ line.

Even at constant speed. (Make it constant speed).

In constant speed no result force on body.

Of which other observer,

had to pull on body to bring it to rest.

must be balanced by other $-F_{k'}$ component here.

This is the real gravity.

But $F_{\perp}$ exists also.

$F_{\perp}$ + $F_{\perp'}$ don't cancel since act on different bodies.

$F_{\perp}$ pulls on $u$, $F_{\perp'}$ pulls on $v$

Thus from outside, $F_{\perp}$ exists as well as $F_{\perp'}$.
\[ F = \Sigma m \omega \times w \] gravitational

right underrotated

This is inertia, e.g. moving body on rot ref frame.
Why no bodies speed up as you show r.

Here are:
- Falling in grav field
  - This is the Coriolis force

\[ F = \Sigma m \omega \times w \]

equivalent to grav force in rot frame.

This can explain somethings:

demo 1
- Hydrate edge gyro
  1. It rotates on hydrate edge
  2. Try to speed it up (in process)
     a. It loses its hold
     b. it goes the other way.
  in fact goes right angles to the line.

demo 3: bicycle wheel precession.
When you let the bicycle wheel fall
it is equal to a coriolis force. (momentarily)

Rotary body.
Actually in free fall.
Centripetal force = gravity.

Centrifugal force:

\[ F_c = \frac{m \cdot v^2}{r} \]

\[ m \cdot \overrightarrow{w} \]

\[ F_c = \frac{m \cdot w^2}{r} \]

\[ = \text{not the same as freely falling body due to coriolis} \]
move to the left.

move to the right

object thrown due to Coriolis

clockwise

deflection

RH Rule gives left to left always.

merry go round

child on swing

bow legs at bottom of swing on + swing

Coriolis push from behind

mow

mow
I alternate equal red frames star or not.

but we live on not red from east.

Weather patterns high to low pressure forces air from high to low, but air is deflected by Coriolis air spirals in due to deflection.

CF with mag force on moving object. 

\[ F_m = qv \times B \]

\[ m \text{grav equiv of mag field.} \]

Charge in B field will align itself with B.

Spinning mass in Coriolis field will tend to align itself with Coriolis field.
Gyro always points to N whether it is on head, in the car, or in space.