

Extra Extra

Will not be <sup>in</sup> exam but useful to know.

## Fictitious, Pseudo - Forces (or Inertial Forces)

In an accelerating frame, introducing fictitious forces can make  $\vec{F} = m\vec{a}$  work again if  $\vec{F}$  includes fictitious forces.

Fictitious forces are not fundamental forces in the sense of e-m forces or gravitational forces, but they (can) feel just as real.

This is only in the sense of Newtonian mechanics -- in Einstein's general relativity, the distinction between the gravitational force and the fictitious force disappears.

- ① For an accelerating frame, there is a force  $\vec{F}_i = -m\vec{a}$  that is felt within that frame.
- e.g. • force felt in an accelerating car.
  - centrifugal force =  $-m\vec{a}_c$

This force is an example of a "fake force" --- fictitious or pseudo force.

- ② For a rotating frame, there is a Coriolis force  $\vec{F}_c = -2m\vec{\omega} \times \vec{v}$

(did I not include m in the lecture??)

