* Need to devise a solution that:
  + Limits velocity to *c* in the local frame, even when entering the frame at velocity above *c*
  + Results in particle-dependent acceleration/deceleration effects, as necessary to produce red-/blue-shifting of photons
* Possibilities
  + Force modifiers
    - Amplify forces that reduce velocity relative to frame, attenuate forces that increase velocity relative to frame
  + Total force/acceleration scaler
    - A given amount of force produces different amounts of acceleration based on the velocity relative to the current frame(so that it takes more cumulative force to produce speeds near to *c* in the current frame)
    - Can potentially store summed kinetic energy and direction rather than velocity, and then convert into velocity based on the current frame
      * Always easy frame-shifting whenever the frame shifts
    - Could potentially be integrated with gravity?
  + Each particle has a given amount of energy
* Thoughts
  + Any particle whose path is affected by gravity (e.g. can be pulled in by a black hole) must either have mass or be bound to a particle with mass
  + Photons appear, and cannot appear as anything but single particles in the direction of travel, in our frame of reference due to length contraction (see Lorentz transformation)
  + Regarding reference frame simulation, two options:
    - Single relativistic reference frame at each position. Each position in space time has its own relativistic reference frame dependent on the propagated reference frames of the objects exerting a gravitational potential on that position, proportional to the gravitational potential
    - Infinite relative reference frames. If fully incorporating special and general relativity, each object must have its own reference frame, and this frame must track
      * Some questions:
        + Why would a photon not continue accelerating indefinitely in its own reference frame (or does it?)
        + To a photon, wouldn’t the world appear to be two-dimensional due to length contraction along the direction of travel and, if so, how do photons bend due to local gravitation effects, and how do they determine collisions (with nearest rather than farther objects, which should be pancaked on top of one another on the photon’s 2d world)

Thoughts: might photons actually be travelling below the absolute speed limit? Is the equation for Lo

**Forces**

* Forces may be mediated by a combination of fields (at short distances?) and force carriers (at longer distances?)
  + Transmission of impulse from force carriers to massive targets must be directional (e.g. incoming gravitons pull, but outgoing gravitons do not)

**Gravity**

* Gravity travels at exactly *c* (as evidenced by gravity waves coincident with light rays from stellar collisions), which suggests that the velocity of gravity and photons is determined by the same factor, either by a universal speed limit (which is presumably *c*), or by their force carriers
* Gravity and gravitons, if they exist, are not blocked by other massive objects in their path
  + But is gravity itself bent by gravity?

**Photons/Light**

* Photons are spontaneously emitted by massive objects at high temperature (black-body radiation), and this photon emission is accompanied by decreased temperature of that object
* Photons are emitted by accelerating charged particles (e.g. Bremsstrahlung, Synchrotron, Cherenkov radiation)
* To allow polarization of individual photons, these must consist of at least two individual particles (if photon velocity is an inherent property), or three particles (if photon velocity is an emergent property as a result of intra-photon particle repulsion)
* Possible mechanisms to explain constant photon velocity at *c*:
  + Photons are completely mass-less and accelerate instantaneously to the universal speed limit as soon as they are endowed with any energy
  + Photons are sparingly massive and are accelerated near instantaneously by uni-directional intra-particle repulsion

**Graviphons**

* Idea: photons and gravitons are transmitted by the same mass-less particle, but in the case of photons have an additional “energy” payload