

Impact of Symmetry [mln70]

Classical mechanics:

- *Continuous* symmetries have major impact on dynamics.
- *Discrete* symmetries have minor impact on dynamics in comparison.

Quantum mechanics:

- *Continuous* and *discrete* symmetries have comparable impact on spectrum and transition rates.

Inertial reference frame:

- Classical mechanics rests on the assumption that it is always possible to find a frame of reference with respect to which space is homogeneous and isotropic and time is homogeneous.

Consequences:

continuous symmetry	conservation law
space is homogeneous	linear momentum
space is isotropic	angular momentum
time is homogeneous	mechanical energy

The general relationship between continuous symmetries and conservation laws in classical mechanics is described by Noether's theorem [mln12], [mln13], [mln42].