

Lagrangian Mechanics

Lagrangian mechanics is a formulation of classical mechanics which uses the action of a system as the fundamental quantity to describe its motion. It is the most general formalism in classical mechanics, and is applicable to a wide variety of systems, from celestial mechanics to particle mechanics.

Equations

Here are some equations related to Lagrangian mechanics:

1. The Lagrangian of a system:

$$L = T - V$$

2. The Euler-Lagrange equation:

$$\frac{d}{dt} \frac{\partial L}{\partial \dot{q}} = \frac{\partial L}{\partial q}$$

3. The equation of motion in terms of the Lagrangian:

$$\frac{d}{dt} \left(\frac{\partial L}{\partial \dot{q}} \right) - \frac{\partial L}{\partial q} = 0$$