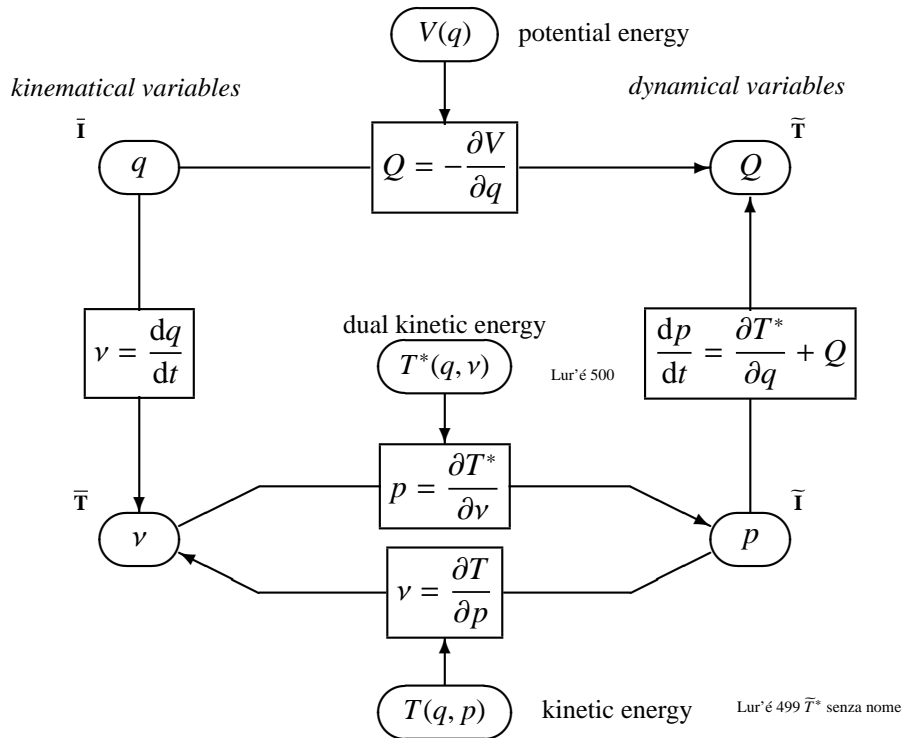


Analytical mechanics of a particle



dual kinetic energy

$$T^*(q, \dot{q}) \triangleq \sum p(q, \dot{q}) \dot{q} - T(q, p)$$

Lur' é 503

$$\frac{dp}{dt} = \frac{\partial T^*}{\partial q} - \frac{\partial V}{\partial q}$$

$$L(q, \dot{q}) \triangleq T^*(q, \dot{q}) - V(q)$$

$$\boxed{\frac{d}{dt} \frac{\partial L}{\partial \dot{q}} - \frac{\partial L}{\partial q} = 0}$$

Lagrange equations

AMd1-10; <http://discretephysics.dica.units.it>

$$\frac{\partial T^*}{\partial q} = -\frac{\partial T}{\partial q}$$

$$\frac{dp}{dt} = -\frac{\partial T}{\partial q} - \frac{\partial V}{\partial q}$$

$$H(q, p) \triangleq T(q, p) + V(q)$$

$$\boxed{\begin{aligned} \frac{dq}{dt} &= +\frac{\partial H}{\partial p} \\ \frac{dp}{dt} &= -\frac{\partial H}{\partial q} \end{aligned}}$$

Hamilton canonical equations