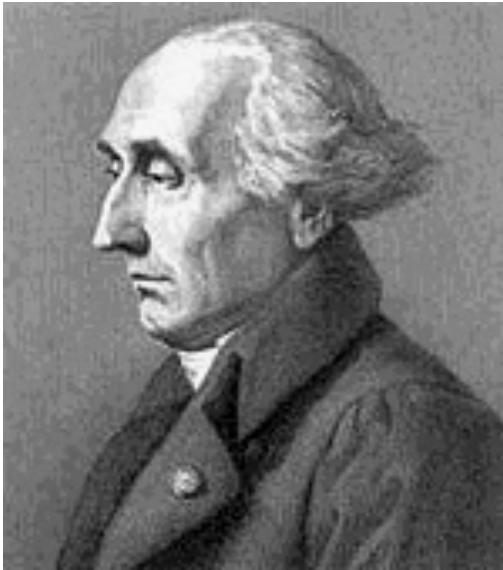


Joseph Louis Lagrange 1736-1813



Lagrangian

Euler Lagrange equation

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

Law of the Divirgent

Links volume integral with integral over enclosing surface

Lagrange multipliers – minimization with constrains

$$\nabla f + \lambda_1 \nabla g_1 + \lambda_2 \nabla g_2 + \dots = \mathbf{0}.$$

$$\iiint_V (\nabla \cdot \mathbf{F}) dV = \iint_S (\mathbf{F} \cdot \mathbf{n}) dS.$$

Scalar potential function in a conserving field

Vector field – force from the derivative