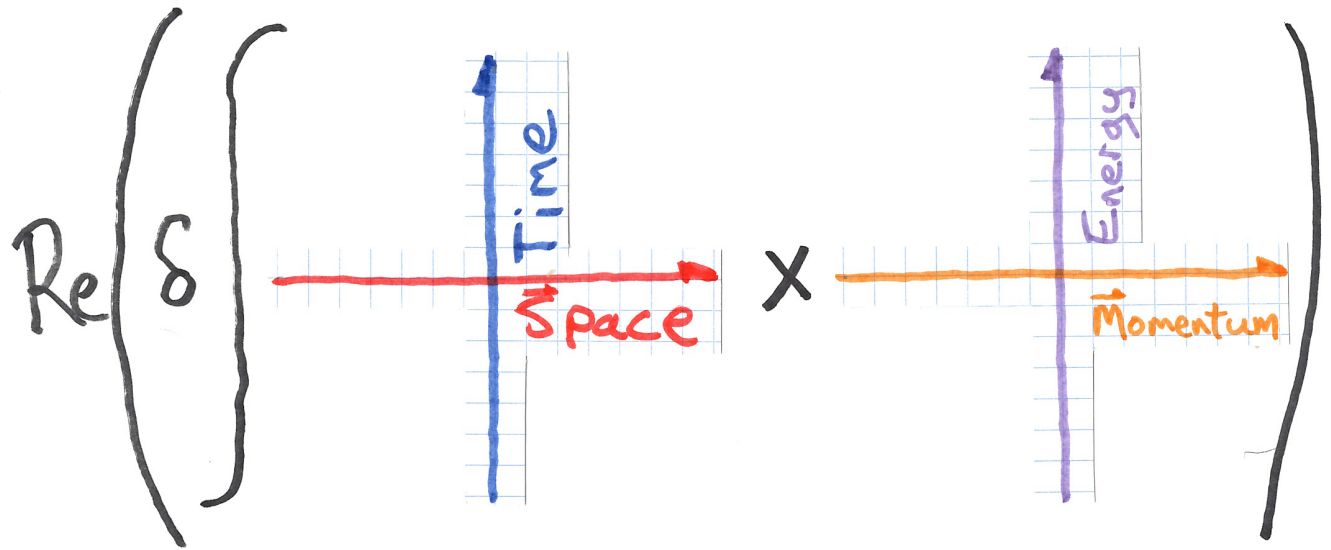


Symmetry and Conservation Physics

Find a symmetry that leaves the action unchanged, there is a conservation law.



$$\begin{aligned}
 \delta \text{ Action - Phase} &\equiv - \delta \int \overbrace{(dt, d\vec{R})}^{\text{Space-time}} \times \overbrace{(E, \vec{P})}^{\text{Energy-momentum}} \\
 &= - \delta \int (dt, d\vec{R}) m \left(\frac{dt}{d\tau}, \frac{d\vec{R}}{d\tau} \right) \\
 &= - \delta m \int \left(\frac{dt^2 - dR^2}{d\tau}, 2 \frac{d\vec{R}}{d\tau} dt \right) \\
 &= \left(\delta S, \delta 2 \frac{d\vec{R}}{d\tau} dt \right)
 \end{aligned}$$

Variations on $\underbrace{\quad}_{\text{the Action}}$ $\underbrace{\quad}_{\text{the Phase - more physics}}$

My proposal for more physics is to work with the phase terms to complete the stories in physics.