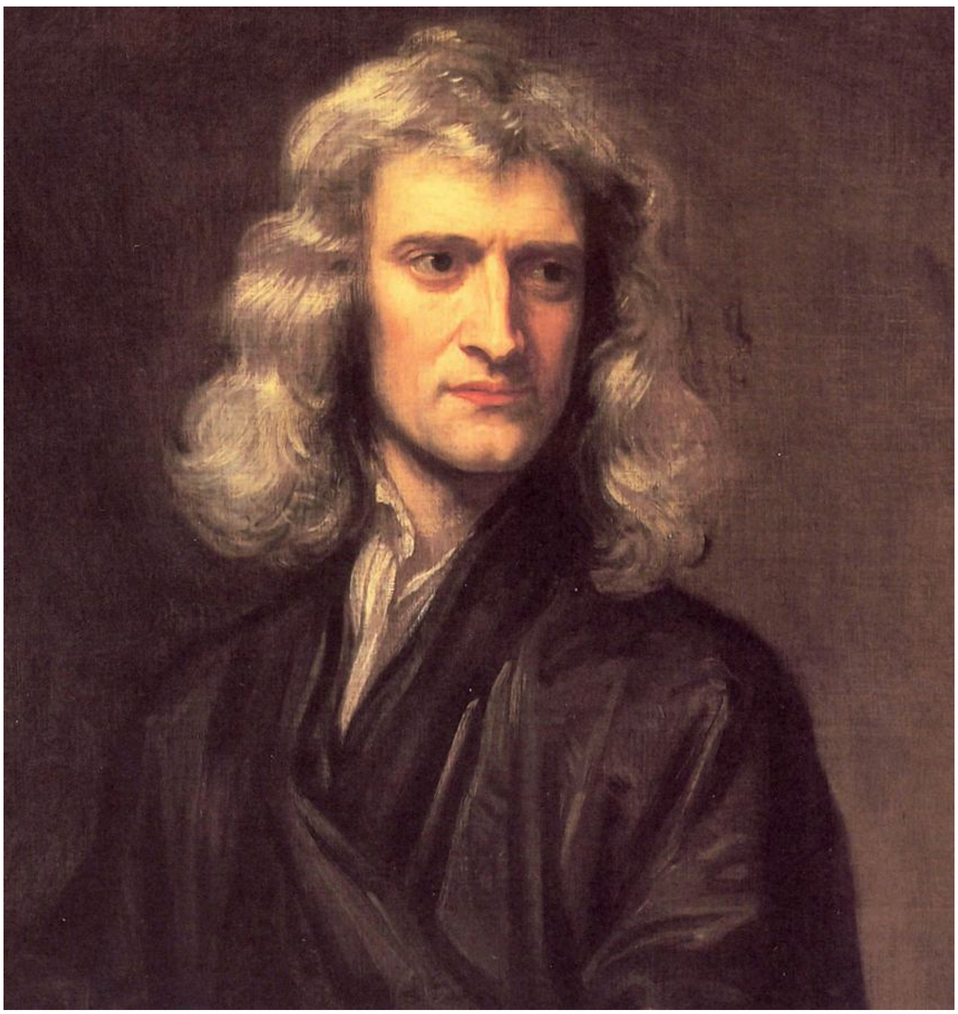
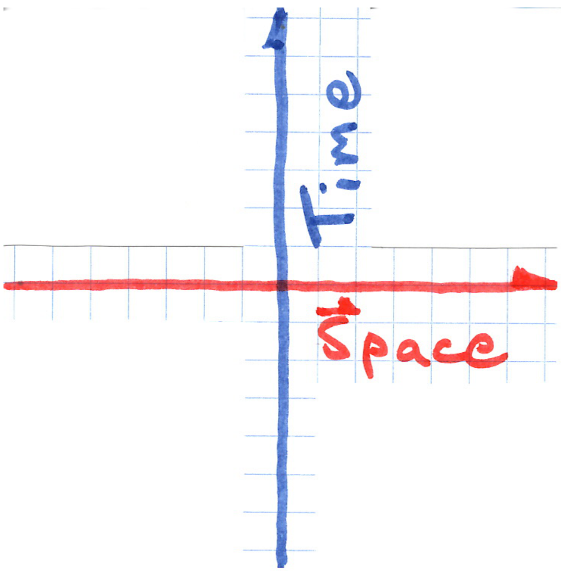
Sir Isaac Newton

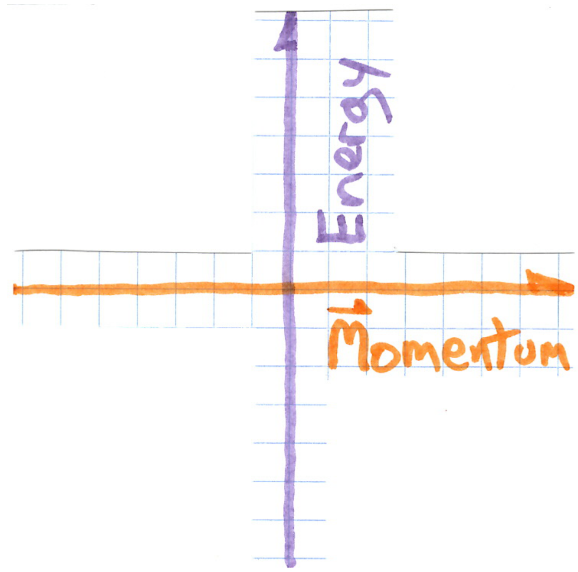
Founder of Mathematical Physics



Classical Physics

is time, space, energy, and momentum, isolated.





The new math is calculus.

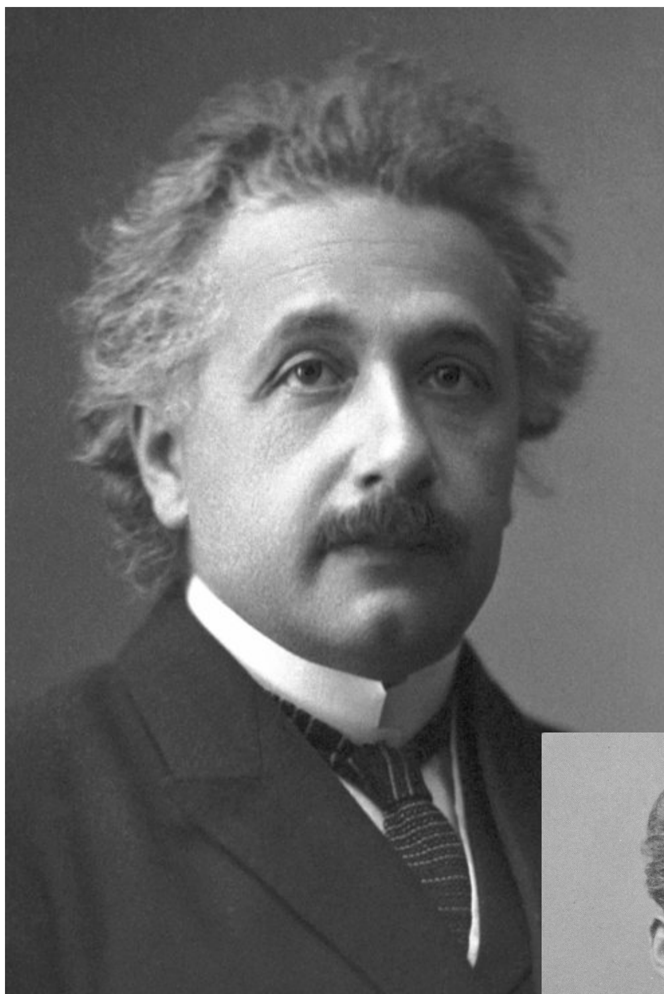
Time is absolute.

Space is absolute.

Calculus applied to time, space, energy, and momentum is rich enough to study even today.

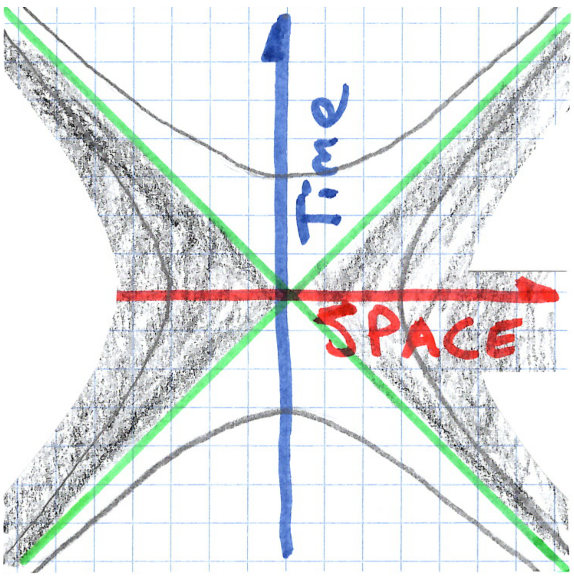
Albert Einstein,

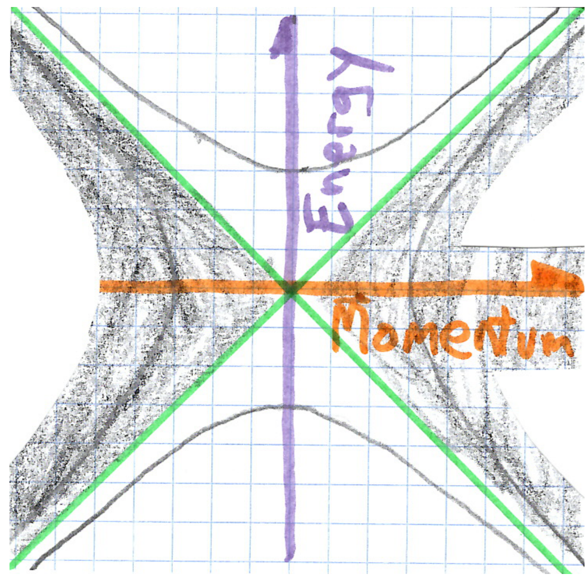
Hermann Minkowski:
The permanent union of **space-time** and energy-momentum.



Relativistic Physics

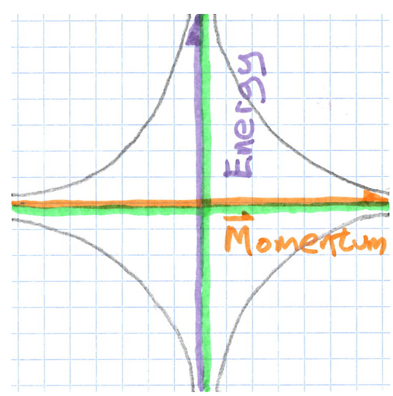
allows time to rotate into space,
energy to rotate into momentum.





The new math is the Lorentz group for space-time, and the Poincaré group for energy-momentum.

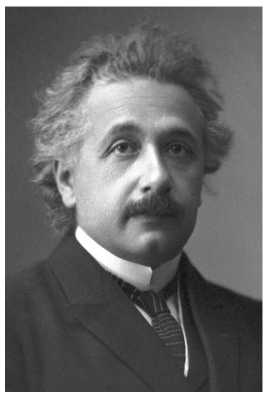
Events in the past-light cone - local events - can cause things that happen at the origin.

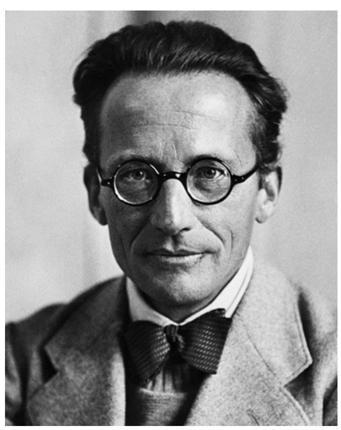


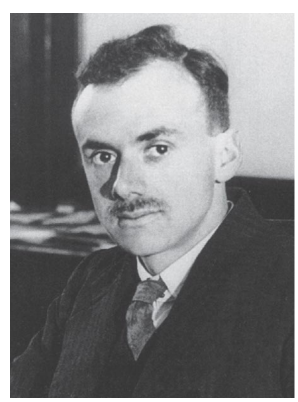
A new symmetry for gravity: energy times momentum is conserved for non-inertial observers in a gravity field. Works for light, experimental tests.

Planck, Einstein, Bohr, Schrödinger, Heisenberg, Pauli, Dirac

A team built quantum mechanics using non-local events - **not in the past light-cone.**

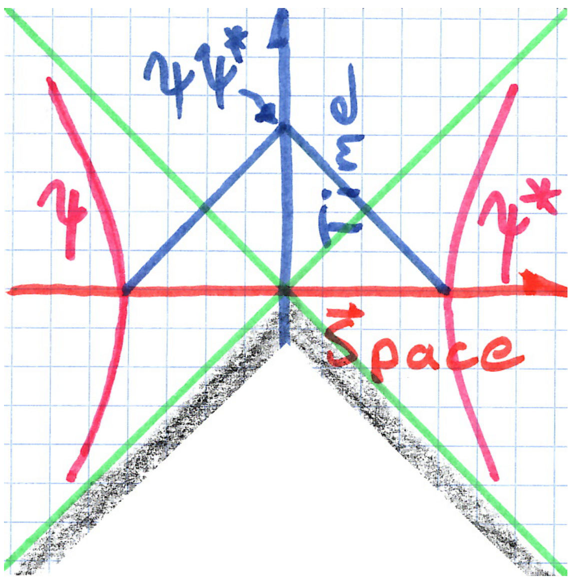



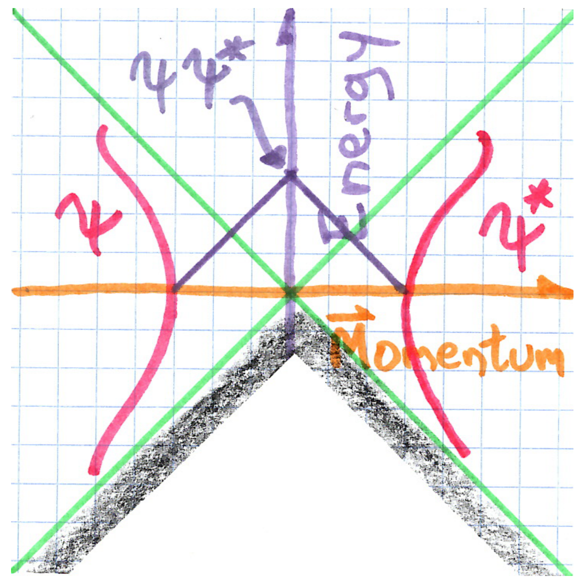


Quantum Physics

puts space-like information to use by creating a mirror image and calculating future event odds.





The new math is a complex-valued Hilbert space. I have had luck using quaternion series QM.

Events in the past-light cone (local events) are not in the wave function, the point of Bell's inequality.

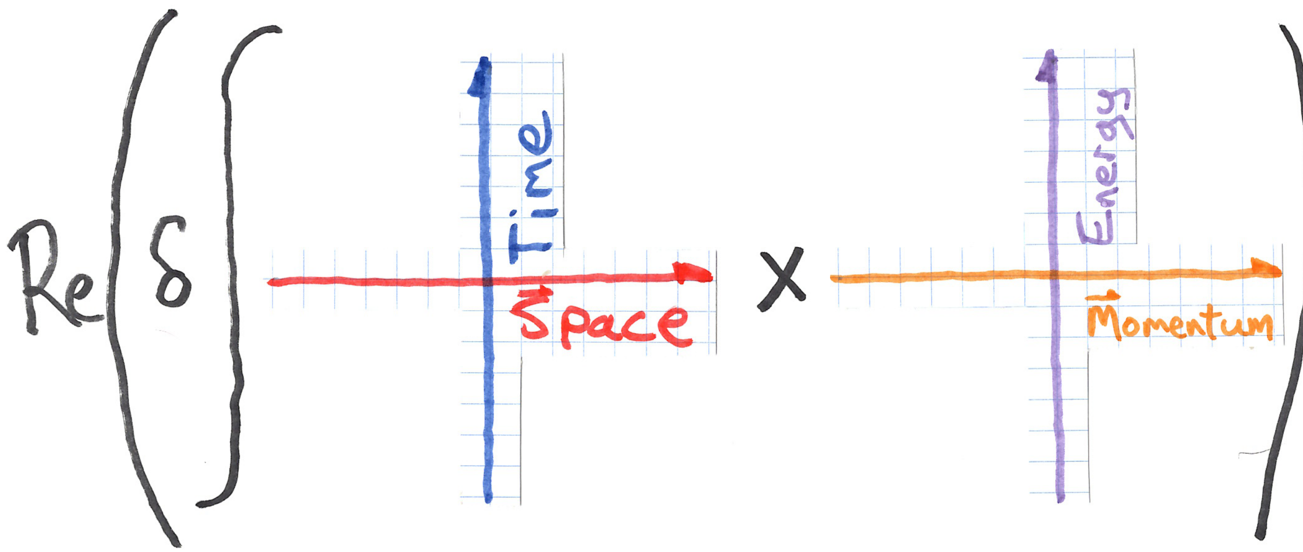
The product of a space-like separated wave function and its space-like separated conjugate is a real number function.

Emmy Noether

Provided the way to link all symmetries
to all conservation laws in all of physics.

Symmetry and Conservation Physics

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



$$\delta \text{ Action-Phase} \equiv -\delta \int \overbrace{(dt, d\vec{R})}^{\text{Space-time}} \times \overbrace{(E, \vec{P})}^{\text{Energy-Momentum}}$$

$$= -\delta \int (dt, d\vec{R})\, m\left(\frac{dt}{d\tau}, \frac{d\vec{R}}{d\tau}\right)$$

$$= -\delta m \int \left(\frac{(dt^2 - dR^2)}{d\tau}, 2\frac{d\vec{R}}{\partial\tau}dt\right)$$

$$= \Big(\underbrace{\delta S}_{\text{the Action}}, \underbrace{\delta\, 2\frac{d\vec{R}}{\partial\tau}dt}_{\text{the phase — more physics}}\Big)$$

Variations on

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