

For gravity relativity, we all see things differently and we all can agree to parts of squares

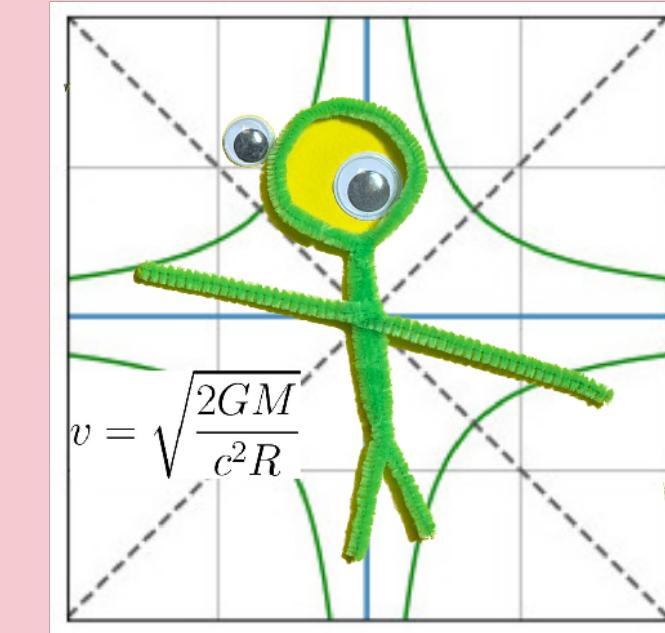
The third Spiritual Physics Research Series Discussions

Final Friday, Mar. 26, 2021

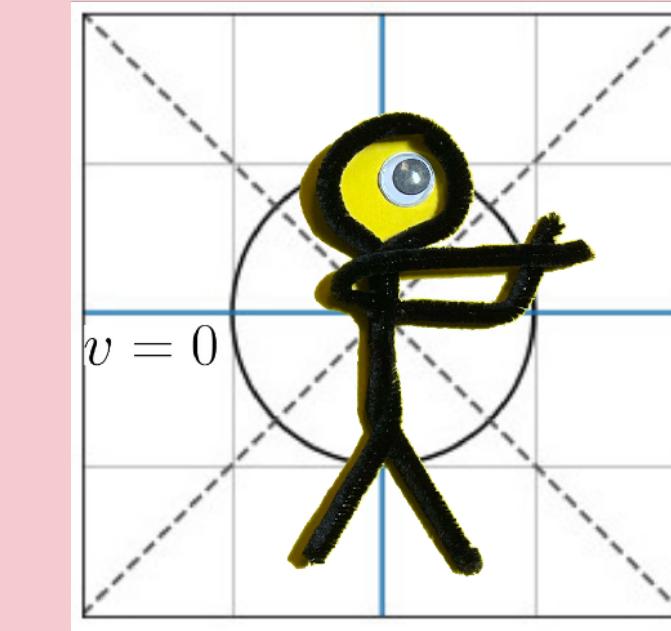
First Church Unitarian of Littleton, MA

Spiritual framing by Rev. Lara Hoke

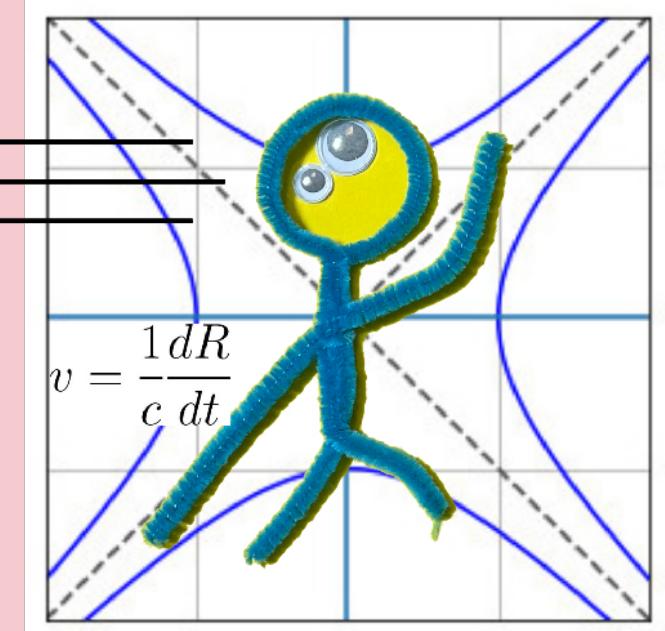
Physics research slide presentation by
Doug Sweetser
Slide design by Elle Sweetser



High Guy is
Gravity relativity



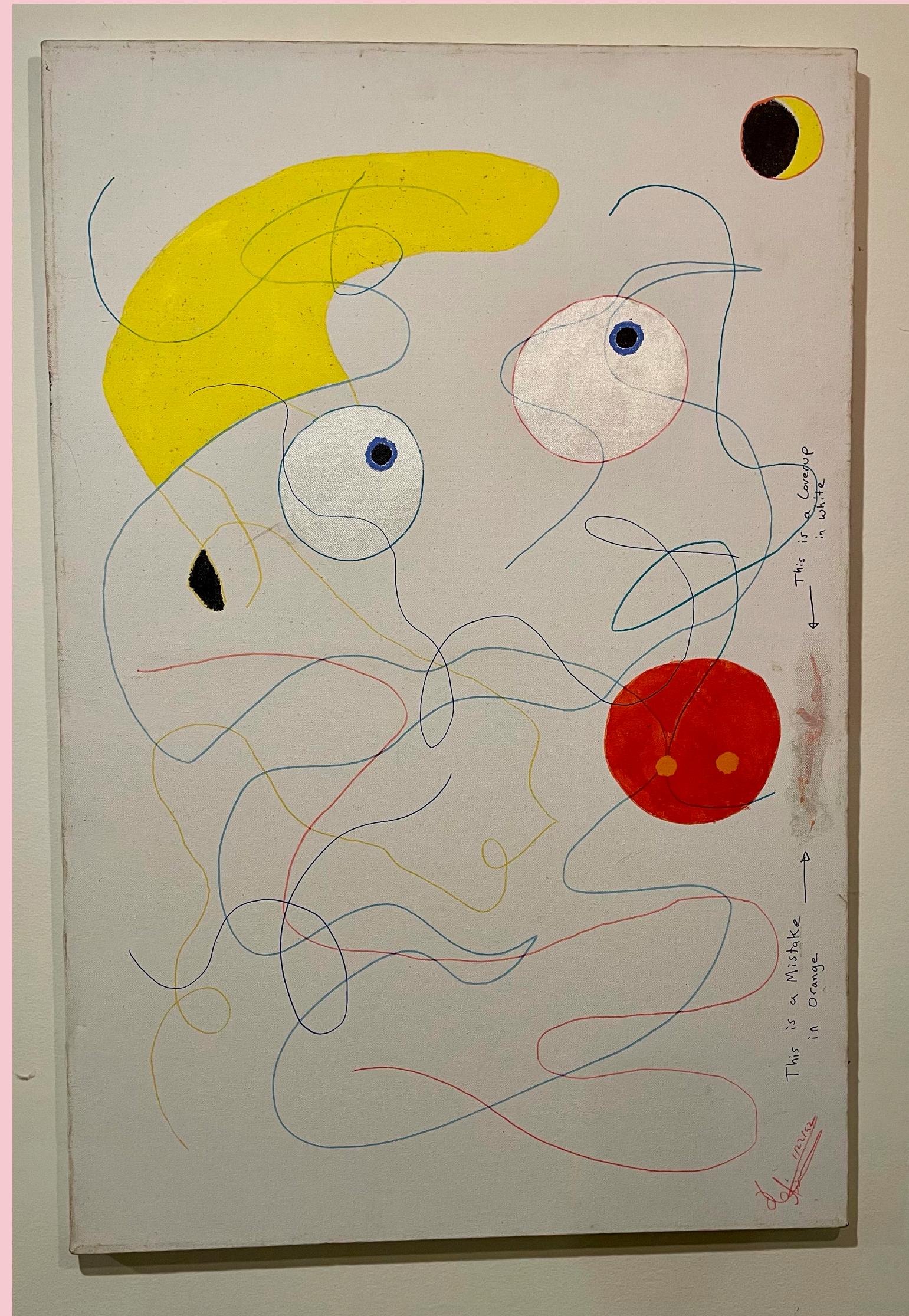
Me here-now



Zippy You is
Special relativity

Precise!
Relative disagreements lead
to calculated agreements

Self-portrait scribble-drawing looking at the moon



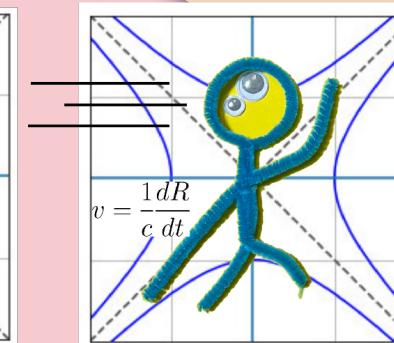
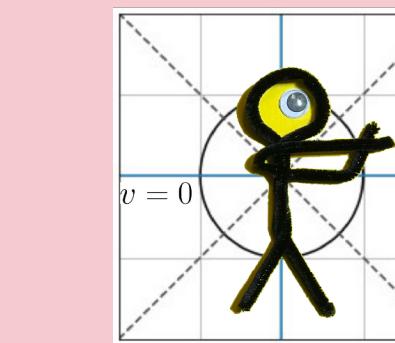
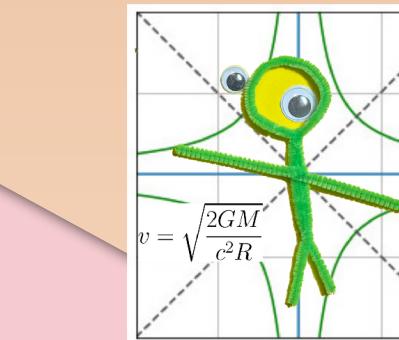
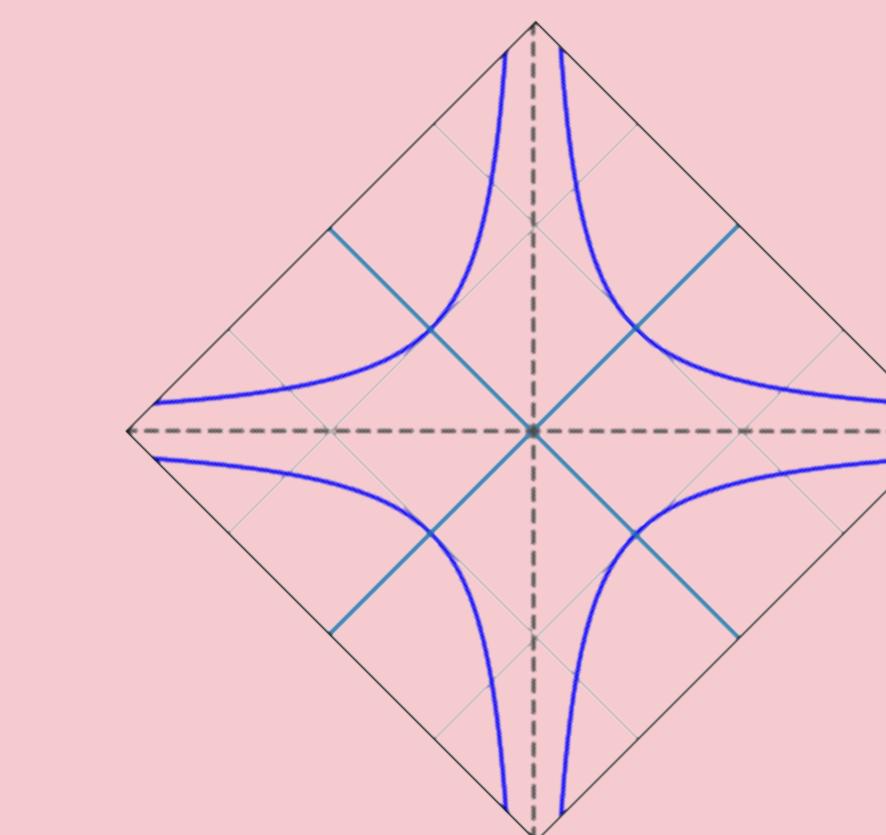
Outline for tonight's slides

Look at the t-shirt

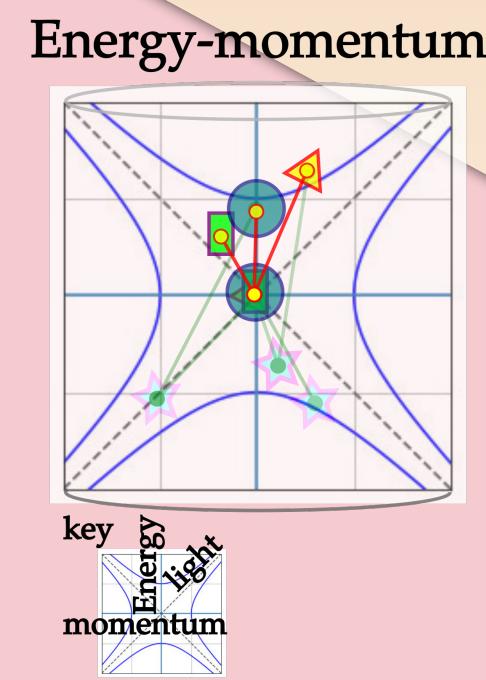
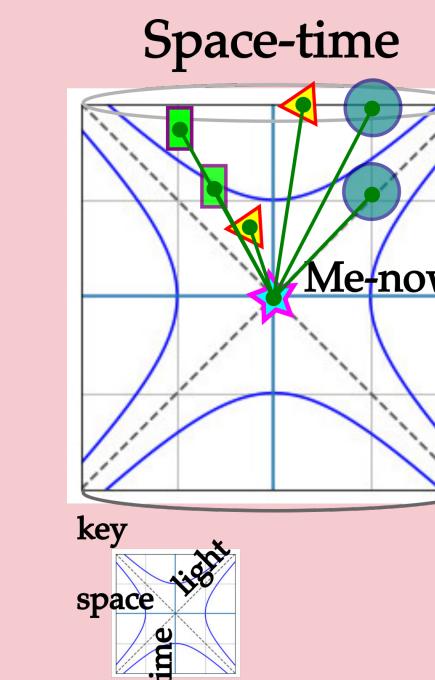
Review last discussion

Discuss commitment & intimacy

Look into inertia and gravity relativity

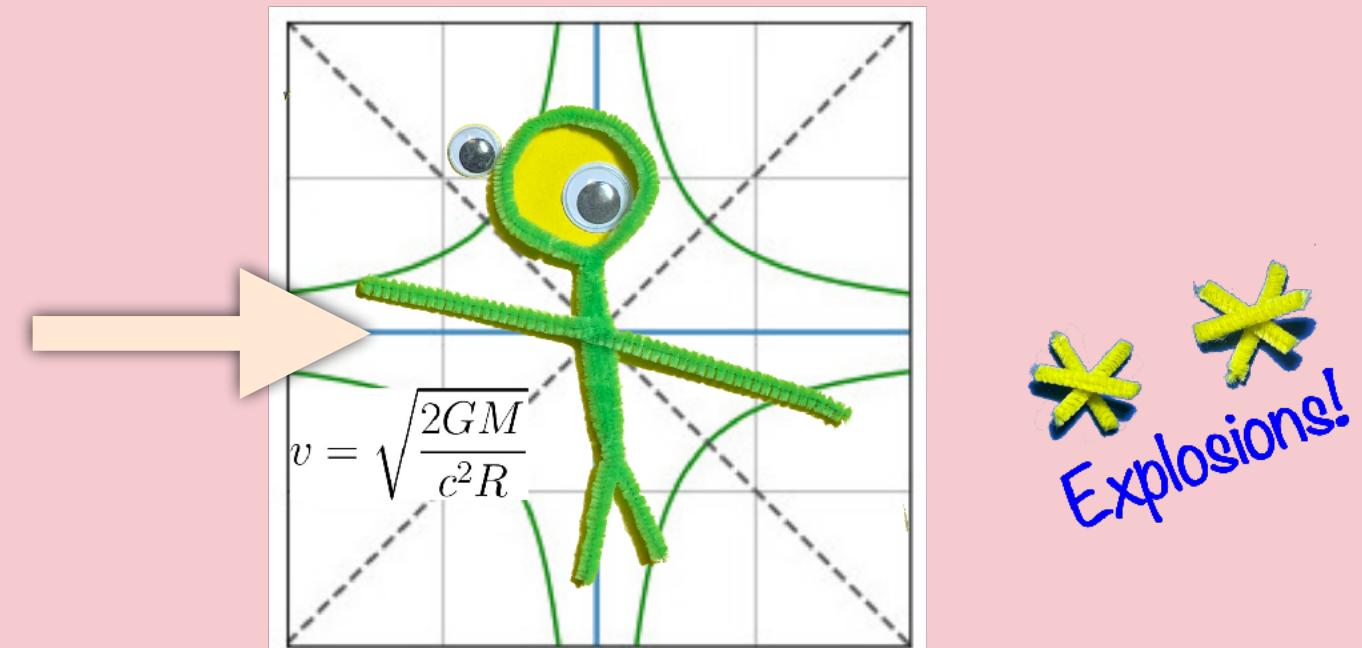


Precise!
Relative disagreements lead
to calculated agreements

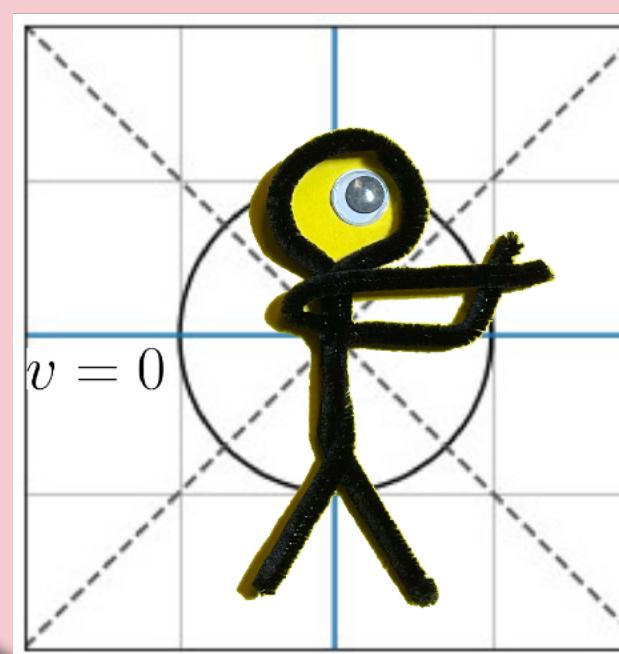


Relativity is about 2 people looking at exactly the same thing

Gravity



High Guy is
Gravity relativity

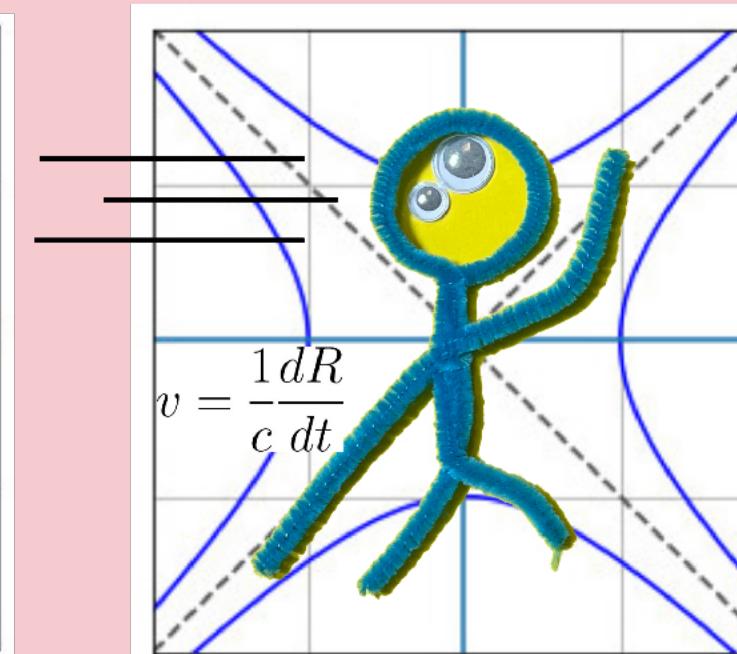


Me here-now

Precise!

Relative disagreements lead
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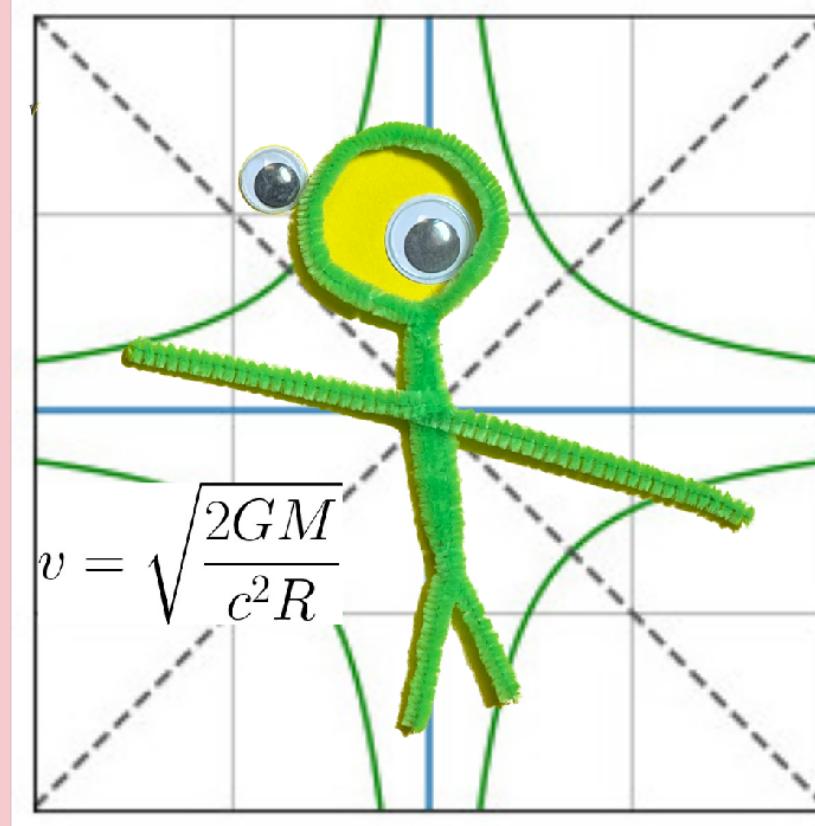
Exactly the same thing,
So you MUST agree
On something



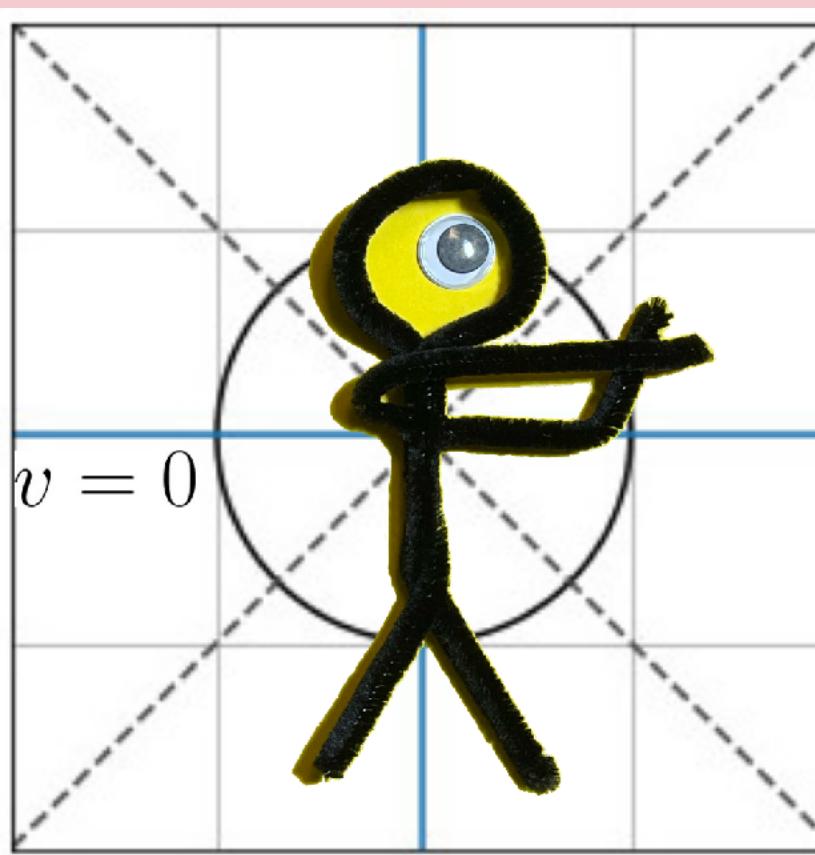
Zippy You is
Special relativity

Done:
speedy relativity

We all see the Universe differently and We can all agree on parts of squares



High Guy is
Gravity relativity



Me here-now



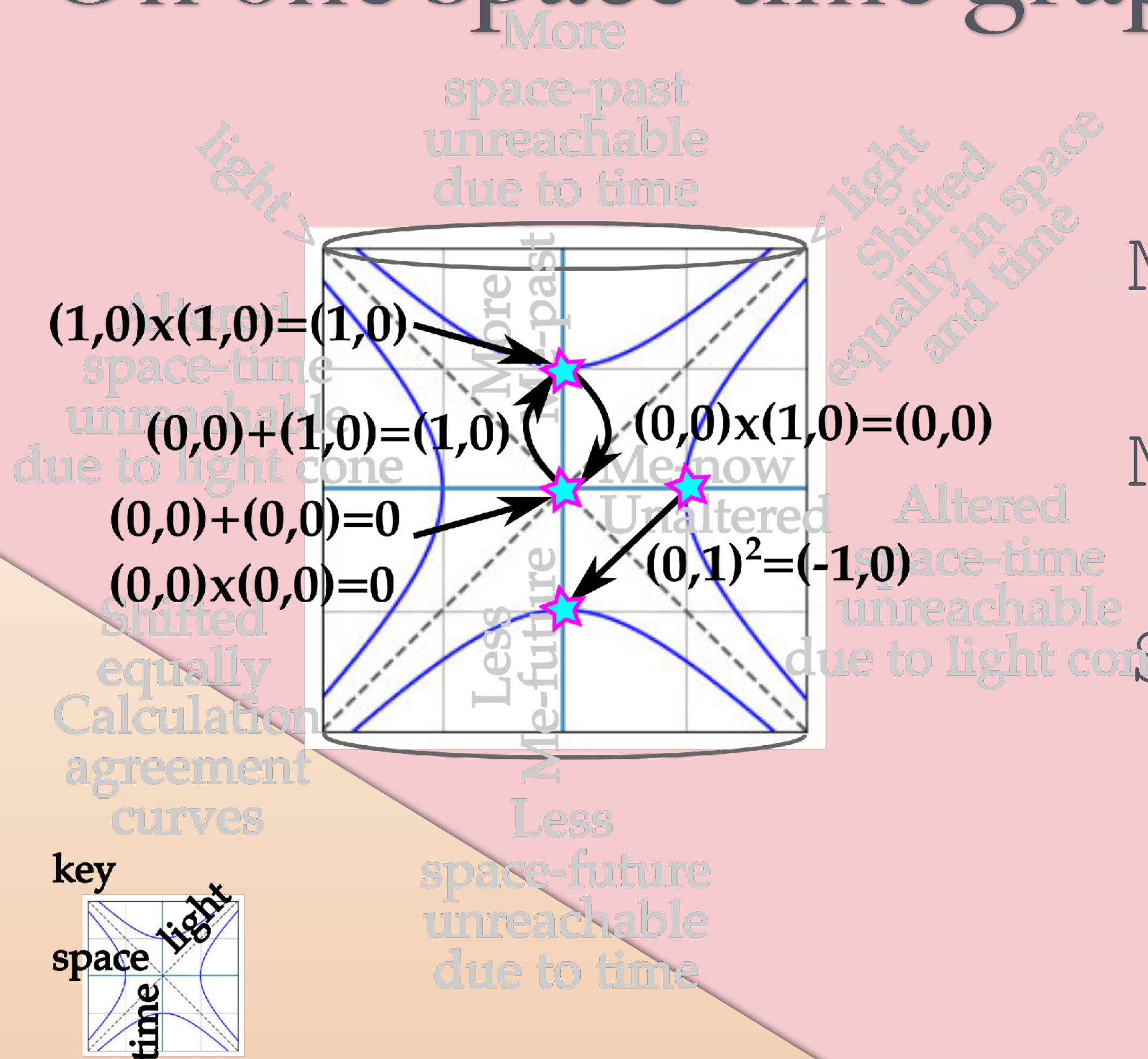
$$(dt, dx, dy, dz)^2 =$$

$$(dt^2 - (dx^2 + dy^2 + dz^2), 2dtdx, 2dtdy, 2dtdz)$$

~~explosions!~~

The 5 most important equations in physics

On one space-time graph

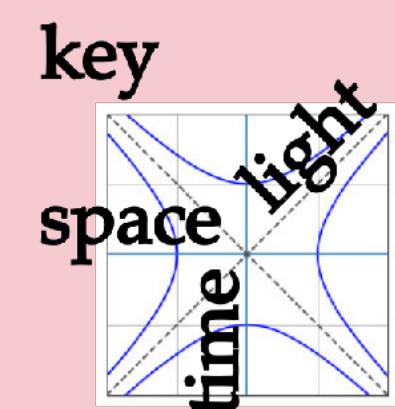
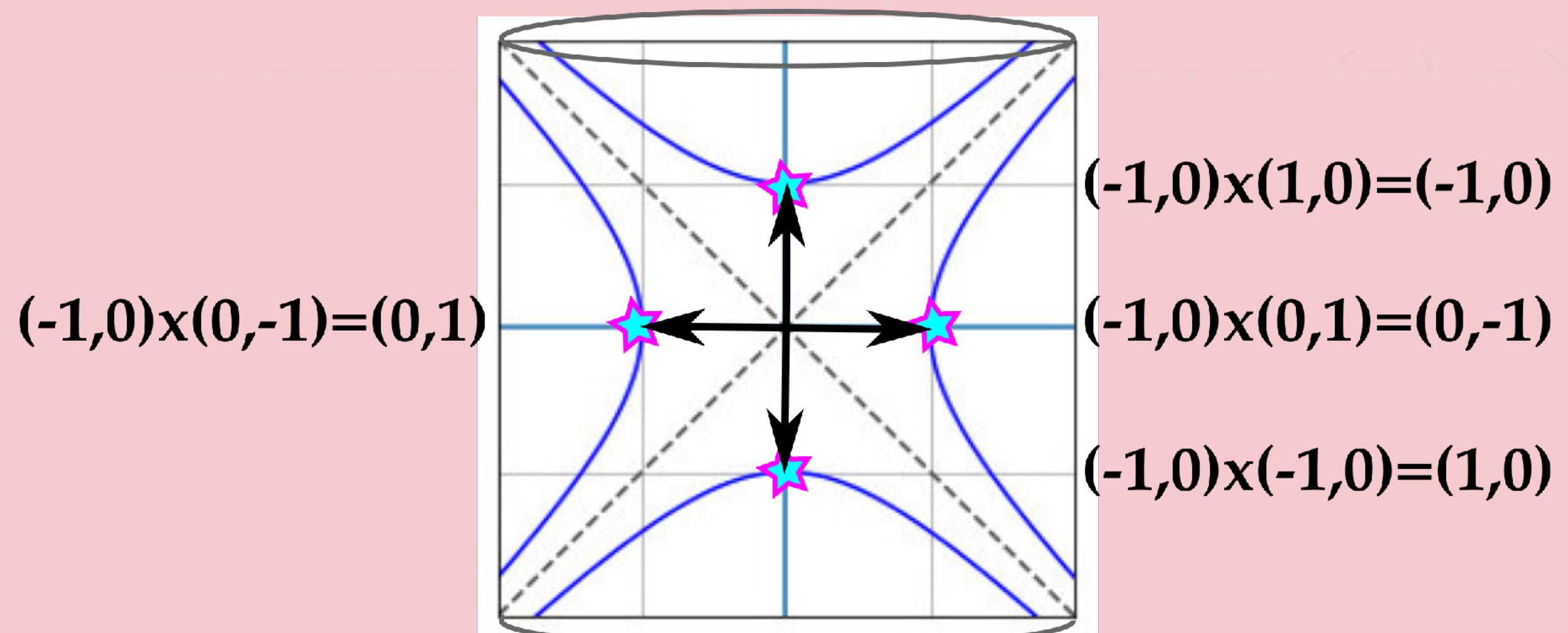


Me-now remains Me-now

Me-now remembers the past

Square there-now to here-future

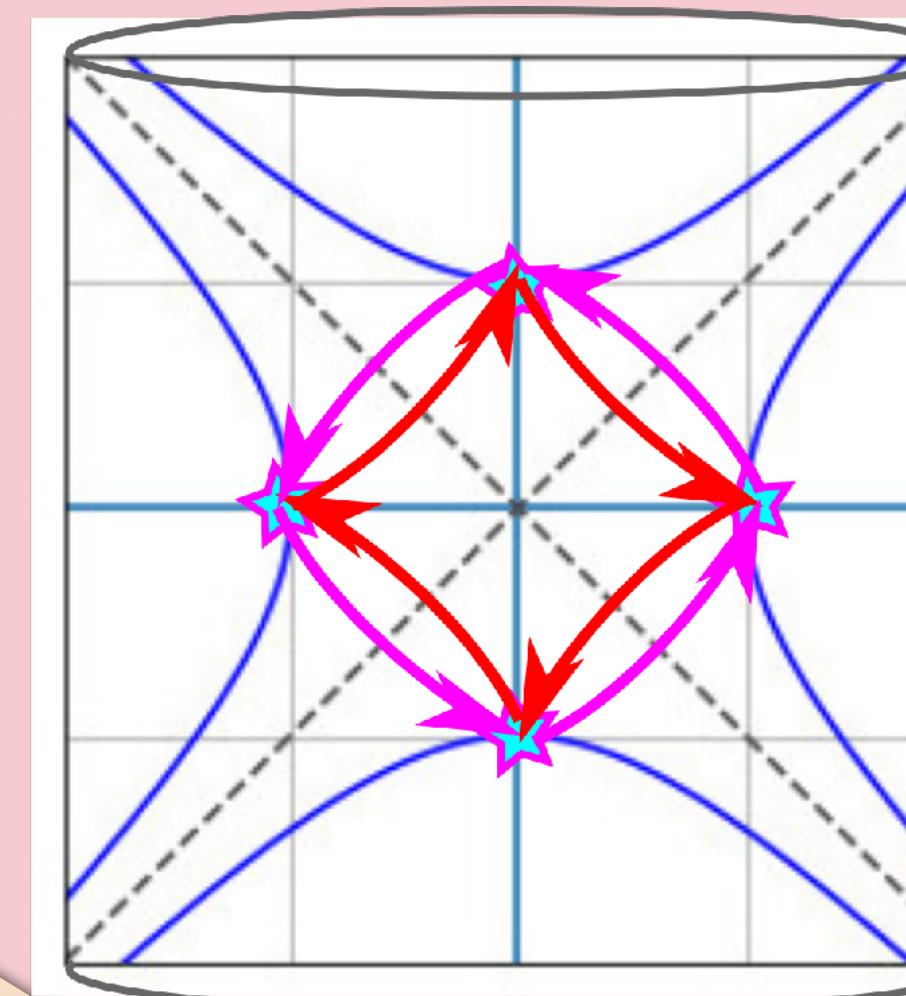
Create anything by putting the future-here (-I, o) to work. The past-here (I, o) will change nothing



(-1, 0) times numbers changes things

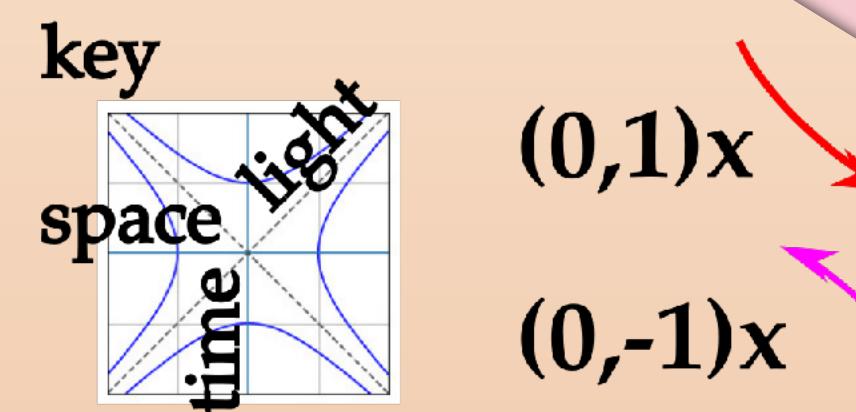
(+1, 0) times numbers does not

Multiply by there-now spins the world around me-
now one way. Use a minus for the other way

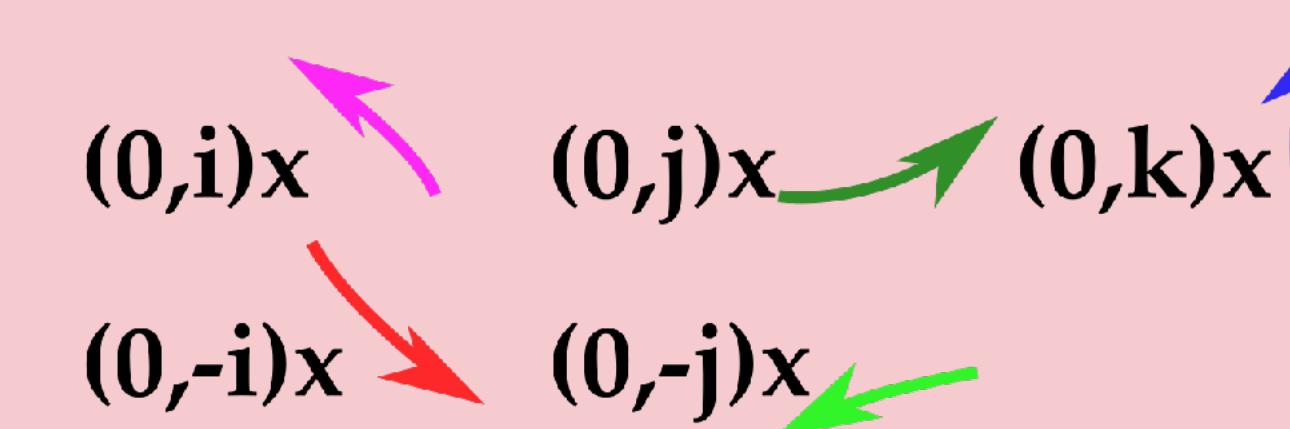
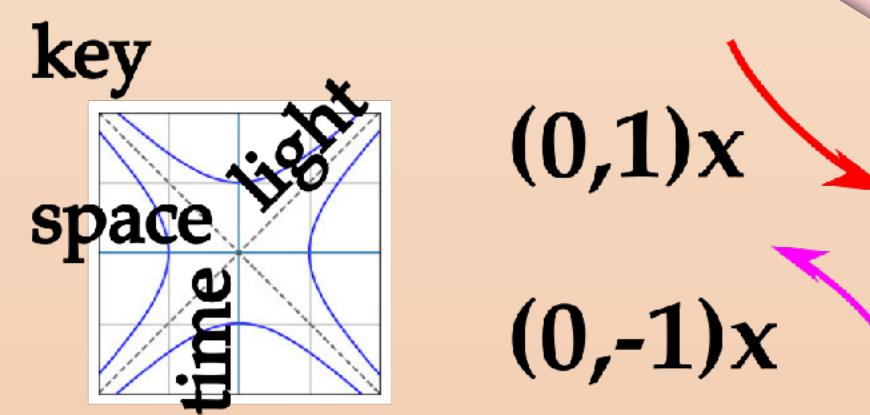
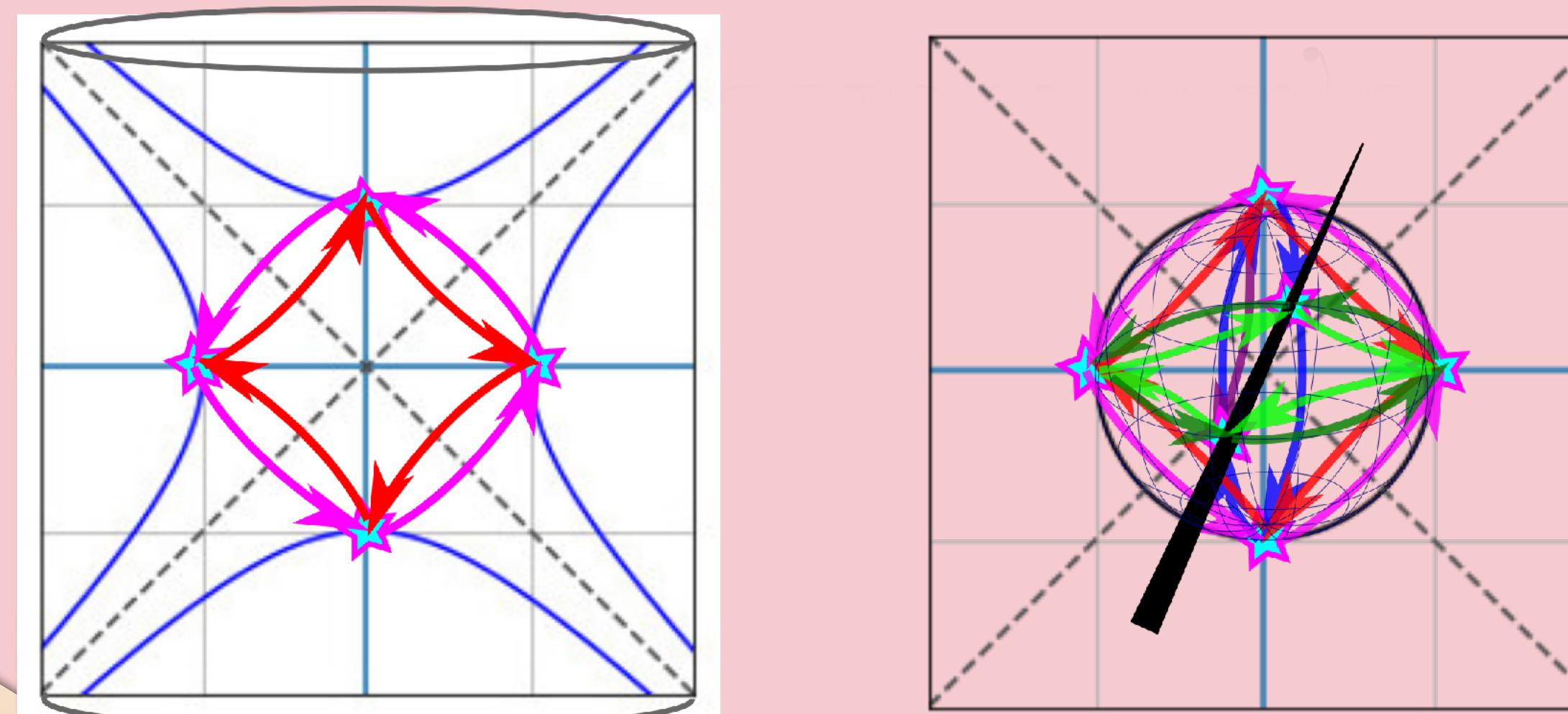


$(0, +1) \times \text{a number}$ goes
clockwise

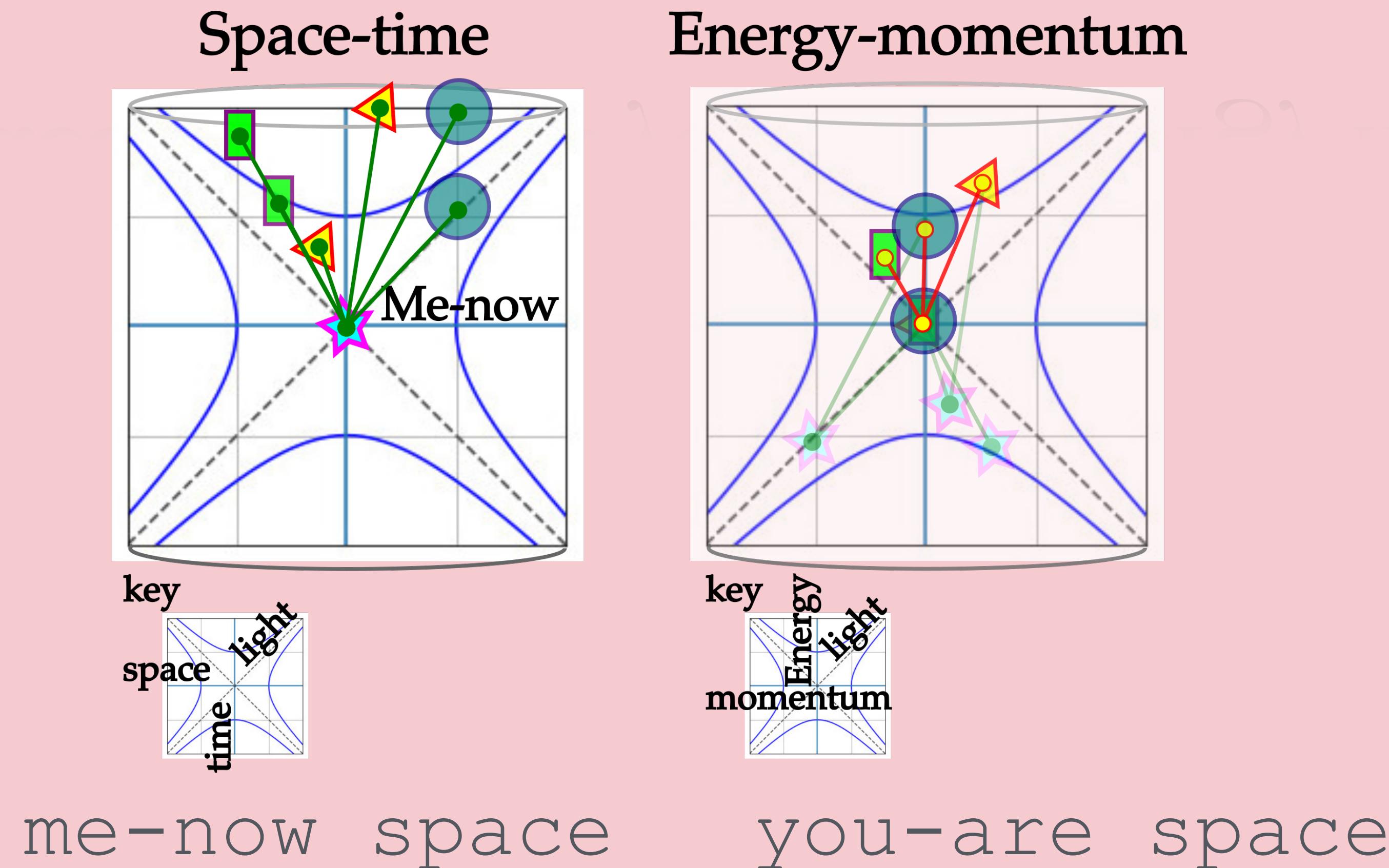
$(0, -1) \times \text{a number}$ goes
counterclockwise



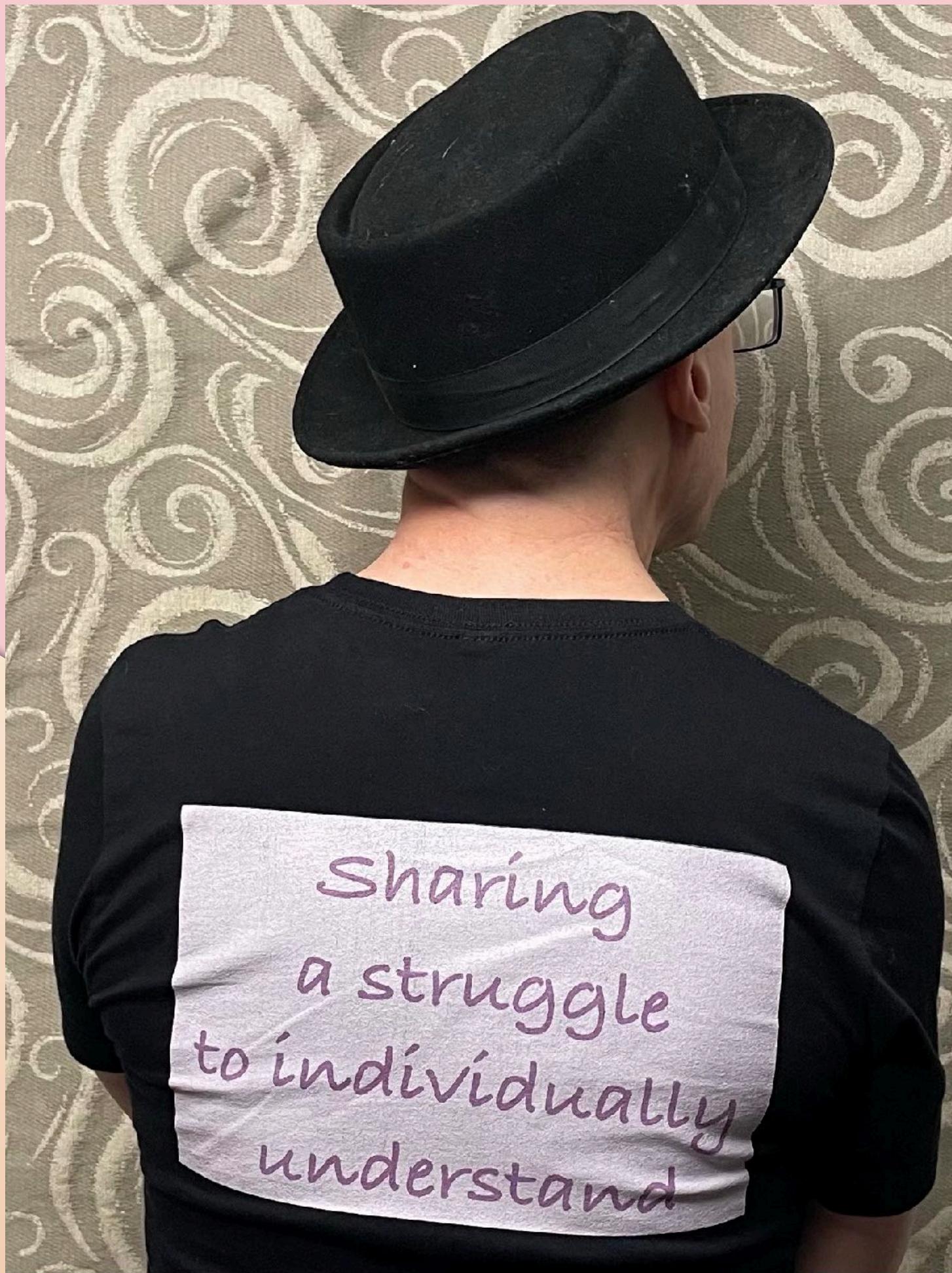
Multiply by 3 there-nows spins the world around me-now in all possible ways



To describe things, we need both me-space
(space-time) and you-are (energy-momentum)



Commitment to the spiritual physics research discussion group



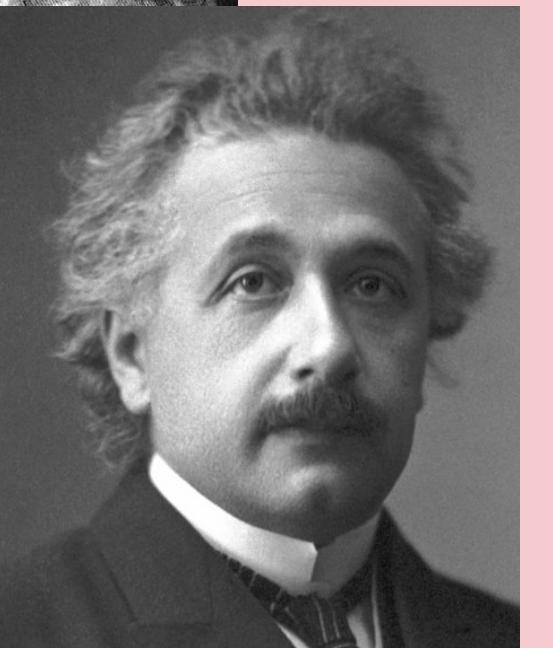
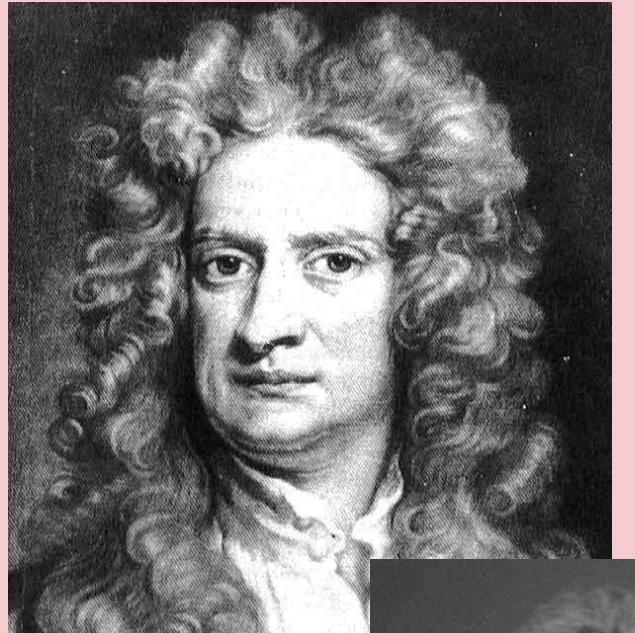
An hour and a half
On a Friday
For 5 months

The Karma Sutra, 7 books on living-well and direct discussions on topics of love

An ancient guide to a very wide range of subjects in relationships: flirting, finding a partner, and details on making diverse love. Via “the third sex”, is a precursor to current LGBTQ+ issues

Wish I had spent more time in serious study with this collection of old and still true observations

Intimacy of time and space



Newton: time is absolute
Space is absolute

Einstein: time can rotate into space
Energy can rotate into momentum

21st century: physics is only about all possible intimate relations of time with space and energy with momentum. Quantum mechanics is about repeated patterns of intimate relations



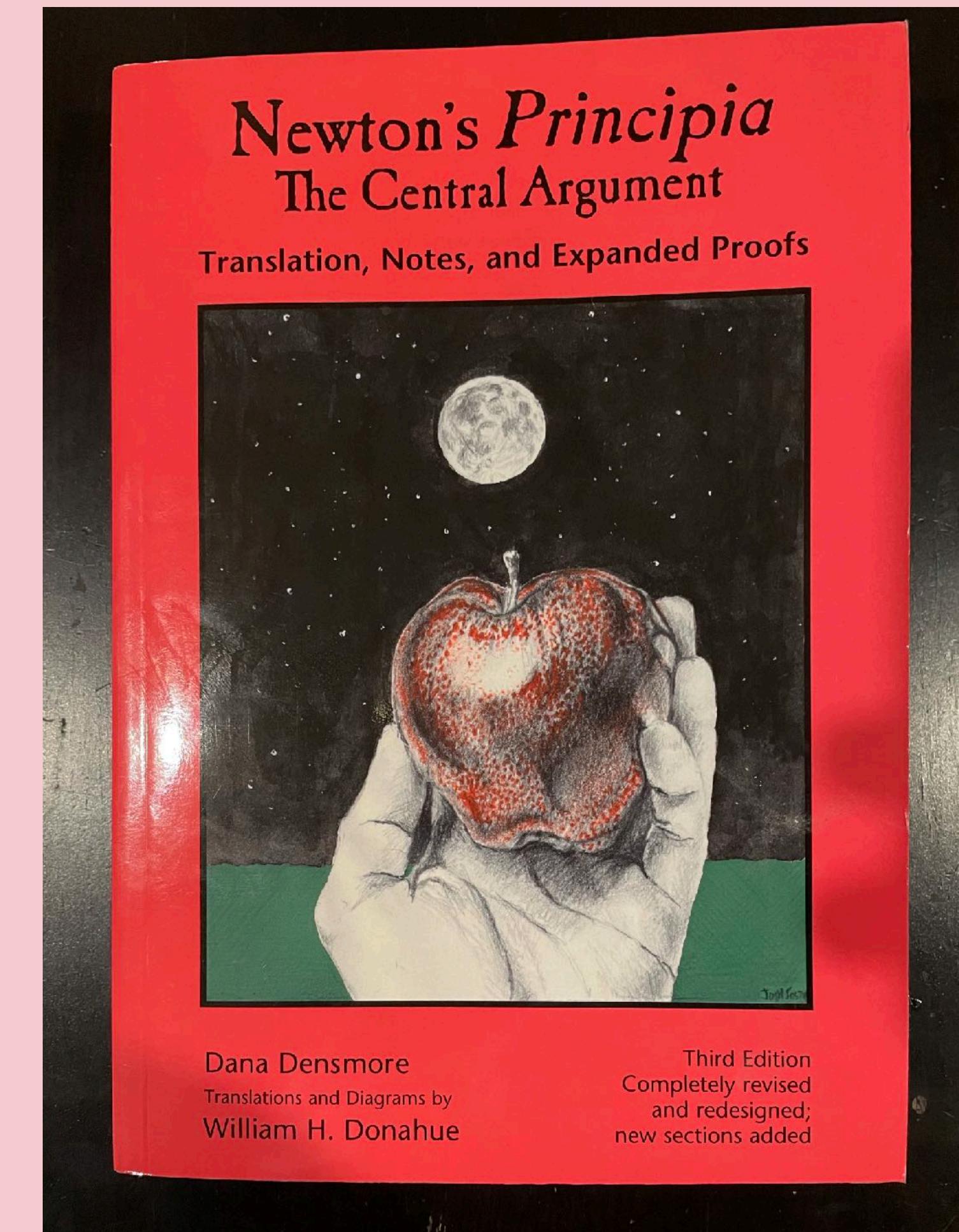
The FIRST LAW in Newton's Principia is about Inertia - an object in motion stays in motion

This is the exact opposite of what Aristotle said

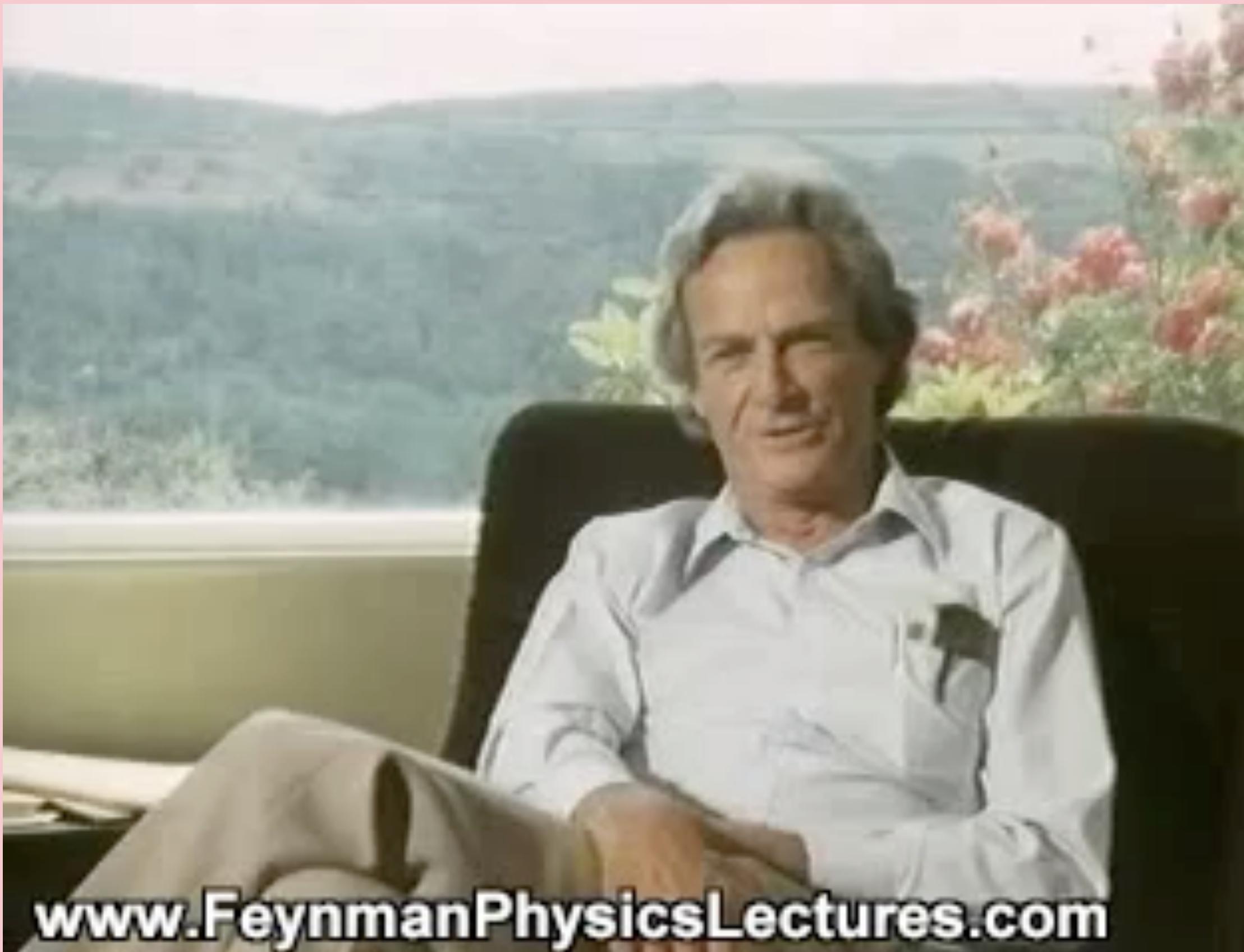
Newton had to create an ideal world without friction in his mind

Why?

No reason was given in 1687



Feynman's father says no progress has been made on why things resist change



www.FeynmanPhysicsLectures.com

Observe and be honest

Jargon vs Understanding

Be patient

Respect the struggle

I was not happy to have to tell you this truth
...so I got to thinking...(research)...

I use explicit descriptive words over words
physicists use to make it easier on my brain

Speedy relativity

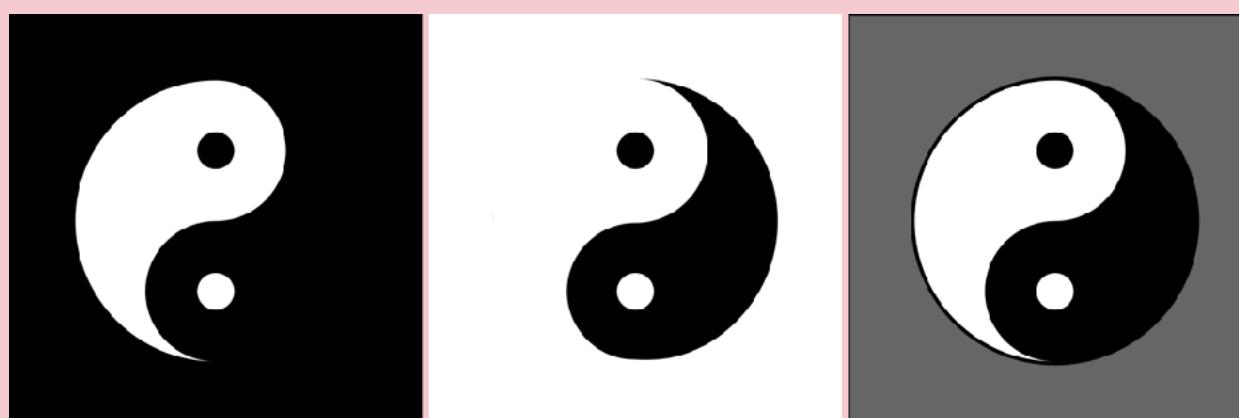
Special relativity

Space-time numbers

Quaternions

Momentum-energy

Momentum OR energy



The two most important types of momentum
are linear and angular momentum

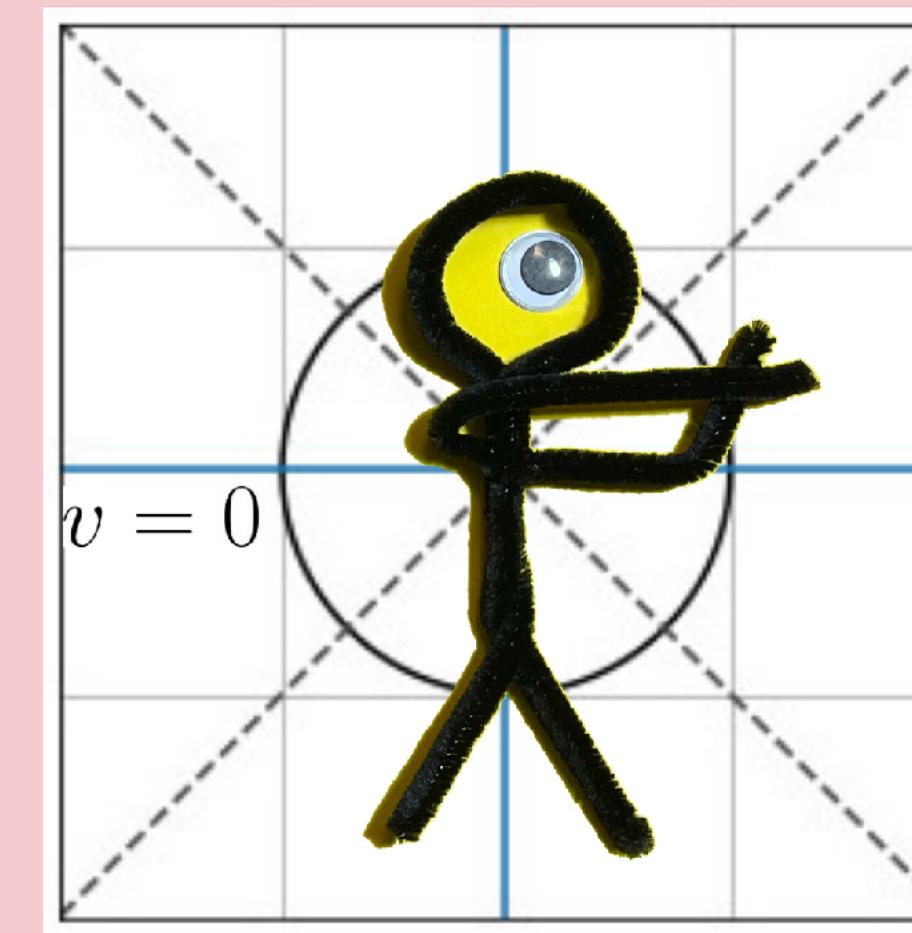
NO !

Linear-momentum-energy
AND
Angular-momentum-energy

New words !

Time to play !

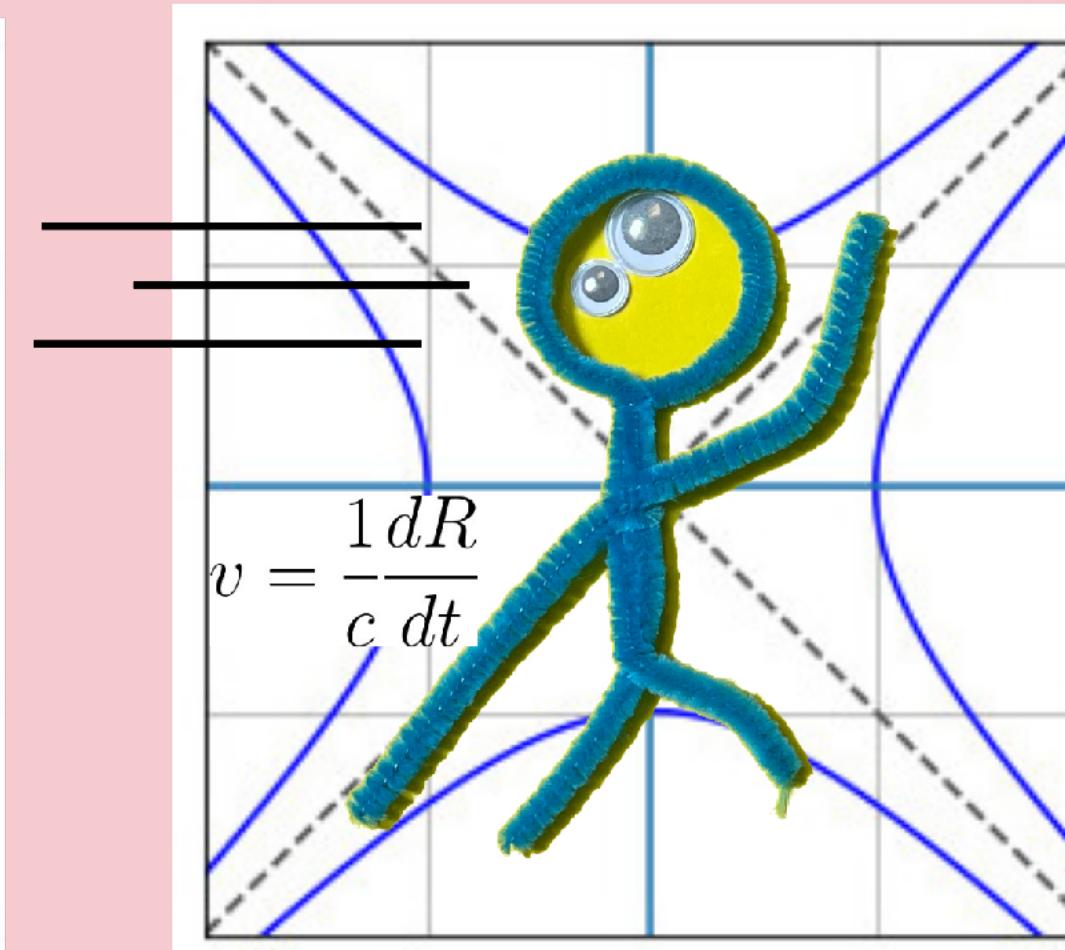
Linear-momentum-energy is about speedy relativity



Me here-now

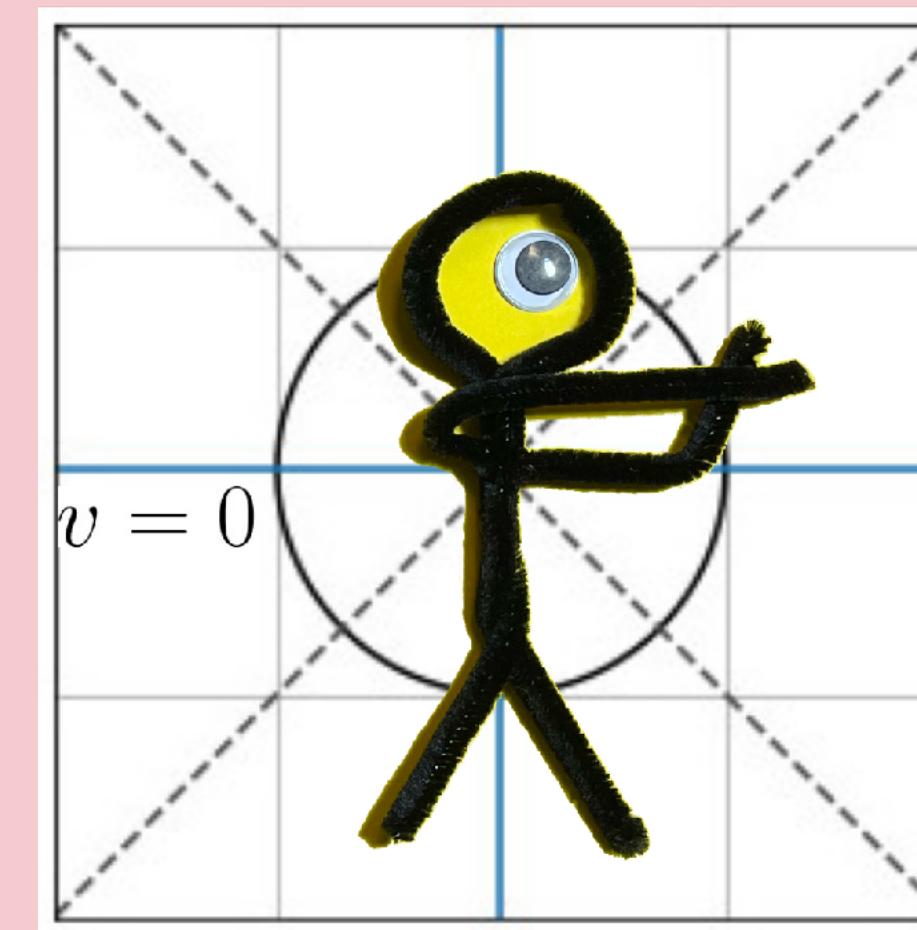
Precise!

Relative disagreements lead
to calculated agreements



Zippy You is
Speedy relativity

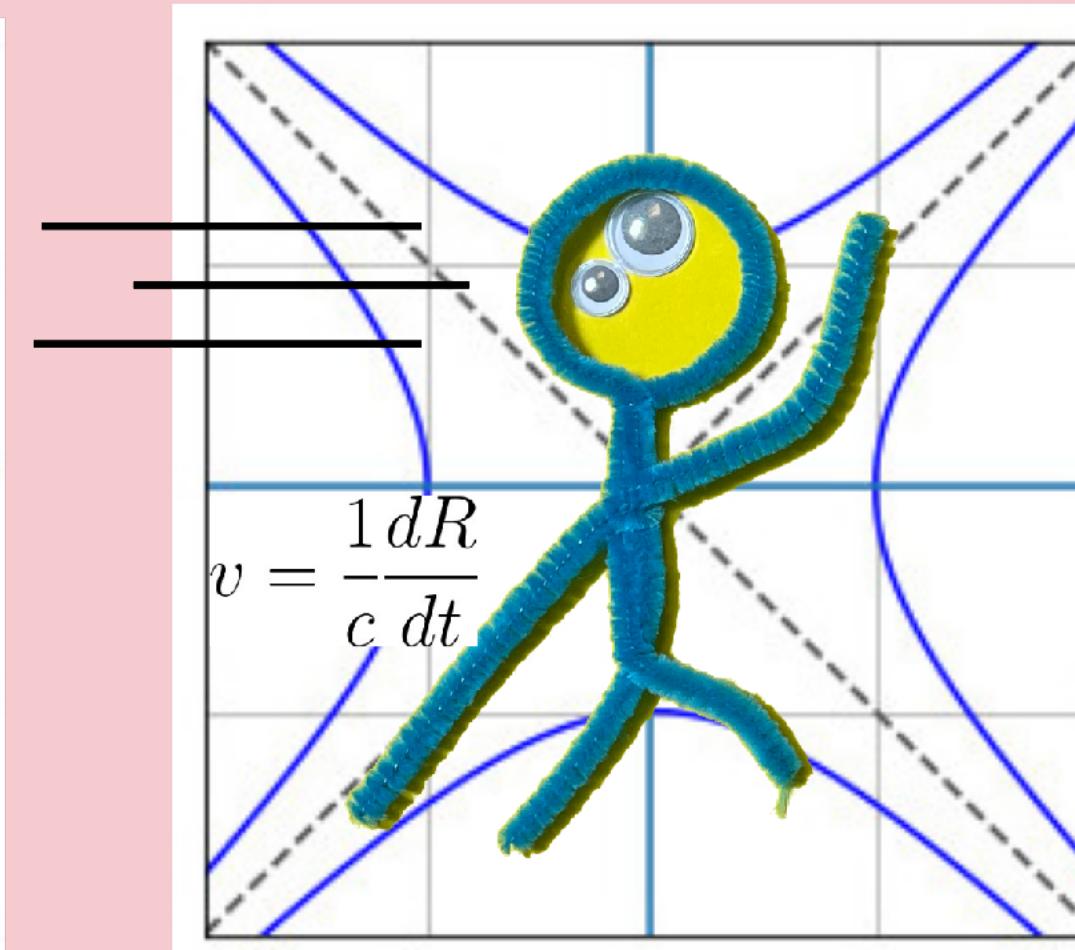
More descriptive: Leaving-momentum-energy is about speedy relativity



Me here-now

Precise!

Relative disagreements lead
to calculated agreements



Zippy You is
Speedy relativity

Angular-momentum-energy is about ?

It should be just as important as speedy relativity

Angular - sounds like jargon, go descriptive

Returning-momentum-energy stays in a place,
so could be about inertia

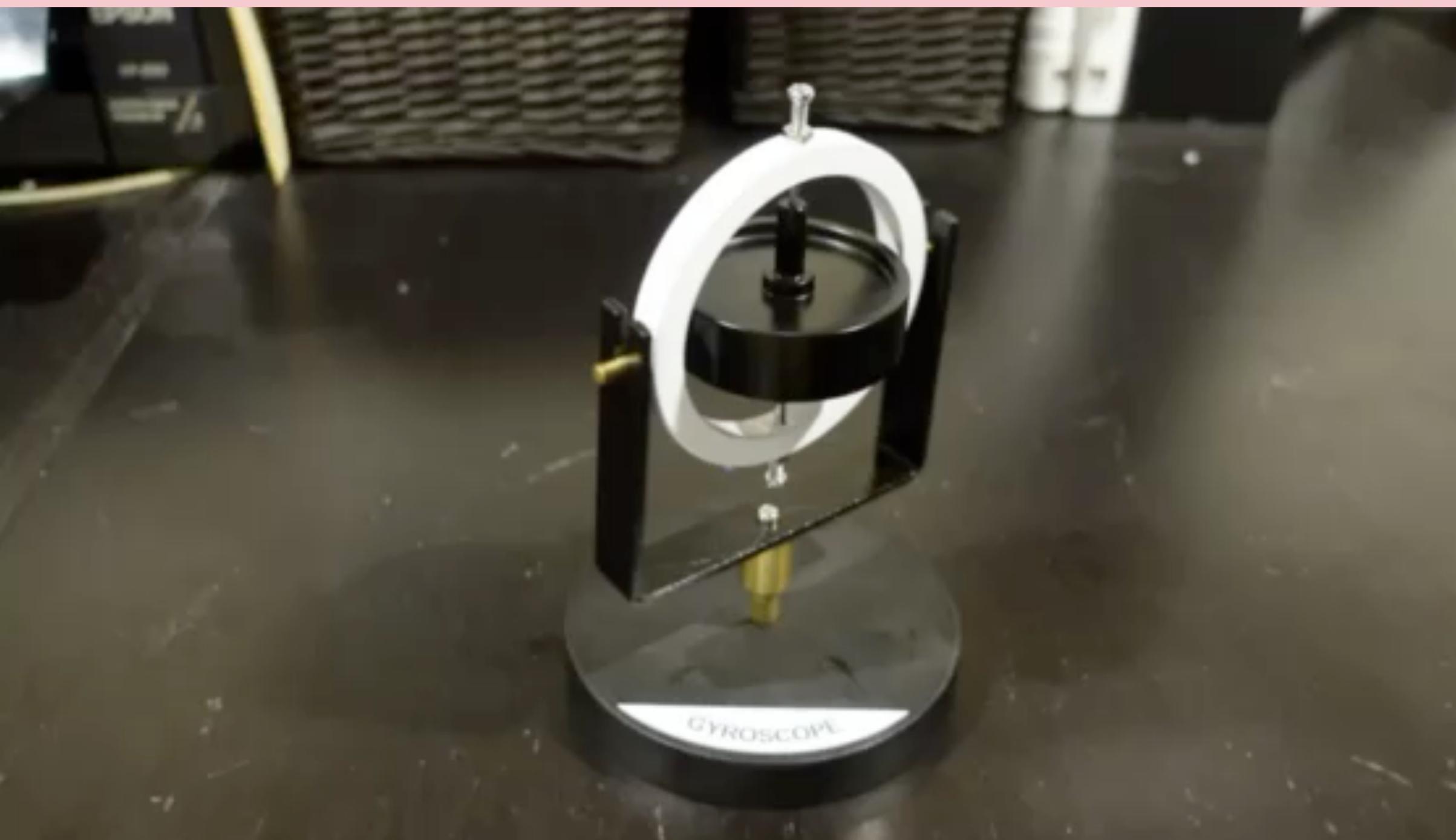
Returning-momentum-energy is a top



Returning-momentum
Points in a direction

Its energy does not
point

Returning-momentum-energy resists being changed, moving in odd ways (like teenagers)



Returning-momentum
Points oddly
(cross product)

Moving it
is a struggle

Imagine 10^{23} returning-momentum-energy tops!



All the random pointing would cancel

All the energy would add

The new idea:
Inertia is randomized
returning-momentum-energy

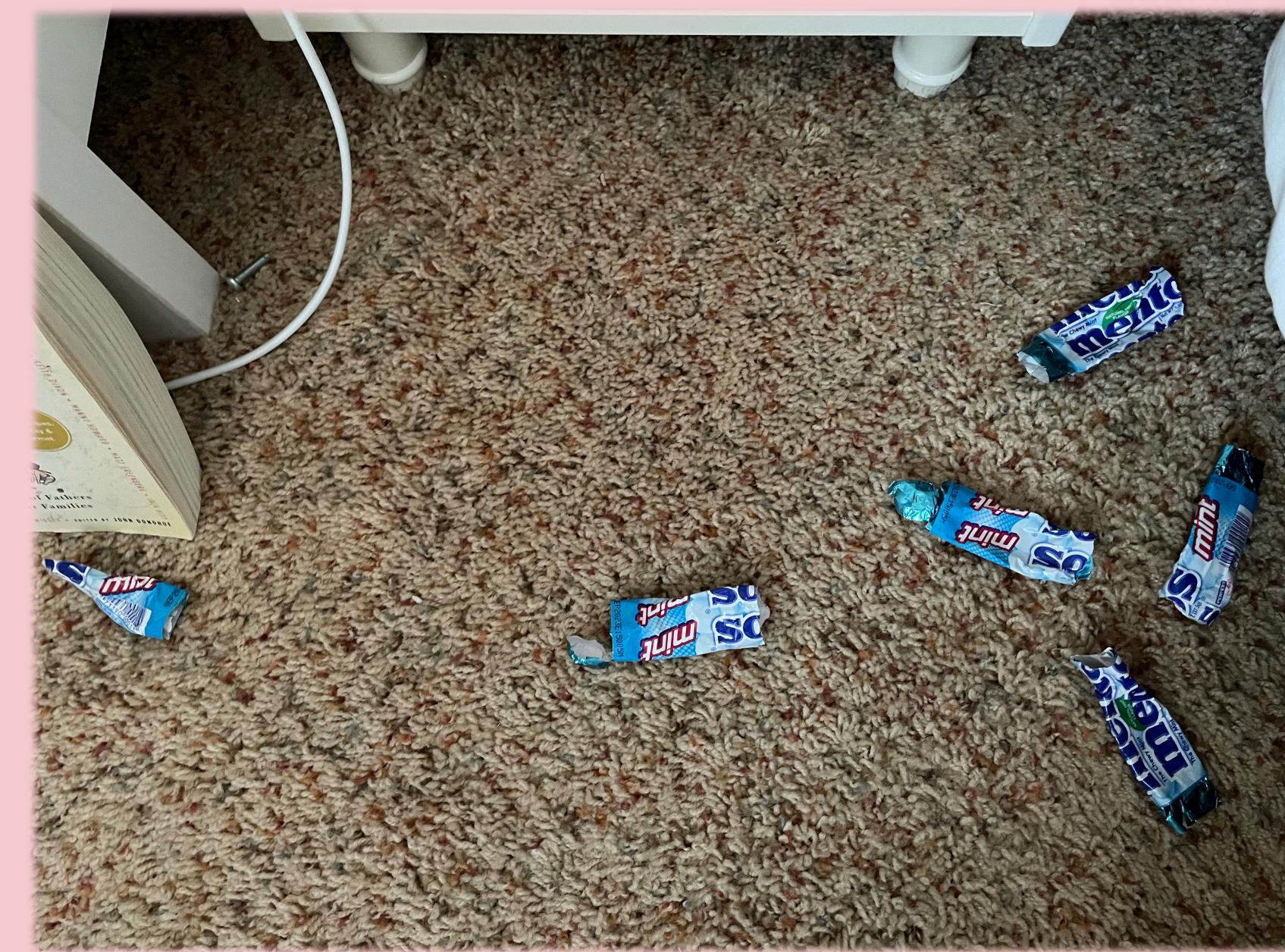
Mostly quantum-returning-momentum-energy, so
who knows what that means yet



Feels like a step forward

More steps needed

March 3, it felt like I rearranged information in my brain. I went through lots of mentos



Einstein's theory for gravity - is it an easy idea or impossibly hard to understand? BOTH

Painter falling from a roof - feels no gravity

The equivalence principle:
Gravity = acceleration

Every possible form of momentum-energy
obeys the equivalence principle

Einstein's math buddy did NOT want to give him the needed tool: Riemannian geometry too hard

Marcel Grossmann helped Einstein pass math classes

Grossmann knew the math Einstein needed (confirmed in a summer 1911 visit to the library) and thought it too hard for him to master (Einstein did, but with harder work of his life)

The math remains too hard for the human mind to handle

Einstein's eventual answer is great, but is not great enough - fails for particles called fermions

So many tests passed

- even all equivalence tests, awesome!

Predicting and confirming gravity waves,
awesome!

Not handling fermions is a deal breaker

Review of speedy relativity: start with the square

$$(t, x, y, z)^2 = (t^2 - (x^2 + y^2 + z^2), 2tx, 2ty, 2tz)$$

~~the first term of the square of 2 events~~

2 observers agree to the 1st term of the square of 2 events

Applies no matter what created the events

Plays nicely with the equivalence principle

My 2015 proposal for gravity relativity: starts with the square (no one else writes these)

$$(t, x, y, z)^2 = (t^2 - (x^2 + y^2 + z^2), \underline{2tx, 2ty, 2tz})$$

2 observers agree to the last 3 terms of the square of 2 events

Applies no matter what created the events

Plays nicely with the equivalence principle

A problem: the 3 things are pointy, so have to do this in the tangent space

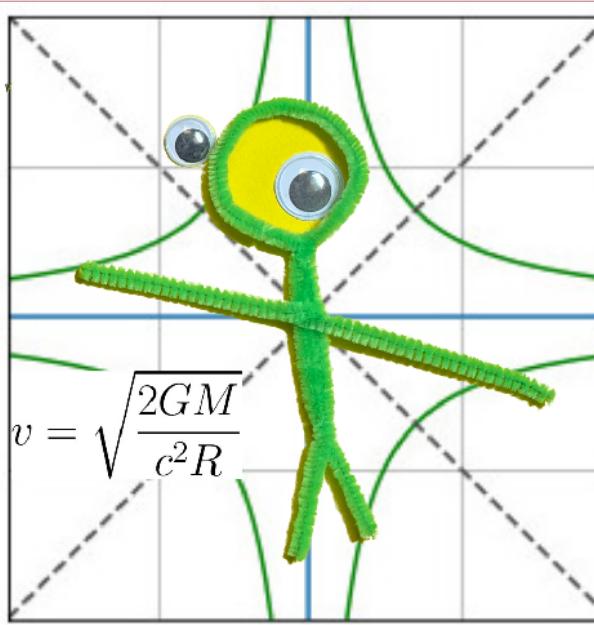
$$(dt, dx, dy, dz)^2 = (dt^2 - (dx^2 + dy^2 + dz^2), 2dtdx, 2dtdy, 2dtdz)$$

~~dt, dx, dy, dz~~

The same thing happens in Einstein's approach

All change happens in energy-momentum, not space-time

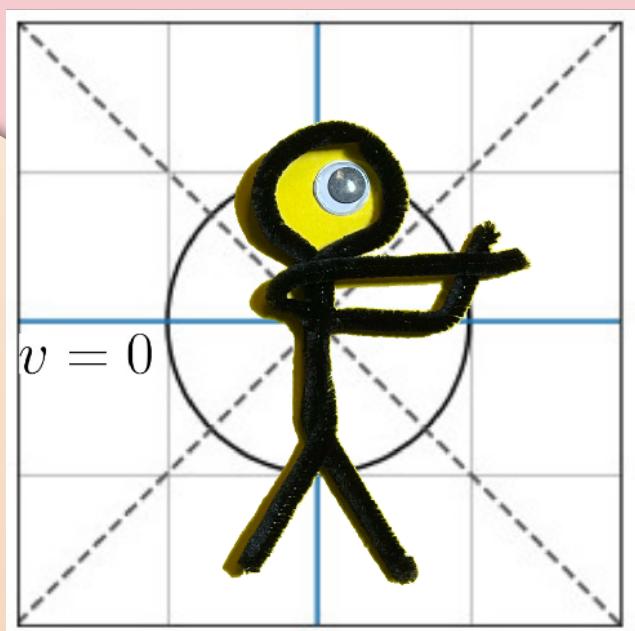
Where are the hyperbola's of agreement? Check out the t-shirt



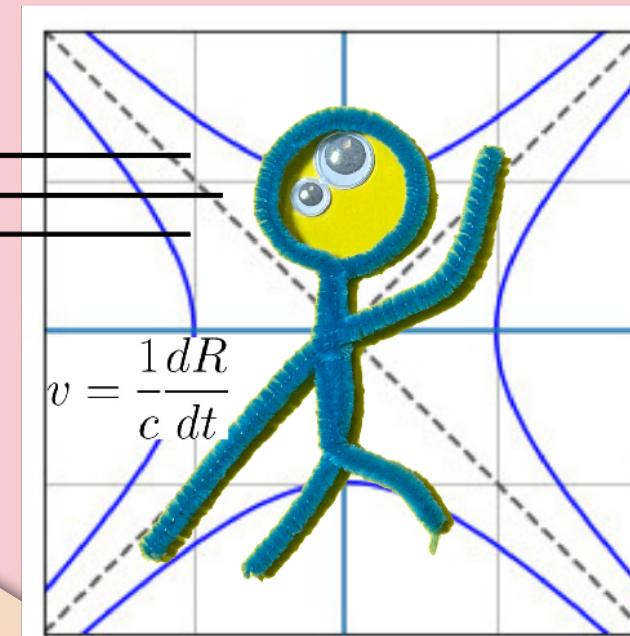
High Guy is
Gravity relativity



Same hyperbolas, rotated by 45 degrees



Me here-now
Precise!

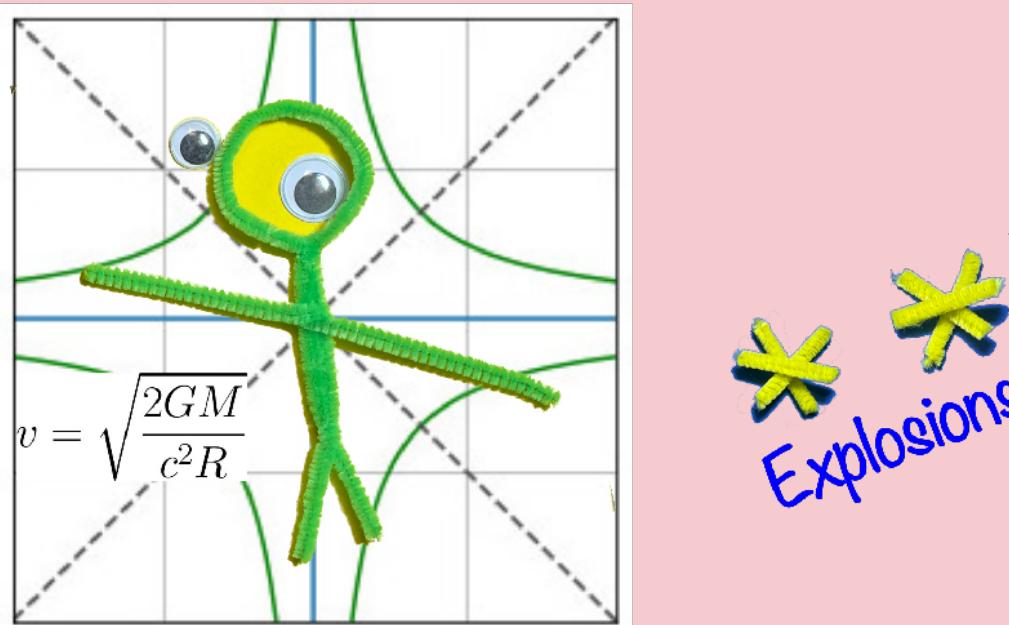


Zippy You is
Special relativity

$$(dt, dx, dy, dz)^2 = (dt^2 - (dx^2 + dy^2 + dz^2), 2dtdx, 2dtdy, 2dtdz)$$

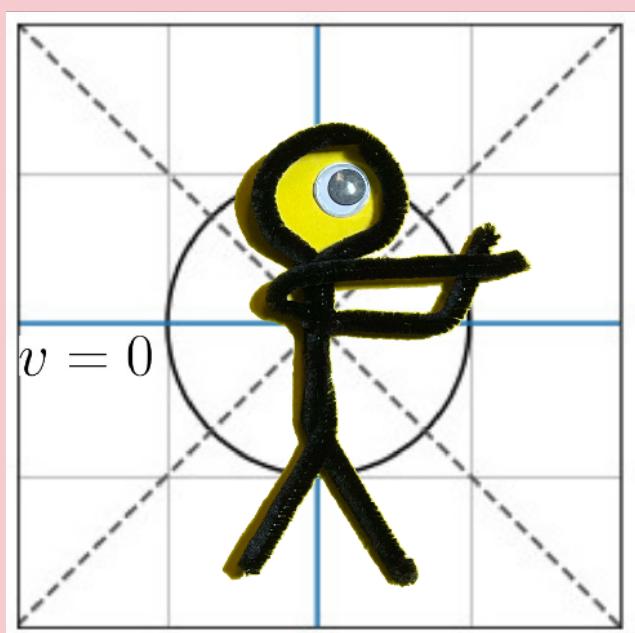


Speedy relativity uses the velocities you see. Gravity relativity uses escape velocity, calculated

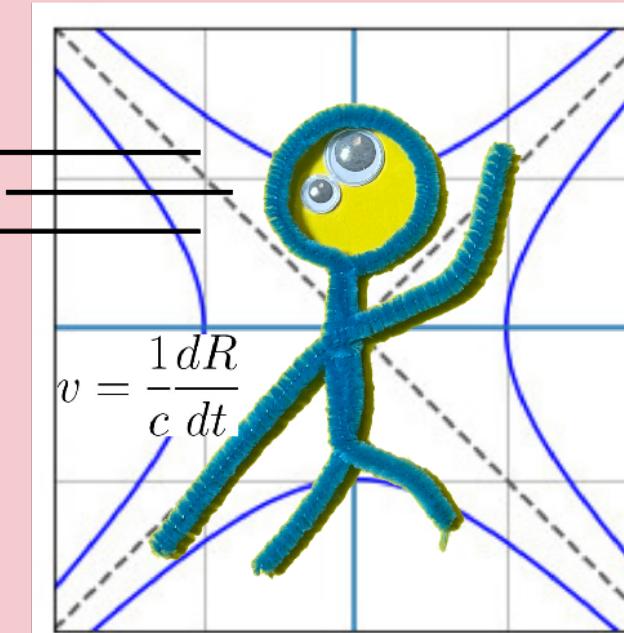


* * Explosions!

High Guy is
Gravity relativity



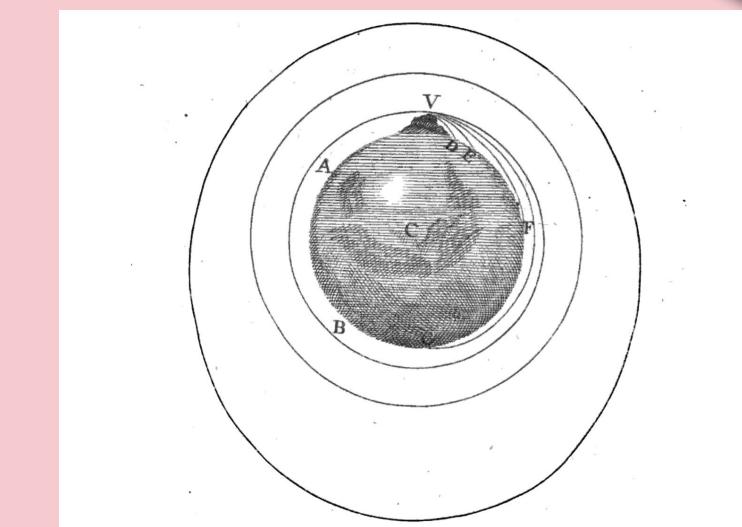
Me here-now
Precise!



Zippy You is
Special relativity

Same hyperbolas, rotated by 45 degrees

$$v_{esc} = \sqrt{2 \frac{GM}{c^2 R}}$$



$$\begin{aligned} d\tau^2 &= dt^2 - dx^2 \\ d\tau'^2 &= dt'^2 - dx'^2 \\ &= \frac{1}{\gamma^2} dt^2 - \gamma^2 dx^2 \\ &\approx (1 - \beta^2) dt^2 - (1 + \beta^2) dx^2 \end{aligned}$$

$$\text{if } \beta = \sqrt{2 \frac{GM}{c^2 R}}$$

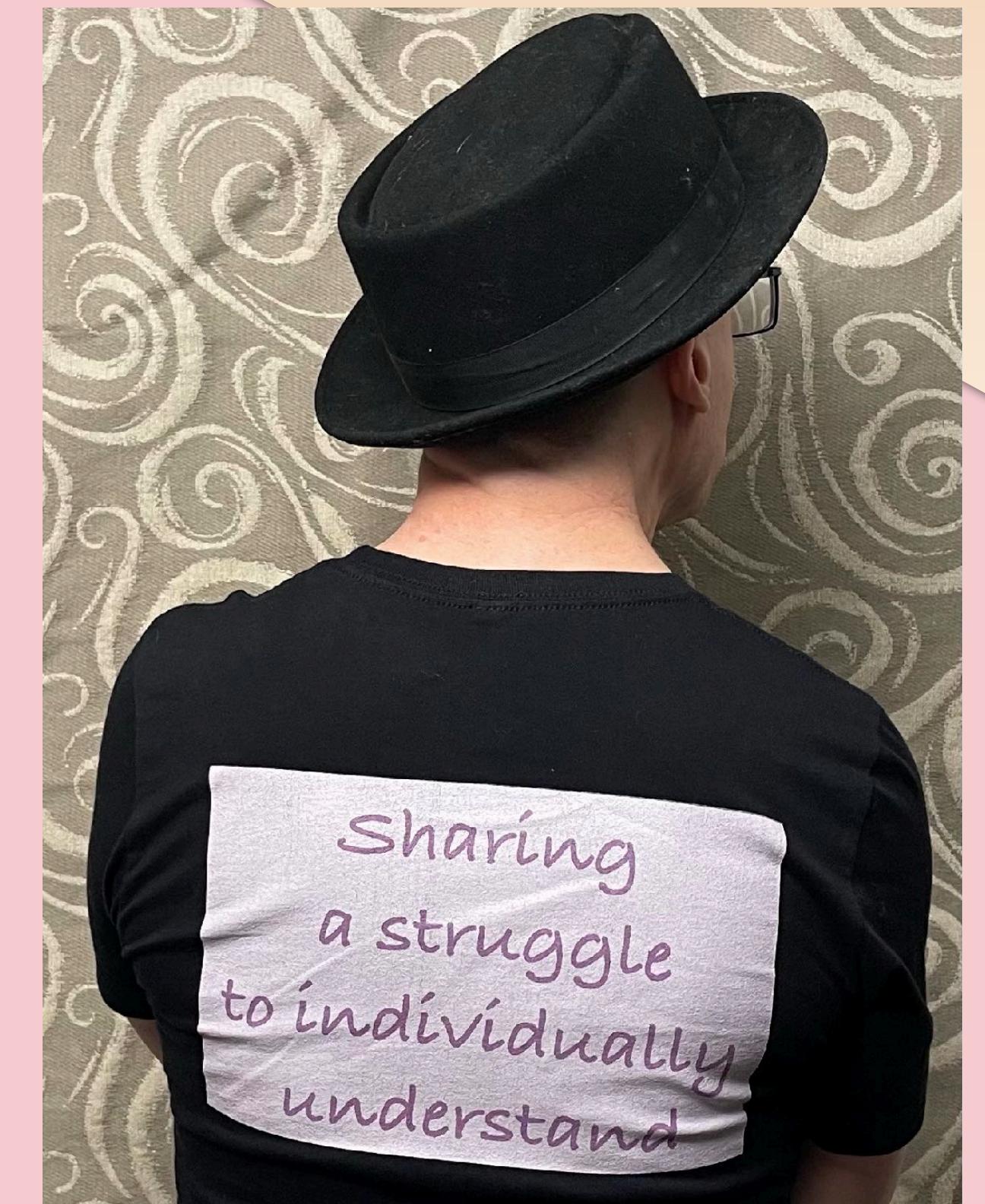
$$d\tau'^2 \approx \left(1 - 2 \frac{GM}{c^2 R}\right) dt^2 - \left(1 + 2 \frac{GM}{c^2 R}\right) dx^2$$

So why then does gravity attract?

I am so happy with the math.
The why, not so much

It is about you-space,
Momentum-energy, not space-time

Is there more
returning-momentum-energy
because of you being there with
me? It would be a crazy small
bonus, but gravity is a crazy
small force





Resources:
https://bit.ly/SPR_site
https://bit.ly/SPR_slides
https://bit.ly/SPR_videos
https://bit.ly/SPR_zoom
https://bit.ly/SPR_t-shirts