

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

The second Spiritual Physics Research Series Discussions

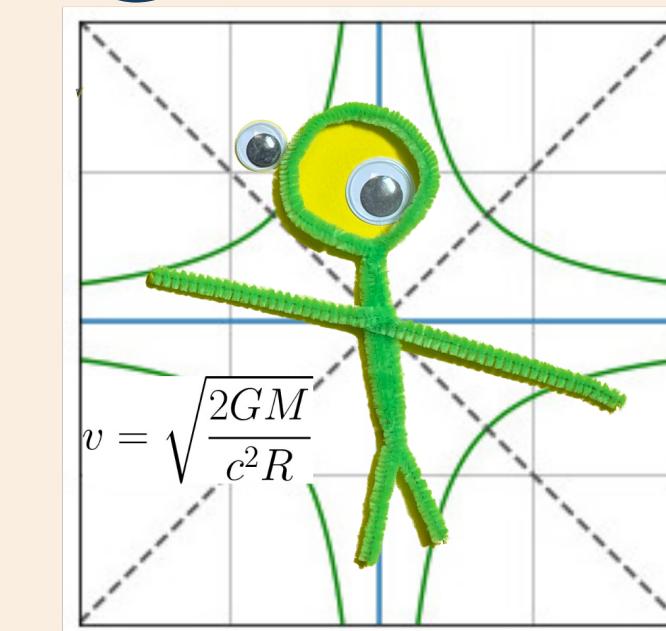
Final Friday, Feb. 26, 2021

First Church Unitarian of Littleton, MA

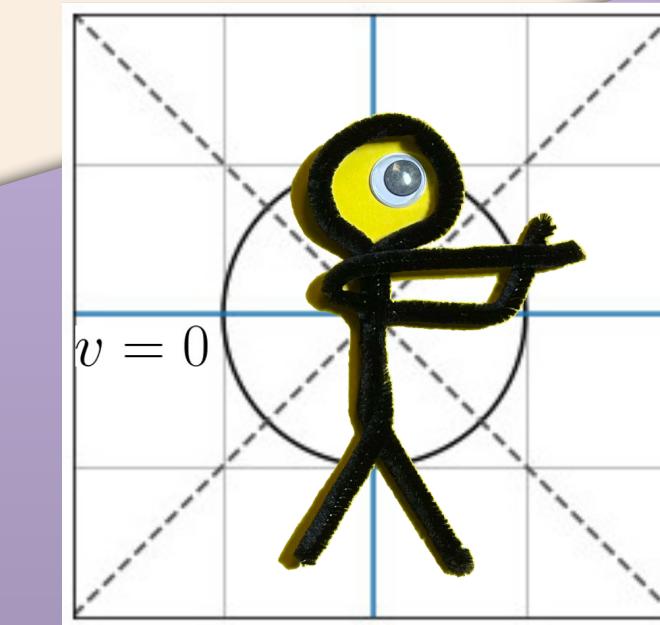
Spiritual framing by Rev. Lara Hoke

Physics research slide presentation by Doug Sweetser

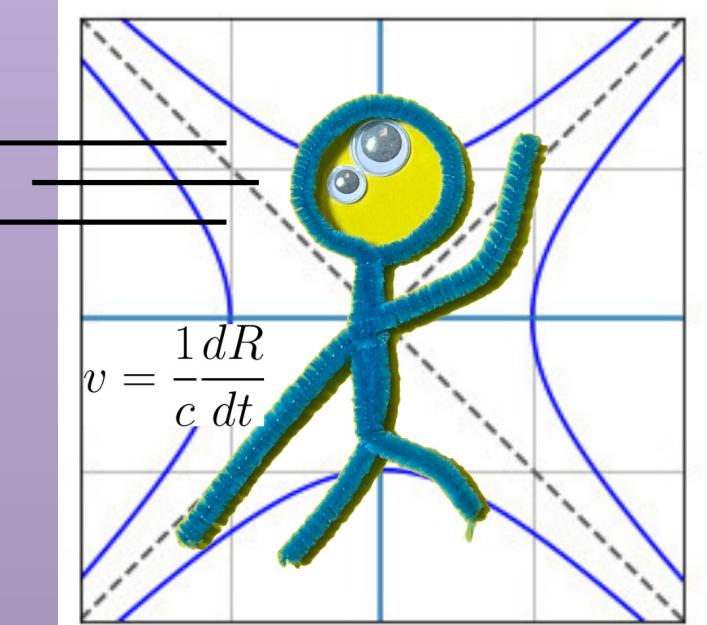
Slide designs by Elle Sweetser



High Guy is
Gravity relativity



Me here-now



Zippy You is
Special relativity

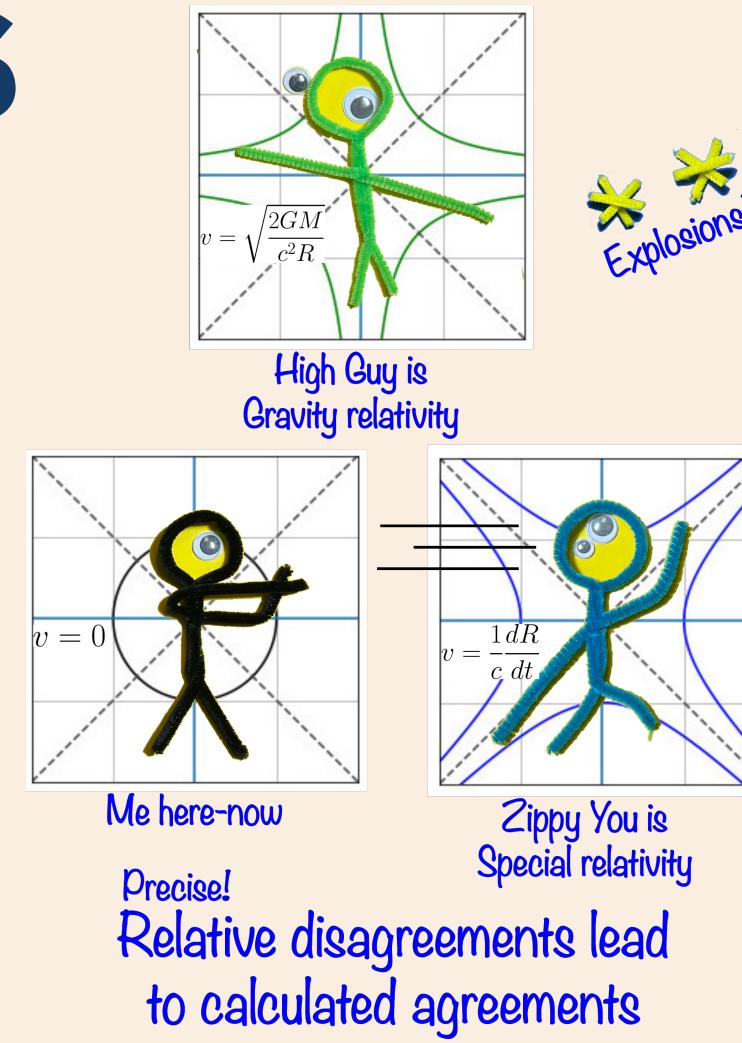
Precise!
Relative disagreements lead
to calculated agreements

About Doug Sweetser in 1 slide

- Married, 58, 5' 7", diabetic with a cow heart valve
- Darra and Elle are my wife and daughter respectively
- MIT class of 1984, degrees in Biology and Chem. Eng.
- Brandeis 2000 masters in software engineering
- Work for Synopsys as a software release engineer
- Let imagination and logic fight interesting battles
- The ultra-orthodox fringe physicist

Outline for tonights slides

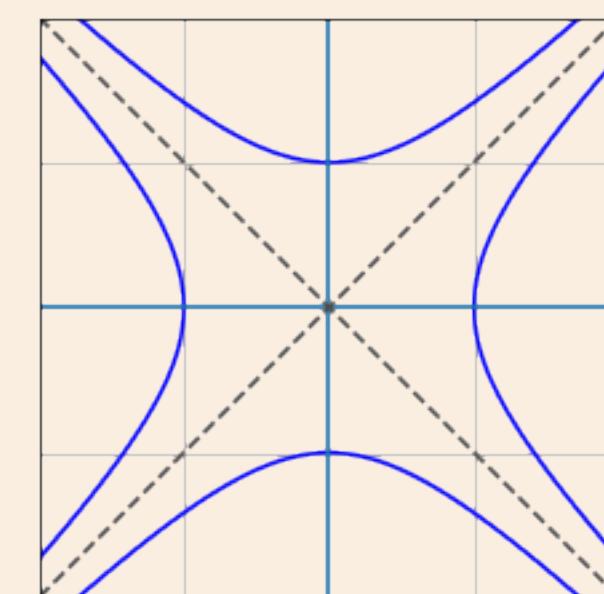
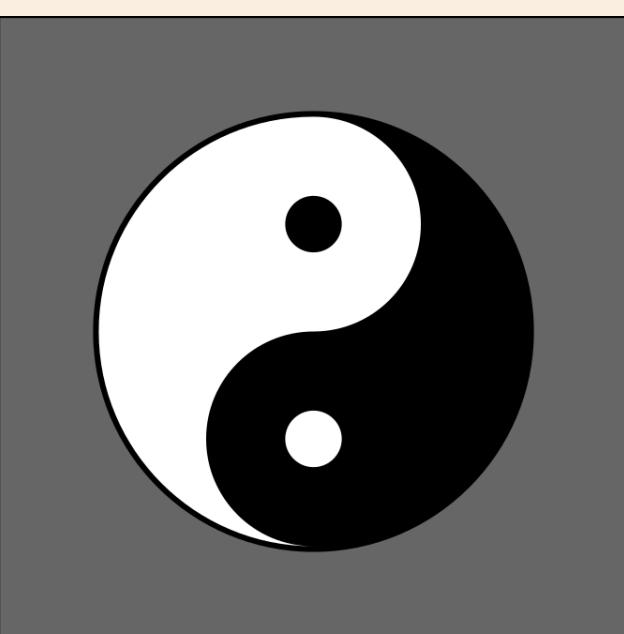
Look at the t-shirt



Review last discussion

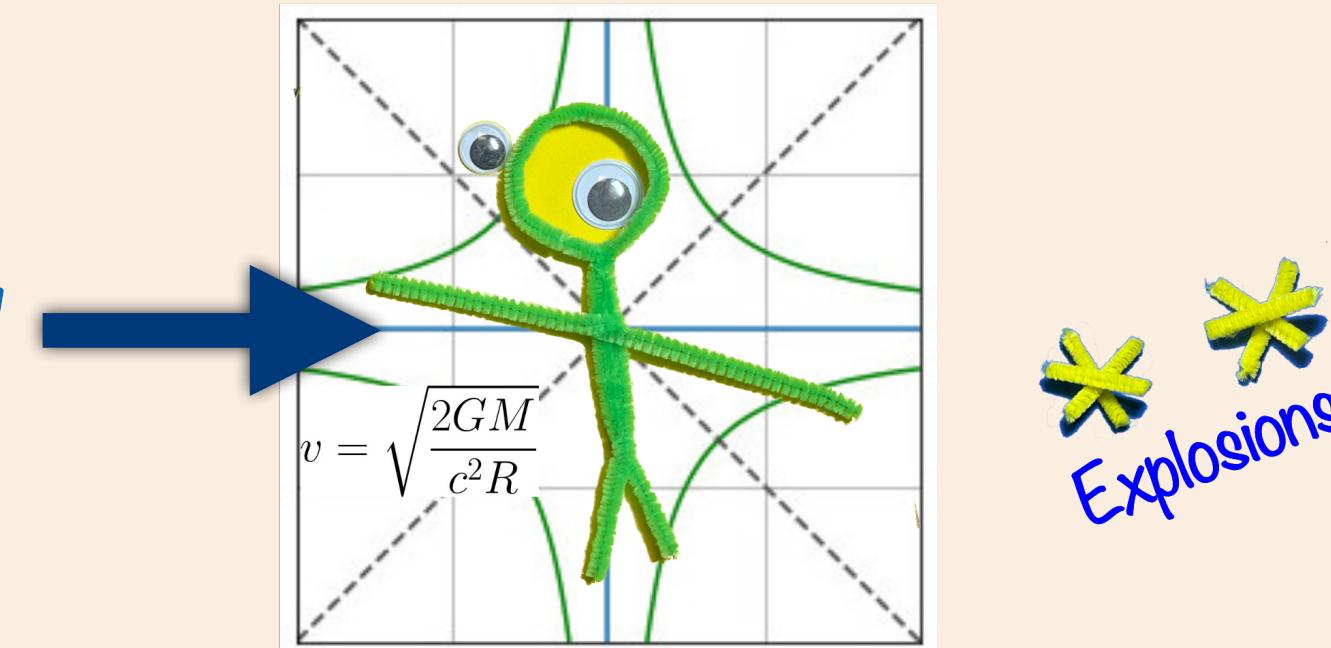
Discuss relevant spiritual ideas

Discuss speedy relativity

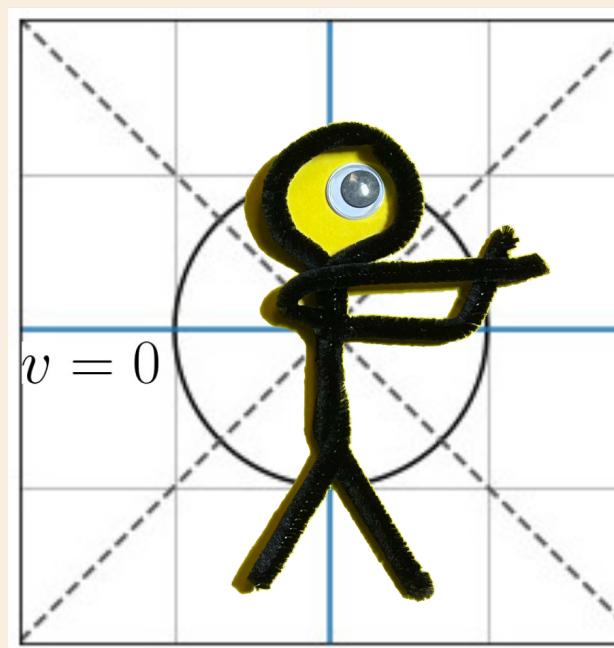


Relativity is about 2 people looking at exactly the same thing

March: Gravity



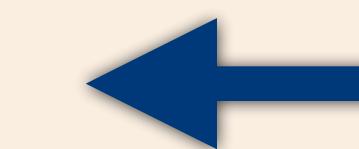
High Guy is
Gravity relativity



Me here-now

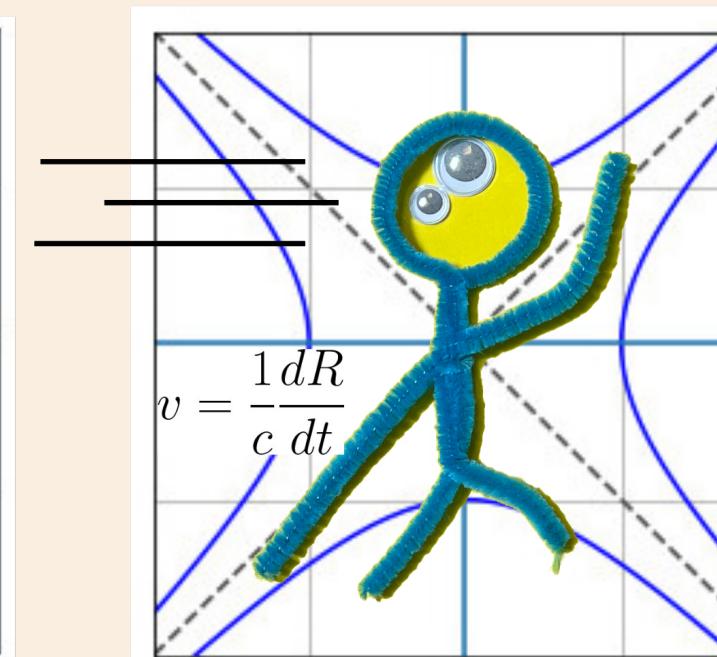
Precise!

Relative disagreements lead
to calculated agreements



Exactly the same thing,
So you MUST agree

On something

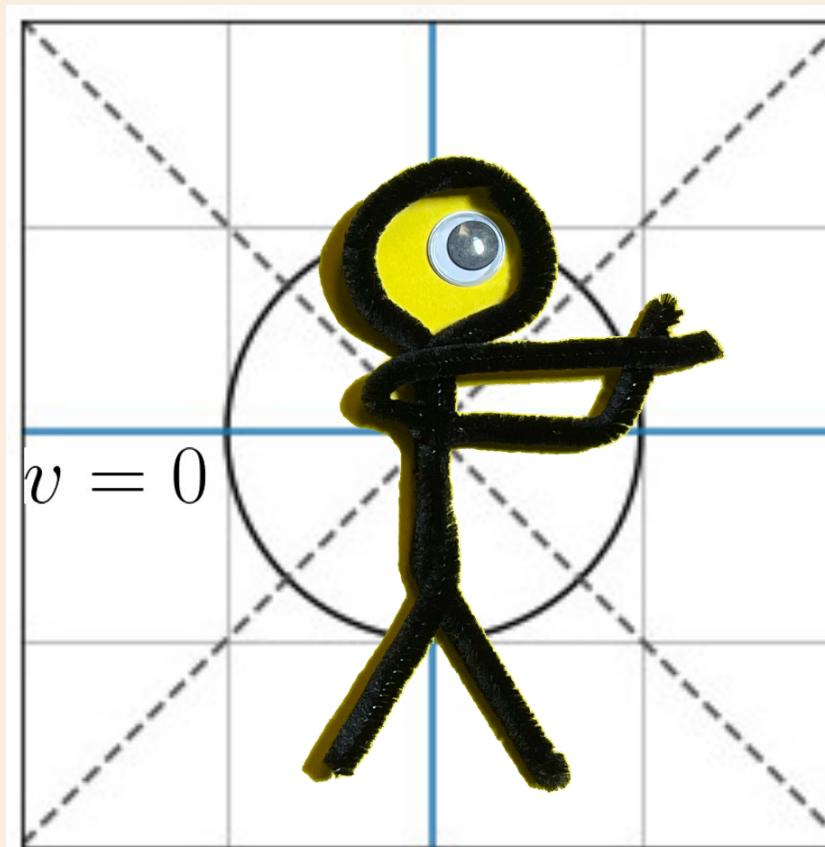


Zippy You is
Special relativity

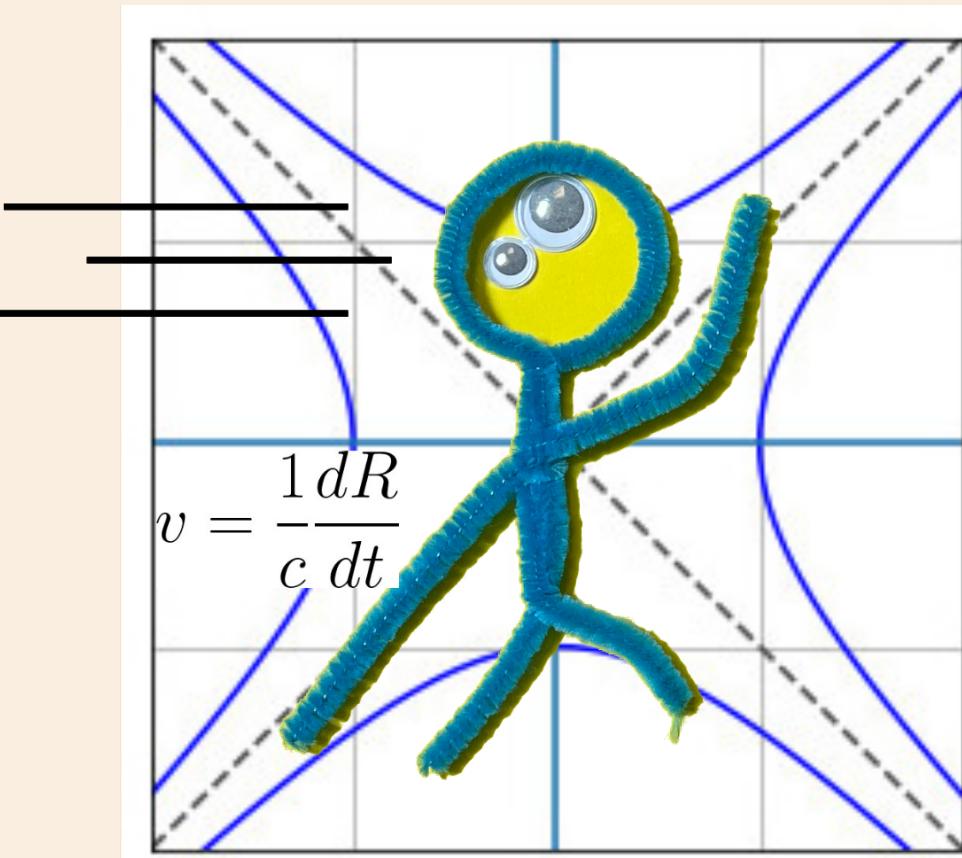
Tonight:

speedy relativity

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



Me here-now



Zippy You is
Speedy relativity

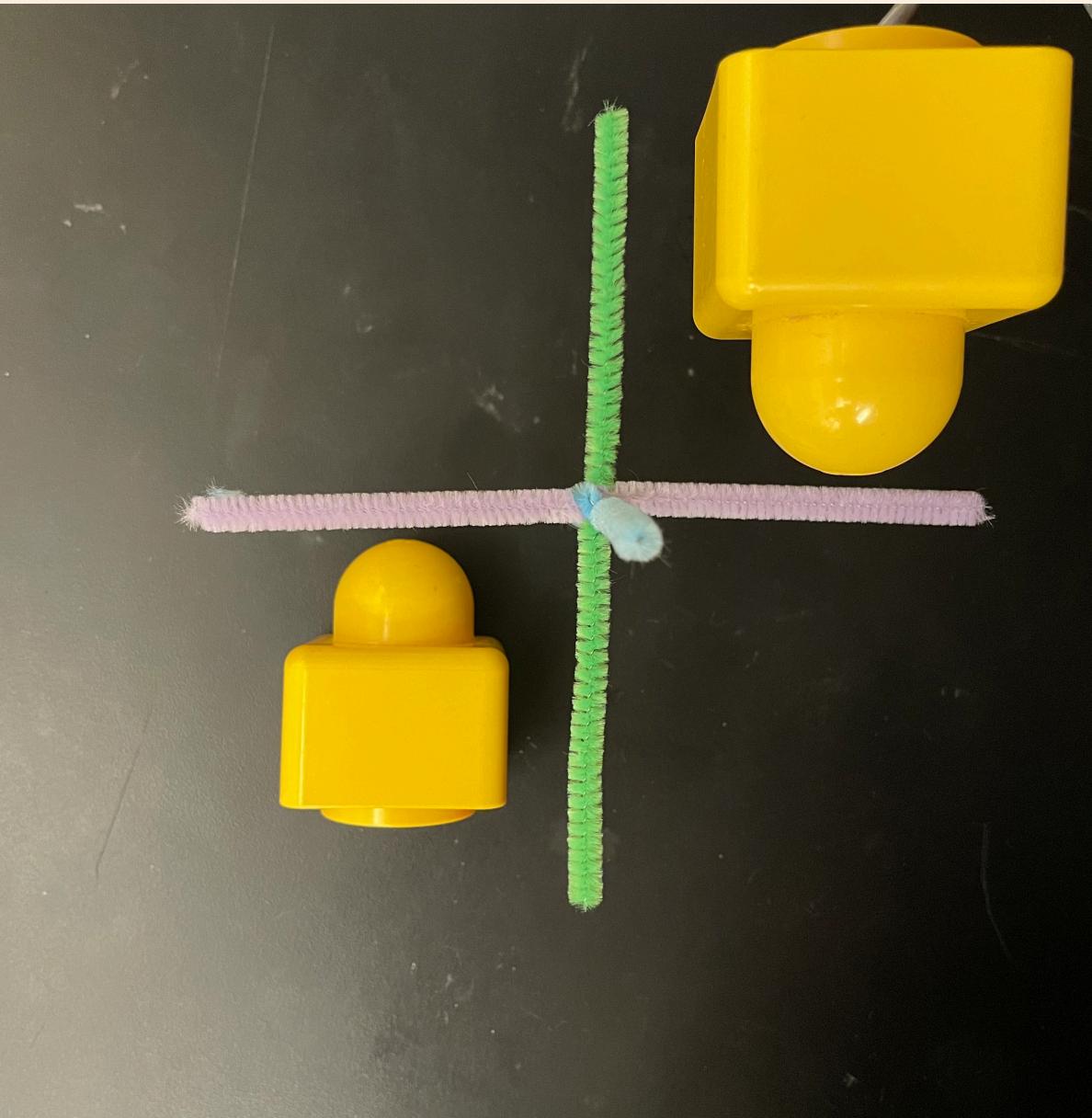
Meditate on the 5 most important equations

- $(0, 0, 0, 0) + (0, 0, 0, 0) = (0, 0, 0, 0)$ Always here-now
- $(0, 0, 0, 0) \times (0, 0, 0, 0) = (0, 0, 0, 0)$ Here-now equals here-now
- $(1, 0, 0, 0) \times (1, 0, 0, 0) = (1, 0, 0, 0)$ The past remains the past
- $(0, 0, 0, 0) + (1, 0, 0, 0) = (1, 0, 0, 0)$ You can know your past
- $(0, 0, 0, 0) \times (1, 0, 0, 0) = (0, 0, 0, 0)$ The past cannot become
here-now

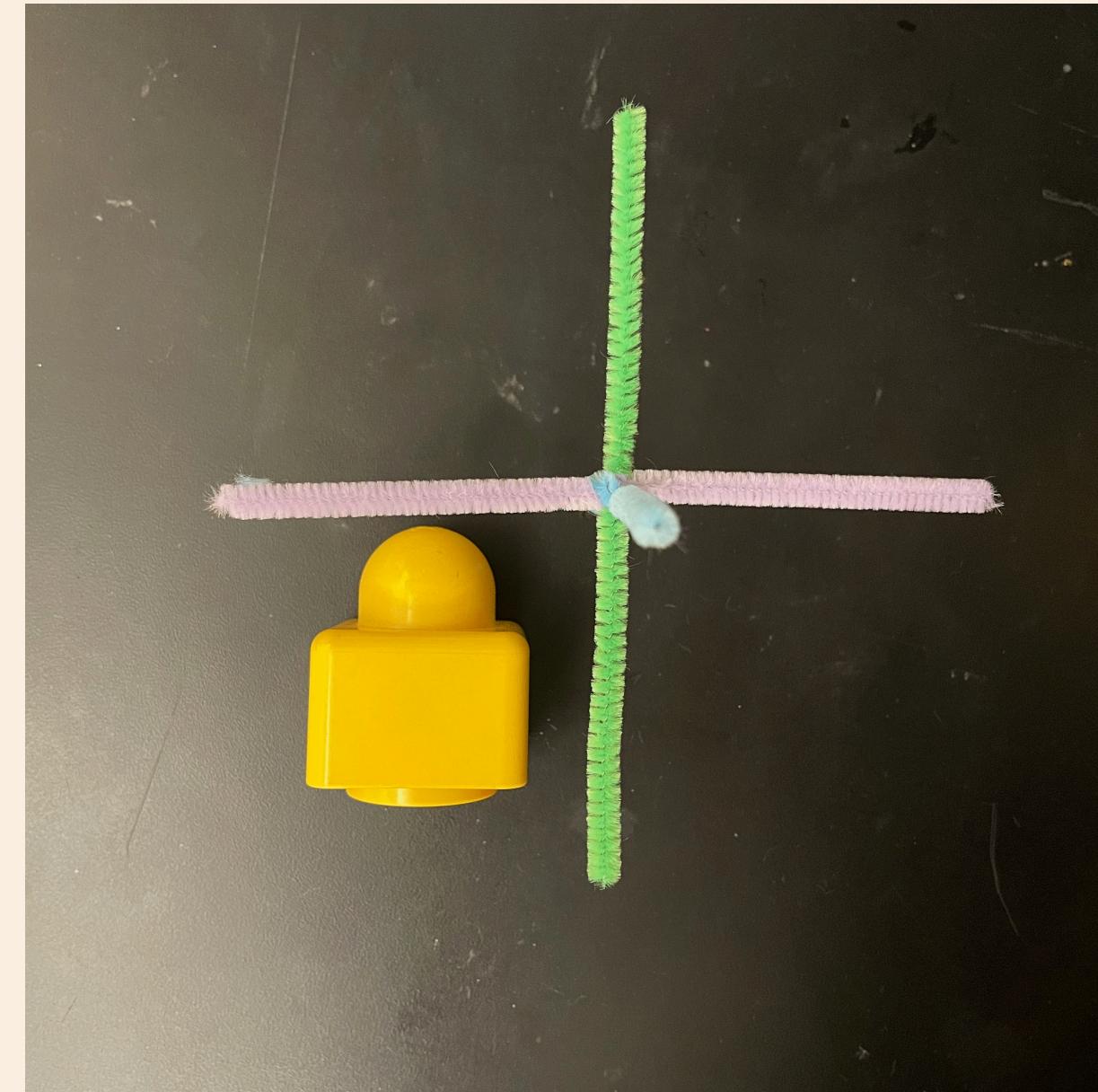
What is a zero box? A badly formed question.

A block takes up space AND time.

A block-now and its
Negative block-now



A block-past and its
Negative block-future



Nothing is permanent: the sand mandala

Monks train for 5+ years to learn how to create and meditate on all elements in a particular mandala. May take weeks/months to create. The final part of the ritual is to sweep it away.



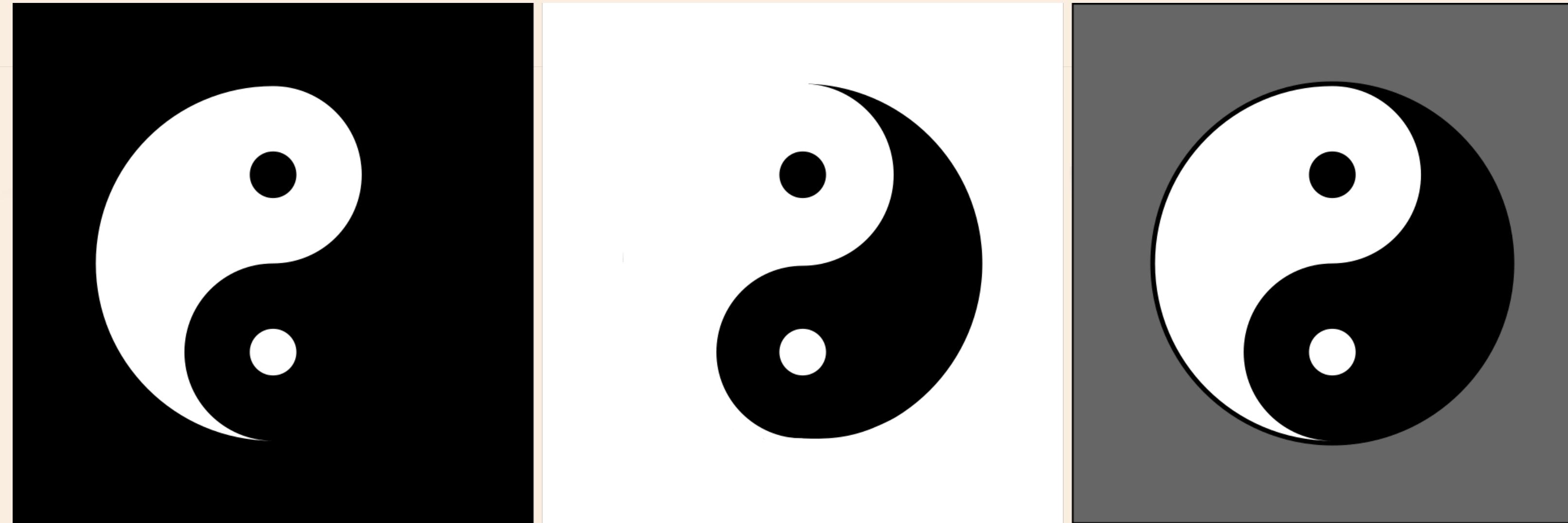
Note: there is a crazy density of stories here going back ages

Space-time numbers are not permanent Because space-time is transient

Struggling against the Euclidean idea of a point lasting

How is the difference between permanent here-now and
here-past created?

The Taijitu symbol originated in China with the simplified version becoming popular in the West

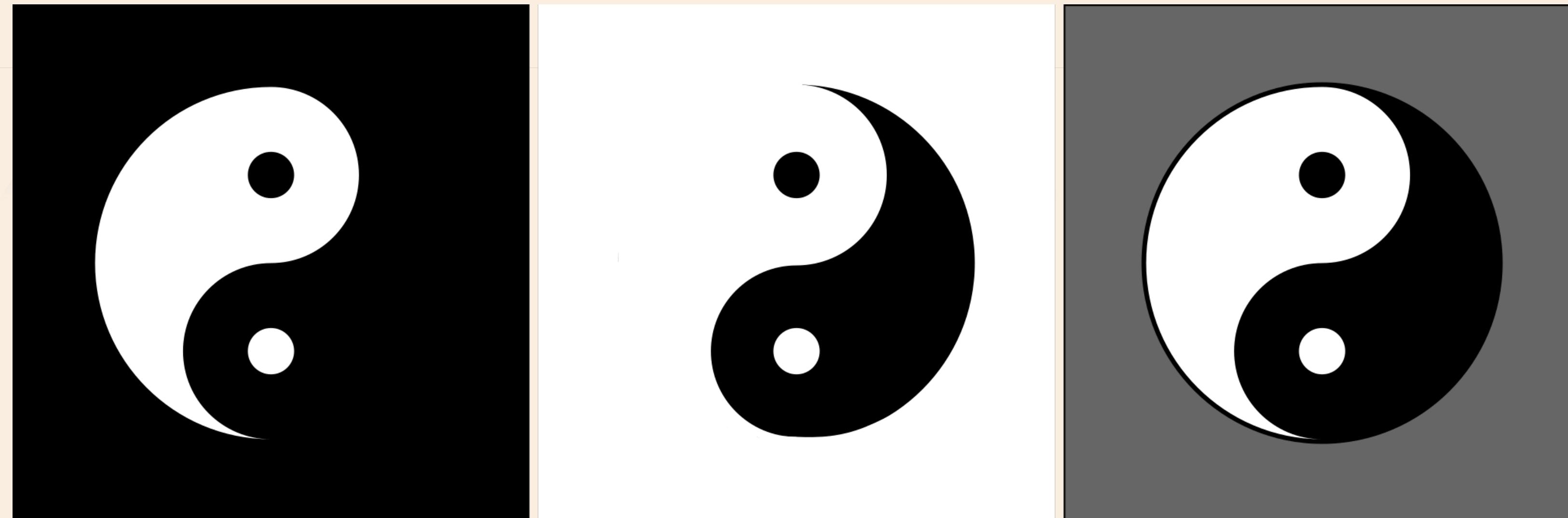


Yang - white/male

Yin - dark/female

Duality is central

Always need dashed physics terms to balance Time(-ish) with 3-Space(-ish), shared/separate



Time
Energy
Mass squared

space
momentum
Energy x momentum

space-time
Energy-momentum
Mass squared-
Energy x momentum

Relativity is hard because diverse teachers discuss yin not yang, or yang not yin

Relativity is always about 2 people looking at the same thing

They always disagree in a precise way

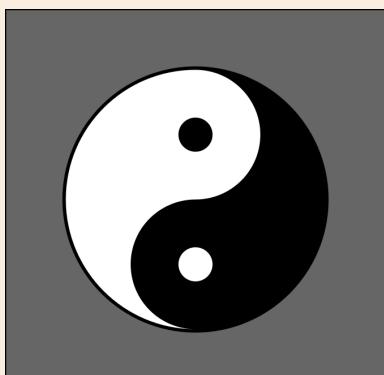
They can calculate an agreement

Example 1: the speed of light is constant!

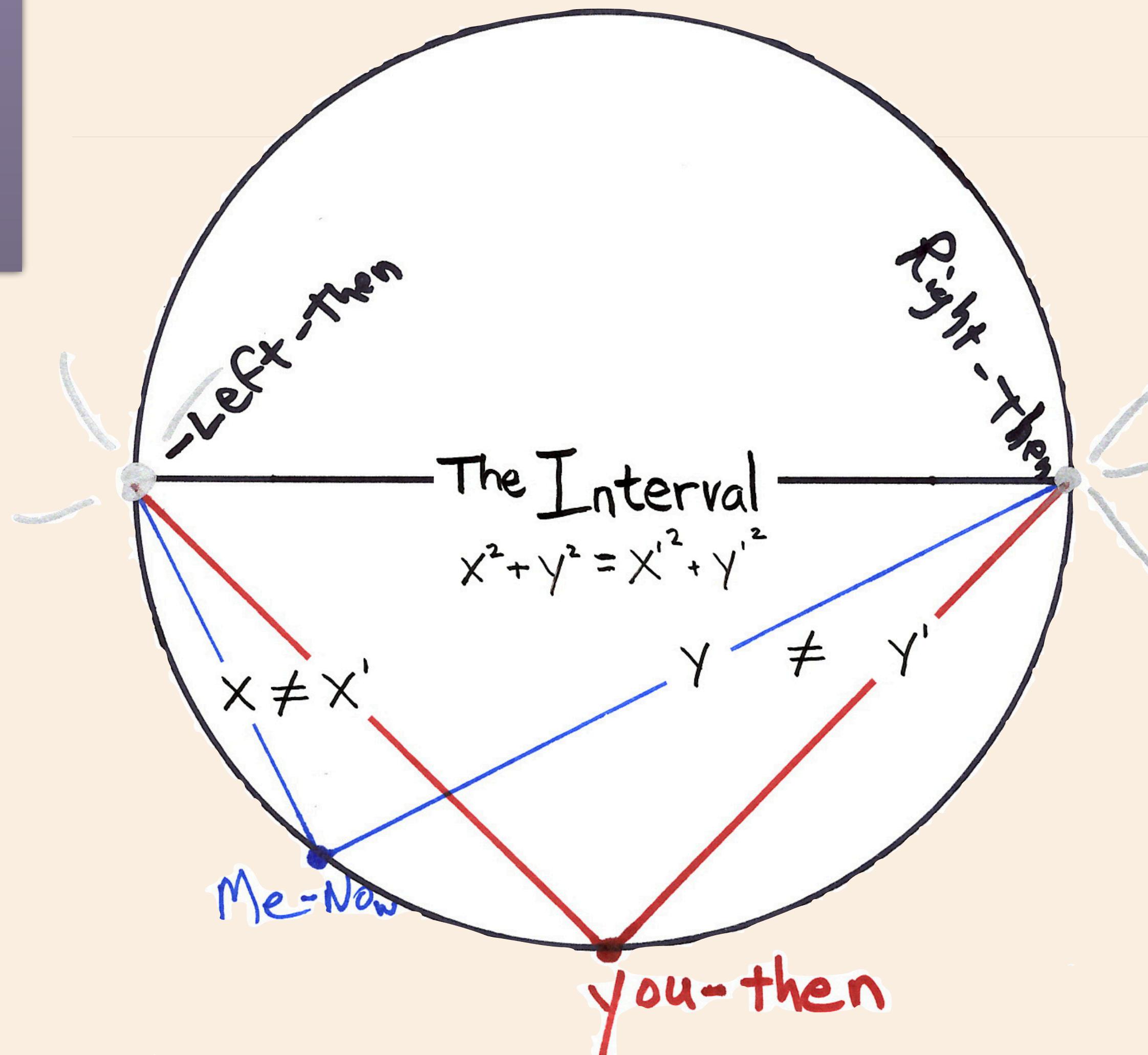
True, but people disagree about wavelength and frequency of light

Example 2: This clock is fast/slow, this ruler is long/short

Not true - just see differently. People do agree on the “the interval”

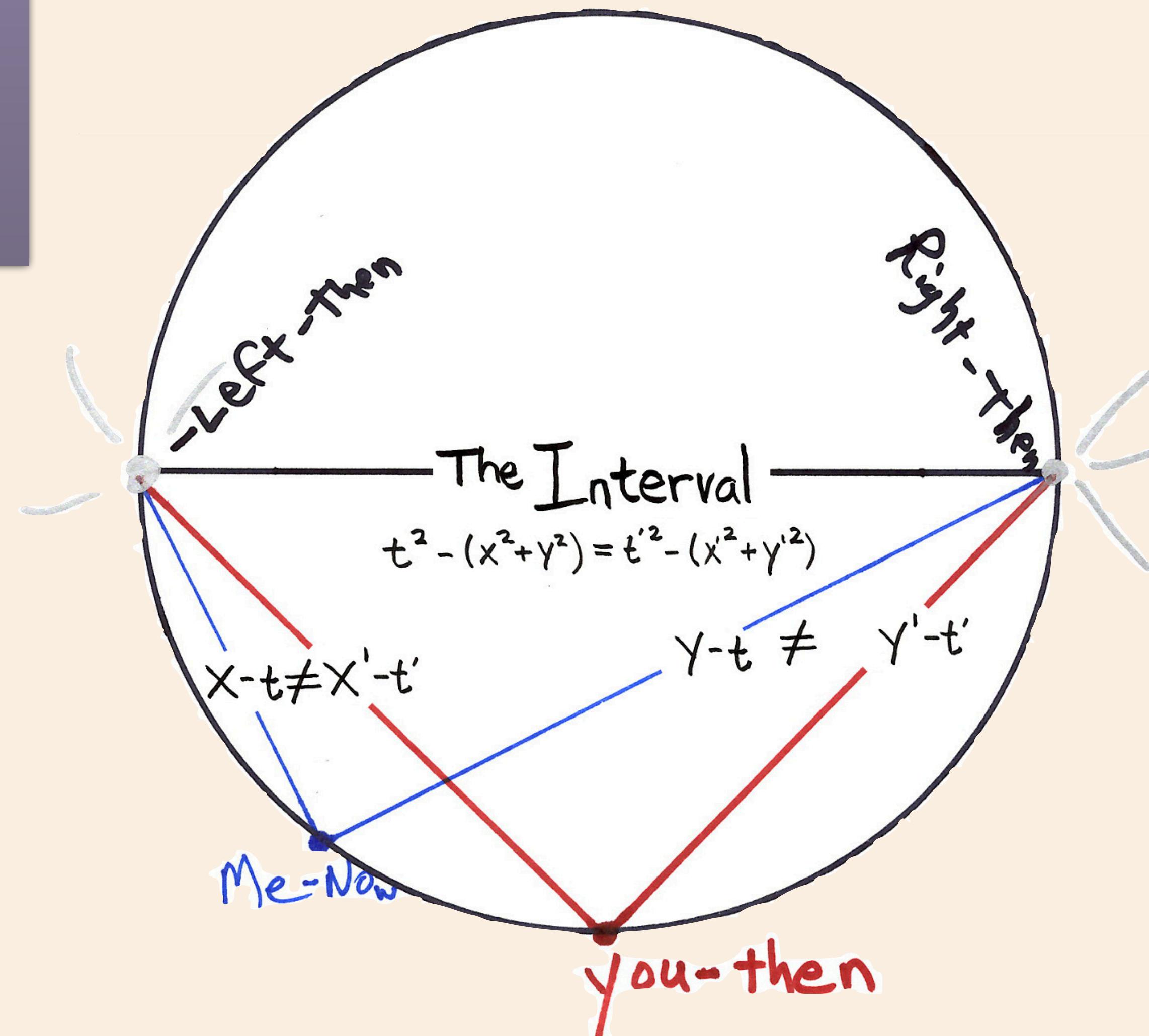


Ruler relativity was known to the Egyptians



Only I get to be -now
All others -thens
No -Futures
We see differently
The calculated Interval is the same

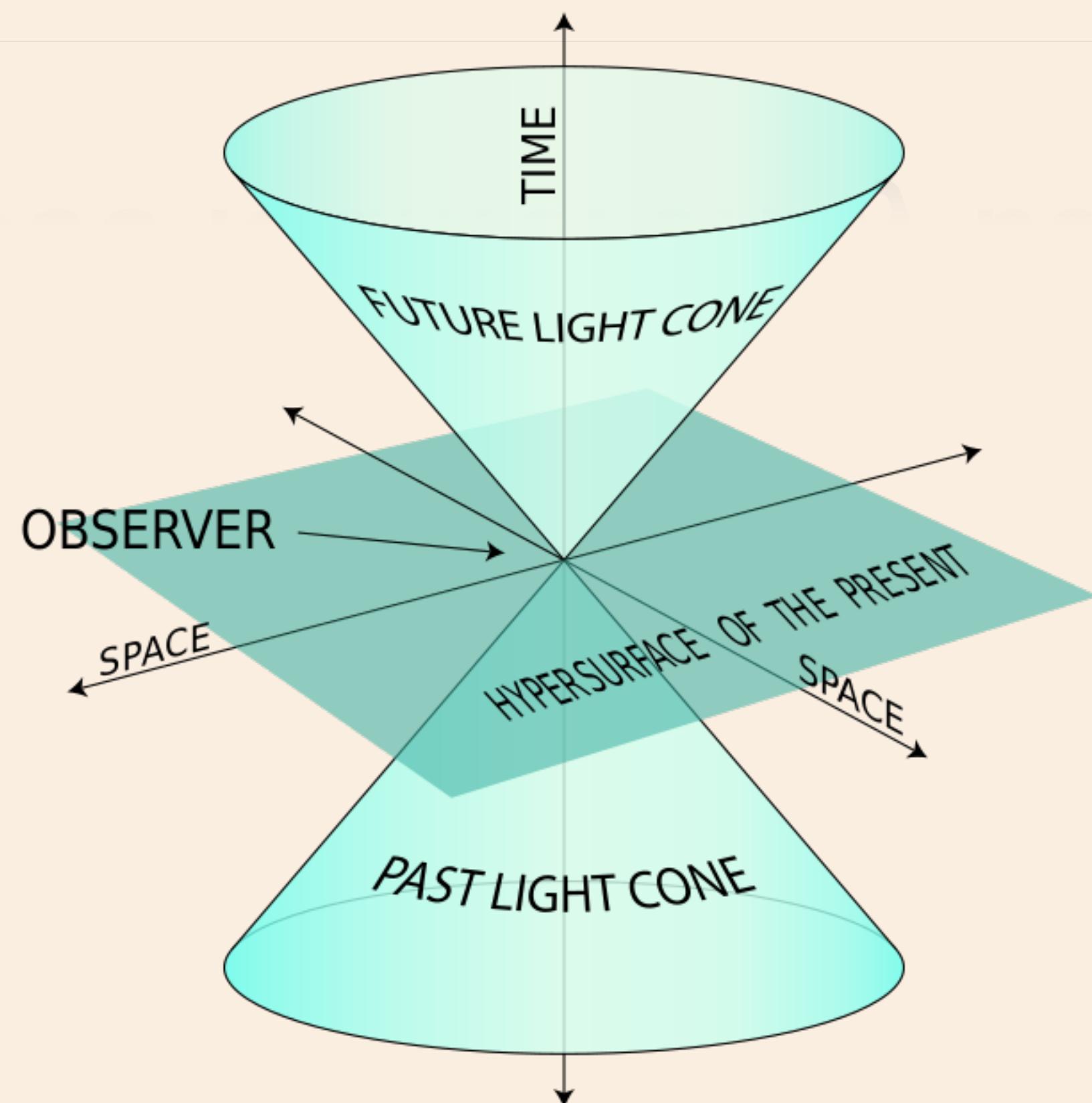
Speedy relativity explicitly includes time



Space-time always used
Time squared included with interval
Minus is the sign of oddness
Time is NOT space, needs minus

This is the t-shirt as math

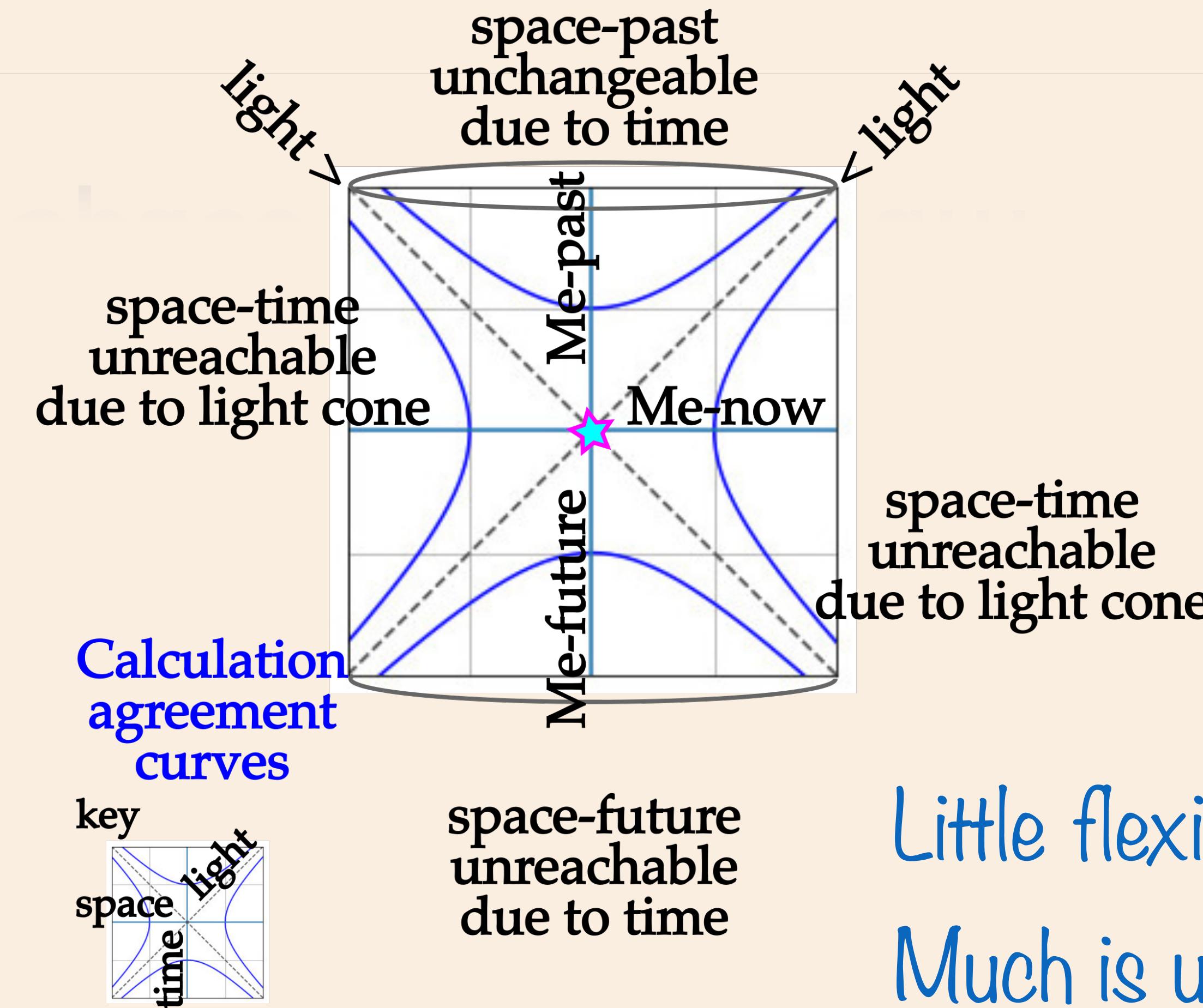
The space-time graph is extensively, but I now see it differently based on our Discussion series



Up is positive but is the past!

Feels like one can go anywhere

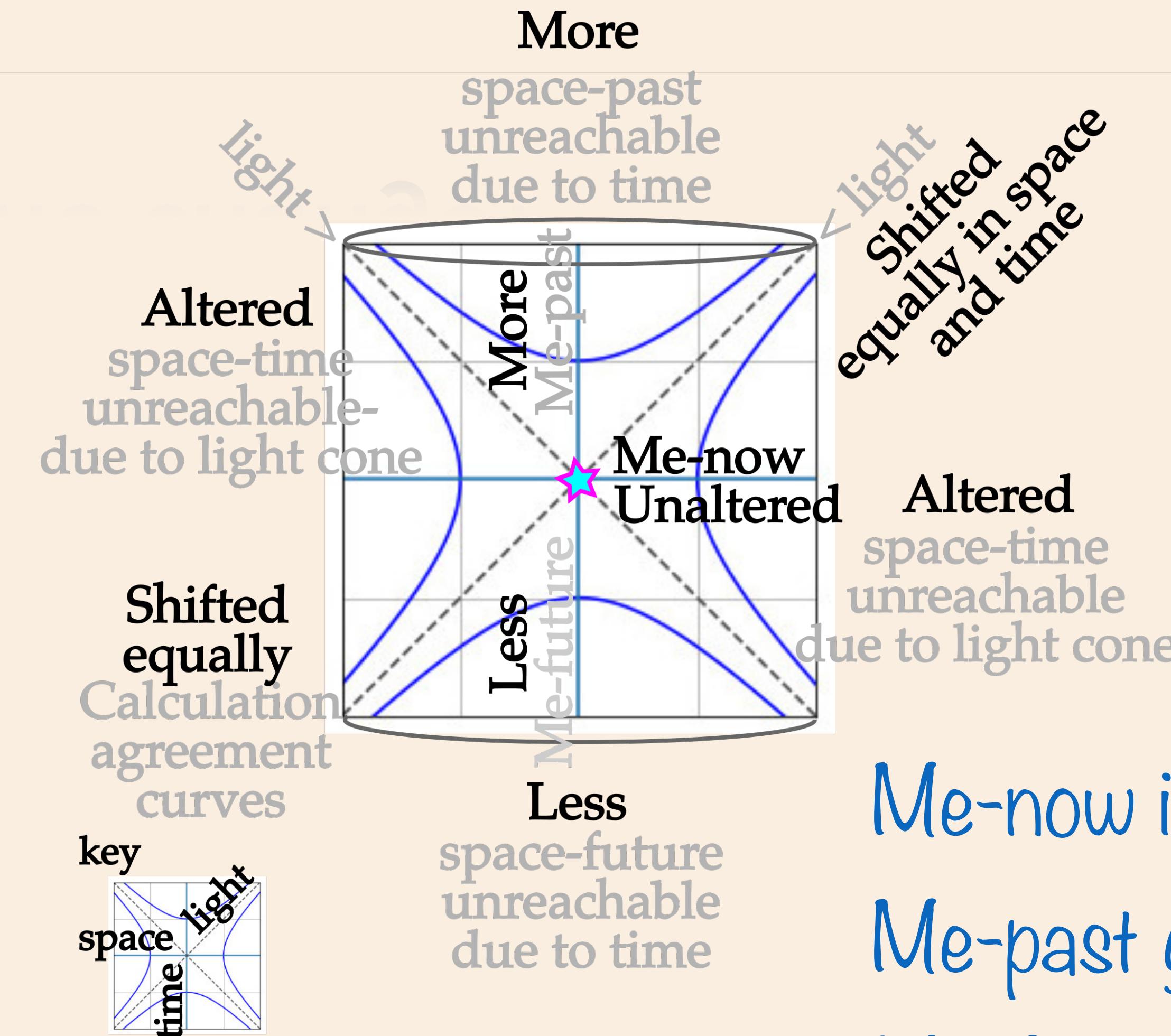
The present is all there is, so point out why that is so in a space-time diagram



Little flexibility in space-time!
Much is unchangeable or
Unreachable

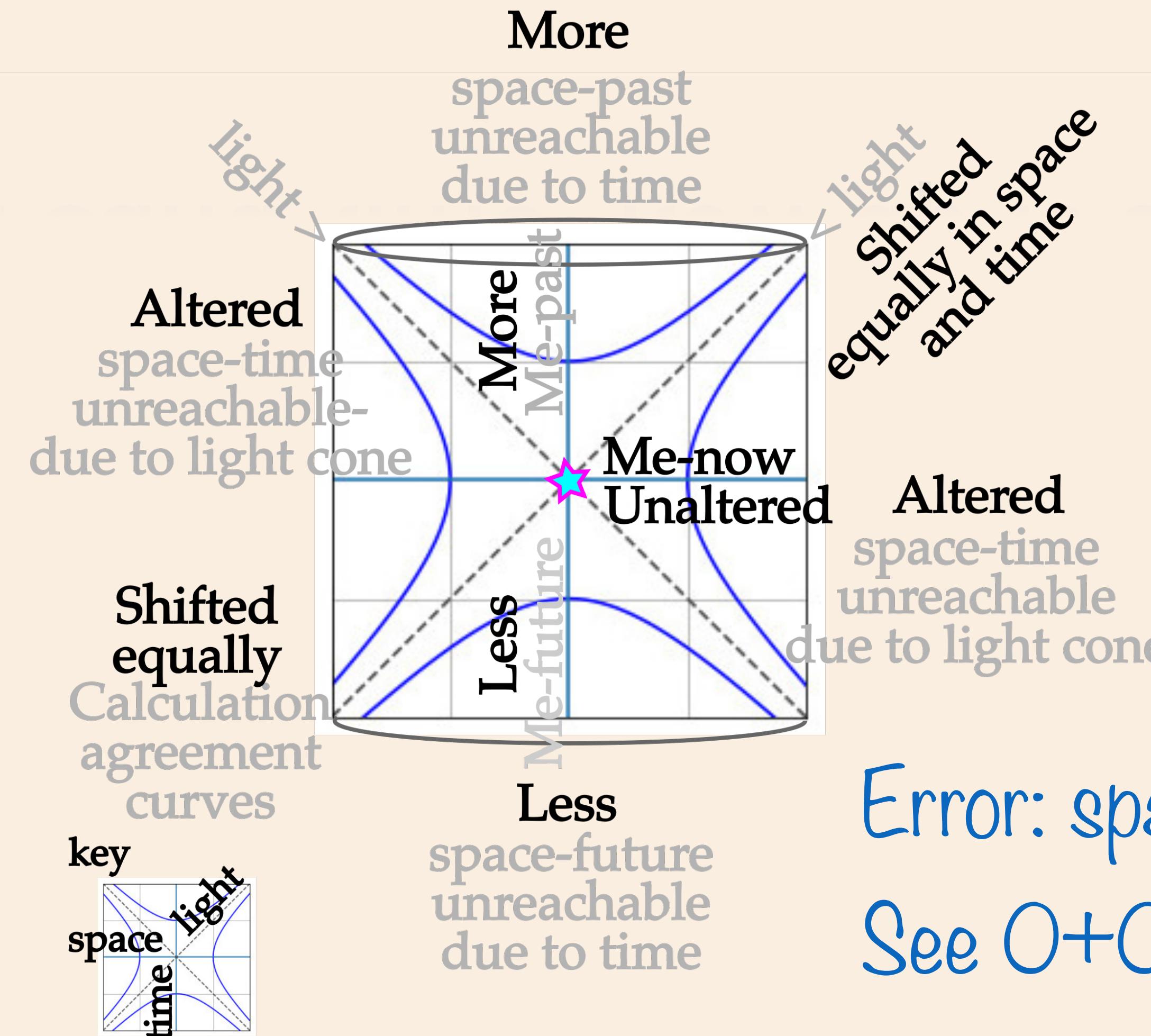
If present always is, how does all the rest of the space-time change?

Idea of outside the light cone
may not be in Buddhism...



Me-now is in the moment
Me-past gets older
Me-future has less time

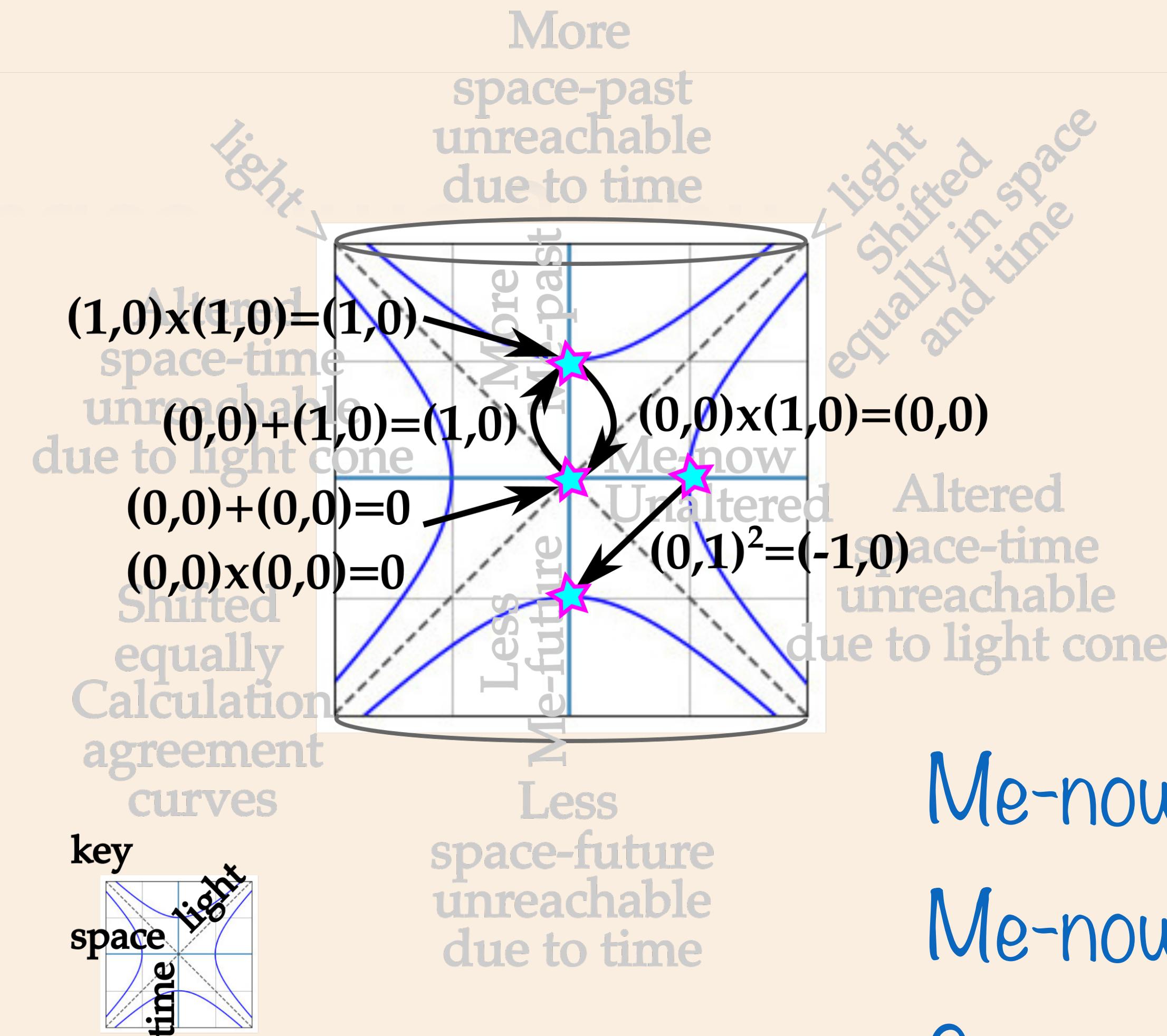
Fun observation of a space-time diagram: “grains of sand-time” flow up to add to age



Error: space-time has no “grains”
See $0+0=0$ equivalence

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

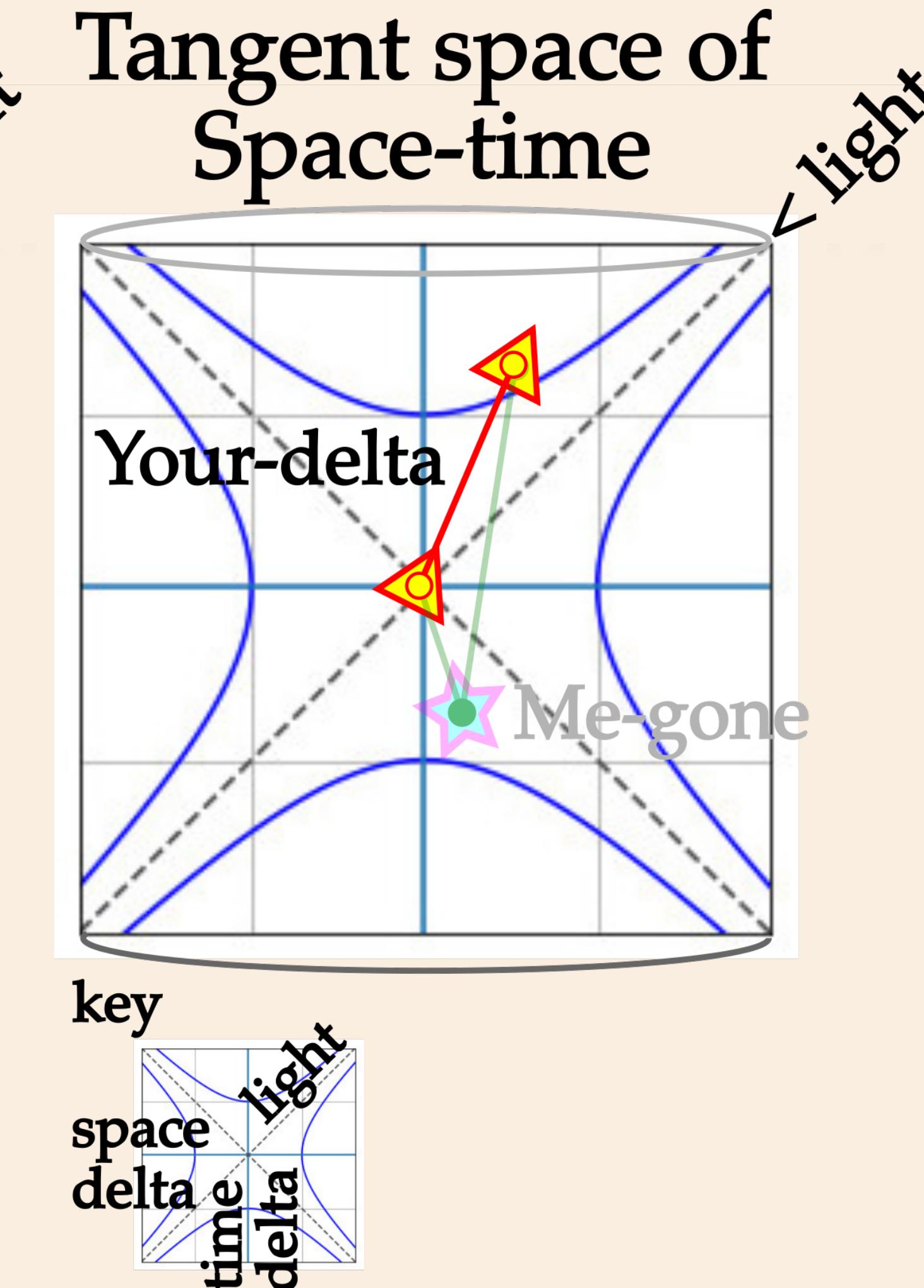
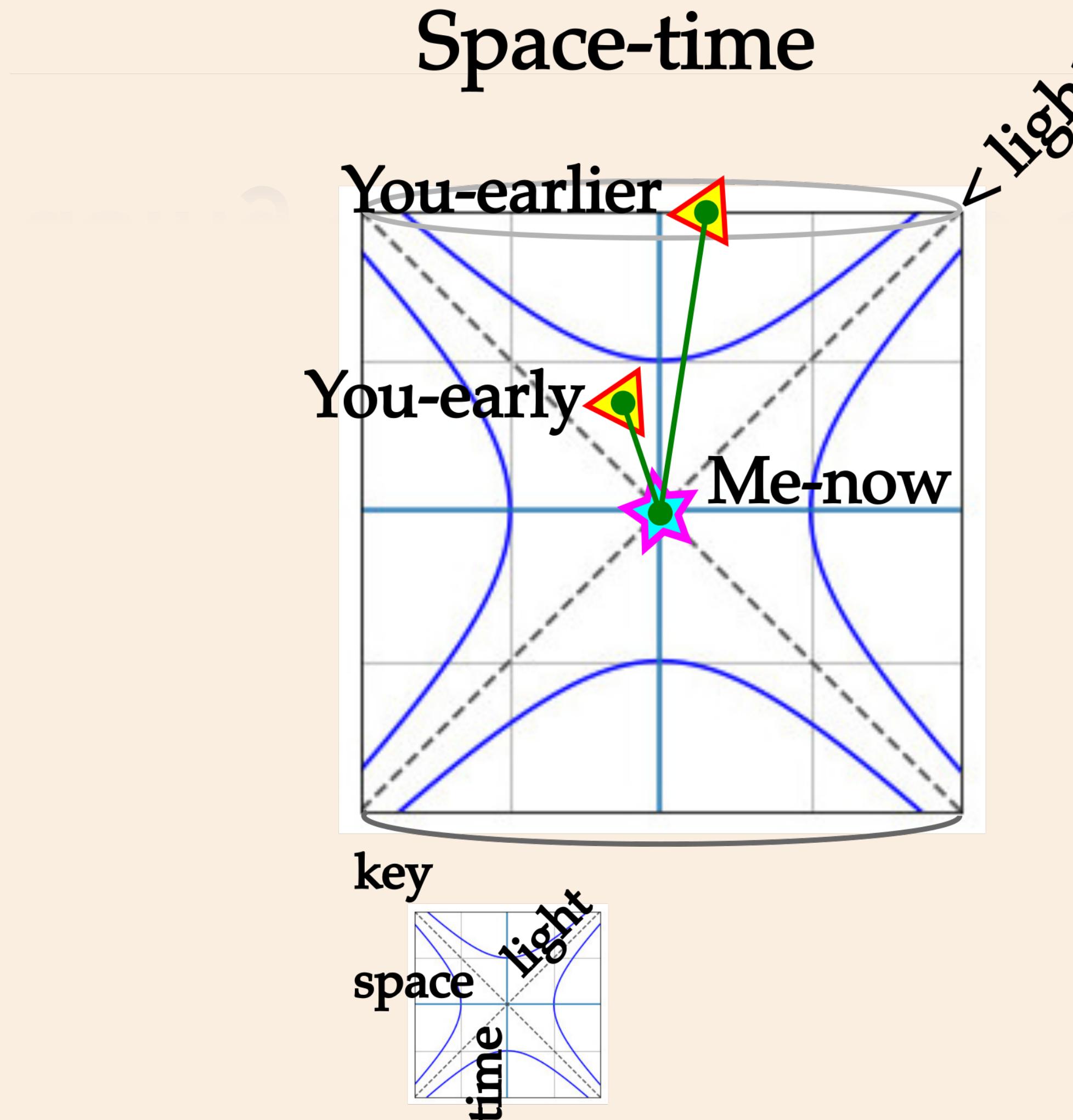
There are serious limitations to space-time

Me-now centric!

The **only thing** one can know about you: where-when you are

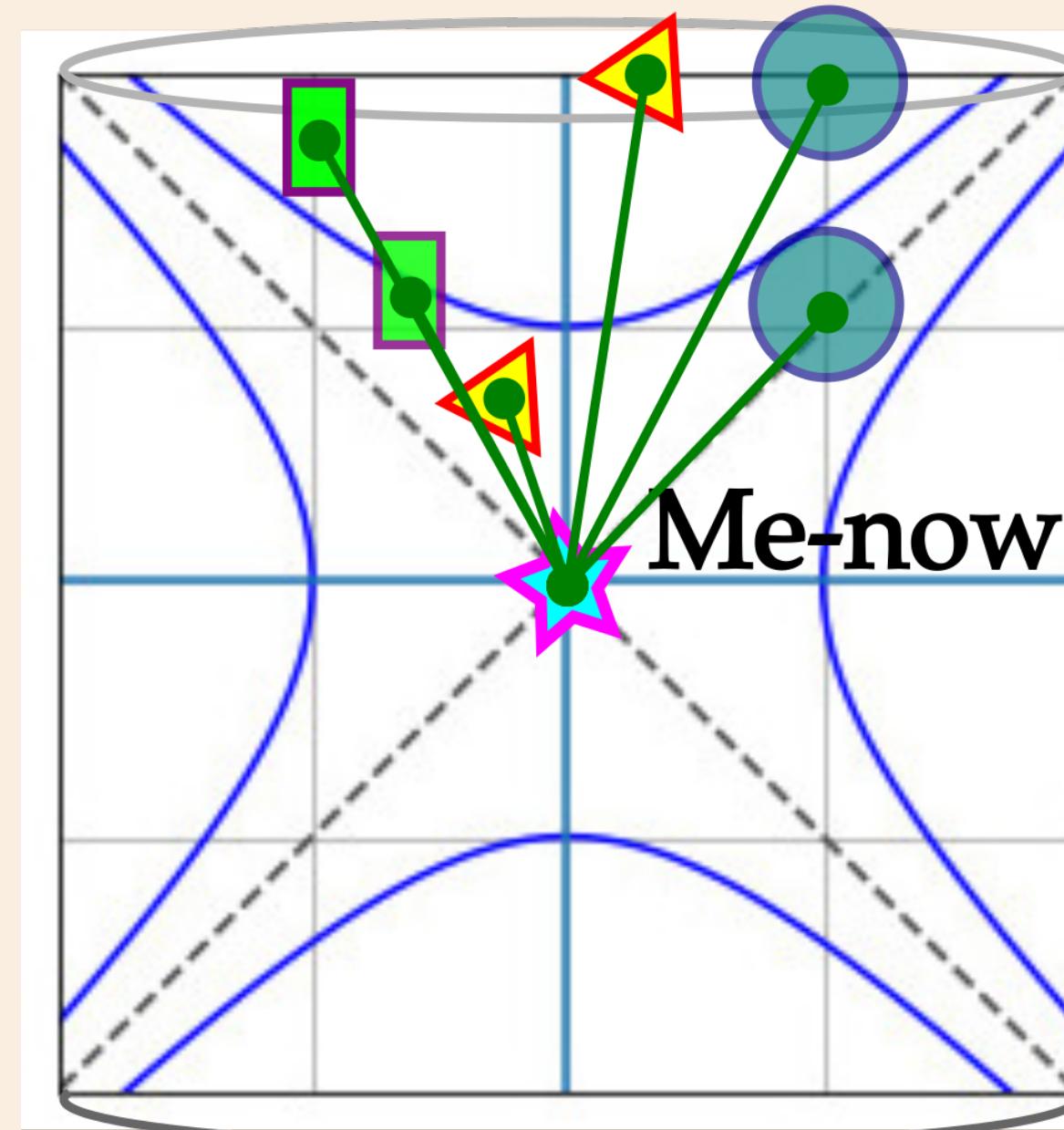
I am not a point, but a volume

Remove Me-now by measuring you using subtraction to create a tangent space

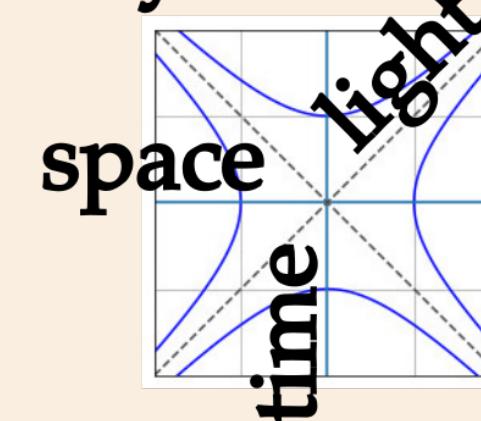


Include just 3 things Fill in rest of the Universe later

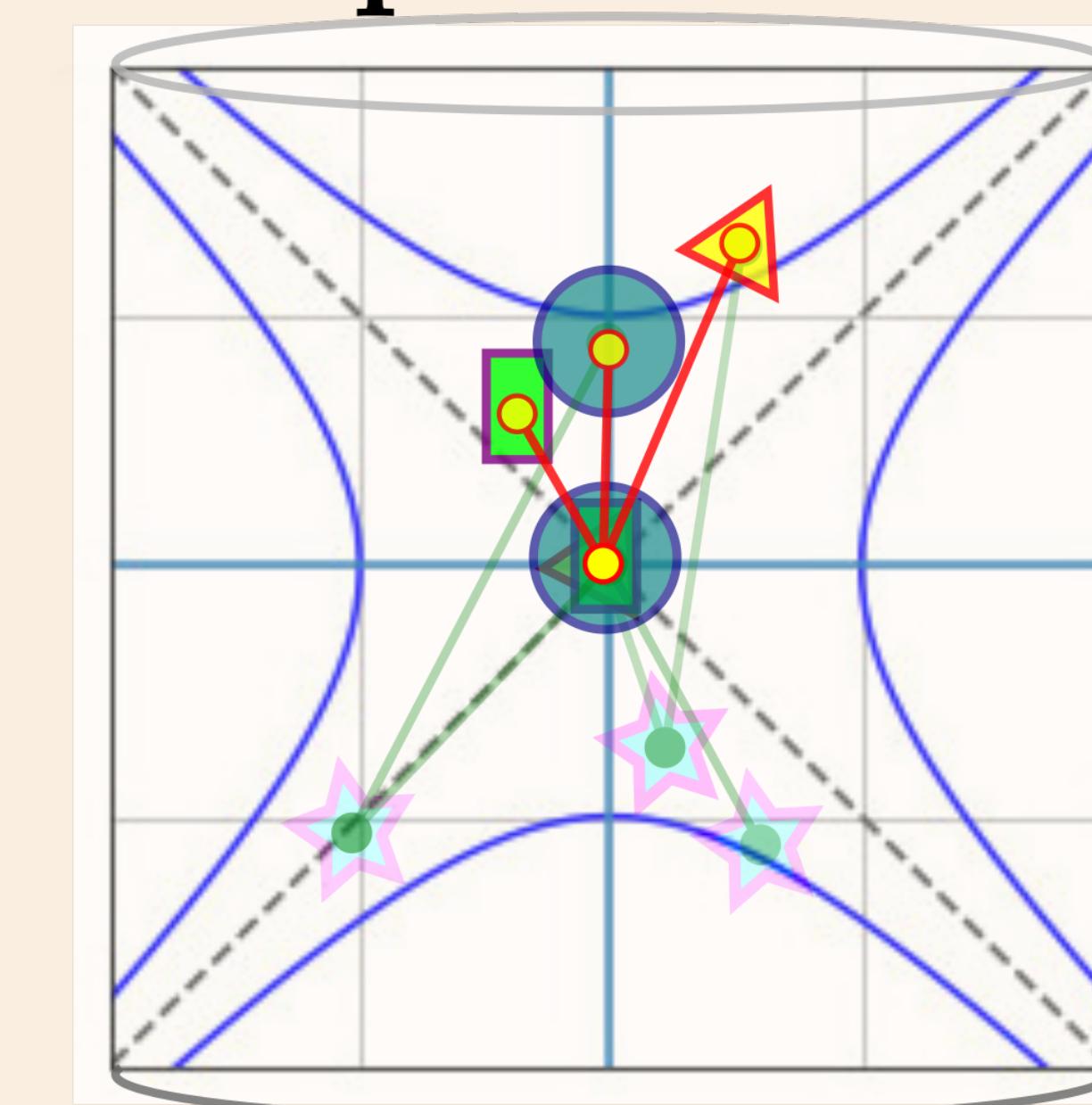
Space-time



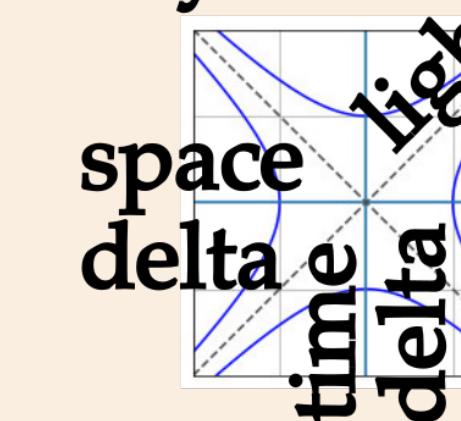
key



Tangent space of
Space-time

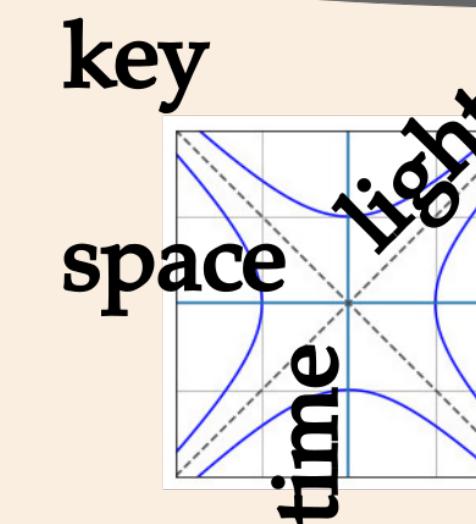
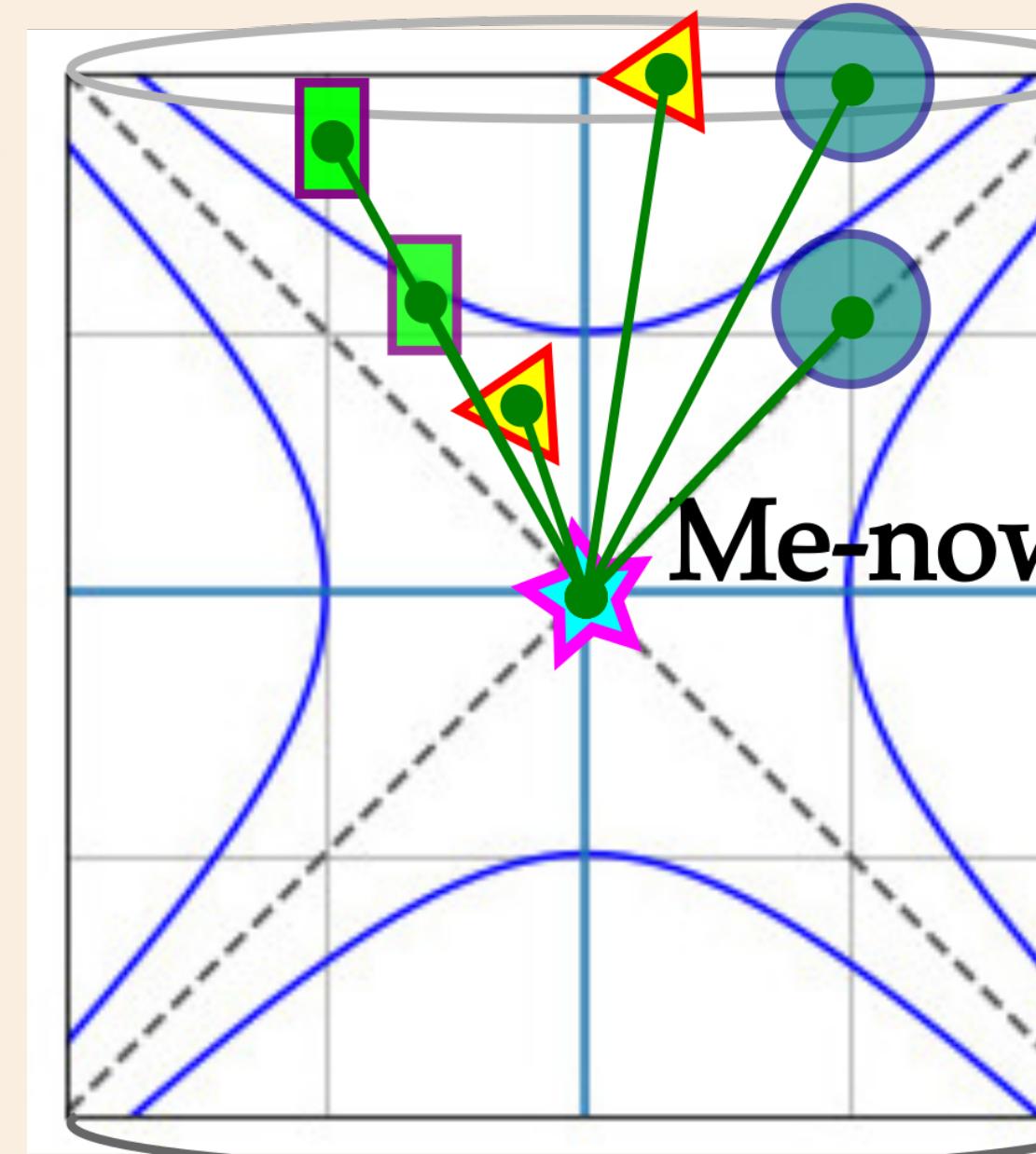


key

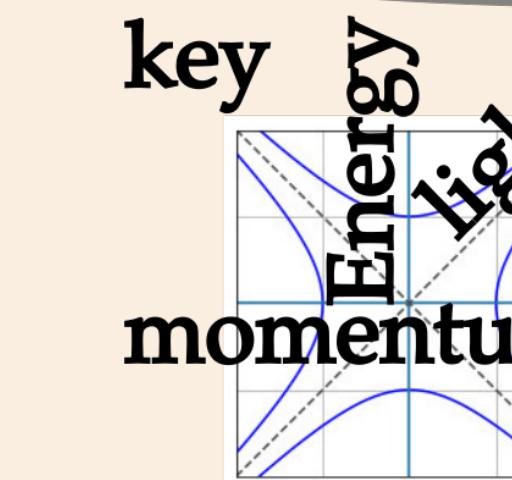
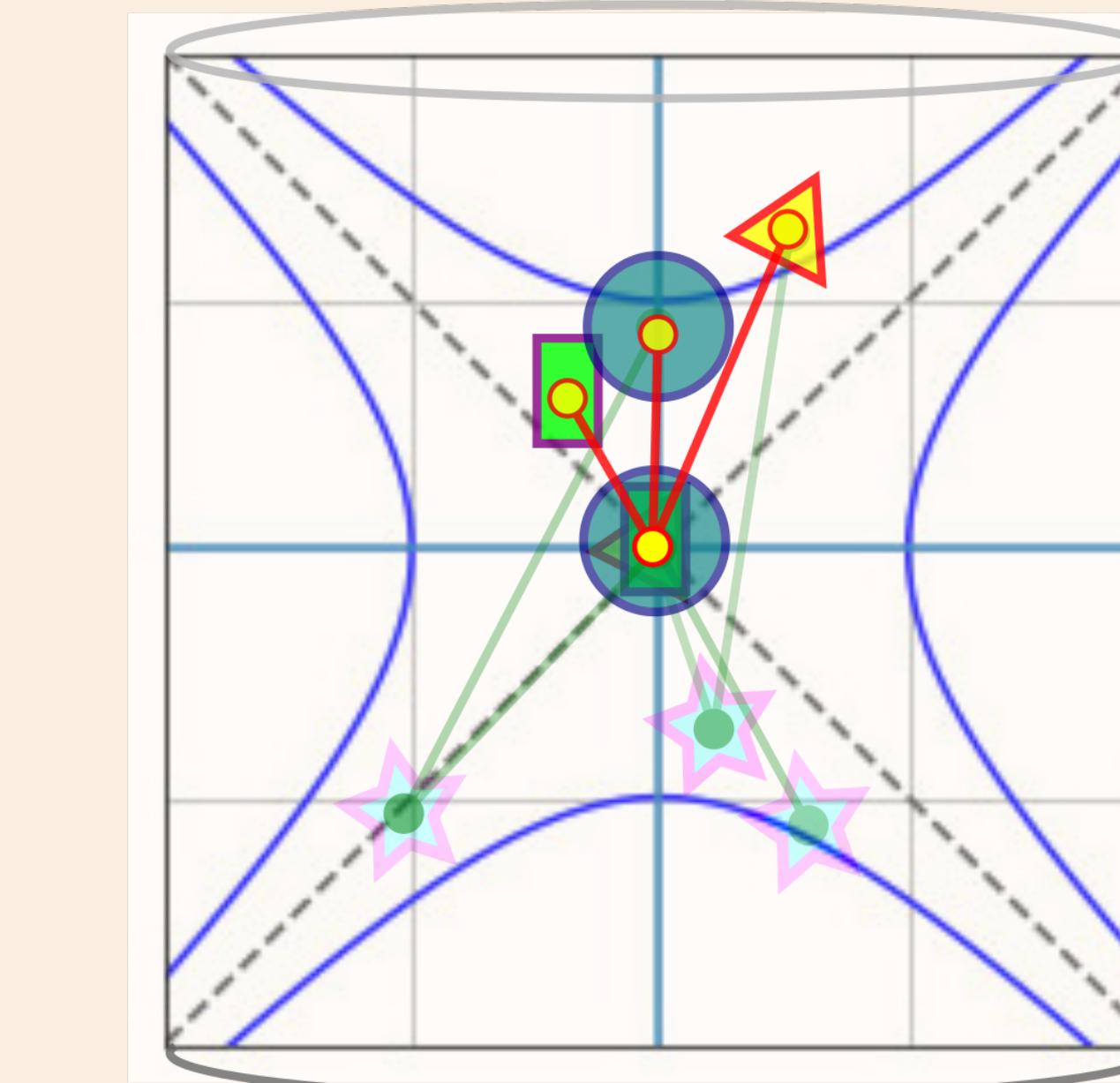


Energy-momentum is the one tangent space we will deal with.

Space-time

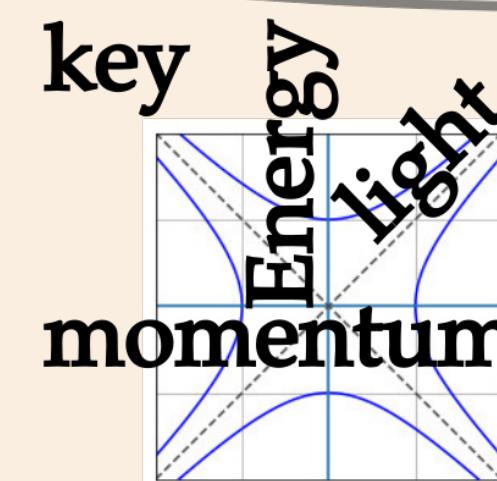
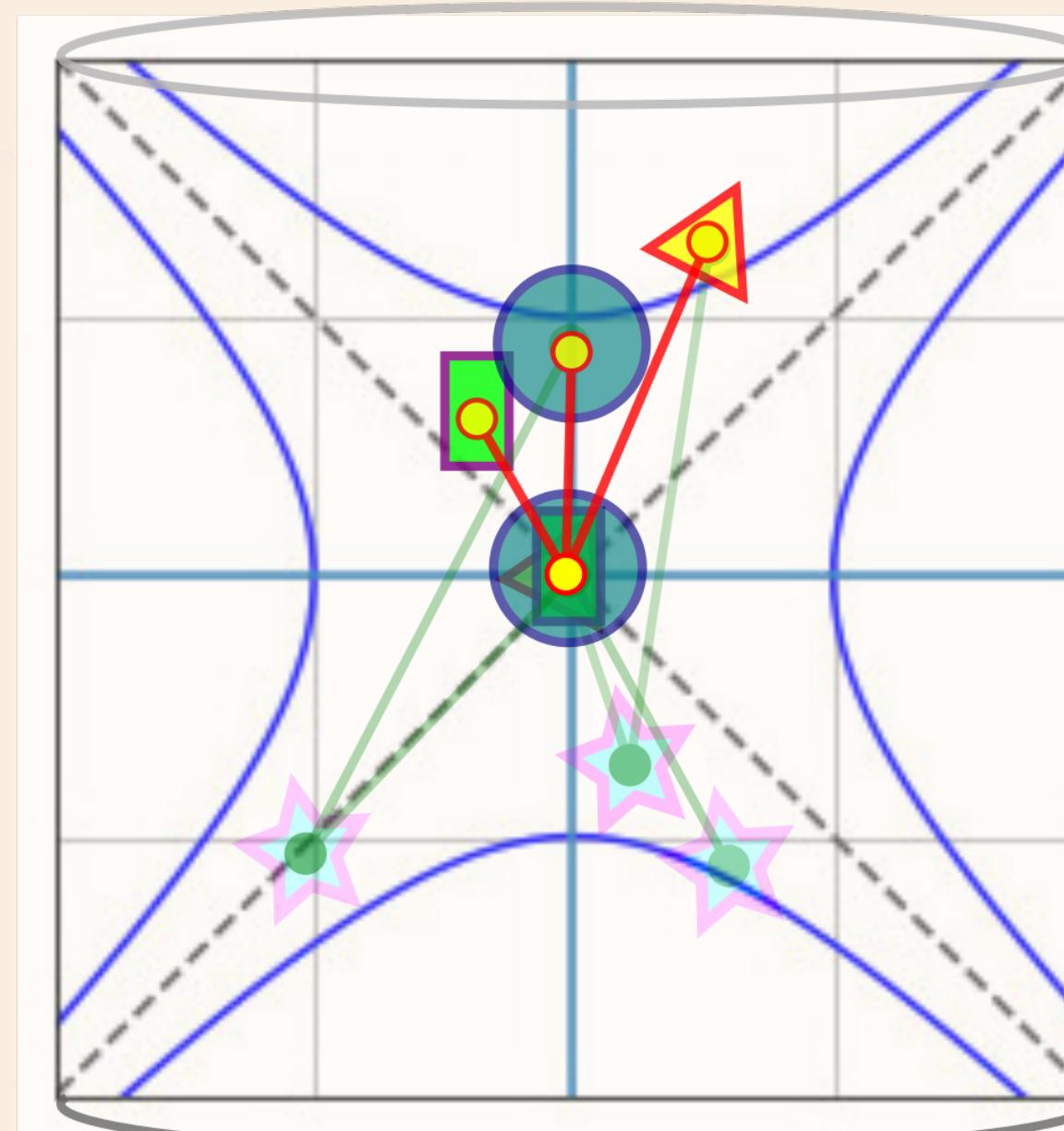


Energy-momentum



Energy-momentum has “curves of agreement” Which are mass squared-energy x momentum

Energy-momentum



$$\begin{aligned}(E, cP_x, cP_y, cP_z)^2 &= (E^2 - (cP_x^2 + cP_y^2 + cP_z^2), 2cEP_x, 2cEP_y, 2cEP_z) \\ &= (m^2c^4, 2cEP_x, 2cEP_y, 2cEP_z)\end{aligned}$$

Thoughts have space-time volume and energy-momentum, so have mass squared-energy x momentum

I have not tried to do the calculation.

Working on Second Live has space-time volume
and energy-momentum, so has mass squared-
energy x momentum

I have not tried to do the calculation.

Open discussion time....

I hope to deeply listen to you - tried to answer some hard questions

I am here to share what I know physics knows,
and what physics does not know

I reserve the right to keep the discussion on target

As it says on the t-shirt



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