I ABSTRACT 2023 MAA MathFest Tampa. (165w)

Rejection! Not my 1st, hopefully my last!

Galileo and the squaring of time

Presuppose Galileo and Descartes collaborated on The Art of Falling. Let's get these two guys together. 15th Century Algebra and beginning Parametric Geometry Analysis. Galileo proffered unit time as range, making unit space as domain arbitrary. Galileo and Descartes, realizing domain fall space, not of fixed meter, needed accommodate changing displacement per units of range (time) presented a challenge. Their solution was to construct algebraic tiles to build an explanatory Euclidean Uniform Acceleration SpaceTime Frame. SpaceTime tiles, in a Descartes 1st Quad happening, would possess space as Central Force domain and range as time. I will use the interrupters Galileo placed on his incline plane as event time, each interruption a 1s range event. We only need two seconds of roll to construct their 1st second Euclidean free fall tile for our Earth's surface acceleration curve enabling a Euclidean SpaceTime frame mapping free fall events for Gravity Field Earth.

Galileo; 02/15/1564 01/08/1642
Descartes: 03/31/1596; 02/11/1560

A Sand Box Geometry Philosophical Exploratory on stuff BC (Before Computers)
ALΣXANDΣR (Pi Day) 1944

Central Force Fields and Relative time. Now is now for everyone. Even those having experience on the other side of Creation, their time is my time. We all exist with God's time. Birth, life, and death. Can't be changed. ALΣXANDΣR

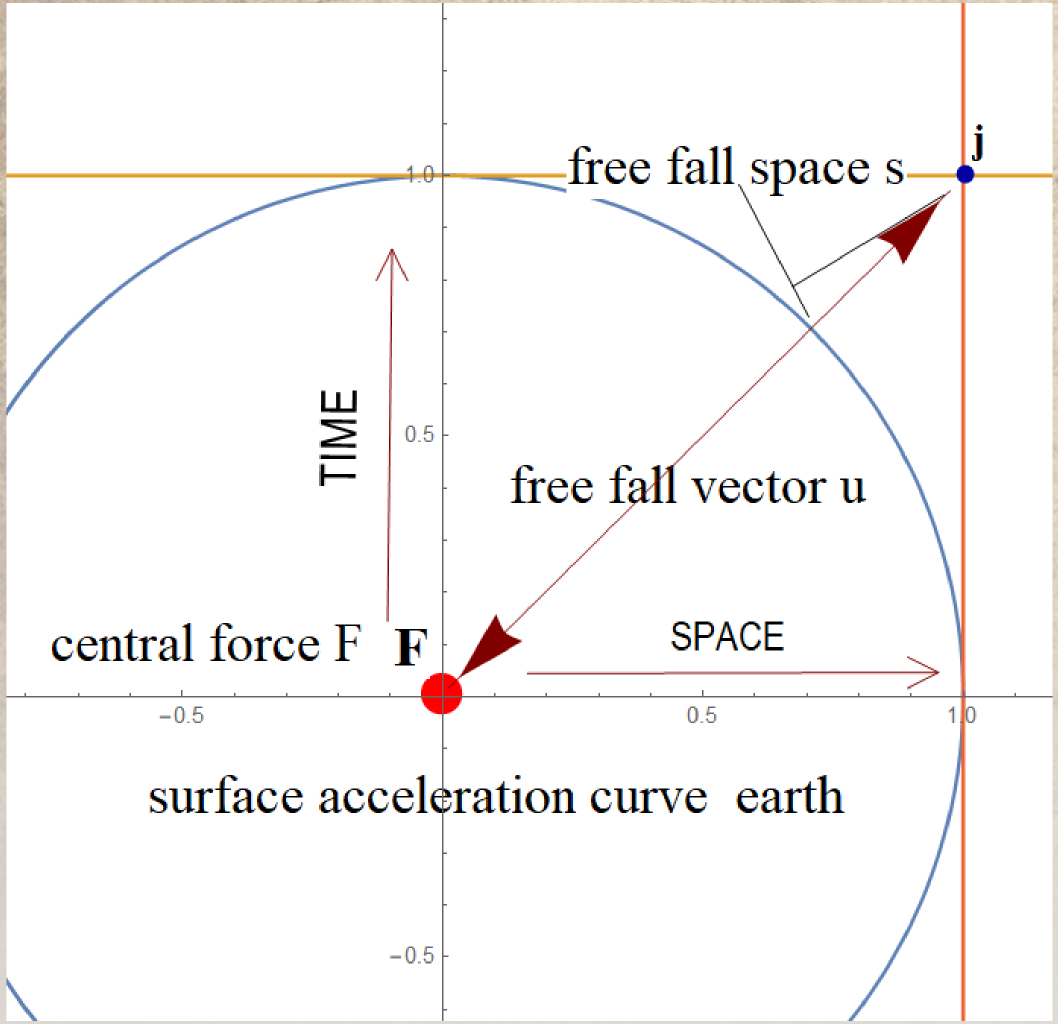
If we select the timeline Galileo as that point in human history where we recognized our Earth is not the center of Creation; we begin with Space and Time Square1 (S&T1). Let me suggest two more S&T's as significant milestones of our human knowledge base. (S&T2) would be Sir Isaac Newton and his Universal Law of Gravity. Followed by (S&T3); late 19th Century and early 20th Century collective development of Quantum Thermodynamics. What happens when atoms sweat or get real, real cold.

S&T1

Galileo's S&T1 provides the source primitive for all S&T space and time squares to come. S&T squares are born in Descartes 1st quadrant. A 1st quad construction will provide positive natural numbers (counting integers) to construct a Uniform Acceleration time square. This allows utility of Euclidean definition of a square; congruent sides giving a one-to-one correspondence, one unit time as S&T range with one unit space as S&T domain.

S&T Uniform Acceleration squares are a parametric geometry function and do not define points in space as a function range and domain, but meter intensity of central force accelerations by distributing time as seconds removed ***from*** the surface curve of M_1; making 'how-high' a metered effort using time. Inversed Square Law meter of field intensity makes each spacetime tile, of the Euclidean SpaceTime Frame, relative with the 1st second experience of the field from which the 1st unit SpaceTime Tile is derived.

1st second free fall for planet Earth. Galileos 1st Sec Tile



(j) is <u>not</u> a point located at $(1, 1)$ on a Cartesian Plane, but position in central force field space of M_1. In fact (j) is 1 second removed from surface acceleration curve of **F**.

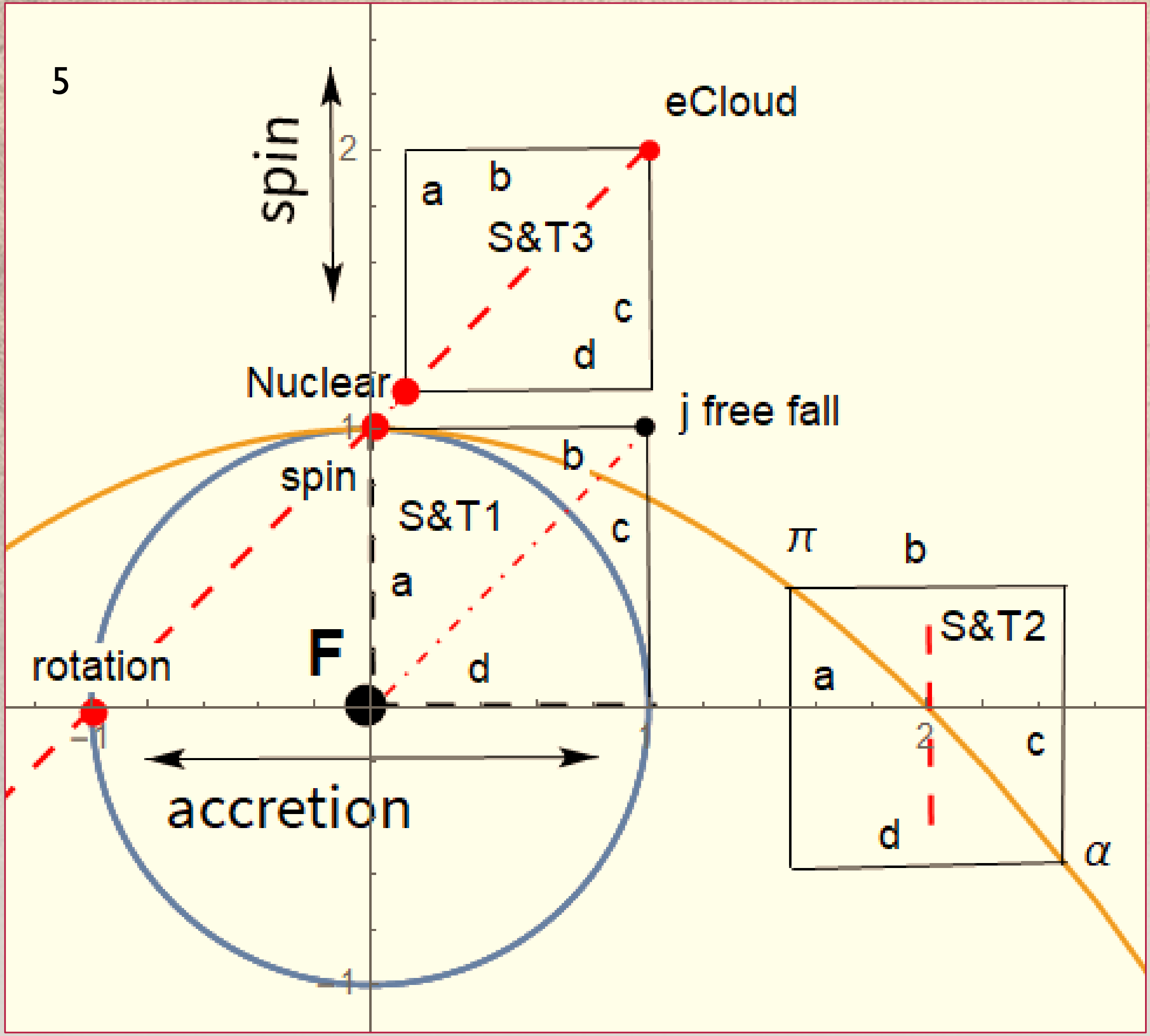
If this S&T Square happened to be 1st second free fall experiment for our Earth, 1 unit of free fall space would be 16ft. Cartesian Coordinate definition for a Uniform Acceleration 1st second S&T tile for our Earth would be:

$$(one\ unit\ space 16ft.(domain), one\ unit\ time 1s\ (range))$$

$$(16feet, 1\ second)$$

We know Imperial meter of Acceleration for Earth to be $(32ft/s^2)$; a velocity vector across 1s of space. Distance moved in that 1s of space is an analytic geometry average.

Initial =0 and final = 32ft. $\left(\frac{32ft}{2} = 16ft\right)$.



PARAMETRIC GEOMETRY

of 3 SPACE TIME SQUARES of HUMAN EXPERIENCE

S&T1: (j) is free fall corner position in G-field acceleration space. (two diagonals; 1 curved, 1 linear).
(Constant Acceleration; Galileo Galilei).

S&T2: (π) is perihelion (high e) and (α) is (low e) aphelion. (one curved diagonal).
(Changing Acceleration; Sir Isaac).

S&T3 connects nuclear corner of space and time with ecloud corner of same space and time. S&T3 has (one linear diagonal) connecting nuclear shaping forces of nucleus and ecloud with atom spin and rotation. S&T3 explores Quantum level thermodynamic experience of Q (heat) and electromagnetic bond.

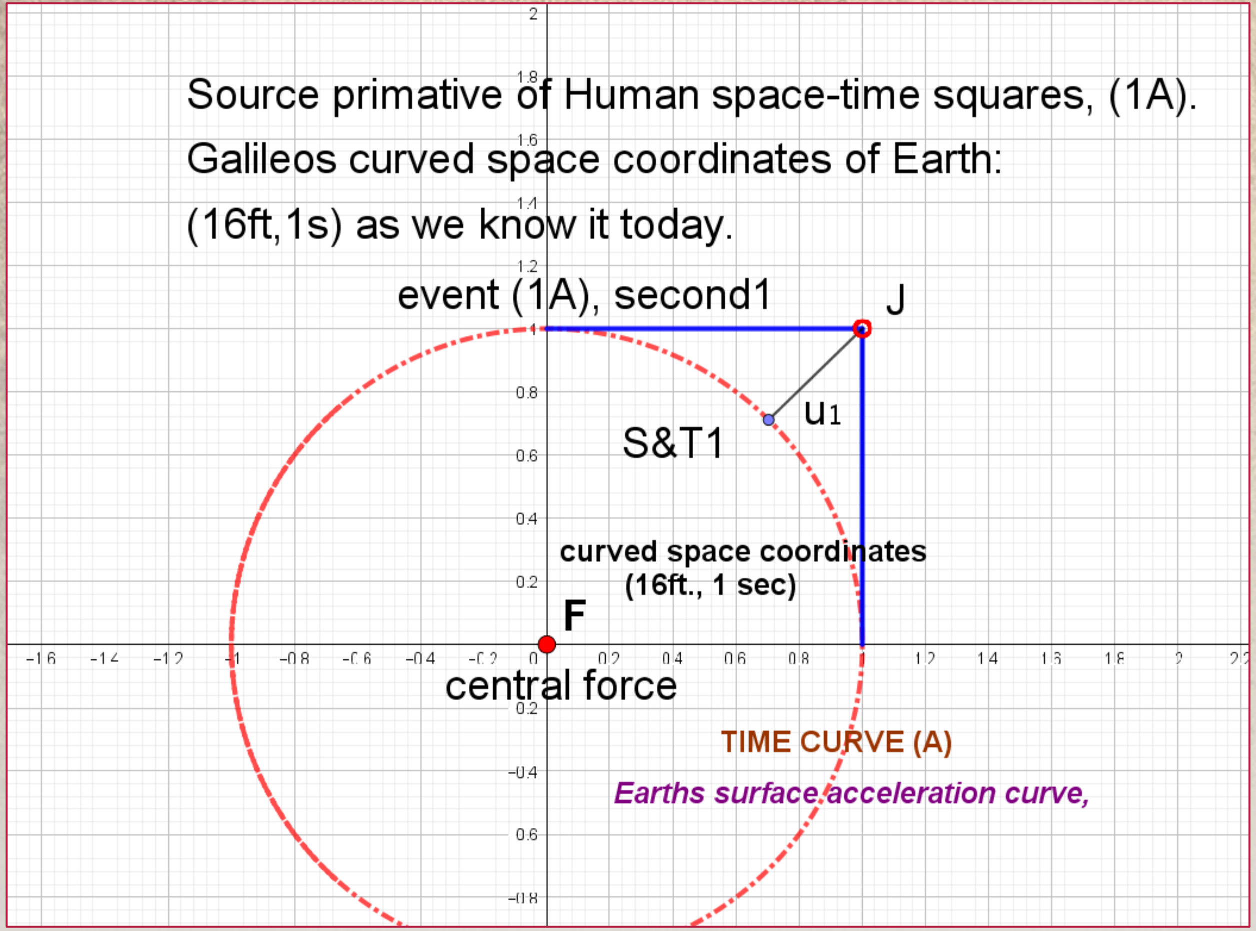
All three SpaceTime tiles share the same Central Force Spin and Rotation axis of F.

If we let S&T2 be a two mass $(M_1 M_2)$ system, stable sustainable dynamics of S&T2 require (M_1) to be an independent space curve, providing system potential. (M_2) will be the system dependent space curve suffering orbit influence of (M_1) en-perpetuity.

I say; if S&T3 is the aggregate of Quantum small and S&T2 is the aggregate of Classic Big, then S&T1 is layered between S&T2 and S&T3 as the domain of living intellect.

The human experience of God's Intentions, our being, lies captured between S&T3 and S&T2 of God's Creation.

.Galileo's S&T1 provides the source primitive for all S&T space and time squares to come. S&T squares are born in Descartes 1st quadrant. 1st quad constructions provide positive natural numbers (counting integers) to construct a Euclidean Uniform Acceleration time square. This allows one-to-one correspondence utility of a square, congruent sides. Providing a one-unit time as S&T range with one unit-space as S&T domain.



Beat1; Second1

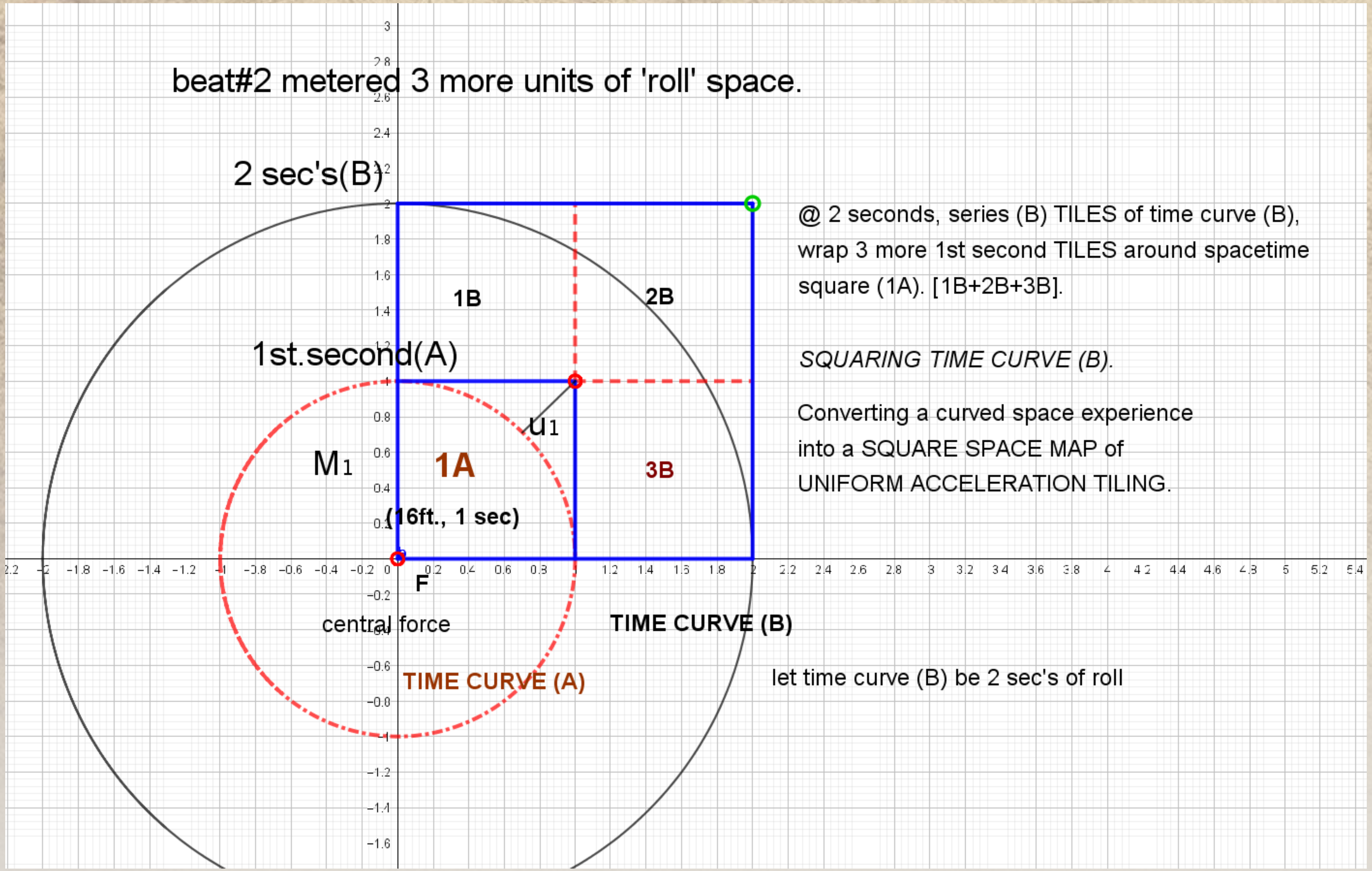
His incline plane established domain(Space) and range(Time) as a collection metered with tempo. One unit time for each beat and meter of collated space per each happening. With Galileo's 1st second tile for our Earth metered up, we can begin constructing a Euclidean Space&Time Frame for S&T1.

Our 1st second tile. Galileo could not know the domain side of his 1st sec tile (16ft). He still set the tempo of Curved Space Coordinates for our Earth's 1st sec tile

$$(16ft, 1s)$$

with his 1st interruption. We will use calculus and my **CSDA** analytical machine to capture those numbers.

Beat2; Second2



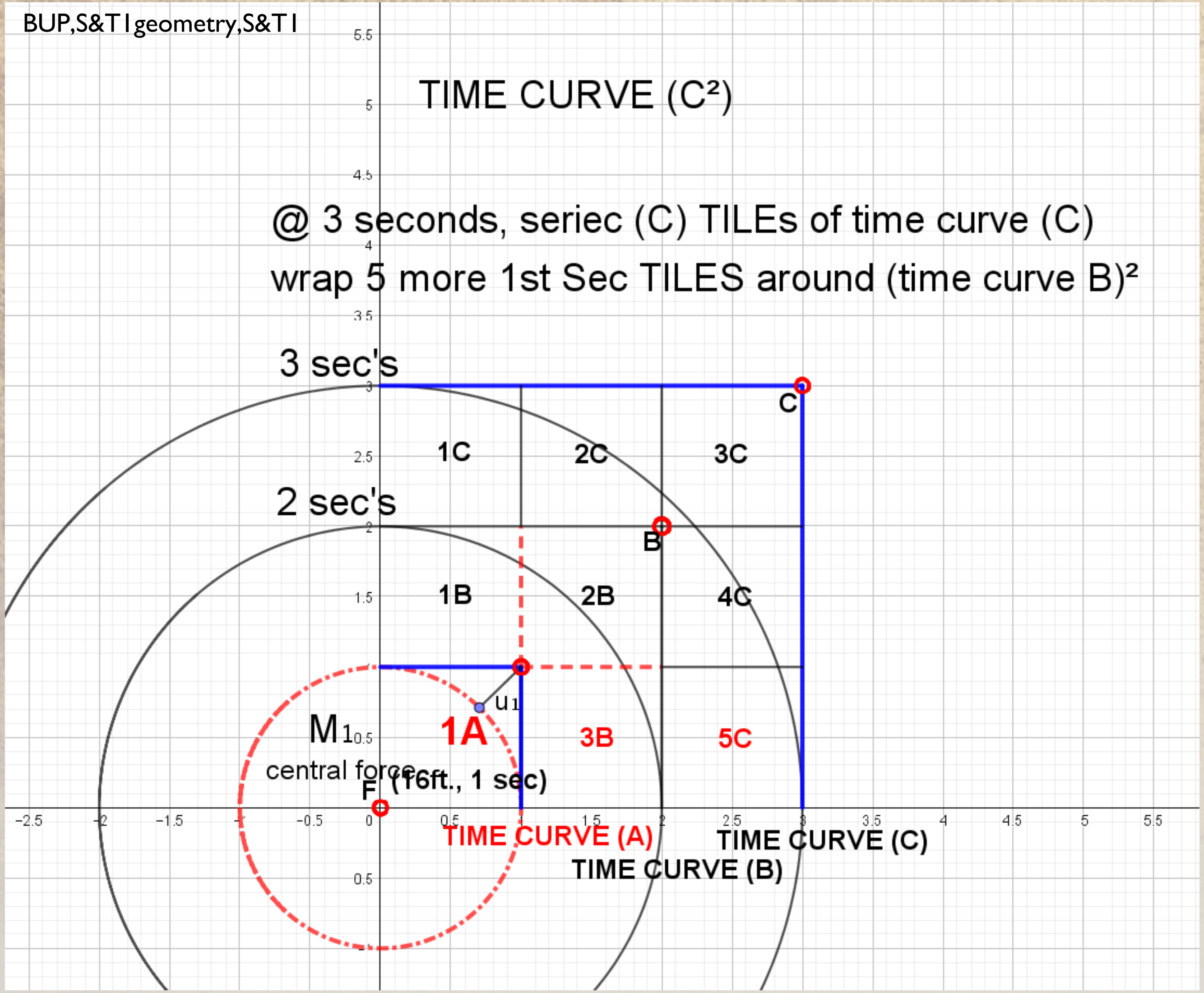
Hearing the beat of adjusted interruptions, he was able to divide increasing fall length into precise sectors of space and time.

$$(sec1 \rightarrow sec2 \rightarrow sec3 \ldots)$$

The 1[st] second interruption is arbitrary. Second #2 is comparative and carries a different length of space with respect to sec#1. Second#2 interrupter adjustment with second#1 provides matched tempo. He noticed change of meter between s#1 and s#2. S#1 measured 1unit space. S#2 measured 3unit space.

Second #3 continues the beat of space*and*time, melding space with time for our 1[st] *ever* curved space Central Force Field inquiry.

Beat3; Second3, Squaring Time Curves



MAPPING A EUCLIDEAN SPACE TIME FRAME

Once he had roll space per unit time, he only had to sum collated distance to meter cost of displacement space to rise above surface acceleration curve of Earth. Cost using S&T Tiles:

$$\left(units\ time^2 * (1st\ \sec domain)\right).$$

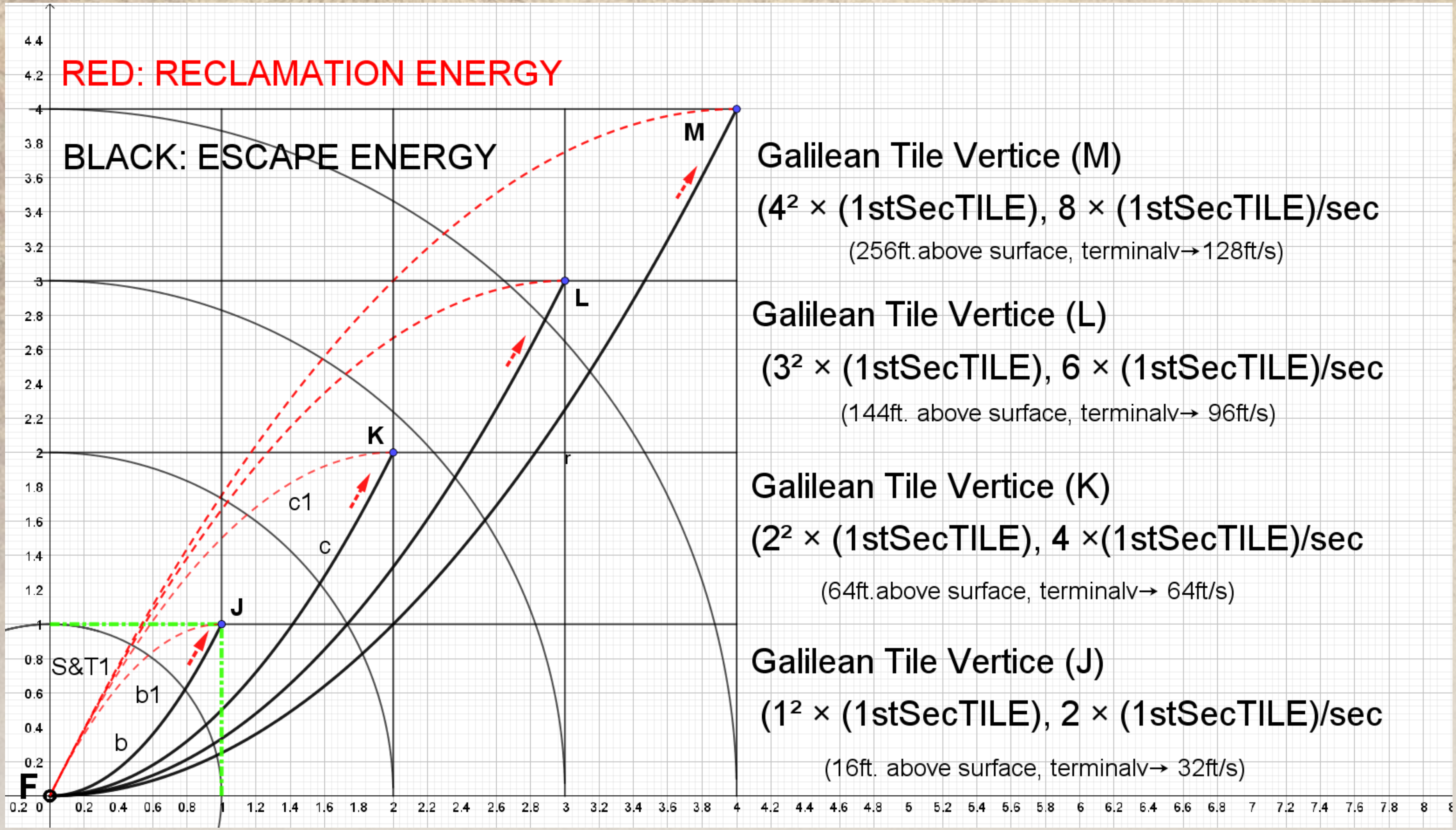
If we are removed 3 seconds from surface acceleration curve Earth, square units of time to aquire analytical cost in tiles needed to gain 3sec's height above surface curve Earth. $(3^2 = 9, tiles\ required)$

Galileo's 3rd interruption provide us with 5 more units of space for our Eucldean time frame.

Terminal velocity of free fall return energy:
(1st derivative of $(time)^2$* 1st sec domain)

$$(height: 3^2 * 16 = 144 feet)$$

$$\left(freefallv = \frac{dt}{ds}(3^2) = 6 * 16 = 96 ft/s\right)$$



Rubber Bands of Euclidean SpaceTime Tiles.

What goes up; must come down!

Central force escape energy to square space remote corners $(J, K, L, and\ M)$ comes with a price. Cost is embedded with each tile as energy needed to *square* units of time removed from surface of (M_1) using G-field Earth tiles. Uniform Acceleration is a conserved system. If means to support place in space above surface Earth is not provided, energy expended to get there becomes fall energy and terminal velocity collapse back potential of **F.** With vengeance! Falls hurt!

Backup S&T1, WVTC 2021
S&T1 Geometry

RUBBER BANDS of SPACE TIME

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CONSTRUCTION PROTOCOL

Created with GeoGebra

Description	Value	Caption
Curve(cos(t), sin(t), t, -5, 5)	a:(cos(t), sin(t))	second1
Curve(t, t^2, t, 0, 1)	b:(t, t^2)	Escape(e) to J
Curve(t, t^2 / 2, t, 0, 2)	c:(t, t^2 / 2)	Escape(e) to K
Curve(t, t^2 / 3, t, 0, 3)	d:(t, t^2 / 3)	Escape(e) to L
Curve(t, t^2 / 4, t, 0, 4)	e:(t, t^2 / 4)	Escape(e) to M
Curve(4cos(t), 4sin(t), t, 0.03, 1.6)	n:(4cos(t), 4sin(t))	Second4
Curve(3cos(t), 3sin(t), t, 0.03, 1.6)	o:(3cos(t), 3sin(t))	Second3
Curve(2cos(t), 2sin(t), t, 0.03, 1.6)	p:(2cos(t), 2sin(t))	Second2
Point J	J = (1, 1)	
Point K	K = (2, 2)	
Point L	L = (3, 3)	
Point M	M = (4, 4)	

Unit time	Tiles recorded	(¿DISPLACEMENT *howfarrr…?*) $(units\ time^2 * (1st\sec domain))$	$(v = 2 * t * 1st)$
1	1	$(1^2 \times 16ft) = 16$ ft	32f/s
2	3	$(2^2 \times 16ft) = 64$ ft	64f/s
3	5	$(3^2 \times 16ft)$ = 144 ft	96f/s
4	7	$(4^2 \times 16ft)$ = 256 ft	128f/s
5	9	$(5^2 \times 16ft)$ = 400 ft	160f/s
6	11	$(6^2 \times 16ft)$ = 576 ft	192f/s
7	13	$(7^2 \times 16ft)$ = 784 ft	224f/s
8	15	$(8^2 \times 16ft)$ = 1024 ft	256f/s
9	17	$(9^2 \times 16ft)$ = 1296 ft	288f/s
10	19	$(10^2 \times 16ft)$ = 1600 ft	320f/s

I find Kinematic equations confusing. Exploring Central Force ME, I use my **CSDA** machine to study two system events.happening with a closed Uniform Central Force Acceleration System.

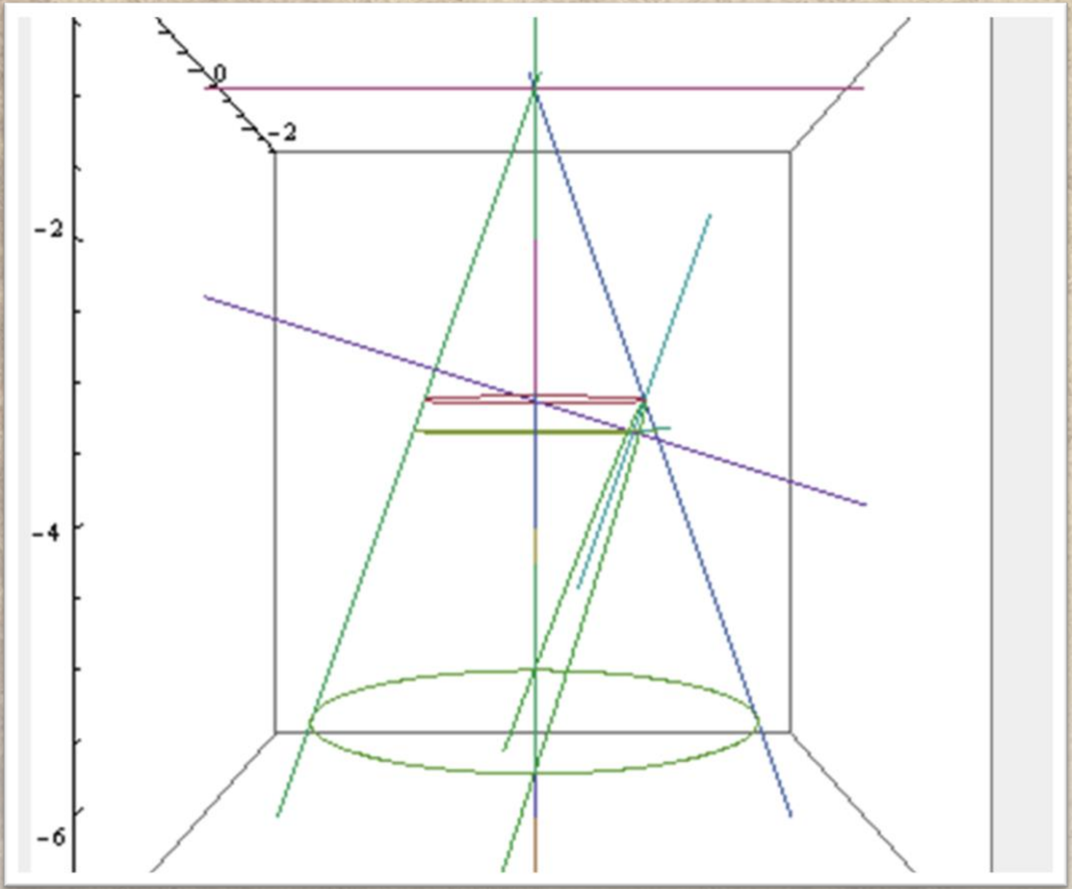
Return energy, or terminal velocity, and height in terms of seconds removed from surface acceleration curves.

For displacement space above surface acceleration curves using Euclidean spacetime tiles:

$$\left(\left(units\ time^2 * (1st\sec domain)\right)\right)$$

Finding terminal velocity: if $(units\ time^2 * (1st\sec domain))$ defines height, I use a 1st derivative on this description of cost in tiles to find terminal velocity of return energy.

$(2 \times unit\ time \times 1st\sec domain)$ = terminalv



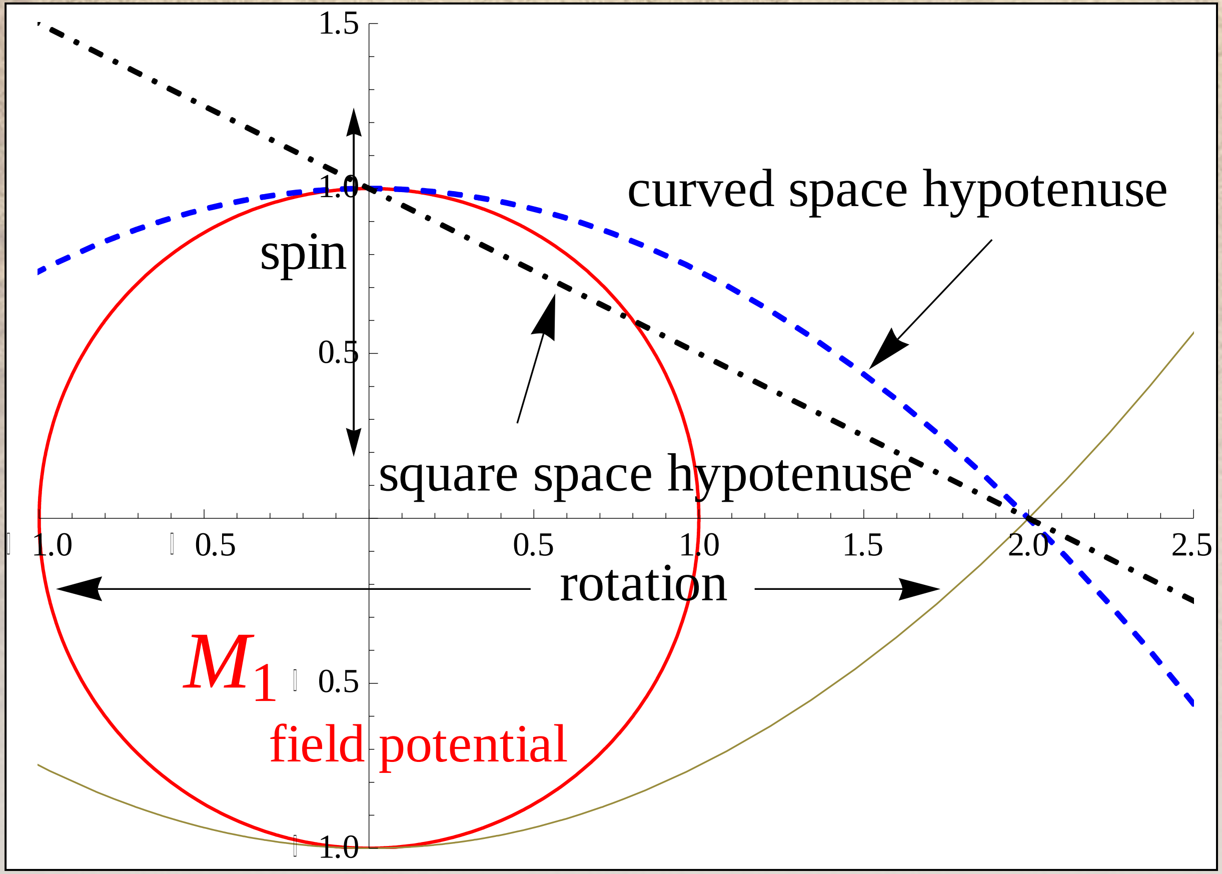
Sand Box Geometry LLC, a company dedicated to utility of Ancient Greek Geometry in pursuing exploration and discovery of Central Force Field Curves.

Using computer parametric geometry code to construct the focus of an Apollonian parabola section within a right cone.

"It is remarkable that the directrix does not appear at all in Apollonius great treatise on conics. The focal properties of the central conics are given by Apollonius, but the foci are obtained in a different way, without any reference to the directrix; the focus of the parabola does not appear at all...
Sir Thomas Heath:
"A HISTORY OF GREEK MATHEMATICS"
page 119, book II

Alexander; CEO and copyright owner: alexander@sandboxgeometry.com

The square space hypotenuse of Pythagoras is the secant connecting (π/2) spin radius (0, 1) with accretion point (2, 0). I will use the curved space hypotenuse, also connecting spin radius (π/2) with accretion point (2, 0), to analyze g-field energy curves when we explore changing acceleration phenomena.



We have two curved space hypotenuses because the gravity field is a symmetrical central force, and will have an energy curve at the **N** pole and one at the **S** pole of spin; just as a bar magnet.

When exploring changing acceleration energy curves of M_2 orbits, we will use the N curve as our planet group approaches high energy perihelion on the north time/energy curve.

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END and QED