Saturday, April 25, 2020

Covid-19 initiated first time ever worldwide shutting down of schools. Remote education became only access platform between teacher and student. This paper is about improving remote STEM education platforms using 21st century computer technology.

Conserved energy and inverse square law

March 14
2020

Inverse square law has been around since Merton College Calculators (14th century) developed and worked out a mean speed theorem. Both Sir Isaac and Galileo intuitions on mechanical motion are sourced from the Calculators. I will use a standard model for G-field orbit analytics to construct two orbits of our planet group using Sir Isaac Newton's Universal Law of Gravity. Standard model parametric geometry allows a comparative of energy curves, potential and motion of M1M2 stable orbits. Not only will we observe inversed radii of M2 in action, we will see orbit stability dependent on conservation laws of energy and angular momentum. All STEM secondary education comprehension.

Finding conserved energy sum with parametric geometry

10 pages 1650 words

Section 4; part 5 (Space Curves of Mars)

On The Heliocentric Circular Mechanical Energy Curves of Galileo

Galileo, born 7 years before and dying 12 years after Kepler, was well aware of Kepler's solution concerning complexity about orbit parameters of our brother planet Mars. He refuted till his death, Keplerian elliptical planetary motion as much too complicated a curve. Though a heliocentric advocate as was Kepler, he held that natural curves of an orbit required simplicity and therefore must be circular. This paper explores Galileo's concept of circular heliocentric planetary motion. I develop a standard gravity field M_1M_2 model using two plane geometry curves, a unit circle and its construct unit parabola, creating a plane geometry function needed to measure g-field central force energy curves. It turns out that g-field inverse square energy curves are spherical, can be constructed using NASA sourced observation parameters of our planet group and moons, build a standard model space and time square, once constructed provide analytics for orbit momentum around our sun and across the g-field time curve, all within reach of STEM HS math. Both orbit curves, his circles and Kepler's ellipse, can be used to explain gravity field orbit mechanics, I invoke Sir Isaac Newton's inverse square law to confirm Galilean perception.

On the Heliocentric Circular Mechanical Energy Curves of Galileo

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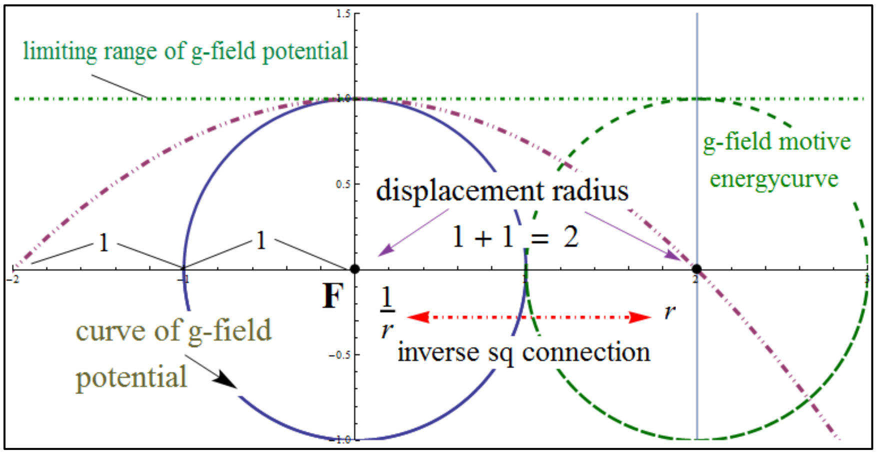


Figure 1: basic **CSDA** demonstration of two unity curves (radius and radius of curvature = 1) and inverse connection. Degree 2 geometry working with degree 1 profile (flat plane) embedded lines and curves.

Reference Baltimore JMM (Jan. 2014): This is the only place in curved space that two unity curves (a place where curvature and RoC = 1) can co-exist as equals. This cooperative endeavor gives us a two-unity curved space event composition on a square space two-unit displacement number line, one curve for potential and one curve for motion. A degree 2 curved space conserved energy parametric geometry happening. Evenly split space to sum conserved energy of M_1 potential and M_2 motion.

Notice the inverse connector joining potential curvature (micro-infinity) with (macro-infinite) event radius of curvature. Only on a **CSDA** dependent average energy curve diameter (4-unit latus rectum) can event radius (r) and its inverse (curvature) exist as two distinct unity curves composing a two-unit event radius happening, metered across both our infinities, with a slope ±1 curved space unity energy tangent happening.

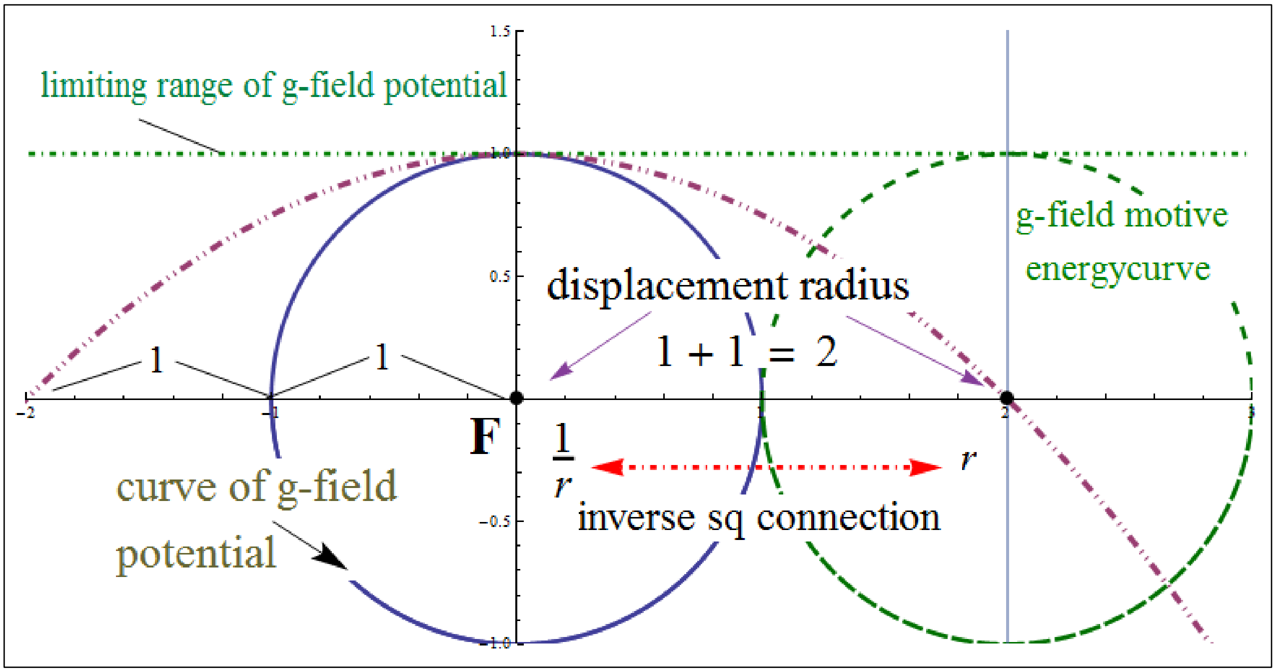
End reference.

Proof for conserve orbit mechanical energy.

PROPOSAL: LET THERE BE TWO (Gfield) CURVES COMPOSING AVAILABLE ENERGY EXCHANGE BETWEEN POTENTIAL AND MOTION ($M_1 \leftrightarrow M_2$):

Galileo's intuitive THEOREM on spherical energy: LAW OF CONSERVED ENERGY AND G-FIELD ORBIT MOTION: Since energy exchanged between these two curves (motion and potential) determines orbit momentum, we need two equal curves to initialize shared energy QUANTITY; when added together zero balance the exchange for stable orbit motion. Somewhere, on the period time curve, there will be a motive curve of same shape as potential less the content. Enter the latus rectum average orbit diameter, reference level of gravity field orbit energy curves. It is here, and only here, on the average diameter of an orbit can two unity curves co-exist.

SLIDE 19: Construct two unity curves, one as central force potential, and one at energy tangent (slope - 1) event on G-field time curve.



(Slide 19: dialogue)

- Construct two unity curves, one as central force potential, and one at slope (-1) event on G-field time curve. This is the only place on the G-field time curve that two unity curves can co-exist. This cooperative endeavor gives us a two-unit curve event composed using two energy unit radii, one for potential and one for motion.

- Notice the inverse connector joining potential curvature (micro-infinity) with (macro-infinite) event radius of curvature. Only on a **CSDA** average energy curve diameter can event (r) and its inverse exist as two distinct congruent curves composed using a two-unit event radius metered across both our infinities.

SLIDE 20: Going from orbit radius of curvature (r) to inversed square event curvature $\left(\frac{1}{r}\right)^2$. $[F_{acc} \propto G\frac{(M_1 \times M_2)}{r^2} = F_{acc} \propto (k \times \left(\frac{1}{\mathrm{r}}\right)^2)]$

To use Sir Isaac Newton's Inverse Square law to construct and prove shape of energy curves, I need to roll the fixed parameters of event radius orbit math into one constant of proportionality as coefficient to curvature.

Since M_1 and M_2 won't change much in our lifetime roll them into G and let them = constant of proportionality k; we have:

$$\left(k \times \left(\frac{1}{r}\right)^2\right)$$

To surmise the shape of the motive energy curves we invert.

$$\left(k \times \left(\frac{1}{r}\right)^2\right)^{-1} = \text{ shape of motive energy curve.}$$

I found the **CSDA** latus rectum diameter is the g-field constant of proportionality for mechanical energy description of potential (M_1) and motion (M_2).

Theorem (On the Potential and Motive Circles of Galileo)

1). Conserved sum of available energy for system motion is stored on **CSDA** Latus Rectum Diameter. When central force potential curvature =1, and focal radius motive curvature =1; then **CSDA** Inverse Square Radius 2 will balance, center to center, two unity curves (curvature and radius of curvature; RoC =1). First curve is about center **F** of potential and second curve is at center of motive event at (slope m = -1) of energy tangent happening (where?) on CSDA period time curve (when?) at dependent curve latus rectum rotating diameter.

2). $[Motive\ curve\ M2\ +\ energy\ level\ (f(r)) =\ Gravity\ Field\ M1\ potential\ curve.]$

3). $[Potential\ curve\ M1\ -\ (Motive\ curve\ M2\ +\ energy\ level\ (f(r))\ =\ zero]$

Prove shape of average motive curve = shape of potential curve.

1. Construct range of potential as a tangent limit through orbit space.
2. Construct shape of potential curve (curvature = 1) about center **F**; given.

3. Compute and construct shape of motive curve at event (m = -1), using:

a) focal property difference;
b) Sir Isaac Newton's Universal G-field law.

a) radius of motive curve = (focal radius mag - potential) ⟶ 2 - 1 = 1

b) shape of motive energy using displacement radius of M_2 from M_1:

$$\left(\left(\frac{1}{2}\right)^2 \times 4(1)\right)^{-1} = 1$$

(about (b)): Where $\left(\frac{1}{2}\right)$ is event radius (2) inversed and $(4(1))$ is system Latus Rectum (constant of proportionality) as average energy *and* average diameter of M_2 orbit. Result term is inversed to change orbit curvature into displaced radius of curvature.

QED: massive Gfield energy curves.

ALΣXANDΣR; CEO SAND BOX GEOMETRY LLC (12/31/2017)

Go to my GeoGebra cloud to see (2) UCF STEM ed dynamic demonstrations. One for energetic Mercury, easy to read inclusive dynamics of potential M_1 and motion M_2.

space and time orbit energy square EARTH: on the other hand, requires GeoGebra zoom in and zoom out to encompass the complete picture because Earth's low eccentricity (5,000,000) between high energy curve perihelion and low energy curve aphelion.

https://www.geogebra.org/u/apollonius

basic template for pursuit of standard g-field orbital

Source: CSDA parametric geometry, central r orbit parameters (.nb) Mathematica

MERCURY

step #1 compose data field. ASI is an acronym for Acceleration Sphere of Influence, a means to define the meter of g-field potential.

central relative position	square space	curved space
□	□	□
perihelion	46 000 000	1.58867
aphelion	69 820 000	2.41133
average	57 910 000	2
ASI	28 954 613	1
average v	47.87	
f (π)	10 684 630	0.369032
f (α)	-13 135 678	-0.453626
□	□	□
focal radius (π)	47 225 370	1.63097
focal radius (α)	71 045 678	2.45363

EARTH

step #1 compose data field.

central relative position	square space	curved space
□	□	□
perihelion	147 090 000	1.96644
aphelion	152 100 000	2.03342
average	149 600 000	2
ASI	74 797 500	1
AVERAGE V	□	35.02
f (π)	2 484 030	0.0332784
f (α)	-2 525 970	-0.0336992
average v	29.78	29.78
focal radius (π)	147 115 970	1.98655
focal radius (α)	152 125 970	2.01355

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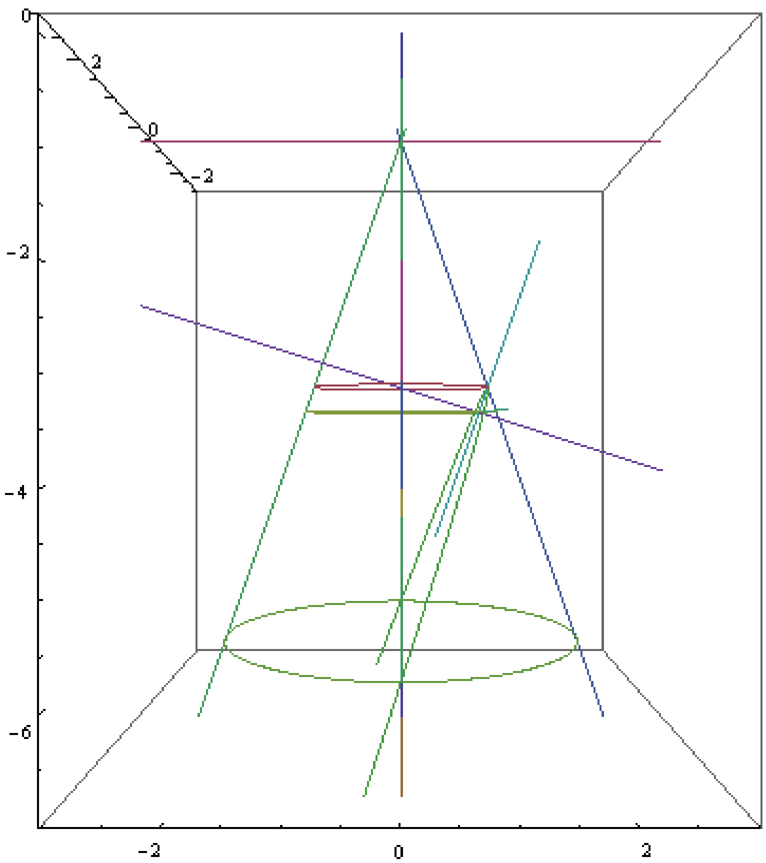
Sand Box Geometry LLC, a company dedicated to utility of Ancient Greek Geometry in pursuing exploration and discovery of Central Force Field Curves.

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.

The computer is my sandbox, the unit circle my compass, and the focal radius of the unit parabola my straight edge.

ALΣXANDΣR; CEO SAND BOX GEOMETRY LLC

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.

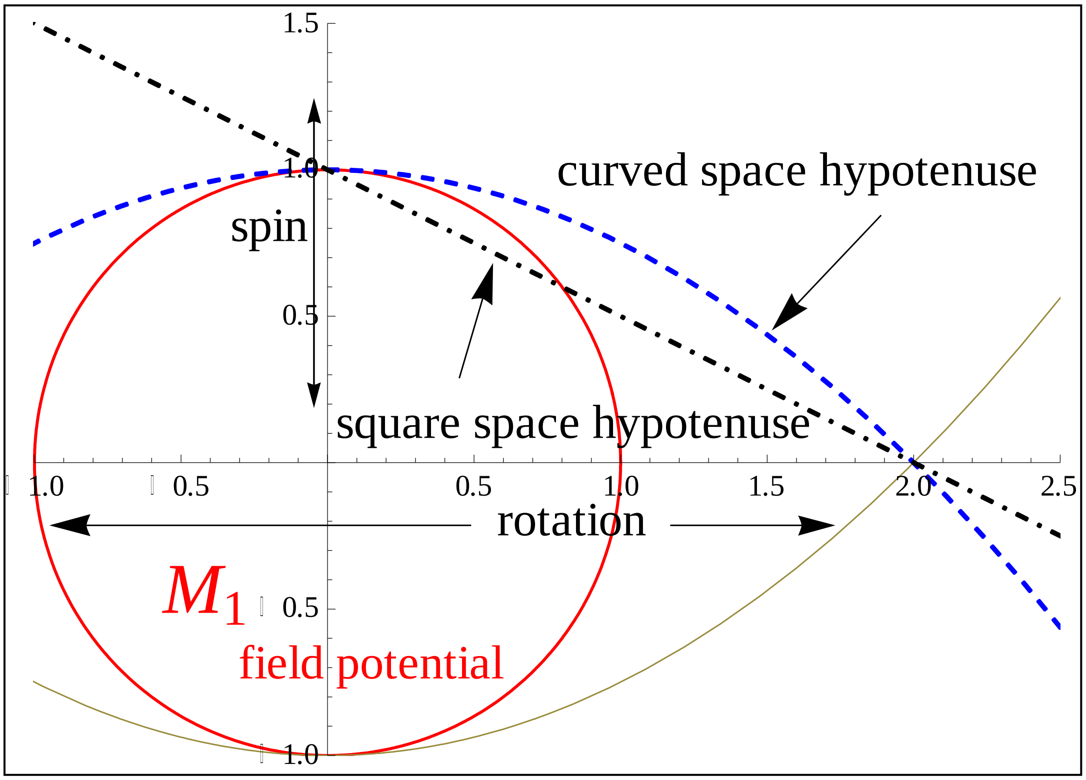


Figure 2: CSDA demonstration of a curved space hypotenuse and a square space hypotenuse together.

We have two curved space hypotenuse 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.

ALΣXANDΣR