



AUGUST 1, 2023

# Propellant-less Thought Experiment

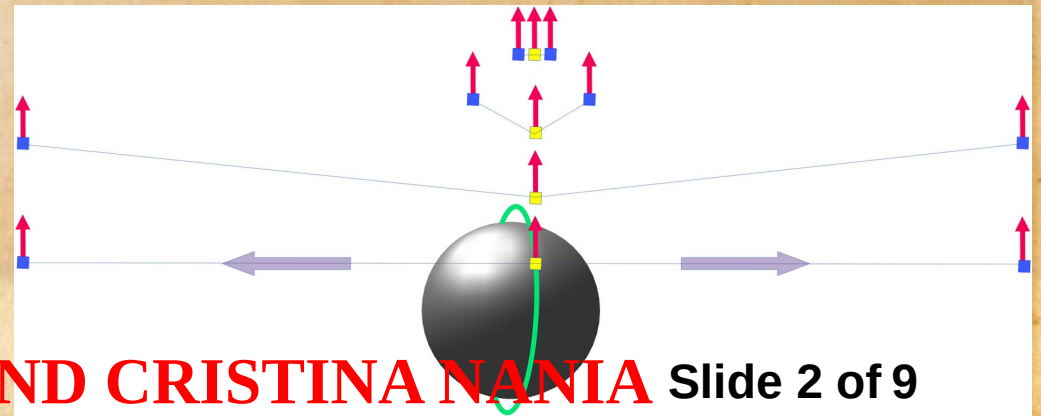
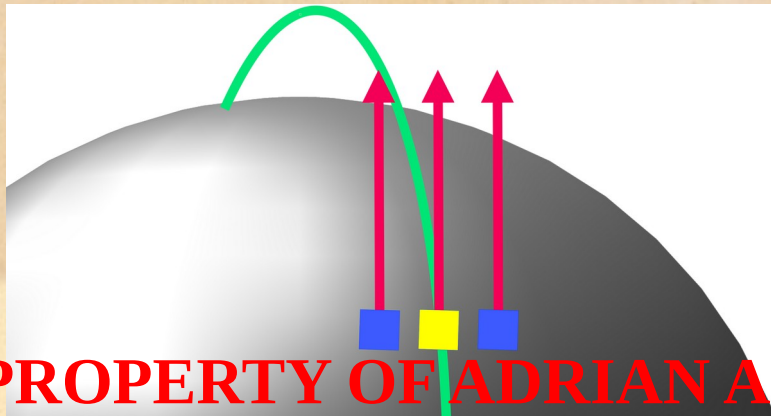
**A JACA ENGINE**

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# Propellant-less Thought Experiment

- Breaking news: **you cannot break the laws of physics**
- Imagine you have a satellite (YELLOW) in LEO with 2 railguns
- Use 2 very heavy projectiles (BLUE) hooked to the satellite through ideal fishing lines
- Fire these projectiles from the satellite to the left and right, much faster than escape velocity
- When the projectiles are 30,000 km away, stop them through the ideal fishing lines
- Now wait for the heavy projectiles to pull the satellite into the deep space
- When the satellite is in the deep space, reel in the projectiles
  - Surprise No. 1: The satellite travels now in the deep space, with both projectiles back on board
  - Surprise No. 2: No mass was lost/gained/exchanged, this is true deep space propellant-less propulsion
- Breaking news: **no laws of physics are broken by our propellant-less engine**



# Thought Experiment - Findings



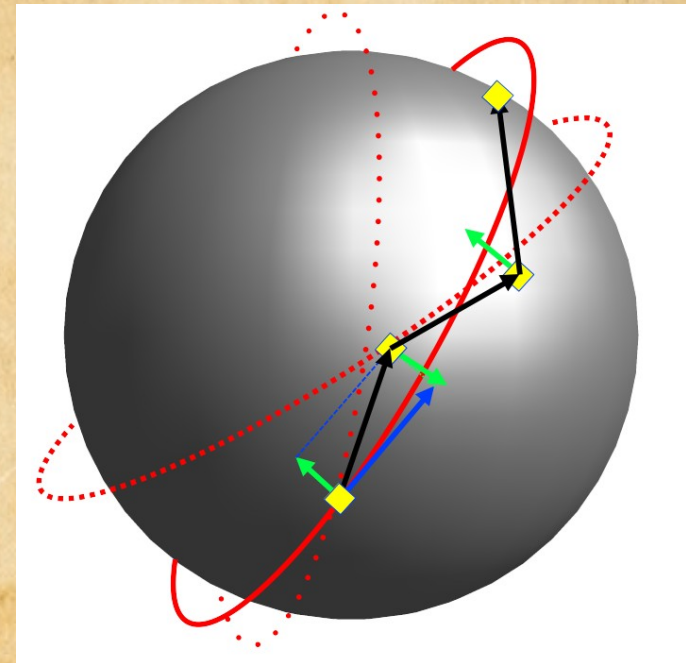
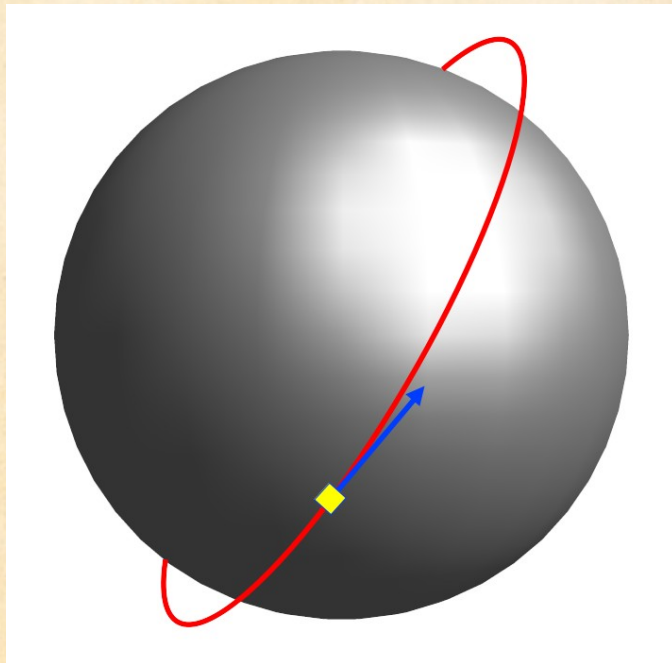
- Solid projectiles can be replaced by particles, gas, liquid
  - Any oscillating mass could replace the shooting projectiles
    - 30,000 km or 1  $\mu\text{m}$  distance, 1 Hz or 1 THz makes no difference
    - What we need is continuous oscillations for continuous acceleration
    - A JACA engine will push against gravity and decelerate or accelerate
  - The secret here is a gravitational field - gravity assist harvest
- Without gravity for acceleration our experiment will fail
  - There is no place in the Universe without Gravity
    - Moons, planets, stars, galaxies, clusters, filaments: all have gravity
    - Oscillations are the way of amplifying and harvesting gravity assist

# A JACA ENGINE

- The centrifugal force will sling shoot an object with mass moving through a gravitational field
- Gravity Assist does not necessarily have to be around a planet/star and completing full/partial orbital cycles
- Gravity Assist can manifest over any length of space where a gravitational field is present, anywhere in the Universe (any minute directional change = acceleration)
- **Gravity Assist can be employed for continuously generating and harvesting an acceleration gradient**
  - **The most important question is: how?**

# JACA Engine For Space Travel

- It is a propulsion system with recovered/reused propellant (oscillating), as opposed to ejected/wasted propellant
- JACA engine uses Folded Acceleration (oscillation)
  - The propellant is replaced by any oscillating object with mass



# JACA Engine Principle

- The average speed (BLUE vector) along the initial RED trajectory is not changed
- The absolute speed (BLACK vector) has higher magnitude
  - It is maintained higher through Folded Acceleration (oscillation)
  - The masses (“propellants”) are pushed left and right equally, periodically, and continuously
- The immediate direct consequence: higher centrifugal force
  - The centripetal force remained constant (i.e. Earth gravity)
  - The satellite/spacecraft is moving upward now, one bit at a time, continuously, additive, with every single JACA sideways push

# A Practical JACA Engine



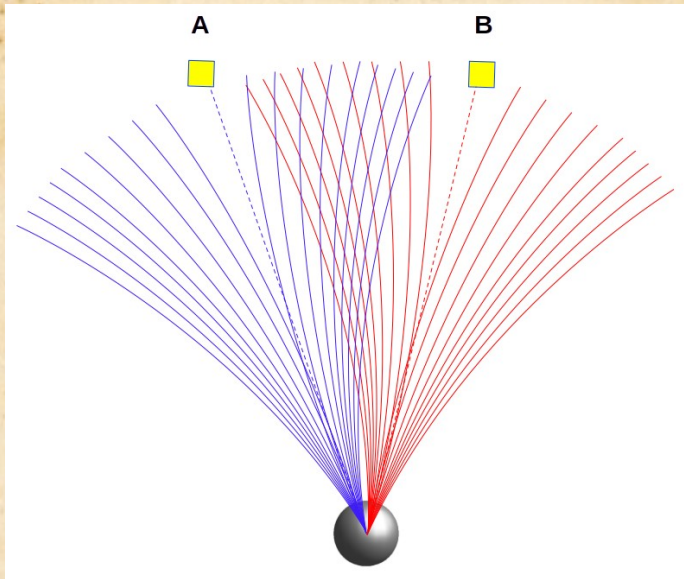
- A purely electromagnetic/mechanic/microwave propulsion system in a physically “isolated” system (nothing can hide from Gravity)
  - Any object with mass (gas, liquid, solid, plasma, quantum particles) could oscillate with added electro/mechanic/microwave energy as “propellant”
  - (CYCLE 1.A): push the mass to the left, equivalent with releasing propellant to the left and accelerating the satellite/spacecraft to the right
  - (CYCLE 1.B): retrieve the same mass to the initial position, equivalent with releasing propellant to the right and accelerating the satellite/spacecraft to the left
  - (CYCLE 1.C): push the mass to the right side, equivalent to releasing the propellant to the right side and accelerating the mass to the left side
  - (CYCLE 1.D): obviously, we must close the cycle by retrieving the mass, equivalent with releasing propellant to the left and accelerating the satellite/spacecraft to the right, and then starting over with a new (CYCLE 2.A)
    - Opposite and symmetrically positioned vibrating mass objects (as JACA engine pairs) will take care of eliminating unwanted vibrations

# What is a Gravity Well Ladder?

- What is a Gravity Well, and how to build and use a Gravity Well Ladder? Or, more precisely, how can a satellite, rocket, or spaceship could make use of Gravity Well Field Lines to climb out and push against gravity? Is there a ladder inside a gravity well?
- There are basic laws of physics, common sense ideas that were missed for a very long time. We do not need fantasy constructs to imagine space travel, we do not need to violate, bend, or magic wand new physics into existence. The Universe is real, accessible, and friendly: it was created for us to explore it. The time is long overdue.
- As it happens, gravity is the only force responsible for accelerating the Universe expansion. No "Dark" fantasy constructs are needed, the Universe is expanding because, not despite gravity. We are indeed on the brink of opening a new era of deep space exploration. This is the point in time and space when the human race will start a new age of true deep space exploration and space industry. Wouldn't be nice to spend your vacation on a newly terraformed moon? Or to have autonomous robots harvesting resources from the asteroid belt, moving the heavy industry directly in space, in zero gravity? What about defense and aerospace, is it not this the sector to benefit the most? Want to know more? Keep reading our short presentation.
- All we need now is to raise interest, to make our engine known, to bring into attention the common sense physics that so many people lost a long time ago. Our intent is to bring people together; only then we will be able to lift-off into the future. The beauty of our Universe is staring you in your face. Are you ready?



# Gravity Well Ladder: What is Folded Acceleration?



- Imagine you have a Folded Acceleration engine moving an object with mass in a gravitational field between 2 points in space: A and B
- In A and B we have different gravity field lines, BLUE and RED
- Pushing an object with mass cyclically between A and B will help the object to push upward on the gravity field lines ladder: local artificial gravity assist and harvest

