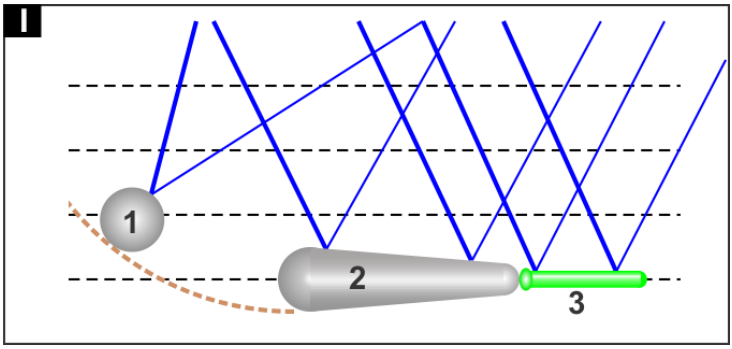
Deductions of the Space-sci Sherlocks



How Momentum-Transfers Create Potential Energy

Professor Du-Ane Du

www.Wacky1301SCI.com, *"Looking at serious science, sideways!"*

Three sisters, Pico, Hectii, and Tera, the "Space-sci Sherlocks," are traveling through the Asteroid Belt. They perform some momentum-transfer experiments and discover a way to create gravitational potential energy.
—Excerpted from *Murdered Energy Mysteries*, Part 2, Chapter 7, by Du-Ane Du, (Amazon, Kindle, ebook 2018, paperback 2021).

TERA: Hi Grandma Aaret.

HECTII: Good morning Grandma.

PICO: Howdy Grandma Aaret and Grandpa Proge, we're using our Chip Micro's voice-to-text mode!

TERA: We made a fascinating discovery yesterday.

PICO: It's our **#4 rule of misleading potentials.** It tells us, pure science is a study of things that actually happen in the natural world. Potential things may happen if certain conditions are met, or potential things may not happen at all.

HECTII: Circular equation sets [C = A = B = C] are designed to enable scientists to make predictions, hypotheticals, and potentials that accurately model what nature is about to do (in a given situation).

TERA: Literally speaking, potential things are hypothetical, so they don't actually exist in the natural world.

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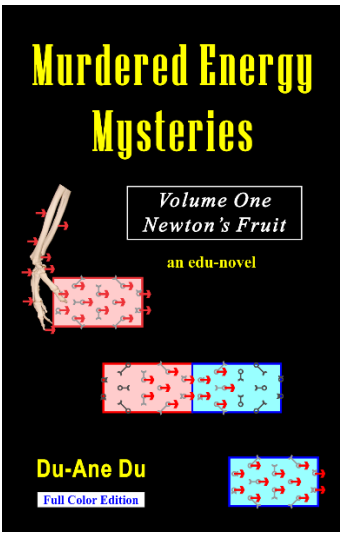

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HECTII: Potential impulse does not exist. Gravitational energy is a murdered myth. Gravitational potential momentum and gravitational potential energy are mathematical predictions of the future.

PICO: These predictions do not currently exist in the present natural world.

TERA: But I don't see why the equation set is circular. It just looks like groups of equations—like, how you can use the height of an object to predict how much momentum it'll have if it falls a specific distance. That one's called Gravitational Potential Distanced Impulse or:

$$\underline{GPDI} = m\sqrt[||]{|2gh|}$$
$$\underline{GPDI} = m\sqrt[||]{|2gh|} + mv_{initial}$$

PICO: Or, you can time how long the object will fall. That would involve Gravitational Potential Timed Impulse. You know, like this:

$$\underline{GPTI} = mgt$$
$$\underline{GPTI} = mgt + mv_{initial}$$

TERA: But where's the circle?

HECTII: Actually, those equation pairs are parts of the overall circle. If I eliminate the names of the equations, the circular equation sets will look like this:

$$im\Delta\rho = mv_f - mv_i = im\Delta\rho = mgt = im\Delta\rho = m\sqrt[||]{|2gh|} = im\Delta\rho$$

and

$$mv_f = mv_i + im\Delta\rho = mv_i + mgt = mv_i + m\sqrt[||]{|2gh|} = mv_f$$

HECTII: By the way, the acceleration symbol can be exchanged for the gravity symbol, and distance can be exchanged for height, to make another pair of circular equation sets:

$$im\Delta\rho = mv_f - mv_i = im\Delta\rho = mat = im\Delta\rho = m\sqrt[\text{II}]{|2ad|} = im\Delta\rho$$

and

$$mv_f = mv_i + im\Delta\rho = mv_i + mat = mv_i + m\sqrt[\text{II}]{|2ad|} = mv_f$$

TERA: Now I can see why these are circular equation sets—the beginning and the end of the sets match each other, the middles match too.

PICO: And we derived all these equations without using any of the energy equations!

TERA: Why would we use the energy equations? After all, we know gravitational potential energy doesn't exist in nature.

HECTII: Have we established that?

PICO: Shouldn't need to. After all, when we did the rocket experiments, the rockets with less mass generated kinetic energy much faster than the rockets with lower masses.

HECTII: But do pendulums do the same thing?

TERA: They must. After all, gravitational potential energy is all about predicting kinetic energy. If objects with lower mass generate more energy (speed infused impulse),

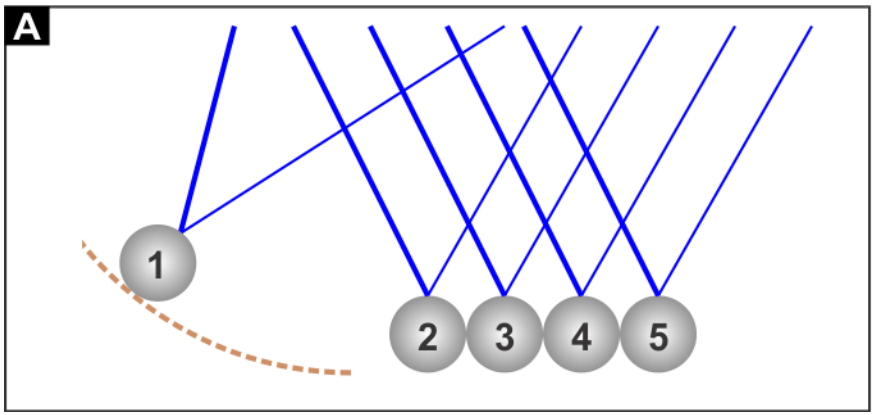
then a lighter pendulum must create potential energy faster than a heavier pendulum.

PICO: There must be a way to test this. Can we force a heavy pendulum to transfer its momentum to a lighter pendulum?

TERA: Last year my science teacher showed us a gadget with five pendulums. Could we use something like that?

HECTII: I think it's called a Newton's Cradle. Chip, can you show us a picture of a Newton's Cradle?

CHIP: A Newton's Cradle has a series of five pendulums, and it's designed to transfer momentum from one end to the other. It looks like this:

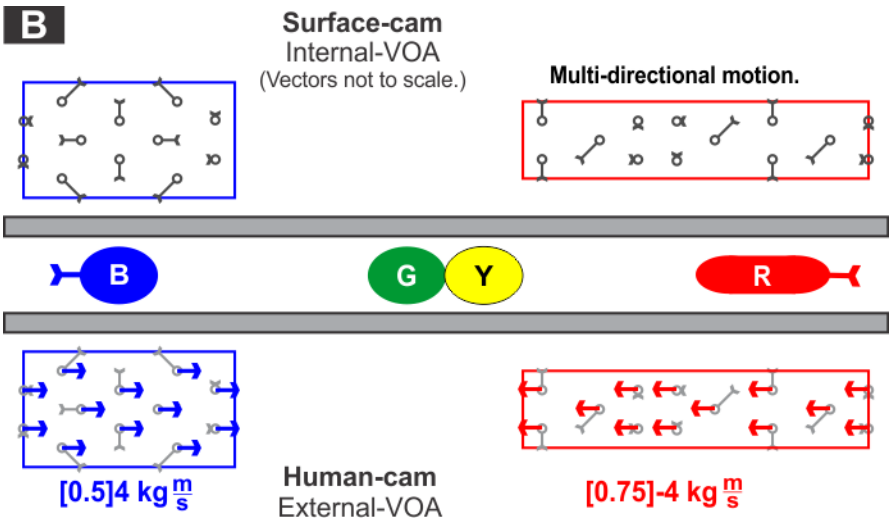


HECTII: It looks like all we need to do is replace the fifth ball with an object with less mass… maybe decrease the number of balls in the middle, to increase the efficiency of momentum transfer.

TERA: I wonder what controls the transfer of momentum from one end to the other.

PICO: I can explain that. Weeks ago, when we were traveling through the Asteroid Belt, I did some virtual experiments with my friend Femton. We were hitting pucks made of diamond and colliding them with each other. Chip, show us the first picture from our last experiment.

CHIP: Here:



PICO: I hit the left-blue puck rightward, and Femton hit the right-red puck leftward.

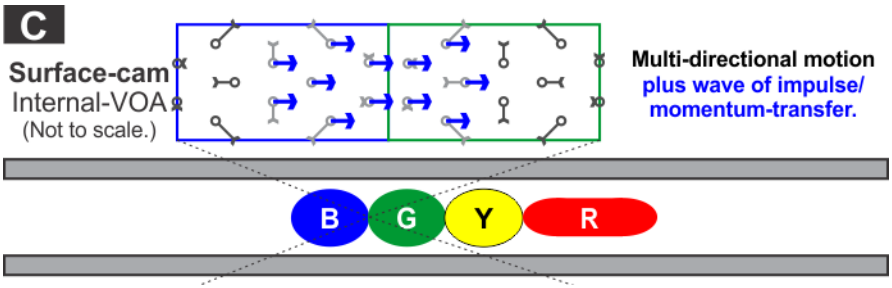
TERA: Above the pictures, you can see the INVO-atomic view of the atoms. That's the INternal View of the Object's Atoms.

HECTII: In the lower pictures, you see the human-level view of the object's atoms. That's called the EXVO-atomic view.

PICO: According to the data at the bottom of the picture, I hit the left-blue puck with an impulse of 2 ρ, causing a velocity of +4 m/s, while Femton hit his right-red puck with an impulse of 3 ρ, and causing a velocity of –4 m/s.

HECTII: Chip, show us the next picture.

CHIP: This one focuses what happens at the blue/green atomic interface, immediately after the moving pucks hit the middle pucks:



HECTII: Look at the top pictures! The left-blue momentum has moved to the invo-atomic level.

TERA: It's a wave?

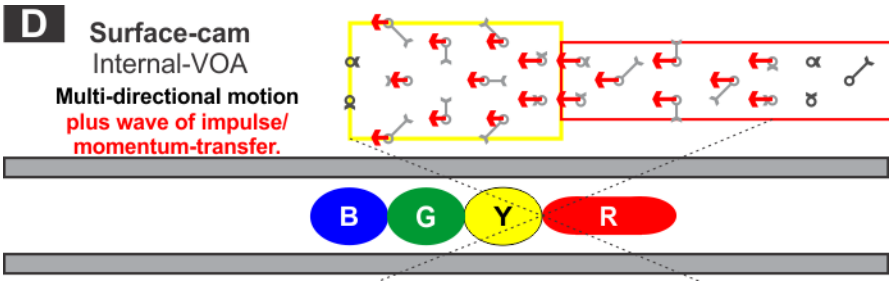
PICO: Yes, it's an invo-atomic impulse wave. And it's the length of the left-blue puck—10 cm, if I recall correctly.

HECTII: Fascinating. The 10 cm blue impulse wave is moving toward the right-red puck… but the right puck is narrower and longer.

PICO: This particular right-red puck was 15 cm long.

TERA: What's going to happen when the 10 cm blue impulse wave enters the 15 cm red puck? Chip, show us the next picture from Pico's experiment.

CHIP: Here is a picture of what's happening at the yellow/red atomic interface:



PICO: Oops, this is the right side, but it's showing what happened when Femton's right-red puck hit the middle pucks.

TERA: It also came to a stop.

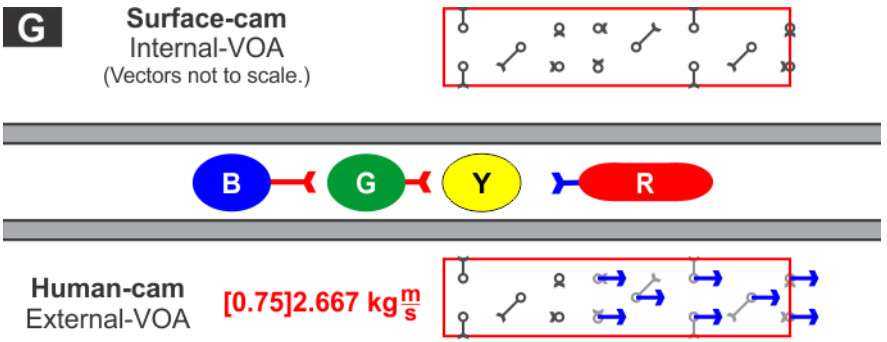
HECTII: And the top picture shows us, the momentum from the right-red puck internalized and became an invo-atomic impulse wave. If the red puck was 15 cm, then the red impulse wave should also be 15 cm long!

TERA: Wait, the 15 cm red impulse wave is heading toward the left-blue puck. But the blue puck is only 10 cm long.

What's going to happen to the rest of the 15 cm impulse wave? The wave won't fit inside the 10 cm puck.

PICO: Chip, now show us what happened when the impulse waves reach the ends.

CHIP: Here:

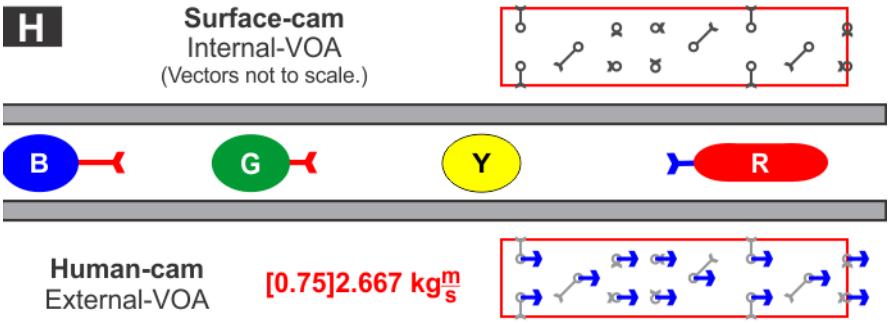


HECTII: Fascinating.

TERA: The right-red puck is longer than the blue impulse wave, so when the blue wave reaches the end—

PICO: …the red puck begins…

CHIP: Sorry to interrupt, there's one last picture to consider:



TERA: Distributive…something—the blue impulse wave has spread out to fill the right-red puck.

HECTII: That's the answer!!

PICO: What's the answer?

HECTII: The length, the length of the starting puck determines how long the impulse wave is. And the length of the receiving object determines how much of the wave the object receives.

TERA: I think I know what you're trying to say.

PICO: If we want a Newton's cradle to send momentum from a heavy pendulum to a light pendulum, then the light pendulum needs to be significantly longer than the heavy pendulum.

HECTII: Precisely! We need a Newton's cradle with a heavy pendulum on the starting end, then a long rod in the middle, followed by a nail-like receiving pendulum, and the receiving pendulum should be twice as long as the starting pendulum.

PICO: This sounds like a challenge for Ms. Ono, the science teacher!

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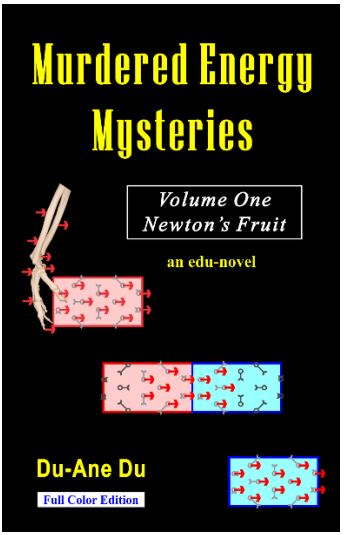

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* * *

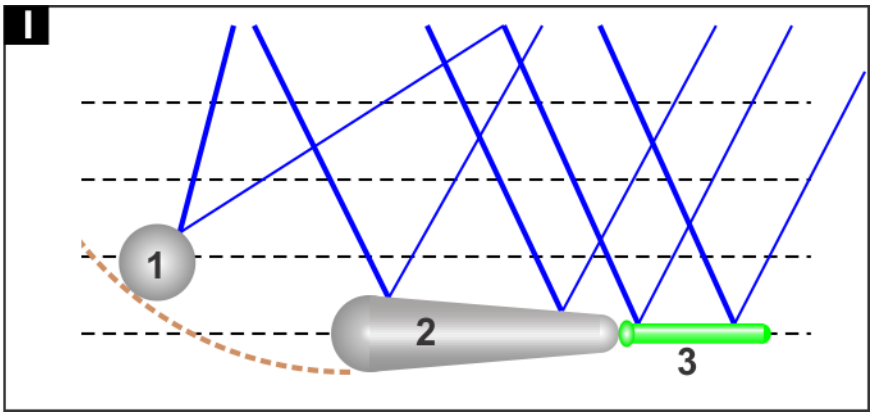
PICO: Hi Grandma and Grandpa, sorry for the big gap in our letter.

TERA: This is a long letter. But we thought you'd be interested in seeing if we can use this gadget to create potential energy.

HECTII: Ms. Ono had the equipment we need, and we took an elevator to an empty observation room. The gravity is fairly strong—9.0 ρ/s/kg, almost as strong as earth!

PICO: The equipment is over a meter tall, lots of strings, the starting pendulum is round and has a mass of 1 kg.

TERA: The middle pendulum is about 5 times longer than the starting pendulum, and it has a mass of 5 kg. While the receiving pendulum is twice as long as the starting pendulum, but it only has a mass of 0.4 kg.



PICO: This is exciting. The level of gravity is 9 ρ/s/kg. Let's give it a test.

TERA: I'll raise Pendulum-1 to a height of 0.1 meters, and let it swing downward.

HECTII: That'll give it a swinging-momentum of:

$$\textit{Pendulum-1 GPDI} = m\sqrt[\text{II}]{|2(gravity)(height)|}$$

$$\textit{Pendulum-1 GPDI} = m\sqrt[\text{II}]{|2gh|}$$

$$\textit{Pendulum-1 GPDI} = (1.0\ kg)\sqrt[\text{II}]{\left|2(9\tfrac{\rho/s}{kg})(0.1\ m)\right|}$$

Pendulum-1 momentum = 1.34 ρ

PICO: The experiment worked—it was awesome watching the balls swing!

TERA: It seemed instantaneous, Grandma! Pendulum-1 suddenly came to a stop, and Pendulum-3 swung upward—much higher than the starting position of Pendulum-1!

PICO: According to my Chip Micro, the nail-like Pendulum-3 reached a height of 0.5 m.

HECTII: Pendulum-3, has a mass of 0.5 kg, and the gravity in this room is 9 ρ/s/kg. So, the calculation for the gravitational potential distanced impulse will be:

$$\textit{Pendulum-3 GPDI} = m\sqrt[\text{II}]{|2(gravity)(height)|}$$

$$\textit{Pendulum-3 GPDI} = m\sqrt[\text{II}]{|2gh|}$$

$$\textit{Pendulum-3 GPDI} = (0.4\ kg)\sqrt[\text{II}]{\left|2(9\tfrac{\rho/s}{kg})(0.5\ m)\right|}$$

Pendulum-3 momentum = 1.2 ρ

TERA: That's a lower number than the potential impulse for Pendulum-1. Did we expect that?

PICO: Yes, it means some of the momentum was lost during the collisions. Pendulum-1 started with a momentum of 1.34 ρ, and Pendulum-3 ended up with a momentum of 1.2 ρ.

HECTII: We can calculate the efficiency of the collisions by dividing the two momentum values, like this:

$$Collision\ efficiency = \frac{out\text{-}momentum}{in\text{-}momentum} \times 100\%$$

$$Collision\ efficiency = \frac{1.2\ \rho}{1.34\ \rho} \times 100\%$$

Collision efficiency = 89.6%

TERA: 89.6% doesn't seem very efficient.

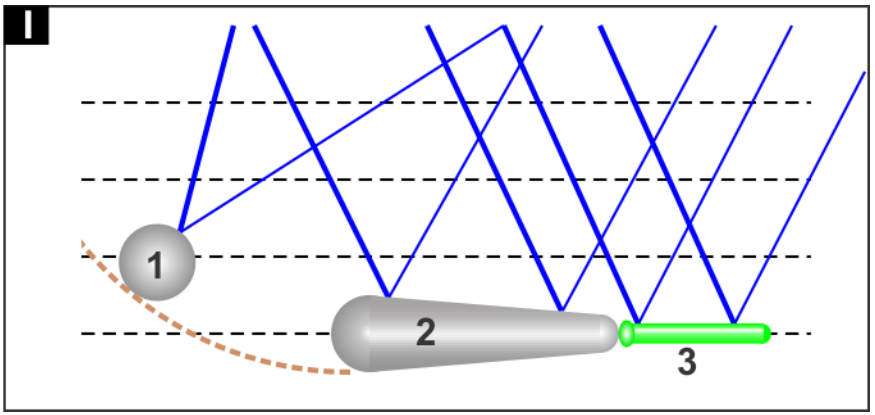
PICO: I'd be surprised if we created any additional gravitational potential energy—with an efficiency that low. (singing)

I am impulse, I am speedy,
I am speedy impul -l -l -l -l -l -lse,
'Cause that's what energy is—!

TERA: Enough with the singing, you'll boor Grandma.

HECTII: You never know about energy, worth checking the numbers. To that end, the mass and swing-height numbers for our two pendulums were:

before, Pendulum-1, mass: 1.0 kg
before, Pendulum-1, swing-height: 0.1 m
after, Pendulum-3, mass: 0.4 kg
after, Pendulum-3, swing-height: 0.5 m



PICO: According to my Chip Micro, the formula for gravitational potential energy, or gravitational speedy impulse is:

$$\boldsymbol{GPE = mgh = \left(m\sqrt{2gh}\right)\left(\frac{1}{2}\sqrt{2gh}\right) = (im\Delta\rho)(speedy)}$$

TERA: The first one is easiest, I'll do the calculations for Pendulum-1's alleged potential energy, before the collision:

Pendulum-1 GPE = mgh
$\textit{Pendulum-1 GPE} = (mass)(gravity)(height)$
$\textit{Pendulum-1 GPE} = (1\ kg)(9\frac{\rho/s}{kg})(0.1\ m)$
$\boldsymbol{\textit{Pendulum-1 GPE} = 0.9\ J_{[1.5]}}$

PICO: But, did all that alleged energy transfer to Pendulum-3 once the collision was over?

HECTII: No way, the collisions were only 89.6% efficient.

PICO: Then we should multiply by the efficiency to calculate the ideal amount of gravitational potential energy that we'd expect to find in Pendulum-3.

TERA: Ok, if I multiply, it becomes:

$$\textit{Ideal GPE for Pendulum-3} = (0.896)(0.9\ J_{[1.49]})$$

$$\textbf{\textit{Ideal GPE for Pendulum-3}} = \mathbf{0.8064\ J_{[1.49]}}$$

HECTII: Great job, Tera. Who wants to calculate the gravitational poten—

PICO: I've got it. Pendulum-3 had a mass of 0.4 kg and it achieved a swing-height of 0.5 m. That calculation is:

$$\textit{Pendulum-3 alleged GPE} = mgh$$

$$\textit{Pendulum-3 alleged GPE} = (mass)(gravity)(height)$$

$$\textit{Pendulum-3 alleged GPE} = (0.4\ kg)(9\tfrac{\rho/s}{kg})(0.5\ m)$$

$$\textbf{\textit{Pendulum-3 alleged GPE}} = \mathbf{1.8\ J_{[0.67]}}$$

TERA: *We really did create gravitational potential energy!!*

HECTII: Here's how much:

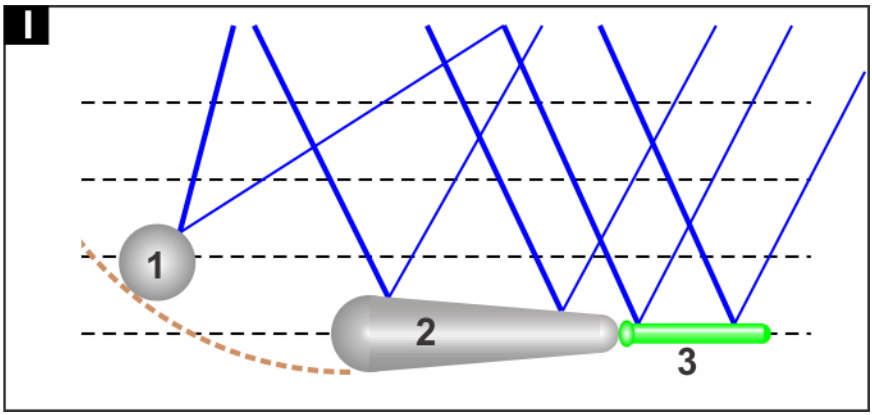
$$\textit{alleged GPE created} = \frac{out\text{-}energy}{in\text{-}energy} \times 100\%$$

$$\textit{alleged GPE created} = \frac{1.8\ J}{0.8064\ J} \times 100\%$$

$$\textbf{\textit{alleged GPE created}} = \mathbf{223\%}$$

PICO: Stunning job, Hectii. This was a *great* experiment—we created a huge amount of energy, a 223 percent increase!

TERA: Let's do it again, we can try one of the smaller nails.



HECTII: We'll create even more energy with a smaller nail, ha-ha-ha.

PICO: (snicker snicker)

TERA: Did I miss a joke?

HECTII: You can't create something that doesn't exist! **And, if you can create it, then it doesn't exist in nature.** We can create gravitational potential energy, therefore it has to be another murdered myth.

TERA: Did we just murdered another form of *energia*?

PICO: And, we almost fell for the misleading potential, hint, hint.

HECTII: Rule #4 of misleading potentials.

TERA: Got it! Literally speaking, potential things are hypothetical, so they don't actually exist in the natural world.

PICO: Precisely, potential impulse does not exist. Gravitational energy can't be transmitted, so it doesn't exist.

HECTII: Gravitational potential momentum and gravitational potential energy are mathematical predictions of the future. These predictions *do not currently exist* in the present natural world.

PICO: Hurry, Sisters, we need to conclude this letter. Good-by Grandma and Grandpa.

TERA: Sorry this letter was so long.

HECTII: But, it's important to know that we succeeded in creating some non-existent, mythological Gravitational Potential Energy!!!

PICO: It works a lot like kinetic energy—objects with low masses generate potential energy faster than objects with higher masses. If you want to create alleged energy, simply move momentum out of a heavy object and into a light object!

HECTII: The lighter object will have a higher velocity and it will reach a greater swing-height—thereby creating more non-existent, mythological gravitational potential energy.

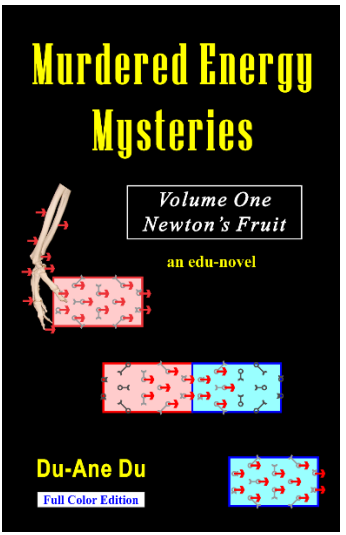
TERA: Which means we could also destroy alleged potential energy by using a Newton's Cradle that moves momentum from a light object to a heavy object.

PICO: But it's an illusion, because potential things are hypothetical—they don't really exist in nature. *Gravitational potential energy is a murdered myth*.

TERA: And that's a Space-sci Sherlock's scientific fact!!

CONCLUSION: More research needs to be done into the relationship between mechanical energy and other theoretical forms of energy. Many common beliefs may actually be philosophical myths.

Murdered Energy Mysteries seeks to increase understanding of the various forms of momentum and momentum transfer, as well as the various forms of energy and energy transfer. The lack of understanding on the part of the scientific community is substantial, and more research needs to be done.



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—Du-Ane Du, author of the edu-novel *Murdered Energy Mysteries* (Amazon, Kindle, e-book 2018, paperback 2021.)

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