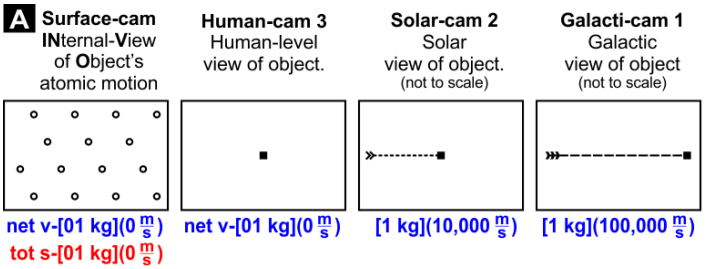


Galactic View Shows Momentums Are More Accurate

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 examine atomic motion from solar and galactic views to see why measuring momentums of impulse is more accurate than joules of kinetic energy.
—Excerpted from *Murdered Energy Mysteries*, Part 3, Chapter 5, by Du-Ane Du, (Amazon, Kindle, ebook 2018, paperback 2021).

"Strange dream I just had," Pico declared, as she walked into the kitchen, shaking her head. "First, I almost decided that a calorie is equal to 4.958 $\pm$0.04 ρ of heat-impulse, but then I wondered if the traditional definition of 4.18 $J_{[IC]}$ of

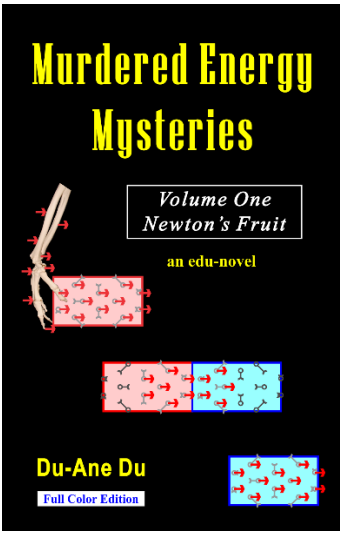
kinetic energy might be more accurate… then I fell asleep and had the strangest dream."

"You shouldn't take a nap after eating a jalapeno-pep-peroni pizza," Tera said with a laugh. "All of that spice would give me bad dreams too."

"It wasn't a bad dream," Pico said defensively, as she sat on a dining chair, next to Hectii.

"The dream was strange," Pico said. "I'd been reading some *Secrets of Murdered Energia… Greatest Conundrum* information when I fell asleep. …something about using simple-relativity to test the reliability of scientific units of measure—maybe that'll provide the answer we're looking for."

Excerpted from:



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"That would give me bad dreams for a week," Tera said with a smirk.

"Chip," Hectii said, a note of curiosity in her voice. "What kind of test was Pico reading about?"

"The complete name," Chip said, "is the Parallax/Simple-Relativity Test of Unit Reliability."

"Parallax error is caused by looking at a measuring devise from an angle," Hectii remembered. "You know, when

you measure something with a ruler, you must place your eye in the correct place or you'll read the measurement incorrectly."

"That's it," Chip said. "And there's an angular component to the parallax/simple-relativity test that works the same way. Basically, to make a truly accurate measurement of a moving object, you must always take the measurement in direct alignment with the motion of the object. An angled measurement will always be smaller than a correctly-aligned measurement."

"I don't see anything there to cause a bad dream," Hectii said.

"The dream wasn't bad, it was strange," Pico insisted. "Basically, the dream was similar to the first experiment we did when we were traveling through the asteroid belt."

"The rocket experiments?" Tera said.

"The invo-atomic motion experiments, you know, the ones with the rocks," Pico said. "In my dream, we Space-sci Sherlocks were doing some experiments way out in space. Far from our galaxy, in a part of space that was light-years away from any galaxy."

"Where was I?" Tera said, intrigued.

"You were standing stationary in space," Pico said. "Hectii was sitting in a spaceship that was passing you at a velocity of 90 000 m/s."

"That fast?" Hectii said. "Chip, what kind of objects travel at that velocity?"

"Stars on the edge of a galaxy," Chip said. "Modern astronomers have determined that our solar system is traveling around the center of the Milky Way Galaxy at over 200 000 m/s. That means every object in our solar system has a minimum galactic velocity of over 200 000 m/s and everything on earth has a minimum galactic velocity of over 200 000 m/s."

"Interesting," Hectii enumerated. "In the dream, Tera has a galactic velocity of 0 m/s and I, Hectii, have a galactic velocity of 90 000 m/s. It's like Tera is standing at the center of the Milky Way, and Hectii is standing on the sun. If you think about it, Tera's stationary position enables Tera to observe Hectii's galactic motion—we should call Tera's view, the galactic perspective."

"Tera could see me too," Pico said. "And I was standing on an asteroid that was passing Hectii at a… I had a galactic velocity of 100 000 m/s, but I was passing Hectii at a velocity of 10 000 m/s."

"Chip, how fast is Earth traveling as it orbits the sun?" Hectii said.

"About 30 000 m/s," Chip said. "In Pico's dream, Hectii appears to be observing Pico from a solar perspective—as if Hectii is standing on the sun."

"But I'm moving," Hectii said. "I may represent a solar perspective, but my perspective won't be as accurate as Tera's galactic perspective. She's the only person who isn't moving. It seems like Tera's galactic perspective is going to produce the most reliable observations."

"Did we do some experiments?" Tera prompted.

"I did," Pico said. "I was holding a 1.0 kg block of gold. I attached a string to the block, reached out, and suspended the gold block directly above the surface of the asteroid."

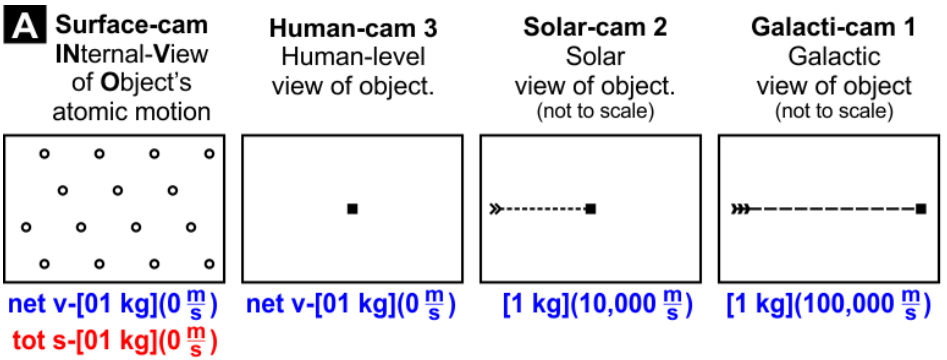
"What did each of us see?" Tera said. "Chip can you create—"

"Oh, each of us had video cameras in the dream," Pico quickly interposed. "I placed a camera on the side of the asteroid and pointed it at the gold block. I placed another camera on the surface of the block. The surface-cam was zoomed into the atomic level, so I could observe the invo-atomic motion."

"My camera will show us the solar-view, from a position near the sun," Hectii said. "And Tera's camera will show us the galactic-view, from a stationary position near the center of the Milky Way Galaxy."

"What would that look like, Chip?" Tera said.

Chip placed the following illustration on the refrigerator's display-screen:



"I've adjusted the angles so each of the cameras views the motion as going to the right," Chip said. "That eliminates the possibility of a parallax error."

"The surface-cam shows, the gold atoms have an invo-atomic speed of 0 m/s," Tera distinguished.

"That means the atoms aren't moving with respect to the sides of the gold block," Hectii added. "And it also means the gold block has a temperature of zero Kelvins."

"But the atoms are actually moving to the right in a perfectly aligned pattern," Pico said. "Or maybe I should say the gold block is moving. The solar-cam shows that the gold block has a velocity of 10 000 m/s, and it has a v-momentum of 10 000 ρ."

"But that's not the absolute v-momentum," Hectii said. "The absolute momentum would be related to Tera's measurement of 100 000 m/s, or 100 000 ρ."

"If I may," Chip said. "I should note that the measurements and comparisons you're making involve a mathematical

process we can call, **simple relativity**. In the early 1900's Einstein developed two additional forms of relativity called Special Relativity and General Relativity. Einstein's equations are usually used for objects moving near the speed of light."

"Are these velocities that fast? Pico said.

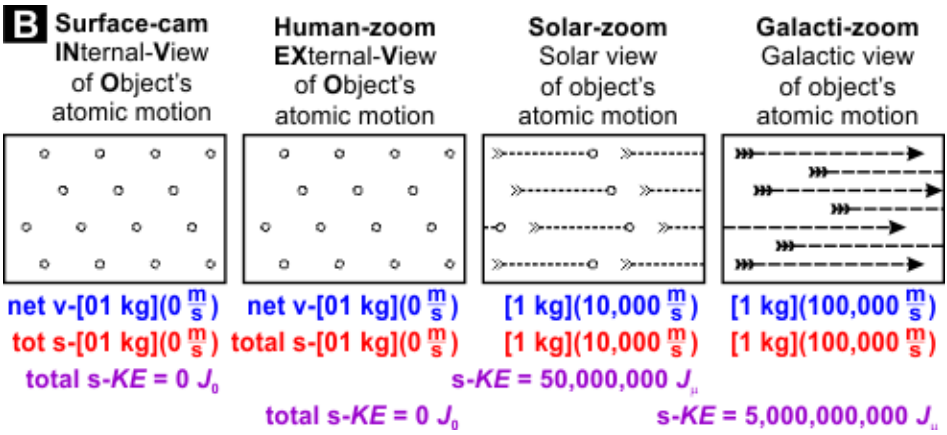
"Definitely not, light travels much faster than the Milky Way Galaxy, and your dream-experiment is even slower than the speeds that our solar system is actually experiencing," Hectii assured. "Chip do we need to use Einstein's equations?"

"The Parallax/Simple-Relativity Test of Unit Reliability is usually done using velocities ranging from 10 m/s to 1 000 m/s," Chip said. "The velocities you're using are a little high, but the mathematics should still produce reliable answers."

"I don't want to use complicated equations if we can avoid it," Tera said earnestly. "What's next, Pico? It was your dream."

"We zoomed all of the cameras to the atomic level," Pico said. "Chip, show us what the atoms are doing, according to each view."

"How's this:"



"Look at the last two pictures," Pico said, pointing to the right side of the display. "It's like I said, the atoms are moving to the right in a perfectly aligned pattern."

"Fascinating," Hectii said. "And now the energy (speed infused impulse) becomes a factor."

"Why's kinetic energy a factor?" Tera said.

"Grandpa Proge mentioned it, remember?" Pico said. "A scientist named Lord Kelvin proposed that heat was caused by the transfer of molecular kinetic energy from one object to another."

Tera shook her head and walked to the refrigerator, "That takes us back to multi-parabolic kinetic-joules$_{[IC]}$."

"But at least the calculations are easy," Pico said optimistically. "All we do is multiply the momentum by half the velocity, $(mv)(v/2)$."

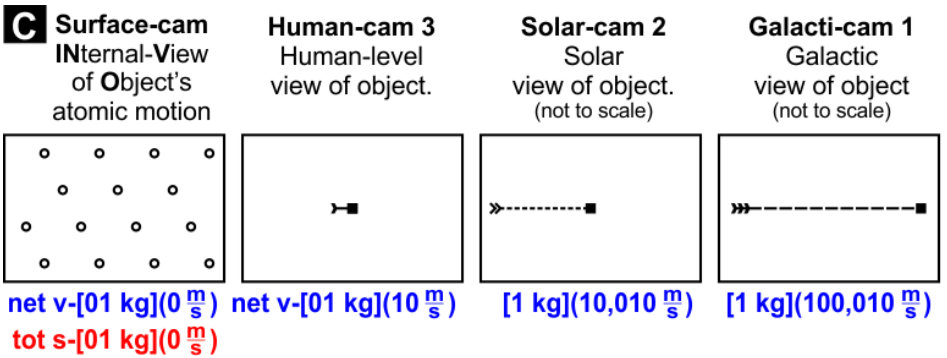
"And Chip did that for us," Hectii said. "The surface-cam shows that the atoms aren't moving. That means they have an invo-atomic kinetic energy of 0 $J_{[IC]}$."

"But the solar view shows ~50 000 000 $J_{[\mu]}$," Tera protested, as she pulled a bottle out of the refrigerator. "And the galactic view shows an atomic kinetic energy of ~5 000 000 000 $J_{[\mu]}$. Is that a problem?"

"It shouldn't be," Hectii said decidedly. "The amount of atomic momentum is also different in each view. What happened next, Pico?"

"In my dream," Pico said insistently. "I pushed the gold rock until it had a velocity of 10 m/s, to the right."

"Chip, show us what we would have seen," Tera said, as the following appeared on the display.



"The atoms inside the block are still stationary with respect to the sides of the block," Hectii observed. "Which means, the temperature is still 0 Kelvins."

"Simple enough," Tera said. "If we multiply the mass of the gold block by the velocity, we see that the atoms in the gold block now have a human-level momentum of 10 ρ, a solar momentum of 10 010 ρ, and a galactic-absolute momentum of 100 010 ρ."

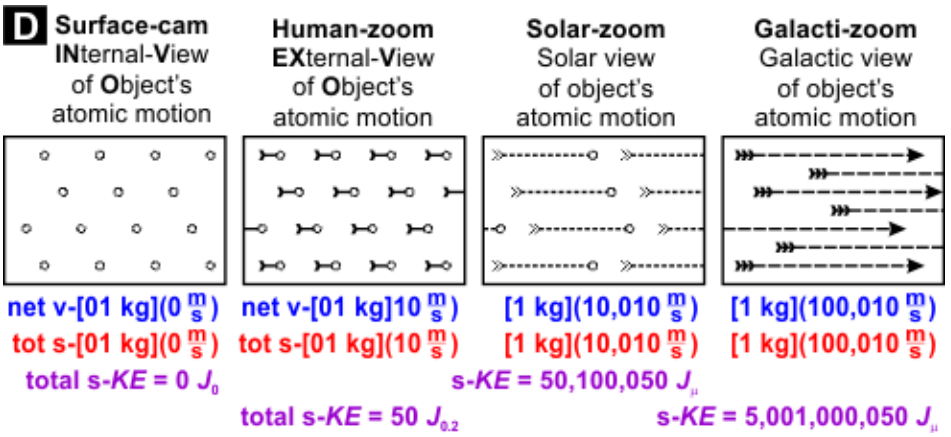
"More importantly," Pico said, as she keyed data into her phone. "We can subtract the momentum before I pushed to find the impulse that I applied to the atoms in the gold block. The calculations are:"

> *human-view im$\Delta\rho$: 10 – 0 =* ***10ρ***
> *solar-view im$\Delta\rho$: 10 010 – 10 000 =* ***10ρ***
> *galactic-view im$\Delta\rho$: 100 010 – 100 000 =* ***10ρ***
> appeared on the display.

"Ten momentums each time, they're all the same," Hectii said thoughtfully. "And the human-view will always be the same as the exvo-atomic view, which means what happens at the human level is actually a measure of what's happening at the exvo-atomic level *and* it's also a measure of what's happening at the solar and galactic levels."

"Does the transfer of kinetic energy work the same way?" Pico said. "Chip, show us the atomic-zoom views of these pictures."

"I'll also add the atomic kinetic-energy data," Chip said, as the following appeared on the wall display:

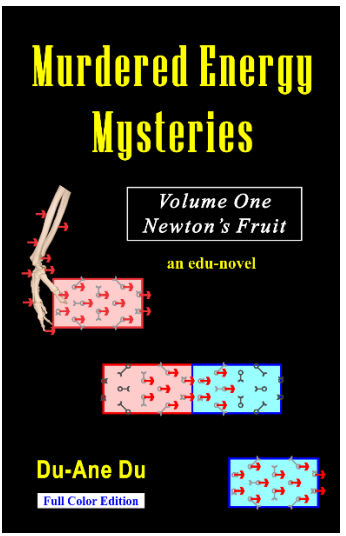


"When Pico pushed the rock, she gave it an impulse of 10 ρ," Tera pointed out. "How much kinetic energy did the blocks gain?"

"Sorry to interrupt," Chip said. "You may recall that the correct term for the amount of kinetic energy allegedly gained, lost, or transferred is work energy. This idea parallels the idea of impulse—impulse is the gain, loss, or transfer of momentum, and work-energy is the alleged gain, loss, or transfer of kinetic energy."

"This is mine, I'll key the numbers for the transfer of kinetic/

Excerpted from:



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work energy," Hectii said, as she performed the following calculations on her phone:

> *Work-Energy* (*WE*): $KE_{final} - KE_{initial} =$
> *human-view WE:* $50 - 0 = 50\ J_{[0.2]}$
> *solar-view WE:* $50\ 100\ 050 - 50\ 000\ 000 =$
> $\sim 100\ 050\ J_{[\mu]}$
> galactic-view *WE*: $5\ 001\ 000\ 050 - 5\ 000\ 000\ 000 =$
> $\sim 1\ 000\ 050\ J_{[\mu]}$
> appeared on the display.

"The answers for the amount of kinetic energy allegedly transferred don't match each other," Pico announced, with a touch of irritation.

"Of course not," Tera said, "work-energy and kinetic-energy transfer involve multi-parabolic kinetic-joules$_{[IC]}$. From what we saw in our other experiments, multi-parabolic answers rarely match each other."

"Tera's galactic view shows us the actual absolute galactic velocity of the atoms," Pico said as she opened the refrigerator and located a pan of blueberry cobbler. "My perception was limited by the fact that I was moving when I took the measurement. I was unable to perceive the actual galactic velocities involved."

"That's true," Tera supportively verified. "Which means, the most correct measure of atomic kinetic-energy

transfer must be the galactic value—because that's the only view that involves the actual galactic distances and galactic velocities. Pico must've given the atoms at least ~1 000 050 $J_{[\mu]}$ of additional energy."

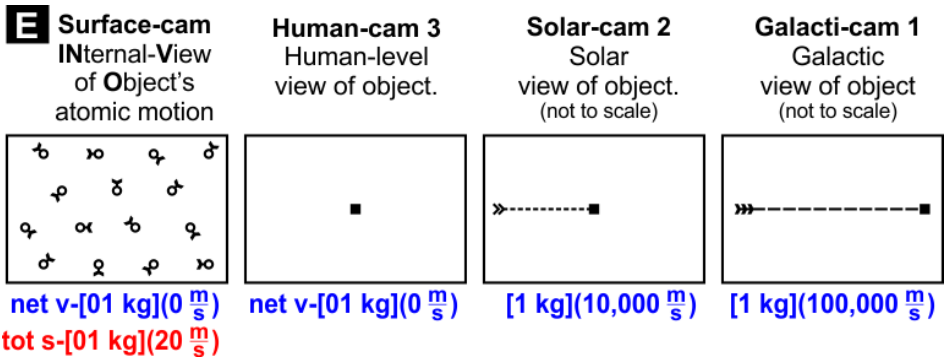
"But how would you known that, if you could only take a human-level measurement?" Hectii protested. With a nod and a wave, she signaled for Pico to cut her a piece of blueberry cobbler. "The human-level measure of impulse is the same as the galactic measurement. But the human-level measure of the transfer of atomic kinetic energy doesn't relate to what's happening at the galactic level."

"That seems very important," Tera said. "The human-level measurement of the *alleged* transfer of atomic kinetic energy from one object to another does not relate to what's *actually* happening at the galactic level. Pico, what was the next experiment?"

"First, I used a string to pull the gold block back to me," Pico began, "Then I struck the gold block with a hammer many times. Eventually, the atoms in the block had an invo-atomic average speed of 20 m/s, with respect to the sides of the block."

"What would that look like, Chip?" Tera said.

"Check out these four pictures," Chip said, as the following appeared on the display-screen:



"If you look at the internal picture, on the left, the atoms are moving randomly," Pico said. "This is multi-directional invo-atomic motion."

"That makes sense," Hectii sincerely replied. "And this time the impulse happened at the invo-atomic level. There was no increase in exvo-atomic, human-level motion, so the net velocity of the block is still 0 m/s."

"That's true," Pico said. "And invo-atomic motion always involves the actual forward speed of the atoms, not their directional velocity."

"Plus the invo-atomic average speed relates to temperature, correct?" Tera said rhetorically. "That means the temperature of the gold block is higher than it was before Pico caused the atoms to start moving."

"But was the rise in temperature caused by the transfer of invo-atomic s-momentum?" Hectii said, "or was the rise in temperature caused by the transfer of invo-atomic kinetic energy?"

"Let's start with by calculating the momentum transfer. Based on the surface-cam data," Pico recounted, "the atoms had a starting forward speed of zero. That means we can calculate momentum transfer and work/kinetic energy by using the forward speed of the atoms after I struck the gold block. The calculations will be:"

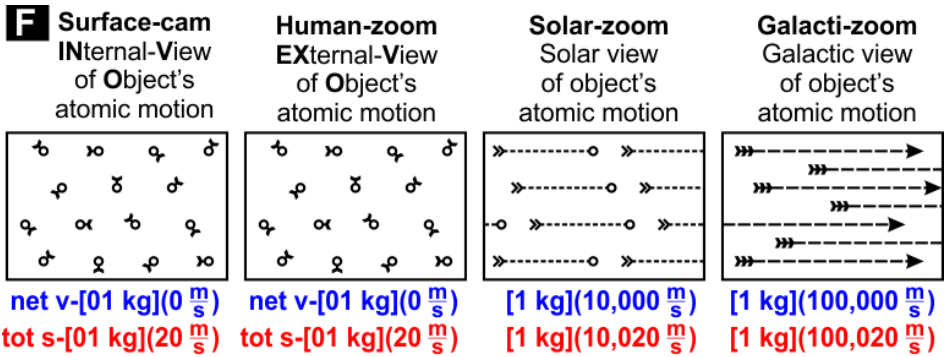
speed-based im$\Delta\rho$: $mv - 0 = (1\ kg)(20\frac{m}{s}) = 20\ \rho$

Work-Energy: $\frac{1}{2}mv^2 - 0 = \frac{1}{2}(1\ kg)\left(20\frac{m}{s}\right)^2 = 200\ J_{[0.1]}$

appeared on the display.

"That was simple, now let's calculate the impulse for each view," Tera suggested. "Chip, show us all four views of the atomic motion."

"One quick note," Chip said. "When you view atomic motion from a moving perspective, it creates a parallax error. To prevent the parallax error, I'll include the atomic s-momentum information, too." Chip said, as he placed the following on the wall display:



"In the human-level exvo-atomic view, the atoms are moving multi-directionally, just like in the invo-atomic view," Pico said. "That tells us the gold block isn't moving."

"But you applied an impulse to the block," Tera said. "And it caused the atoms to begin moving in all directions."

"That's accounted for in the red line called, total s-momentum," Hectii carefully extrapolated. "From the human-level perspective, the total s-momentum of the block will be the net v-momentum plus the invo-atomic s-momentum. We add the two, to account for the parallax error caused by the atom's angled flight paths, right Chip?"

"Correct," Chip said.

"That's right, my arm was moving forward when I applied the impulse to the rock!" Pico said hastily. "But when the atoms bounced off one another, the angular collisions turned the forward impulse into omnidirectional momentum."

"After the collisions, the atoms moved in many different directions," Hectii said.

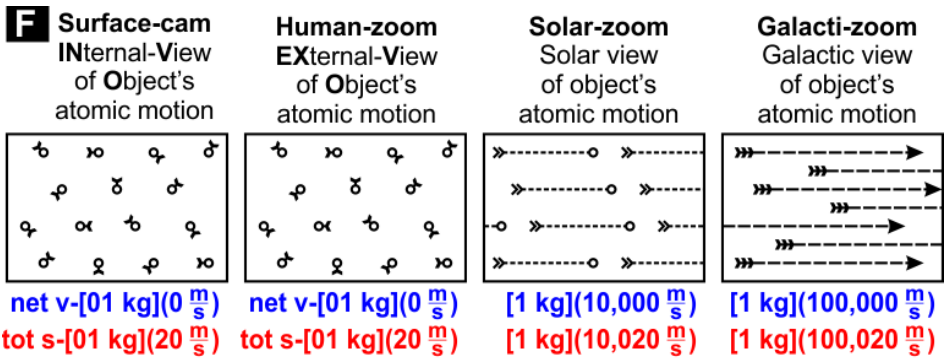
"Let's pause a moment," Tera said cautiously, as she glanced at the computer-simulated window. The doe and fawn had left the glade, and a swarm of florescent-blue butterflies were now feeding on the colorful flowers that grew beside the fountain.

"If I understand what you two are saying," Tera said, cautiously gesticulating as she spoke, "when Pico struck the gold block with a hammer, the hammer was going forward. The hammer gave the atoms in the gold block invo-atomic forward s-momentum. The atoms of gold collided with each other at different angles, converting the forward momentum of the hammer into multi-directional invo-atomic s-momentum in the atoms of gold."

"Precisely," Hectii said praisingly. "The conservation fact for r-s-t momentum states, the grand total amount of radian/angular-momentum, s-momentum, and trapped momentum in a system remains constant. That means, if s-momentum is add to the invo-atomic level, it must also be added to the human level—even though it isn't visible to the human eye. Total means total, and you add to produce the total. That means to find the total amount of human-level atomic s-momentum, you add the invo-atomic s-momentum to the exvo-atomic net v-momentum."

"Goodness," Tera said. "If that's true, then the galactic-view atomic s-momentum will equal the galactic-view atomic

net v-momentum plus the invo-atomic s-momentum inside the gold block."



"That actually makes sense," Hectii said. "If you don't add the speed-based invo-atomic momentum to the local net velocity-based momentum, then the parallax error will cause your answers to be inaccurately small."

"Excellent deductions girls, your grandfather would be proud," Chip said. "The key involves both the need to eliminate parallax error, and it involves the omnidirectional nature of atomic collisions. As Hectii said, total s-momentum is the total."

"Ok, we've established that when I struck the gold block with a hammer, the gold atoms experienced a transfer of atomic s-momentum which can be viewed from several different perspectives," Pico said, as she began keying data into her phone. "Now let's check the figures for the amount of impulse involved. I'll subtract the original data from the current data:"

invo-atomic im$\Delta\rho$: $20 - 0 = 20\ \rho$
human-view im$\Delta\rho$: $20 - 0 = 20\ \rho$
solar-view im$\Delta\rho$: $10\,020 - 10\,000 = 20\ \rho$
galactic-view im$\Delta\rho$: $100\,020 - 100\,000 = 20\ \rho$
appeared on the display.

"Which means, when we include the parallax-angle adjustments," Tera announced, "then the human-level data for impulse matches the galactic data of 20 ρ of impulse."

"If you ask me," Hectii said. "We've just stumbled on another Space-sci Sherlock fact of pure science. We should call this our **galactic fact #1 of measurable impulse/momentum-transfer.**"

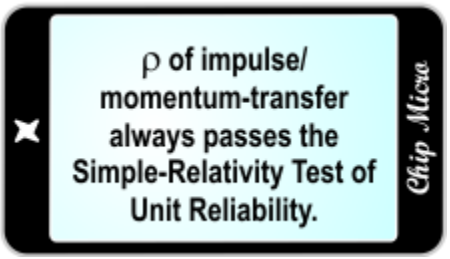
"Great perspective," Pico encouraged, "because relative to the center of the Milky Way Galaxy, Earth is moving through space at a speed of over 200 000 m/s."

"True," Tera said, "but relative to the center of the Universe, Earth could be moving several times faster than that. It is impossible to know for certain what an object's absolute speed is. Ideally, when an object changes speed, the calculation of its

momentum-transfer/impulse should be measured with respect to the object's galactic or absolute speed."

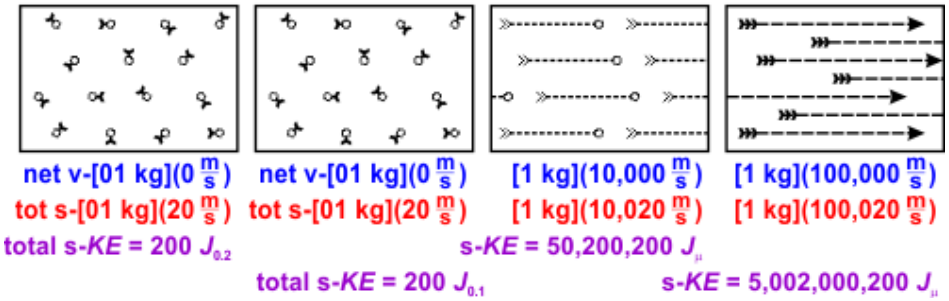
"Fortunately," Pico said, "the values for human-level measurement of impulse are always identical to the values for galactic-level impulse. Therefore, human-level measurements of impulse are a valid and highly accurate reflection of what's happening at the galactic level."

"That's our galactic fact #1 of measurable impulse/momentum-transfer," Hectii decisively concluded. "And it tells us that ρ of impulse may be viewed as an absolute measurement.



"Will the data for the alleged transfer of kinetic-energy also match?" Pico "Save us some time, Chip, show us the rest of the data."

"I'll fill in the bottom of the table, like before:"



"I'll subtract the purple KE numbers to find the alleged work/kinetic-energy transfer," Hectii said, as she performed the following:

human-view WE: $200 - 0 = 200\ J_{[0.1]}$
solar-view WE: $50\ 200\ 200 - 50\ 000\ 000 = \sim 200\ 200\ J_{[\mu]}$
galactic-view WE: $5\ 002\ 000\ 200 - 5\ 000\ 000\ 000 = \sim 2\ 000\ 200\ J_{[\mu]}$
appeared on the display.

"From the human-level view, there was an alleged transfer of 200 $J_{[0.1]}$ of kinetic energy," Pico read. "But from the solar-view it appeared that I gave the gold block an energy transfer of ~200 200 $J_{[\mu]}$, and the galactic view shows ~2 000 200 $J_{[\mu]}$ of kinetic-energy transfer.

"Once again, the calculations for the amount of kinetic energy allegedly transferred don't match one another," Tera assessed. "The human-level measurement of kinetic-energy

transfer is not an accurate measure of what's actually happening from the galactic perspective."

"Pico may think she's stationary," Tera continued, "but she's actually moving at a speed of 100 000 m/s—and calculations of impulse or work should always account for what's actually happening as she flies through the universe!"

"Galactic distances and galactic velocities must be accounted for," Hectii declared.

"I agree," Pico said. "It's obvious, I must've given the atoms at least ~2 000 200 $J_{[\mu]}$ of additional kinetic energy."

Hectii nodded, "Measurements made at the human level are relative, and human-level measurements of kinetic-energy transfer will always be horribly inaccurate estimates of what's actually happening at the galactic level."

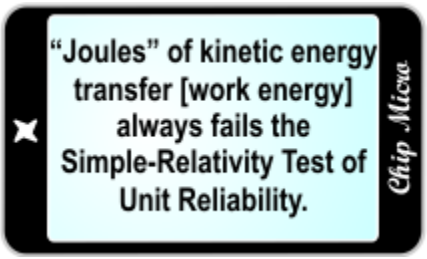
"The human-level measurement of kinetic-energy transfer is not an accurate reflection of what's actually happening at the galactic level," Pico said. "That means we've discovered our **galactic fact #2 of immeasurable work/kinetic-energy transfer**."

"It should begin by noting that relative to the center of the Milky Way Galaxy, Earth is moving through space at a speed of well over 200 000 m/s," Hectii objectively put forth. "Relative to the center of the Universe, Earth may be moving several times faster than that. Therefore, it's impossible to know for certain what an object's absolute speed is."

"Ideally," Tera said, "when an object changes speed, the calculation of kinetic-energy transfer (work-energy) should *always* be measured with respect to the object's galactic speed or absolute speed. Unfortunately, the values for human-level measurement of kinetic-energy transfer are radically different from measurements of galactic-level kinetic-energy transfer."

"Human-level measurements of kinetic-energy transfer are not valid representations of what's happening at the galactic level," Pico developed. "Therefore, *kinetic-energy transfer and work-energy should always be measured from the galactic or absolute perspective.*

"However, it's impossible to know the absolute speed of Earth with respect to the center of the Universe," Hectii reminded. "Therefore, calculations of multi-parabolic kinetic-joules$_{[IC]}$ of work-energy and multi-parabolic kinetic-joules$_{[IC]}$ of kinetic-energy transfer will always involve extremely inaccurate approximations.



"Human level calculations of work/kinetic-energy transfer will never be an accurate prediction of what's happening at the galactic level," Tera said.

"Chip," Hectii said. "What did you call this kind of experiment?"

"The process is called, the **parallax/simple-relativity test of unit reliability**."

"I like the parallax part," Pico said. "It reminds me that to make a truly accurate measurement of a moving object, one must always take the measurement in direct alignment with the motion of the object. An angled measurement will always be smaller than a correctly-aligned measurement."

"That's true," Hectii said. "For a unit to be scientifically reliable, it must produce the same increase/decrease measurements from a wide variety of moving perspectives (once the parallax error has been corrected)."

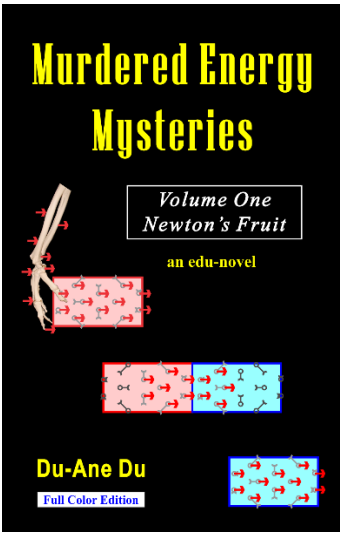
"So far," Tera summed up, "the experiments Pico dreamt about showed that the equations for impulse [momentum transfer] always produce consistent and reliable answers regardless of the observer's speed, therefore kgm/s, or ρ of momentum, is a valid unit of measure."

"Unfortunately," Pico contrasted. "The equations for work-energy and kinetic-energy transfer produce inconsistent and unreliable results when the viewer is moving."

"Measurements for work/kinetic-energy transfer are *not* reliable in *any* situation," Tera forcefully emphasized.

"That's because the solar and galactic perspectives show that everything on Earth is actually moving through the universe at very high speeds!" Hectii determined. "As a result, human-level measurements of kinetic-energy transfer are never reflective of what's actually happening at the galactic level!"

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.



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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.

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

More information, see:
Murdered Energy Mysteries,
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