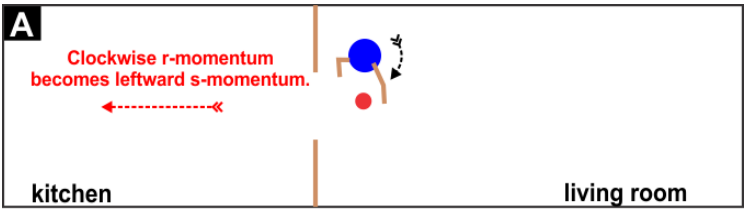
Deductions of the Space-sci Sherlocks



The Many Types of Impulse and Momentum

Professor Du-Ane Du

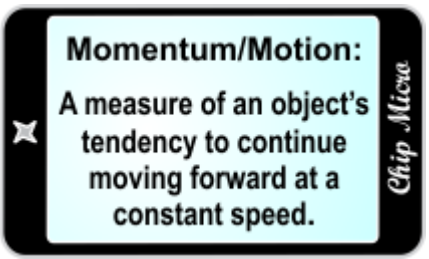
www.Wacky1301SCI.com, *"Looking at serious science, sideways!"*

Three sisters, Pico, Hectii, and Tera, the "Space-sci Sherlocks," are traveling through the Asteroid Belt. They stop to explore asteroids, perform motion experiments, and deduce many types of impulse and momentum.
—Excerpted from *Murdered Energy Mysteries*, Part 1, Chapter 1, by Du-Ane Du, (Amazon, Kindle, ebook 2018, paperback 2021).

Dear Grandma Aaret,

Greetings from the Asteroid Belt. We're enjoying our trip to the Gravity Spa. Today we found an old, damaged computer thing that contained a book-like program.

Our Chip Micro said the title is *Secrets of Murdered Energia… Greatest Conundrum.* The program has a lot of puzzles, experiments, and gaps that we'll have to complete if we are to deduce what the secrets of murdered *energia* are.



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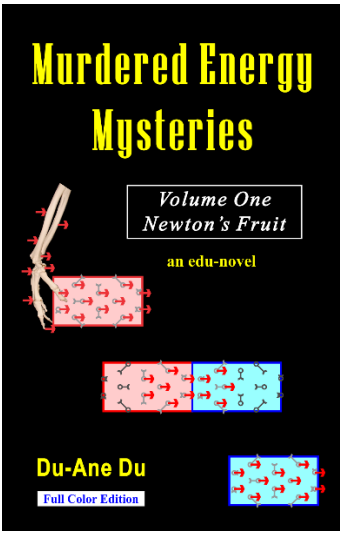

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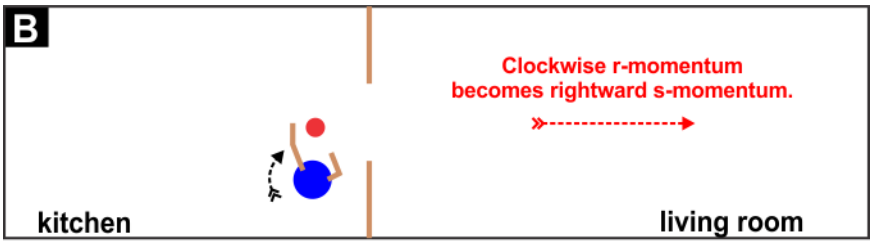
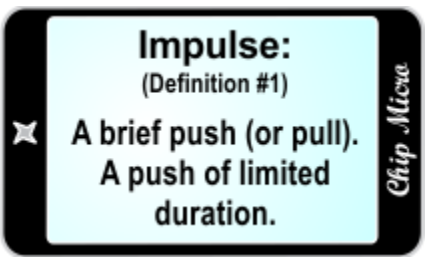
The first gap involved momentum and impulse. It focused on what we are calling our **Cartesian momentum fact #1**, which tells says: The total amount of motion/momentum in the universe never changes, therefore Object A cannot speed up unless a second object slows down, likewise Object B cannot slow down unless one or more other objects speeds up.

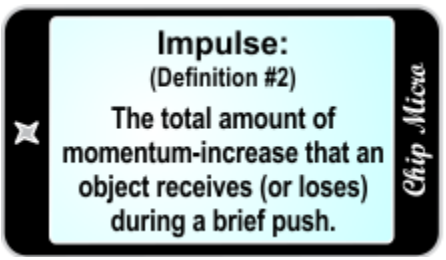
Pico did some experiments in the doorway between the kitchen and the living room. In Pico's experiment, she spun very fast, then she reached out and hit a ball.



When Pico hit the ball, she began to rotate slower, and the ball moved away in a straight line. When she was rotating, she had radian/rotational/angular momentum, which we are calling **r-momentum**. When Pico hit the ball, some of her r-momentum transferred to the ball where it became speed-momentum, which we call **s-momentum**.

When momentum is transferred from one object to another, it's called an impulse/momentum-transfer, or an **impulse**, for short.



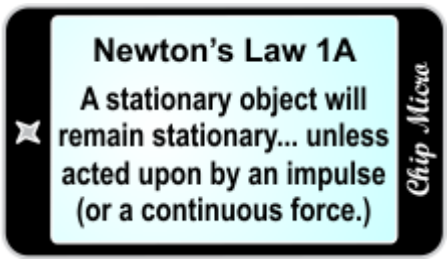


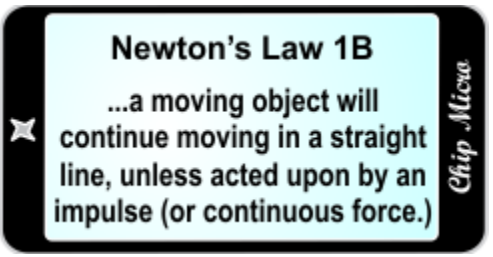
If we look at Pico's experiment carefully, we can see that Pico experienced a negative impulse when the r-momentum transferred out of her body (negative, because she slowed down!). Likewise, the ball experienced a positive impulse when the momentum was transferred into the ball (positive, because it sped up!).

Wow, we deduced a lot. If you didn't know better, you'd think we were still in school.

And that's not everything!

This impulse has a lot to do with Newton's first law. In Pico's rendition, **Newtonian motion fact #1** says, a stationary object won't start moving and a moving object won't stop moving in a straight line, unless the objects experience an impulse, a series of impulses, or a continuous unbalanced momentum transfer.





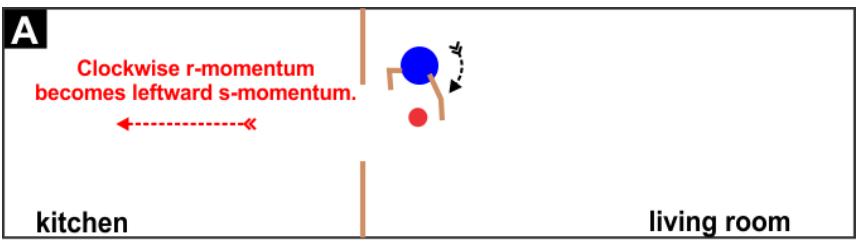
The stationary-to-moving part of Newtonian motion fact #1 is often associated with the momentum-gain equation:

$$mv_{initial} + im\Delta\rho = mv_{final}$$

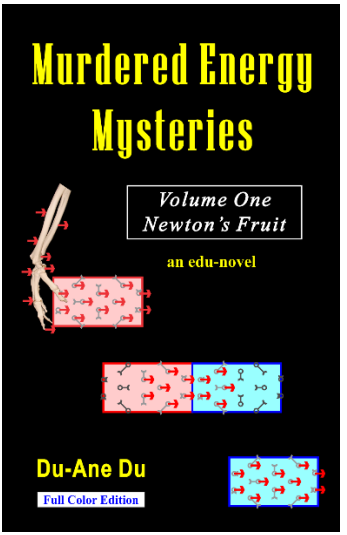
The moving-to-stopped part of Newtonian motion fact #1 is usually associated with the momentum-loss equation:

$$mv_{initial} - im\Delta\rho = mv_{final}$$

We also learned a lot about something we call the **Cartesian #2 clarified conservation fact for radian/speed/trapped-momentum**. In this conservation fact, r-s-t momentum cannot be created or destroyed, but r-s-t momentum can change forms. (r-s-t, means Radian, Speed, or Trapped)



Radian/rotational-momentum is omnidirectional. Which means, r-momentum can be changed into northward s-momentum, southward s-momentum, eastward, westward, forward, backward—and any-other-ward s-momentum. Any direction of s-momentum can be changed into clockwise r-momentum, or it can be changed into counterclock-wise r-momentum, depending on the situation.



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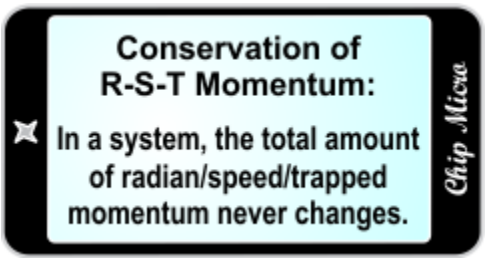
And there is something we call trapped-momentum. T-momentum (better referred to as **t-impulse**) is an impulse/momentum-transfer that has been trapped in a spinning object. Impulse can also be trapped in a vibrating object. The big point is that t-impulse is omnidirectional.

In a system, r-momentum, s-momentum, and t-impulse can change into each other, but the total amount of r-s-t momentum in the system never changes—that's the **Cartesian #2 clarified conservation fact of r-s-t momentum**.



And that's what we deduced today!

I need to sign off now. We're having a great time as our spaceship travels toward the Gravity Spa. And someday, we hope to come and visit your home on Earth.

All our love, Daddy, Pico, Hectii, and your Tera.

* * *

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, visit www.Wacky1301SCI.com