

PhD-equivalent work: The Pi constant identity and local Magnetosphere

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Should scholarly texts have dedications, here is one:

To the Bangor Public Library,

who graciously give provisional resources and allow me to complete this paper.

Abstract

Scholarly work and texts of mathematics and physics are abundant. Regardless of age of such texts that include ubiquitous reason, the pi constant, a modern definition and rule that is only 2-dimensional in established publications and teachings, the author hypothesizes, provides evidence for the 2-dimensionally-saturate world of communications, education, and commerce we live in. Indicatively, television and web displays (2-dimensional text, picture and/or audio) and other established media formats seem to interfere with our understanding of the 4-dimensional world we live in. The un-updated definition of the pi constant evidently is a reason for this. While the value and its digits may be continually updating, it serves no one any greater purpose if our understanding of its function is not simplified. We can prove pi defined as much in a simple 4-dimensional context as the existing 2-dimensional definition, the latter of which is that pi is the ratio of a circle's circumference divided by its diameter. Pi is not in itself a circumference, but like a ring or an earring with a little space between it, and naturally defined as *circulation*.

Introduction

We know that π is the ratio of the diameter of a circle to its circumference. At the date of this writing, this is the definition all published media provides. It has the approximate value of 3.14159265 (Clawson, 1996). Here, the definition of π seems to be expressed as a problem in itself, whether Clawson was aware of such or not:

"For reasons not always apparent, π shows up in many places that seem to be entirely unrelated to the ratio of the diameter of a circle to its circumference. This is not a cosmological problem concerning the universe we live in, but rather a logical problem....If I can define π , why can't I see at once its many relationships to other mathematical objects? But π is not unique." (Clawson, 1996)

"Cosmological" is logical. Clawson assumes that mathematicians' work is definitively *infinite*, and arbitrarily excuses cosmologists from the dialogue regarding its function. In other words, he does not ask the reader, *am I defining π properly in the age of which I am living?* The definition of such a mysterious number, which is admittedly various--more than that of a circle's ratio--is left by dictionary and text-writers and -publishers as vague and unknown and undefined (and not, for example *Ellery Queen* Mystery Magazine material). The value, however, centers the discussion even in the present day of information-overload experienced by many. How impossibly ill-linguistic and paradoxical is this statement about technology today: "There is no evidence that Archimedes deduced the value of π geometrically to further technology, but early technicians were quick to incorporate whatever mathematicians offered." (Motz & Weaver, 1993) What this statement offers readers about speed, if anything at all, is beyond the author of this text. Yet, as the information superhighway was getting underway at the end of the last

century, and as the human genome project reached toward its first electronic sequence completion, Clawson offered that a "third file [on the internet] contains the first 1.25 million digits of π ", which is only information-overload in consideration if one assumes the established definition of π lacks definition.

Discriminatorily, publishers even today seem to want and celebrate mathematicians as much as sport and entertainment stars. (Casti, McLeish, Posamentier) Really abundant reference-listing on contemporary scholarly texts with doctoral dissertations seem to be of higher value than actual literal and functional content within the papers. Here is the age in which we are living, and dying:

"[I]t behooves the educated person to attempt to understand a little of modern genetics not only because it provides the basis for the biotechnology that is transforming our world, but also because it is based on a certain way of looking at human nature." (Byers, 2007)

What does the human genome have to do with π ?

" π is central to astronomy and physics" (Thompson, 2021), yet it is as much ubiquitous in nature and, importantly, human biology. We cannot expect, though we can wonder, that Archimedes, Ahmes, the Babylonians, and any other discerning people had realized a connection between the human composition and the pi constant (" π ") in their time, though we can expect that the lineage of people between they and we have built our world on such simplicity and observation of nature. Merit has no *exact* placement among the ever-evolving industry of study. Thirty years before anyone arrived to the Moon and back, and twice as long before the International Space Station was beginning to be built, Hughes and Miller (1939) recorded in their tome this important segment about how lunar-timekeeping relates to us today: "Table II-- Constants and Their Common Logarithms: Circumference of a Circle in seconds = 1,296,000".

Yet, no one looks at a timepiece today, such as a clock, and realizes we also dwell in a 13-lunar-hour day, just as we do a 13-lunar-month year. There are 129,600 lunar-seconds in a day, exactly 1.5 times that of the Standard seconds we utilize, 86,400. Unlike π , there is no infinitely trailing digital expansion after the 5 expressing "one and a half times". A modern definition of π should support this system of measure, Time, just as it does Space, and that is a 4-dimensional definition that, for some oddly esoteric reason, exists in none of our established publications. While some ascribe evolution theory to randomness (Byers, 2007), ordinary human development may be observed more clearly with higher definition. It has for television. Such may also help reduce convolution among complex disciplinary texts and teachings such as in mathematics. For example:

"Do not confuse our Prime Counting Function, $\pi(n)$, with the ratio of the circumference of a circle with its diameter which is designated as simply π . They are two distinctly different animals, even though they both use the Greek letter pi.... In fact, searching for

primes is not the only compulsive behavior of which mathematicians are guilty. They are also known to become addicted to such numbers as π ." (Clawson, 1996)

Confusing or inadequate definition need not condemn anyone's enthusiasm for human life and development. What else have we got? Some historians strive to be their best, PhD-holders and otherwise:

"It has been shown that this value [3.1415926535] is sufficiently accurate to give the circumference of a circle as large as the earth's equator correct to a small fraction of an inch...One of the earliest references to π is by Ahmes, an Egyptian scribe (1550 B.C.) who used a formula for the area of a circle which gave a value of π , when expressed in our notation, of 3.1604. The Babylonians and early Hebrews used 3 for the value of π (see I Kings, vii, 23 and II Chronicles, iv, 2). Archimedes (287--212 B.C.), one of the great Greek mathematicians, found that π lies between 3.1428 and 3.1408. Later mathematicians computed the value correct to 9, 17, and 37 decimal places. With the invention of Calculus by Newton (1642--1727), methods for computing the value of π far simpler than one given here were discovered. By the use of these more modern methods the value of π has been computed to 707 decimal places." (Seymour & Smith, 1941!)

The Identity of π and Breadth of the Magnetosphere

We can utilize simple arithmetic and prove that π may defined as follows:

1. π : (4-dimensional, biology) One billionth of the human genome, approximately the median between male and female differentiation.

We know this by applying *time* to the value of π mathematically, just as historians abundantly do textually. This is multiplication:

$$\pi \times 10^9$$

We know that humans require 9 months (10 lunar) to develop before birth [$\times 10^9$]. Here it is expressed. Human genome projectionists tend to generally express their findings in the millions. With more and more DNA technology apps available today, and in development, the same knowledge repositories also specify to specific tens and ones of base pair DNA. For purposes of this paper, we prove in millions that π , before time is calculated, has the value in billions, five million, or less than a sixth of 1% deviance from the median (3.136 billion) between females' 3.186 billion and males' 3.087 billion base pairs. By applying time, in millions we prove these to be precisely equal:

The 3.141 billion π value differentiates precisely five million lower and higher, respectively, the female:male base pair median. In other words, 45 million base pair below female sum and 54 million above male sum DNA equals 3.141 billion, or ($\pi \times 10^9$). When we add prenatal time ($\times 10^9$), we can reduce each lunar month of the term (10 total) to 500,000 base

pair DNA per 28 days [5 million / 10 (28-day intervals)], and measure such development in stride with environment specific to the term. Biologists inform us that these micro-structures at DNA-and-up scale of ourselves have Hydrogen bases. It is no surprise then that 500,000, in physique and in the larger astronomical background environment, is the square for the resonance of Hydrogen [per-lunar-month-deviation² = 250 billion in *resonance*].

This is real permeability, and provides a compelling theory about the DNA that exists inside each of the blood cells of the human body: the double-helical structure seems to strive to be in equilibrium with the same double-helical action between the Earth and Moon, and within its biological magnetospherical domain, so that we are freed to move around in these field unities. Most importantly, we can see the dynamism in motion by observing 4D π . If an astronaut plans to travel beyond the diametrically polar altitude of 7,900 miles, that magnetosphere boundary's end of the Earth's magnetic Iron resonance, and beyond its geosynchronous 22-23,000 Oxidation resonance [these rules are tabled in unity with the 156 billion H:He resonance line of the Earth: Moon system], and into the vast Helium-Hydrogen magnetospherical domain on the way to the Moon and back, wouldn't the astronaut want to know a 4D definition of π as it relates to their own DNA?

This five million difference between π and the male:female differentiation pair in human biology and genomics is only different when Time is excluded from the expression. In other words, π alone expresses more than a circle's properties and attributes, but also a human without any motion. When the nine months are applied, the work of circulation is evenly distributed by the work of human and environmental development. Elegantly, $5\pi \times 10^9 = 15$ billion, the *resonance* of Oxygen, about the time the baby born takes a first breath of it. In other words, we prove 10 lunar months, equal to nine regular months, of work simultaneously mostly by mom and dad and their DNA, and about a sixth of 1% DNA by the solar system and magnetosphere throughout time of development before birth. This sixth of 1% gives each of us the remarkable power of our individual diversity and adaptability. The more we are aware of it, the more resilient we can be.

2) π : (4-dimensional, astronomy) A millionth of the sum quantity, in seconds, of one year on Earth.

$$\pi \times 10^7$$

With proof of the discrepancy from a total 100% match identity with the orbital period of the Earth as we keep Time today (about 31 million seconds/year), a difference of 1.6 days, or 141,638 seconds each year (or about 16 seconds/hour), when we assay this back to the time of Archimedes, 2.25 millennia ago, assuming he was *exactly* correct in his time--which would be foolish to do of anyone--then it could be theorized that, along with established theories of Earth's deceleration over time, this 1.6-day deviation may be attributable to that. In fact, the math expresses the deviation between his time and ours at a sum of 10 years worth of seconds. Not

bad, for an ancient astronomer! Geosynchronous again, we can prove that the *resonance* of O₂, a molecular expression of Oxygen, is also equal to this circulatory value. The units, in nature and mathematics, express permeation together, a unity.

The less-than-half of 1% [.0042] deviation between [$\pi \times 10^7$] and the exact seconds of an Earth-year may also be attributable to a larger-magnitude z-axial linear periodicity of Venus, up and down magnetically relative to the Earth's pass of it, since the second planet of the solar system orbits the sun roughly 1.6 *years* relative to the Earth's period. Still, it is surprising that no mention of π 's timely stoicism comes close to this realization other than in "Seasons of Love" and a lyric about the Earth's orbital period (though without mention of the mathematical constant π , or one for Magnetism [in equations here, represented with "M"] (Norton, 2016), whose existence emerged later), "525,600 minutes...." (Larson, 1996), in and out of math classes. I once worked for, and enjoyed, an exceptional electromagnetism team in industry. My interest in these disciplines and industries is not really random at all. Nor are the constants for π and Magnetism, given the world's present Standard systems and units of measure.

To the seventh power in time is equal to the number of planets [7, from Venus to Pluto] whose resonance help differentiate the light of the sun, Earth, and Moon system, radius by radius, on both astronomical and biological, elementary observational levels each year.

3) π : (*nature*) Circulation.

When we observe the Area between the Moon and the Earth, multiplying π with the square of any given distance between the two, we have further opportunity to prove the natural expression that is π , not limited to the mathematical field of inquiry, nor limited to human development and biology. We also utilize here, to prove the methods of *resonance* and *radiance*, two units for the Magnetism system of measure, and complement the standard set in practice with the periodic table of elements. Since the distance between the Earth and Moon is variable to an order of over 31,000 miles, it is important to note that when we observe the squares of these distances in a table format of data (attached), we are not only observing the nature of the Moon's circulation, but also the Earth's--two frames of reference within a single table of relational data--and their differentials of rotation within the overall Area and field unity.

When these two bodies are nearest, the Area of circulation expresses in a symmetrical relationship with the primary elements of the Area being expressed. That is, Hydrogen and Helium. The sum of square mileage expressed when nearest is 156 billion miles-squared. This is no a random coincidence, but an opportunity for further observation and exploration, understanding and awareness. In terms of *resonance*, this is equally and proportionally expressive: 156 billion units of resonance is the *exact* median between the magnetic expressions of Hydrogen and Helium. In other words further, the Earth and Moon allow the magnetosphere this discreet rule:

If Helium interactions become the majority of the Hydrogen and Helium interactions within the magnetosphere--anything greater than 50%, these two bodies, the Earth and the Moon, will repel.

Whilst *radiance* is a more discreet expression of *resonance*--providing the magnetic force of an attributed resonance per the length that light travels per-second, it is charmingly as useful: the *radiance* of Helium, for example, expresses at 338,271 miles [$\underline{M}/\text{He}_{\text{amu}}/c^2/\text{s}$], coloring in the magnetosphere's field lines for a more discreet and expressive relationship inclusive of the Earth and Moon resonance.

So we prove within this element's *radiance* of 338,271 miles, a quartile with the lower half of the bottom quartile nearest Earth, the exact middle of this quartile, the magnetic median, at the *nearest-distance* polarization of Earth and Moon, and the 75% Hydrogen:25% Helium boundary when the distance is *the furthest* between them. This has much to do with the Sun's light that reflects between Earth and Moon, and the quantity of it from phase New to Full. The more light bouncing from the Moon's surface, the greater potential for Hydrogen to exceed the 156 billion H:He median limit. Interestingly, the nearest polarization of 156 billion square miles (where Helium=63 billion units and Hydrogen=250 billion units) is proportional also with the 156 million base pair units of the human genome's X chromosome.

So we prove circulation with π with astronomical, biological coincidences. To simplify further using the same dataset, we apply the Pythagorean theorem and discover the Earth's axial tilt [23.5] *in billions* of degrees of motional force as it relates to its rotation, orbit, and momentum with the Moon's linear, tidal action.

$$a^2 + b^2 = c^2 = \text{2-body tidal action}$$

where a^2 = nearest distance, and resonance is H:He median,
 b^2 = furthest distance, and resonance is H[75%]:He[25%] upper-quartile median,
 c^2 = rotational expression of the two bodies, and 360-degree resonance [billions].

The sum of the nearest and furthest Area's in the Earth:Moon magnetosphere is approximately 360 billion square miles. The root of this figure provides us with the angular distance the Moon travels as it orbits around the Earth, in a linear algebraic expression, with each phase accounts for about 600,000 miles of angular momentum, roughly one half of the *radiance* of Hydrogen [$\underline{M}/\text{H}_{\text{amu}}/c^2/\text{s} = 1,343,219$], equal in miles to one half the equatorial circumference of the Sun (or, its *equatorial radius*). (Nearly a half of this, of course, is Helium's radiance [338,217 miles/s, at lightspeed length], as Helium is about 4 times heavier, or more magnetically dense, than Hydrogen.

The 360 billion square miles [$a^2 + b^2 = c^2$], if we are yet focused on the degrees of the circle, and circulation, that π represents, expresses for us the rotational action of both spheres. The average distance between the Earth and Moon, at 238,855 miles, with the Area expressed,

results in a range of two times, in billions of degrees, further and nearer, equal to the axial tilt of the Earth [23.3, in billions of degrees, in both directions]. In other words, $b^2 - a^2 =$ approximately 47 billion units of square-"miled" resonance (or, 23.5~ north plus 23.5~ south). This is because the embrace of the Earth's north and south polar action is replete at the distance of and position of the Moon (360 degrees spent) within its magnetosphere. Theoretically, if this axial tilt were to be reduced, say, to 13.5 degrees, our table would be much shorter, and the Moon may have more rotational action rather than its present tidally-linear relationship relative to the Earth.

Supporting Magnetism more, this Area's *range* of 47 billion square miles of linear lunar motion and rotational Earth motion, both orbital, expresses these variable distances in action neatly proportional with the Earth's 47 *quadrillion resonance* units (its *radiance* of which is equal to the Magnetism constant itself, 252 billion unities).

How can we prove with triangulation these natural circulations with all of these curved field lines? Have we thus far here? The nature of the discreet light interactions between Hydrogen and Helium in the space between us, and that of the magnetosphere, which we cannot see relative to the brightness of the Sun, occurs at straight and right angle momentum points, before anywhere else. This is why when the Moon is *full*, it is not always positioned furthest from the Earth, and why when it is *new*, it is not always positioned nearest the Earth. The Area between the two begins its work at the 180-degree straight angle median between the two [ranging between 112,000 and 127,000 miles approximately], while the rotation at each increment curves, in effect expanding the Hydrogen:Helium median in a spatial-enough drift between the straight-angle phase work and the curved orbital work of the two. At this halfway marker between the Earth and Moon, whatever the variable distance, it is worthy to note that in terms of resonance, it is still a kinetic mix between Hydrogen and Helium; ie. Helium's precise resonance is yet about 10 billion unities nearer to the Earth, when still more elementary and weighty particles more frequently interact in places empirically known as the "Van Aken Radiation belts".

But, the Moon is always magnetically held by these rules of radiance and resonance, just as the tidal actions upon the Earth's surface are, and just as the atomic weights are steady on the periodic table of elements. As for the heavier elements notably *unstable*, well that is only anthropogenicism in an ever out-of-time quest for knowledge and understanding.

4) π : (2-dimensional) A circle's ratio of its circumference divided by its diameter.

Conclusion

Are these important implementations for the education system in the modern age? Would I want my child learning to themselves, or me alone, "I am a circle", if there are higher definitions available? No wonder so much disorder and unrest exists. In the late last century, a media soundbyte was that America was trailing about 26th from other regions of the world in mathematics. One unity the world has together is the antiquation of one of mathematics' greatest antiques, π . Students and teachers should celebrate their identities: we are all unique, we are all not infinite (to anyone's scientific knowledge), and we all are most certainly not irrational, at least not infinitely. But we are transcendental, in both pure and applied mathematics, regular and linear algebra, history and re-purposed commerce (if the two are distinguishable).

π when these 3- and 4-D definitions are proved and inclusive in regular educational curricula, they will help improve the educational system and world of innovation at large. I may even earn a Hollywood and/or William Shapkespeare play director's pass! When my father once said to me that the day he was born, "I saw light! I'm not joking!", today I still wonder if he was. And that's because a lot of us, myself included, yet wear eyeglasses. The number π is widely taught as *irrational* and *transcendental*. Its irrationality, with my diverse formalism in mathematical understanding, is due to it having an infinite order of digits following its decimal. Yet, astronomically applied, it may be proven at some future time that π is a *rational*, solar systemic key to our understanding about locality and nature. I think its digits end at the solar system's furthest boundaries, and that offers questions for healthy wonder and debate as to how it was so long ago premiered on our record of civilization. And of course, π is ever transcendental. To present these findings in a classroom, say, via the 15-week course I authored, rather than on electronic paper seems more natural and simpler to me. Maybe someday.

REFERENCES

Byers, W. (2007) How Mathematicians Think: Using Ambiguity, Contradiction, and Paradox to Create Mathematics Princeton University Press, Princeton, NJ

genetics:

"it behooves the educated person to attempt to understand a little of modern genetics not only because it provides the basis for the biotechnology that is transforming our world, but also because it is based on a certain way of looking at human nature" p.8

"A simplistic description of the theory of evolution is that genetic mutations occur in a random fashion." p. 319

Casti, J. (1996) Five Golden Rules: Great Theories of 20-Century Mathematics--and Why They Matter John Wiley & Sons, Inc., New York, NY

[null]

Clawson, C. (1996) Mathematical Mysteries: The Beauty and Magic of Numbers Plenum Publishing, New York and London

information overload: "A third file [on the internet] contains the first 1.25 million digits of π "

π :

"We know that π is the ratio of the diameter of a circle to its circumference. It has the approximate value of 3.14159265." p.88

"For reasons not always apparent, π shows up in many places that seem to be entirely unrelated to the ratio of the diameter of a circle to its circumference. This is not a cosmological problem concerning the universe we live in, but rather a logical problem....If I can define π , why can't I see at once its many relationships to other mathematical objects? But π is not unique." p.99

" Do not confuse our Prime Counting Function, $\pi(n)$, with the ratio of the circumference of a circle with its diameter which is designated as simply π . They are two distinctly different animals, even though they both use the Greek letter pi." p.155

"In fact, searching for primes is not the only compulsive behavior of which mathematicians are guilty. They are also known to become addicted to such numbers as π " p. 165

irrelevance:

"Symmetry can be seen everywhere in this equation" p. 227

[...] pp.88-90, pp.137-138, p.210

"How can the sum of an infinite series be connected to the ratio of the diameter of a circle to its circumference?" p.97

"...Euler..." p.104-105, "...beautiful..." p. 218

Frenkel, E. (2013) Love & Math: The Heart of Hidden Reality Perseus Books Group, New York, NY

"David Letterman's show (which was then starting at 12:35 am on NBC) was my favorite. The first time I watched it, I couldn't understand a single word. But somehow it was clear that this was *my* show, that I could really enjoy it, if I could understand what the host was saying. So this provided some extra motivation for me. I would stubbornly watch the show every night, and little by little I started to understand the jokes, the context, the background. This was my way of discovering American pop culture, and I was devouring every bit of it. Some nights, when I had to go to sleep early, I would videotape the show and watch it in the morning while having breakfast. The Letterman show became something of a religious ritual for me." p.146-147

Glabek, J. (1996) Intermediate Algebra NTC Learning Works, Lincoln, IL

fundamentals:

"Solving Linear Equations & Inequalities: To simplify an expression, combine similar terms (that is, terms with exactly the same variables and exponents)." p.12

Hughes & Miller (1938) Trigonometry John Wiley & Sons, Inc., London, UK

symmetries:

"Table II--Constants and Their Common Logarithms: Circumference of a Circle in seconds = 1,296,000"

Motz & Weaver (1993) The Story of Mathematics Plenum Publishing, New York and London

perfection:

"There is no evidence that Archimedes deduced the value of pi geometrically to further technology, but early technicians were quick to incorporate whatever mathematicians offered." p.4

McLeish, J. (1991) Number: The history of numbers and how they shape our lives Ballantine Books, New York, NY

**Norton, M. [me!] (2016) Joint Mathematics Conference, an abstract Joint Mathematics Conference, URL:
https://jointmathematicsmeetings.org/amsmtgs/2180_abstracts/1125-vc-44.pdf**

The Magnetism constant:

"A magnetic constant of 2.52×10^{11} unities/field (M) updates our calculus. To measure small-scale but large-volume chemistry variances, M/amu of an element outputs the element's magnetic oscillation"

"It can be used to predict cures for disease, efficacy and diagnostic differentials of existing medicine and therapies, anthropogenic and other climate change variables...molecular composition and reciprocity among large-body cosmological objects, and neuronal, cellular, and consciousness quanta in humans"

Posamentier, et al (2020) Math Makers: The Lives and Works of 50 Famous Mathematicians Prometheus Books, Guilford, CT

Seymour & Smith (1941!) Plane Geometry The Macmillan Company, New York, NY

Pi:

"It has been shown that this value [3.1415926535] is sufficiently accurate to give the circumference of a circle as large as the earth's equator correct to a small fraction of an inch."

"Historical note. One of the earliest references to π is by Ahmes, an Egyptian scribe (1550 B.C.) who used a formula for the area of a circle which gave a value of π , when expressed in our notation, of 3.1604. The Babylonians and early Hebrews used 3 for the value of π (see I Kings, vii, 23 and II Chronicles, iv, 2). Archimedes (287--212 B.C.), one of the great Greek mathematicians, found that π lies between 3.1428 and 3.1408. Later mathematicians computed the value correct to 9, 17, and 37 decimal places. With the invention of Calculus by Newton (1642--1727), methods for computing the value of π far simpler than one given here were discovered. By the use of these more modern methods the value of π has been computed to 707 decimal places."

Thompson, J. & Norton, M. [me!] (2020) Conversation in the Community, Bangor, ME

" π is central to astronomy and physics". *Neither of us used the time to identify its centrality in the biological sciences during this brief conversation outside of the rigid formal educational sector.*