M – theory

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Abstract

The behavior of smallest unit that creating from superstring and quark is indeterminate, but can be described as one equation according to macroscopic-rules.

So, it is easy to understand in all ages and countries, at any times and places. Newborns speak out the easiest word 'Mom' at the first time they speaking, which Decided the title of the theory.[1]

1) 2000 Mathematics Subject Classification
00A69 (Applied Mathematics, General applied mathematics For physics)

Key words and phrases
Superstring, Bernoulli number, Riemann zeta function

Index

■1. Introduction

1. Quantum hypothesis
2. Quantum field theory
3. Superstring theory
4. Unification SI unit
5. Expression numerical dimension

■2. Rules of the universe - the universe equations

-------------------------------- 1. Derivation Space equation
-------------------------------- 2. Space equation, numerical analysis

■3. Cosmology

1. Apply mathematics
2. Apply human activity
3. Apply engineering
   - Kepler's hypothesis
   - C_{60}Fullerene
   - W B K
4. Physical Applications
   - Turbulent flow
   - Space Nebula hypothesis
   - The complement of string theory
   - Zero Zone theory
   - Constant speed of light derivation
5. The new cosmology
   - Big Bang theory of the Problems
   - Fractal Cosmology
   - Dark energy and dark matter

■4. Understanding the Appendix

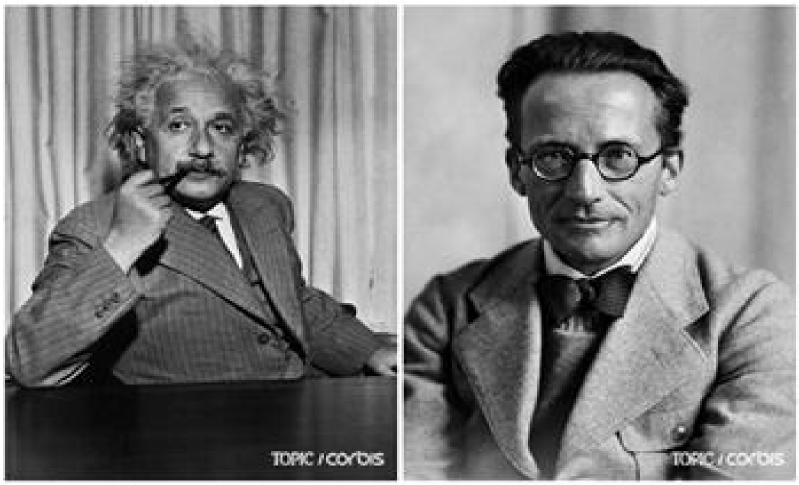
1. π
2. Infinity series
3. Numerical of Dimension
4. Bernoulli Number
5. Kissing number problem

※Footnote

- Reference

■1. Introduction

1. Quantum hypothesis



아인슈타인(좌)과 슈뢰딩거(우)도 양자역학의 발전에 크게 공헌했지만 양자역학을 싫어했다

Planck's law of black-body radiation

$$u = \int_0^\infty u(\nu)d\nu = \int_0^\infty \frac{8\pi h\nu^3}{c^3}\cdot\frac{1}{e^{\frac{h\nu}{kT}}-1}d\nu$$

$$\int_0^\infty \frac{\nu^3}{e^{\frac{h\nu}{kT}}-1}d\nu \;=>\; \int_0^\infty \frac{x^3}{e^x-1}dx = \Gamma(4)\zeta(4) = \frac{\pi^4}{15}$$

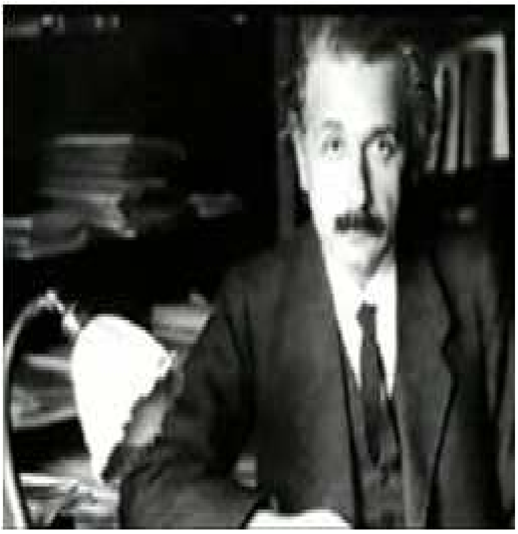
$$= \frac{8\pi^5k^4}{15c^3h^3}T^4 = \sigma T^4$$

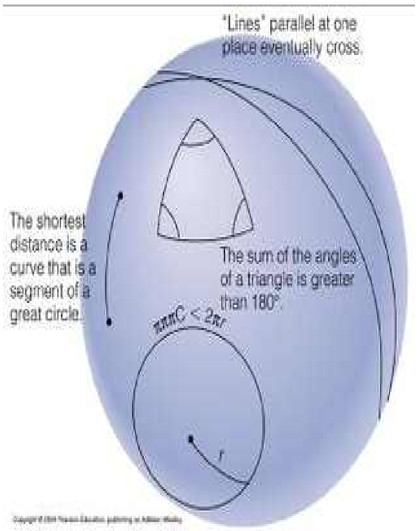
Bose-Einstein statistics : $n_i = \dfrac{g_i}{e^{(\epsilon-\mu)/kT}-1}$

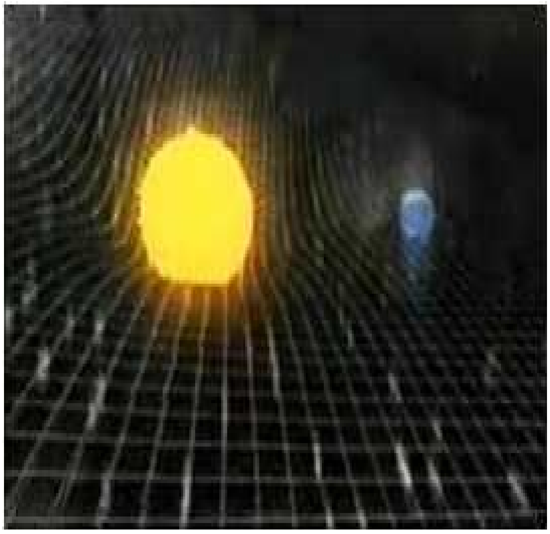
Fermi-Dirac statistics : $n_i = \dfrac{g_i}{e^{(E-E_F)/kT}+1}$

2. Quantum field theory

-Riemann - Riemann geometry -General Relativity







Einstein field equation

$$R_{ik} - \frac{g_{ik}R}{2} + \Lambda g_{ik} = \frac{8\pi G}{c^4} T_{ik} \text{ [1]}, \quad \Lambda = \frac{8\pi G}{3c^2}\rho$$

-Bernoulli - Probability - Uncertainty principle

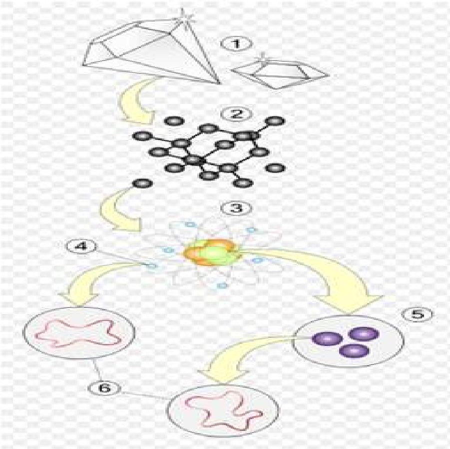
Uncertainty principle

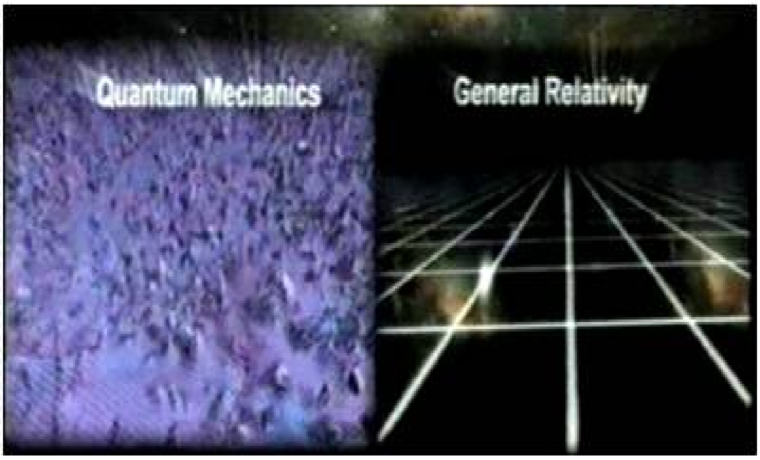
$$\Delta x \Delta p \ge \frac{h}{2\pi} \text{ [2]}, \quad h = 6.62606896 * 10^{-34} kg \cdot m^2/s$$

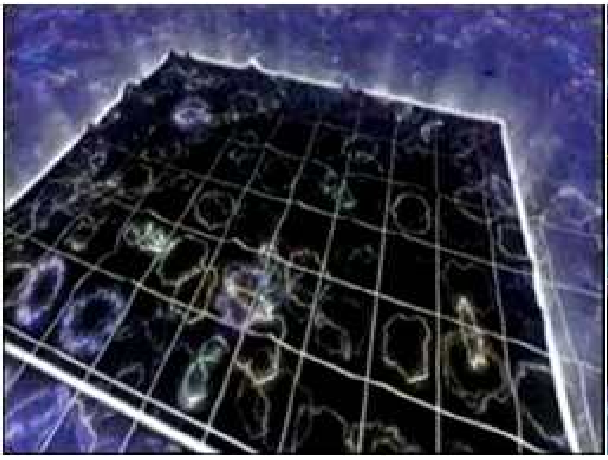
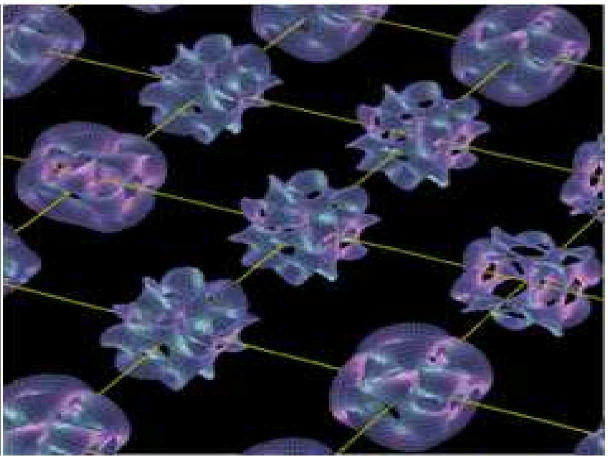
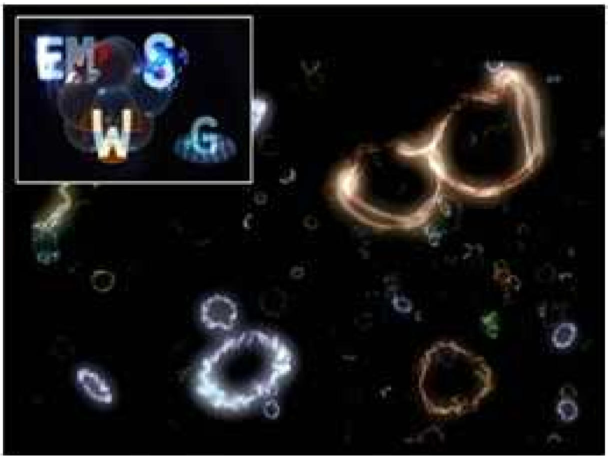
$$(E = mc^2) + (i\hbar\frac{\partial\psi}{\partial t} = -\frac{\hbar^2}{2m}\nabla^2\psi + V\psi) = (\nabla^2 - \frac{1\partial^2}{c^2\partial t^2})\psi = \frac{m^2c^2}{\hbar}\psi$$

3. Superstring theory

The deepest problem in theoretical physics is harmonizing the theory of general relativity, which describes gravitation and applies to large-scale structures (stars, galaxies, super clusters), with quantum mechanics, which describes the other three fundamental forces acting on the atomic scale.






Solved Superstring theory is an attempt to explain all of the particles and fundamental forces of nature in one theory by modelling them as vibrations of tiny supersymmetric strings.

4. Unification SI unit

Zero Zone theory

Name	Unit	Dimensionless number	Uncertainty	Based on units with a constant integration
Length	m	$\frac{1}{299792458}$s	0	c=1, 299,792,458m=1s
Time	s	1s	0	
Kelvin	K	$2.0836644[36]*10^{10}$s	$5*10^{-8}$	k=Hz=1, k/h=$2.0836644[36]*10^{10}$Hz/K K=$2.0836644*10^{10}$
Mole	mol	$6.02214179[30]*10^{23}$s	$2.9*10^{-8}$	NA=$6.02214179[30]*10^{23}$/mol mol=$6.02214179[30]*10^{23}$s
Candela	cd	$2.20964927[11]*10^{30}$s	$1.7*10^{-6}$	cd=$\frac{1}{683}$W/s, W=$kg{\cdot}m^2/s^3$ cd=$2.20964927*10^{30}$s
Ampere	A	$7.71194675[23]*10^{33}$s	$5*10^{-8}$	e=$1.602176487*10^{-19}$C A=C/s, A=$7.71194675[23]*10^{33}$s
Mass	Kg	$1.356392733[68]*10^{50}$s	$5*10^{-8}$	h=1, $6.62606896*10^{-34}kg{\cdot}m^2/s$=1 $kg=\frac{(299792458)^2}{6.62606896*10^{-34}}s$ kg=$1.356392733*10^{50}$s

7th SI UNIT Transform 2nd Unit (m,s)

5. Numerical of dimension

N-dimensional ball of radius r is interpreted $(-r \le x \le r)$			
Name	Dimension	Formula	Volume
Point	0	$0 \le r^2$	0
Line	1	$x^2 \le r^2$	2r
Circle	2	$x^2+y^2 \le r^2$	πr^2
Sphere	3	$x^2+y^2+z^2 \le r^2$	$\frac{4}{3}\pi r^3$
Nothing	4	$x_1^2+x_2^2+x_3^2+x_4^2 \le r^2$	$\frac{\pi^2}{2}r^4$
$\vdots$	$\vdots$	$\vdots$	$\vdots$
n-sphere	n	$x_1^2+x_2^2+x_3^2+x_4^2 \cdots + x_n^2 \le r^2$	$\frac{\pi^{\frac{n}{2}}}{\Gamma(\frac{n}{2}+1)}r^n$
Nothing	n	$x_1^3+x_2^3+x_3^3+x_4^3 \cdots + x_n^3 \le r^3$	Geometric mean loss
$\vdots$	$\vdots$	$\vdots$	$\vdots$
Universe	n	$x_1^k+x_2^k+x_3^k+x_4^k \cdots + x_n^k \le r^k$ $=1^x+2^x+3^x+\cdots+n^x \le r^x$	Geometric mean loss

Numerical Dimension 2nd Unit $\mathbb{C}(\mathbb{R},i)$

$$x_1 \neq x_2 \neq x_3 \neq \cdots \neq x_n$$

$$\lim_{n\to\infty} x_1+x_2 \cdots + x_n = x_1+x_2+\cdots 1+2+3+\cdots+x_n$$

$$=1+2+3+\cdots+x_1+x_2+\cdots+n$$

$$\therefore x_1+x_2 \cdots + x_n = \sum_{k=1}^{n} k$$

Ordinary Differential Equation

■2. Rules of the universe - the universe equations

1. Derivation of Space equation

Through the natural process of emerging rules

Cosmic dust, grains of one, two each gathered a set of mathematical expressions in the rules. $1+1+1+\cdots=n$ is a set of grains of dust n the one character you can switch to algebra.

$$\sum_{k=1}^{n} k = 1+2+3+4+\cdots+n = \frac{1}{2}n^2+\frac{1}{2}n$$

For example, $\frac{1}{2}n^2+\frac{1}{2}n$ $n=3$ the assignment $\frac{9}{2}+\frac{3}{2}=6$

$1-3$ is the sum of those numbers.

$$\sum_{k=1}^{n} k^2 = 1^2+2^2+3^2+4^2+\cdots+n^2 = \frac{1}{3}n^3+\frac{1}{2}n^2+\frac{1}{6}n$$

$$\sum_{k=1}^{n} k^3 = 1^3+2^3+3^3+4^3+\cdots+n^3 = \frac{1}{4}n^4+\frac{1}{2}n^3+\frac{1}{4}n^2+0\cdot n$$

$$\sum_{k=1}^{n} k^4 = \frac{1}{5}n^5+\frac{1}{2}n^4+\frac{1}{3}n^3+0\cdot n^2-\frac{1}{30}n \qquad \vdots$$

$$\sum_{k=1}^{n} k^5 = \frac{1}{6}n^6+\frac{1}{2}n^5+\frac{5}{12}n^4+0\cdot n^3-\frac{1}{12}n^2+0\cdot n \qquad \vdots$$

$$\sum_{k=1}^{n} k^6 = \frac{1}{7}n^7+\frac{1}{2}n^6+\frac{1}{2}n^5+0\cdot n^4-\frac{1}{6}n^3+0\cdot n^2+\frac{1}{42}n \qquad \vdots$$

$\vdots$

$\sum_{k=1}^{n} k^x$ represents the inductive.

$$\sum_{k=1}^{n} k^x = \frac{1}{x+1}n^{x+1} + \frac{1}{2}n^x + {}_xP_1\frac{1}{12}n^{x-1} - {}_xP_3\frac{1}{720}n^{x-3}$$

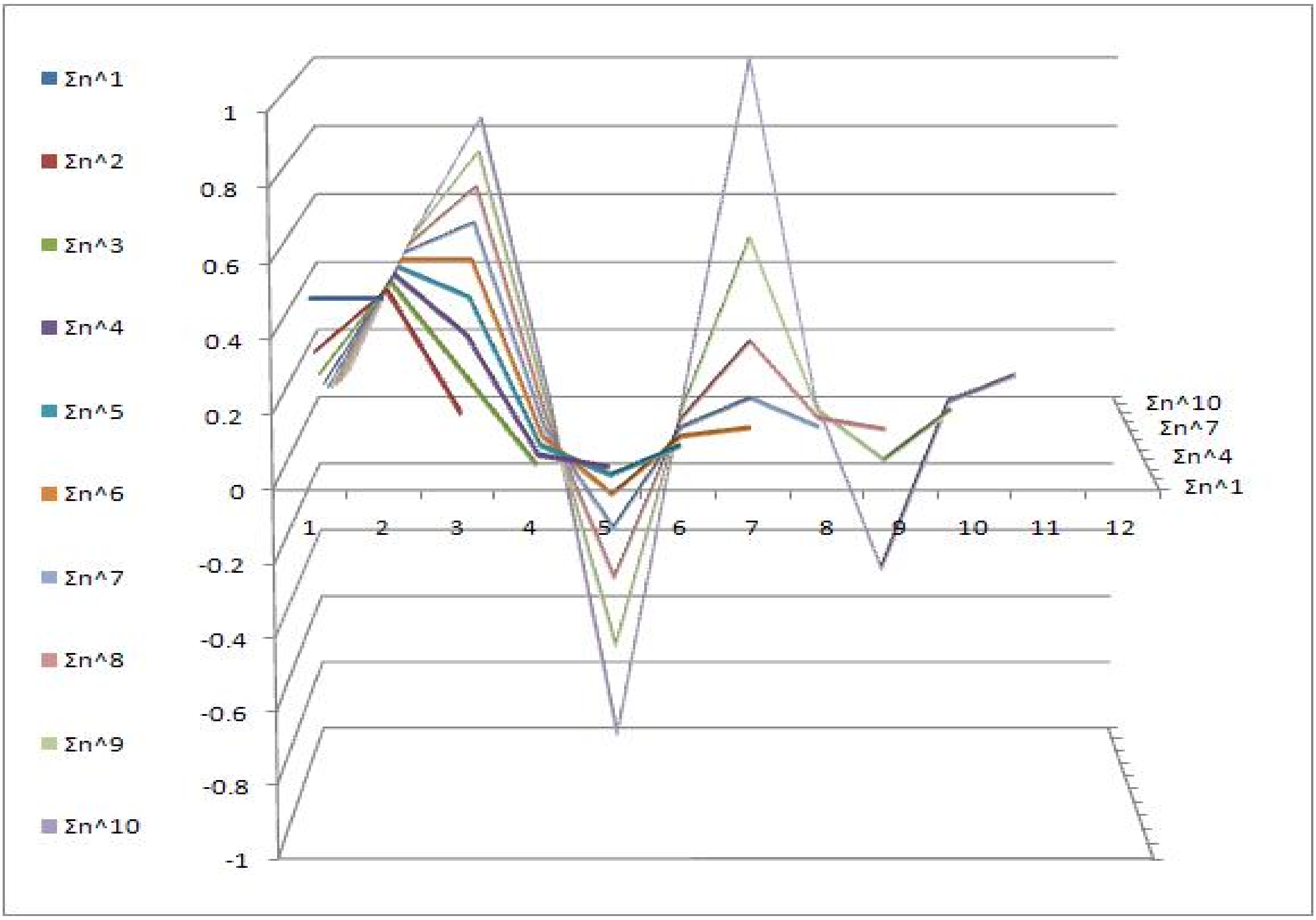
$$+ {}_xP_5\frac{1}{30240}n^{x-5} - {}_xP_7\frac{1}{1209600}n^{x-7} + \cdots$$

$$+ \frac{{}_xP_{2s-1}}{(2s)!}4\sqrt{\pi s}\left(\frac{s}{\pi e}\right)^{2s}n^{x-2s+1}$$

The program using a complex formula $\sum_{k=1}^{n} k^x$ rank, $a_{x,s} = f(x,s)$ was represented as a graph.

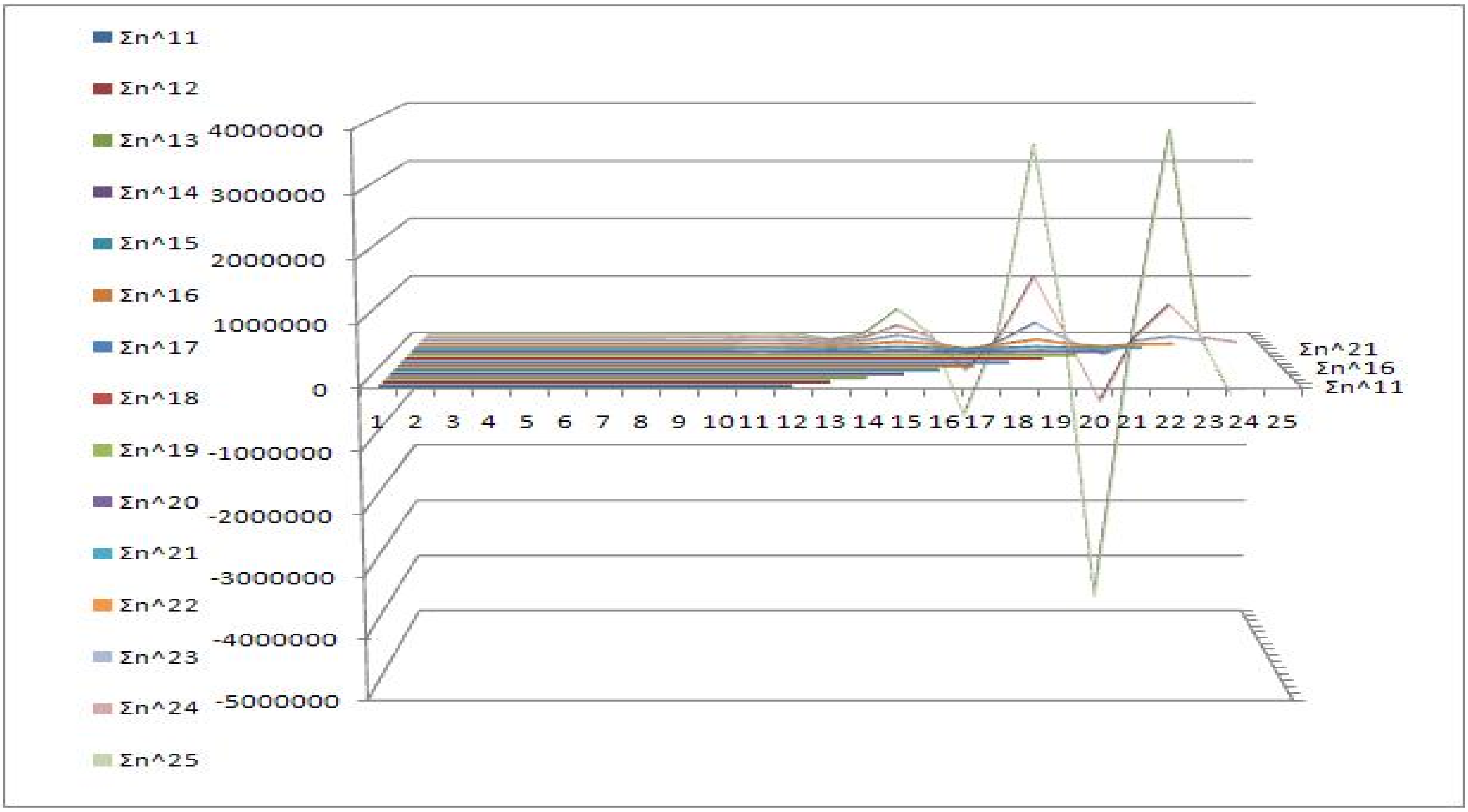
$\sum_{k=1}^{n} k \sim \sum_{k=1}^{n} k^{10}$

Represented by three-dimensional graphs (Excel file attached)

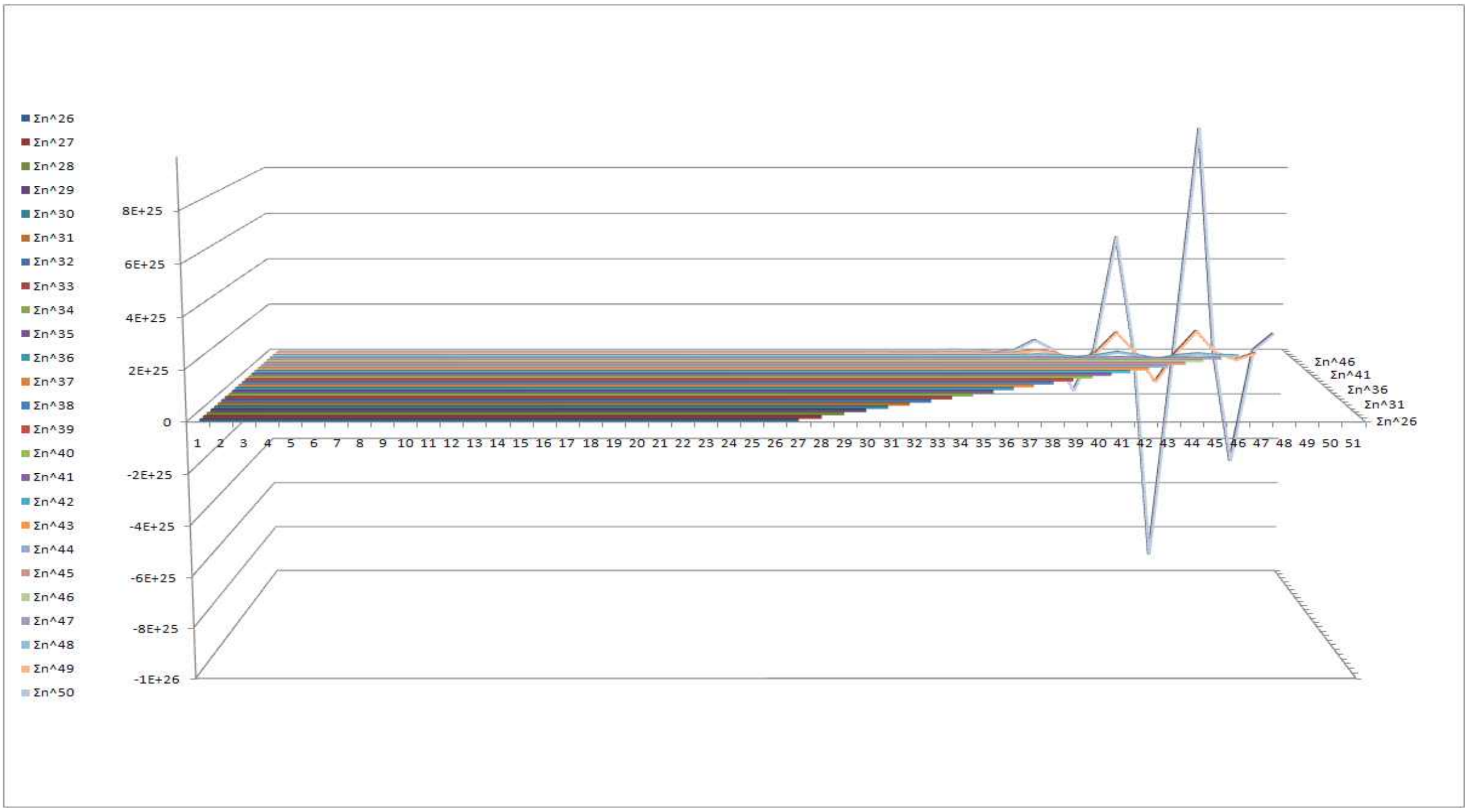


$$\sum_{k=1}^{n} k^{11} \sim \sum_{k=1}^{n} k^{25}$$

Represented by three-dimensional graphs (Excel file attached)

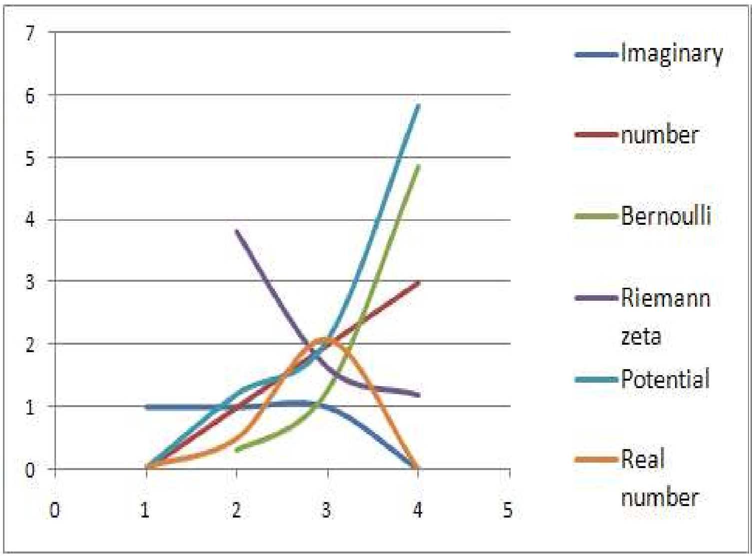


$$\sum_{k=1}^{n} k^{26} \sim \sum_{k=1}^{n} k^{50}$$

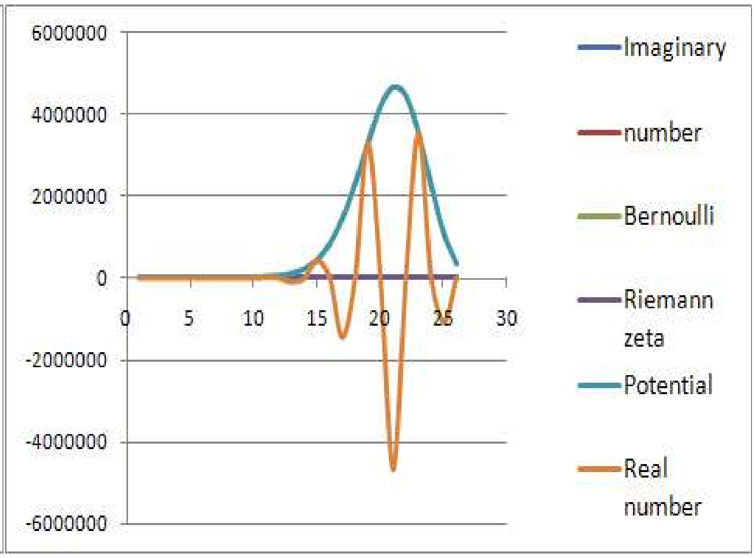


$\sum_{k=1}^{n} k^{50}$ Because the value is too large relative to 0-35 parts linear (laminar), but expanded to look at all the cigarette smoke (turbulent flow) of the same patterns are intended.

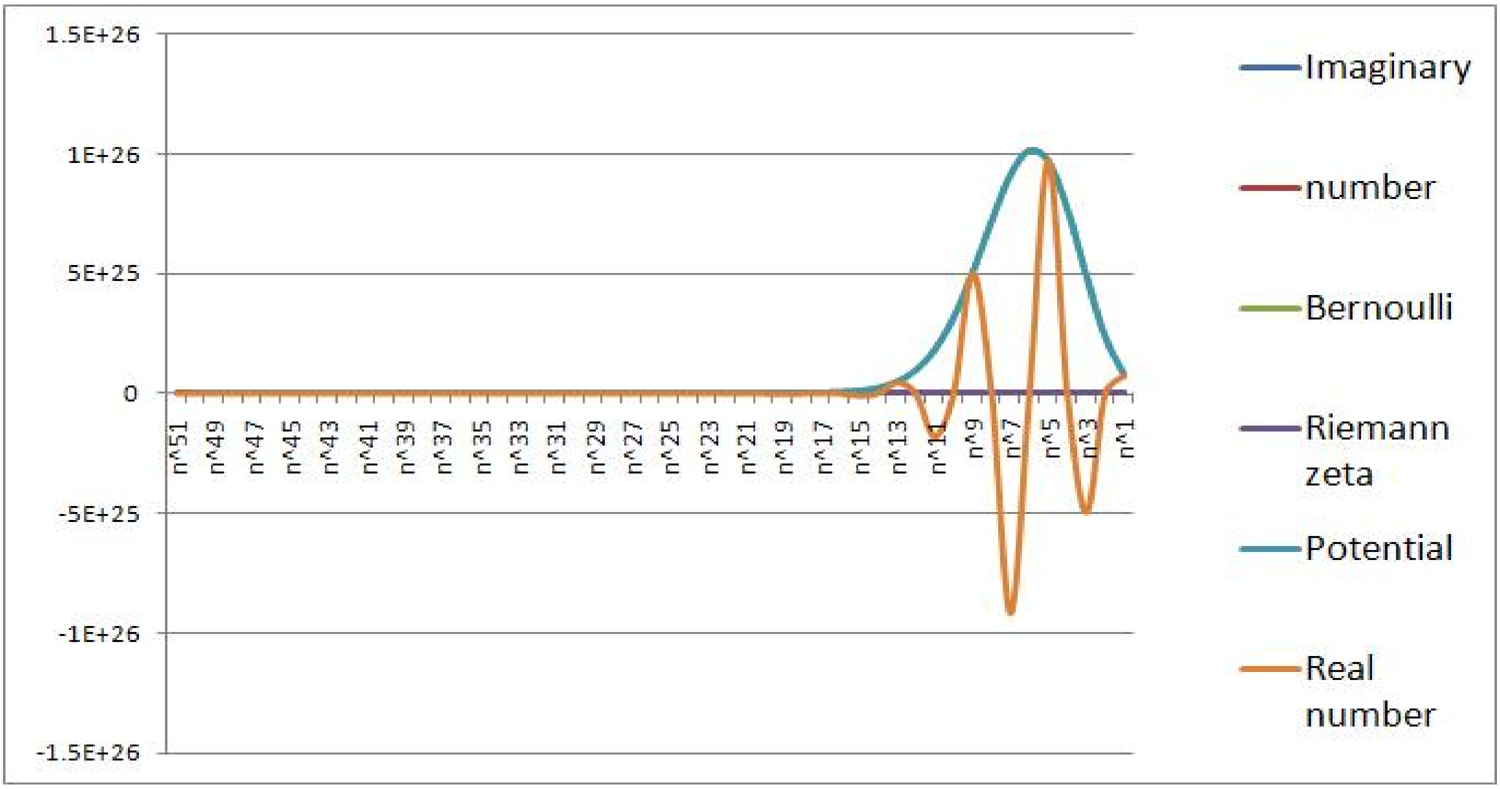
$\sum_{k=1}^{n} k^{25}$ Extending the graph 0-6



$\sum_{k=1}^{n} k^{25}$ Graphs (Excel file attached)



$\sum_{k=1}^{n} k^{50}$ Graphs (Excel file attached)



$\sum_{k=1}^{n} k^x,\ 1,2,3,4,5,\cdots$ Each of the universe exists at least one ranked number (molecules - Atomic - particles (quark, string) - ?[2]) and all particles are affect each other number represented by the power.

The random is entered as a chaos($\frac{1}{x+1}n^{x+1},\ n^x,\ xn^{x-1},\ x(x-1)(x-2)n^{x-3}$) (indeterminate behavior, similar to the concept of human free will)

where ($\frac{1}{2},\ \frac{1}{12},\ -\frac{1}{720},\ \frac{1}{30240},\ -\frac{1}{1209600}\cdots$)[3] is any random number devide cosmic rules. (The probability that the regulatory nature of substance)

ex: any number divided by two others (0, 1) 2, any number divided by 12 others (0, 1, 2 ⋯, 11) 12 there

Chaos (the random input) and
Cosmos (with all the random sharing rule)
that the Harmony

Universe has indeterminate and macroscopic rules.

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2) The smallest Exist(?) is Timespace (m,s)

3) $(\frac{1}{2}+\frac{1}{12}-\frac{1}{720}+\frac{1}{30240}-\frac{1}{1209600}+\cdots)=1$ The sum of the numbers 1

Under the final $\sum_{k=1}^{n} k^x$ 3 expression is same expression.

The first representation

(π, e is universal language)

$$\sum_{k=1}^{n} k^x = \frac{1}{x+1} n^{x+1} + \frac{1}{2} n^x + {}_xP_1 \frac{1}{12} n^{x-1} - {}_xP_3 \frac{1}{720} n^{x-3}$$

$$+ {}_xP_5 \frac{1}{30240} n^{x-5} - {}_xP_7 \frac{1}{1209600} n^{x-7} + {}_xP_9 \frac{1}{47900160} n^{x-9}$$

$$- {}_xP_{11} \frac{691}{1307674368000} n^{x-11} + {}_xP_{13} \frac{1}{74724249600} n^{x-13} \cdots$$

$$- \frac{{}_xP_{s-1}}{s!} 2\sqrt{2\pi s} \left(\frac{s}{2\pi i e}\right)^s \zeta(s) \left(1 + \frac{1}{12s} + \frac{1}{288s^2} - + \cdots\right) n^{x-s+1}$$ [4)3)]

4) ※Stirling formula

$$n! = \sqrt{2\pi n} \left(\frac{n}{e}\right)^n \left(1 + \frac{1}{12n} + \frac{1}{288n^2} - \frac{139}{51840n^3} - + \cdots\right) \approx \sqrt{2\pi n} \left(\frac{n}{e}\right)^n$$

$$e^n = \sqrt{2\pi n} \frac{n^n}{n!} \left(1 + \frac{1}{12n} + \frac{1}{288n^2} - \frac{139}{51840n^3} - + \cdots\right)$$

$$\frac{1}{\sqrt{2\pi n}} \left(\frac{e}{n}\right)^n n! = \left(1 + \frac{1}{12n} + \frac{1}{288n^2} - \frac{139}{51840n^3} - + \cdots\right)$$

Second representation

The first organized expression, let the number of Bernoulli with Bernoulli's representation.

$$\sum_{k=1}^{n} k^x = \frac{1}{x+1} n^{x+1} + \frac{1}{2} n^x + \frac{{}_xC_1}{2} \frac{1}{6} n^{x-1} - \frac{{}_xC_3}{4} \cdot \frac{1}{30} n^{x-3}$$
$$+ \frac{{}_xC_5}{6} \cdot \frac{1}{42} n^{x-5} - \frac{{}_xC_7}{8} \cdot \frac{1}{30} n^{x-7} + \frac{{}_xC_9}{10} \cdot \frac{5}{66} n^{x-9} - \frac{{}_xC_{11}}{12} \cdot \frac{691}{2730} n^{x-11}$$
$$+ \frac{{}_xC_{13}}{14} \cdot \frac{7}{6} n^{x-13} - \frac{{}_xC_{15}}{16} \cdot \frac{3617}{510} n^{x-15} + \frac{{}_xC_{17}}{18} \cdot \frac{43867}{798} n^{x-17} - \cdots$$
$$+ \frac{{}_xC_{2s-1}}{2s} B_s n^{x-2s+1}$$ [5][4]

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5) ※ B_n Bernoulli number

$B_1 = \frac{1}{6}$

$B_2 = \frac{1}{30}$

$B_3 = \frac{1}{42}$

$B_4 = \frac{1}{30}$

$B_5 = \frac{5}{66}$

$B_6 = \frac{691}{2,730}$

$B_7 = \frac{7}{6}$

$B_8 = \frac{3,617}{510}$

$B_9 = \frac{43,867}{798}$

$B_{10} = \frac{174,611}{330}$

$B_{11} = \frac{854,513}{138}$

$B_{12} = \frac{236,364,091}{2,730}$

$B_{13} = \frac{8,553,103}{6}$

$B_{14} = \frac{23,749,461,029}{870}$

$B_{15} = \frac{8,615,841,276,005}{14,322}$

$B_{16} = \frac{7,709,321,041,217}{510}$

$B_{17} = \frac{2,577,687,858,367}{6}$

$B_{18} = \frac{26,315,271,553,053,477,373}{1,919,190}$

$B_{19} = \frac{2,929,993,913,841,559}{6}$

$B_{20} = \frac{261,082,718,496,449,122,051}{13530}$

Third representation

Riemann zeta function $\zeta(2n)$ use is expressed as 2π.

Disc-shaped space is most useful to understand the feeling.

Through 2π then 12, 720, 30240 $\cdots$ are

Periodically, Geometric mean will contain.

$$\sum_{k=1}^{n} k^x = \frac{1}{x+1}n^{x+1} + \frac{1}{2}n^x + {}_xP_1\frac{2}{(2\pi)^2}\cdot\frac{\pi^2}{6}n^{x-1} - {}_xP_3\frac{2}{(2\pi)^4}\cdot\frac{\pi^4}{90}n^{x-3}$$

$$+ {}_xP_5\frac{2}{(2\pi)^6}\cdot\frac{\pi^6}{945}n^{x-5} - {}_xP_7\frac{2}{(2\pi)^8}\cdot\frac{\pi^8}{9450}n^{x-7}$$

$$+ {}_xP_9\frac{2}{(2\pi)^{10}}\cdot\frac{\pi^{10}}{93555}n^{x-9} - {}_xP_{11}\frac{2}{(2\pi)^{12}}\cdot\frac{691\pi^{12}}{638512875}n^{x-11}$$

$$+\cdots+ {}_xP_{2s-1}\cdot\frac{2}{(2\pi)^{2s}}\cdot\zeta(2s)\cdot n^{x-2s+1}$$ [6)5)]

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6) ※ζ(2n) Riemann zeta function

$$\zeta(n) = \prod_p \frac{1}{1-p^{-n}},\ \zeta(n) = \sum_{k=1}^{n}\frac{1}{k^n} = 1+\frac{1}{2^n}+\frac{1}{3^n}+\frac{1}{4^n}\cdots$$

$\zeta(1) = \sum_{k=1}^{\infty}\frac{1}{k} = 1+\frac{1}{2}+\frac{1}{3}+\cdots = \infty$ Harmonic-s $\zeta(2) = \sum_{k=1}^{\infty}\frac{1}{k^2} = 1+\frac{1}{2^2}+\frac{1}{3^2}+\cdots = \frac{\pi^2}{6}$

$\zeta(3) = \sum_{k=1}^{\infty}\frac{1}{k^3} = 1+\frac{1}{2^3}+\frac{1}{3^3}+\cdots = 1.202\cdots$ $\zeta(4) = \sum_{k=1}^{\infty}\frac{1}{k^4} = 1+\frac{1}{2^4}+\frac{1}{3^4}+\cdots = \frac{\pi^4}{90}$

$\zeta(5) = \sum_{k=1}^{\infty}\frac{1}{k^5} = 1+\frac{1}{2^5}+\frac{1}{3^5}+\cdots = 1.036\cdots$ $\zeta(6) = \sum_{k=1}^{\infty}\frac{1}{k^6} = 1+\frac{1}{2^6}+\frac{1}{3^6}+\cdots = \frac{\pi^6}{945}$

$\zeta(7) = \sum_{k=1}^{\infty}\frac{1}{k^7} = 1+\frac{1}{2^7}+\frac{1}{3^7}+\cdots = 1.0083\cdots$ $\zeta(8) = \sum_{k=1}^{\infty}\frac{1}{k^8} = 1+\frac{1}{2^8}+\frac{1}{3^8}+\cdots = \frac{\pi^8}{9450}$

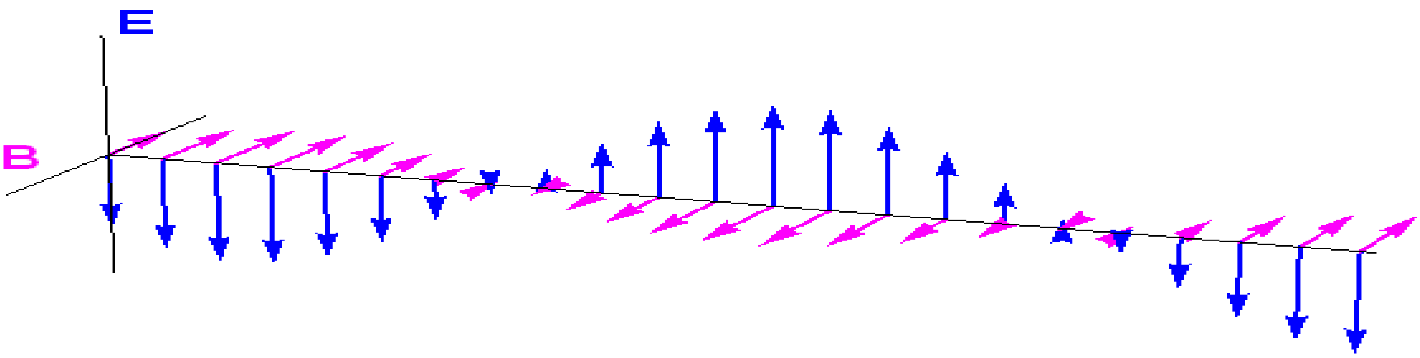
$\zeta(9) = \sum_{k=1}^{\infty}\frac{1}{k^9} = 1+\frac{1}{2^9}+\frac{1}{3^9}+\cdots = 1.0020\cdots$ $\zeta(10) = \sum_{k=1}^{\infty}\frac{1}{k^{10}} = 1+\frac{1}{2^{10}}+\cdots = \frac{\pi^{10}}{93555}$

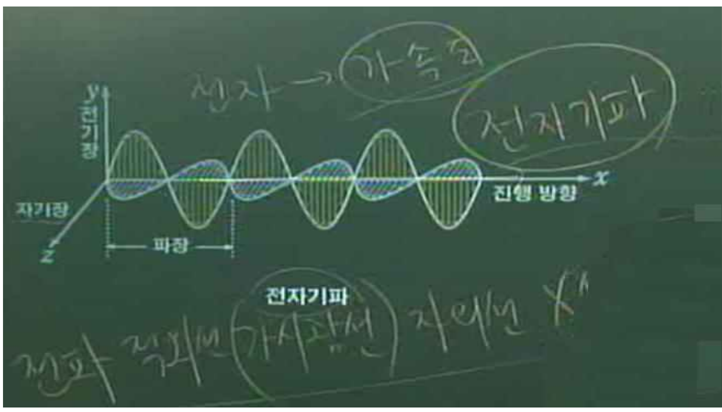
$\zeta(11) = \sum_{k=1}^{\infty}\frac{1}{k^{11}} = 1+\frac{1}{2^{11}}+\cdots = 1.0004\cdots$ $\zeta(12) = \sum_{k=1}^{\infty}\frac{1}{k^{12}} = 1+\frac{1}{2^{12}}+\cdots = \frac{691\pi^{12}}{638512875}$

The final expression

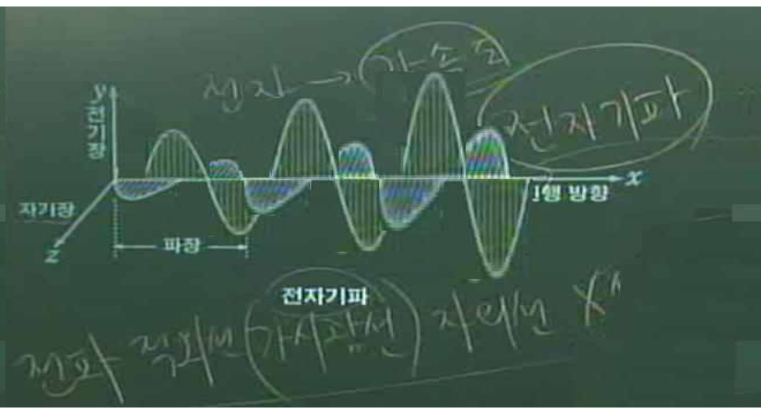
Complex area, expand the ultimate appearance.
Imaginary area(i) is 0 odd term was represented in complex space.

$$
\begin{aligned}
\sum_{k=1}^{n} k^{x} = {} & \frac{1}{x+1} n^{x+1} + \frac{1}{2} n^{x} - {}_{x}P_{1} \frac{2}{(2\pi i)^{2}} \cdot \frac{(2\pi)^{2}}{24} n^{x-1} \\
& - {}_{x}P_{2} \frac{2}{(2\pi i)^{3}} \cdot \zeta(3) n^{x-2} - {}_{x}P_{3} \frac{2}{(2\pi i)^{4}} \cdot \frac{(2\pi)^{4}}{1440} n^{x-3} \\
& - {}_{x}P_{4} \frac{2}{(2\pi i)^{5}} \cdot \zeta(5) n^{x-4} - {}_{x}P_{5} \frac{2}{(2\pi i)^{6}} \cdot \frac{(2\pi)^{6}}{60480} n^{x-5} \\
& - {}_{x}P_{6} \frac{2}{(2\pi i)^{7}} \cdot \zeta(7) n^{x-6} - {}_{x}P_{7} \frac{2}{(2\pi i)^{8}} \cdot \frac{(2\pi)^{8}}{2419200} n^{x-7} \\
& - {}_{x}P_{8} \frac{2}{(2\pi i)^{9}} \cdot \zeta(9) n^{x-8} - {}_{x}P_{9} \frac{2}{(2\pi i)^{10}} \cdot \frac{(2\pi)^{10}}{95800320} n^{x-9} \\
& - {}_{x}P_{10} \frac{2}{(2\pi i)^{11}} \cdot \zeta(11) n^{x-10} - {}_{x}P_{11} \frac{2}{(2\pi i)^{12}} \cdot \frac{691\,(2\pi)^{12}}{2615348736000} n^{x-11} \\
& - \cdots - {}_{x}P_{s-1} \cdot \frac{2}{(2\pi i)^{s}} \cdot \zeta(s) \cdot n^{x-s+1}
\end{aligned}
$$





Maxwell's electromagnetic



Electromagnetic waves by modifying the saved picture

Through Mensuration by parts $\lim_{n\to\infty}\sum_{k=0}^{n}k^{x}$ and $\frac{1}{x+1}n^{x+1}$ to erase Composition of the dust was artificially created and influenced countless mathematical means of removing.

$$V=\lim_{n\to\infty}\sum_{k=0}^{n}S(x_k)\triangle x=\int_a^b S(x)dx$$

$$\triangle x=\frac{b-a}{n}=1\,(b=n,a=0)$$

$$V=\lim_{n\to\infty}\sum_{k=0}^{n}k^x\triangle x=\int_0^n k^x dk$$

$$\lim_{n\to\infty}\sum_{k=0}^{n}k^x=\int_0^n k^x dk=\frac{1}{x+1}n^{x+1}$$

$$\sum_{k=1}^{n}k^x=\frac{1}{x+1}n^{x+1}+\frac{1}{2}n^x-{}_xP_1\frac{2}{(2\pi i)^2}\cdot\frac{(2\pi)^2}{24}n^{x-1}$$

$$-{}_xP_2\frac{2}{(2\pi i)^3}\cdot\zeta(3)n^{x-2}-{}_xP_3\frac{2}{(2\pi i)^4}\cdot\frac{(2\pi)^4}{1440}n^{x-3}-\cdots$$

$$-{}_xP_{s-1}\cdot\frac{2}{(2\pi i)^s}\cdot\zeta(s)\cdot n^{x-s+1}$$

$$0=\frac{1}{2}n^x-{}_xP_1\frac{2}{(2\pi i)^2}\cdot\frac{(2\pi)^2}{24}n^{x-1}$$

$$-{}_xP_2\frac{2}{(2\pi i)^3}\cdot\zeta(3)n^{x-2}-{}_xP_3\frac{2}{(2\pi i)^4}\cdot\frac{(2\pi)^4}{1440}n^{x-3}-\cdots$$

$$-{}_xP_{s-1}\cdot\frac{2}{(2\pi i)^s}\cdot\zeta(s)\cdot n^{x-s+1}$$

Understanding of the Imaginary number i

$e^{i\pi}+1=0$ Euler's equation. $e^{i\pi}=-1$, To take root on both sides

$e^{\frac{\pi}{2}i}=i$, If you take the reciprocal $e^{-\frac{\pi}{2}i}=\frac{1}{i}=-i$

$$-\frac{\pi}{2}i=\infty=\zeta(1)=1+\frac{1}{2}+\frac{1}{3}+\cdots=-\frac{\pi}{2}i$$

$$0=\frac{1}{2}n^{x}-{}_{x}P_{1}\frac{2}{(2\pi i)^{2}}\cdot\frac{(2\pi)^{2}}{24}n^{x-1}$$

$$-{}_{x}P_{2}\frac{2}{(2\pi i)^{3}}\cdot\zeta(3)n^{x-2}-{}_{x}P_{3}\frac{2}{(2\pi i)^{4}}\cdot\frac{(2\pi)^{4}}{1440}n^{x-3}-\cdots$$

$$-{}_{x}P_{s-1}\cdot\frac{2}{(2\pi i)^{s}}\cdot\zeta(s)\cdot n^{x-s+1}$$

$$0=-{}_{x}P_{0}\frac{2}{(2\pi i)^{1}}\zeta(1)n^{x}-{}_{x}P_{1}\frac{2}{(2\pi i)^{2}}\cdot\frac{(2\pi)^{2}}{24}n^{x-1}$$

$$-{}_{x}P_{2}\frac{2}{(2\pi i)^{3}}\cdot\zeta(3)n^{x-2}-{}_{x}P_{3}\frac{2}{(2\pi i)^{4}}\cdot\frac{(2\pi)^{4}}{1440}n^{x-3}-\cdots$$

$$-{}_{x}P_{s-1}\cdot\frac{2}{(2\pi i)^{s}}\cdot\zeta(s)\cdot n^{x-s+1}$$

Quantum mechanics and the imaginary number :

$$i\hbar\frac{\partial\psi}{\partial t}=-\frac{\hbar^{2}}{2m}\nabla^{2}\psi+V\psi$$ Schrodinger equation

Fractal and imaginary number :

$$z_{n+1}=z_{n}^{2}+c$$ (c is Complex) Mandelbrot set

Bernoulli number and Fractal : $\frac{1}{n}\Delta B_{k}(x)=B_{k-1}(x)$

$$B_{2n}(x)=B_{n}(x)^{2}+c$$

2. Numerical analysis of the Space equation

The first representation is easy to understand and examine the representation of numbers

$$
\begin{aligned}
\sum_{k=1}^{n} k^{x} = & \frac{1}{x+1} n^{x+1} + \frac{1}{2} n^{x} + \frac{x}{12} n^{x-1} - \frac{x(x-1)(x-2)}{720} n^{x-3} \\
& + \frac{x(x-1)(x-2)(x-3)(x-4)}{30240} n^{x-5} \\
& - \frac{x(x-1)\cdots(x-6)}{1209600} n^{x-7} + \cdots \\
& + \frac{{}_{x}P_{s-1}}{s!} 2\sqrt{\pi s} \left(\frac{s}{2\pi i e} \right)^{s} n^{x-s+1} \\
& = {}_{x}P_{s-1} \cdot \frac{2}{(2\pi i)^{s}} \cdot \zeta(s) \cdot n^{x-s+1}
\end{aligned}
$$

Appears natural constants

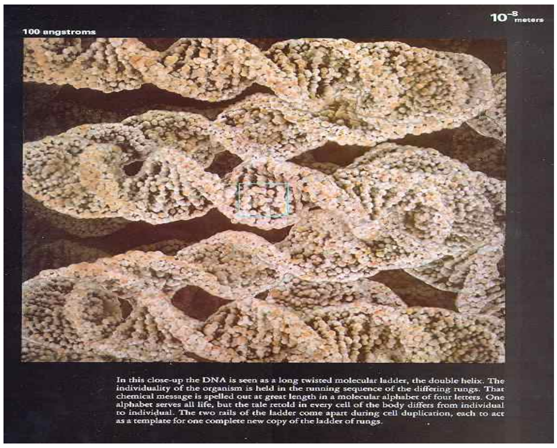
$$2,\ 12,\ 720,\ 30240,\ 1209600 \cdots \frac{s!}{2\sqrt{2\pi s}\left(\frac{s}{2\pi i e}\right)^{s}} \cdots \frac{(2s)!}{4\sqrt{\pi s}\left(\frac{s}{\pi i e}\right)^{2s}}$$

Mathematical constant (the natural constants)

2, 12, 720, 30240, 1209600··· $\dfrac{(2s)!}{4\sqrt{\pi s}\left(\dfrac{s}{\pi e}\right)^{2s}}$

Look forward in the feature space 2, 12, 720, e, π

12, 720 are listed as represented by the Riemann zeta function and the periodic nature of 2π



Double helix $10^{-8}m$

2 : Super string, Double helix, All atoms (+, −), Vibrational properties of all materials, Males and females (all creatures)

12 : Complete harmony, the symbol of the life cycle of the universe,

(source : http://ko.wikipedia.org/wiki/12)

Face-centered cubic lattice (FCC), Any life that included the C_{12},

Any sound can be represented by 12rule[7],

12 kinds of human activity patterns Astrology Category[8]

string mass moment of inertia$=\dfrac{1}{12}ML^2$

12 types of quark particles (6 quark and 6 antiquark), 12month

$\sum_{n=1}^{\infty} n = 1+2+3+\cdots = -\dfrac{1}{12}$ Ramanujan's theorem

Human synthetic 12 amino acid types by Double helix

720 : C_{60}Fullerenes, 360 days$\simeq$1 years, Mesopotamia 60 base,

the sexagenary cycle, Angle of a circle360°

---

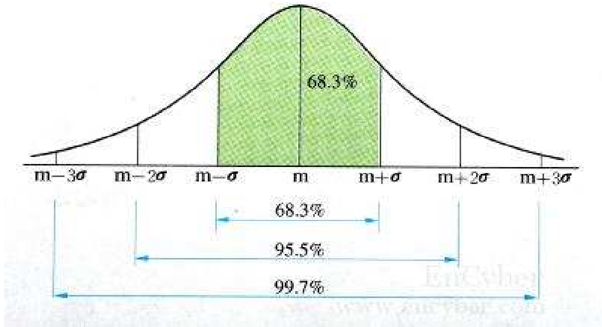
7) Do, Re, Mi, Fa, So, La, Ti, Do#, Re#, Fa#, So#, La# 12sound

8) Western Palace 12 zodiacal constellations, East 12cycle

Mathematical statistics applied

1. Normal distribution[6)]

$$f(x) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{\frac{-(x-m)^2}{2\sigma^2}} \quad N(m, \sigma^2)$$



Normal distribution of height, weight, longevity, intelligence, and rainfall, and various physical values, sales of certain products, etc. All the standard normal distribution follows the distribution of

ex:) 1. South Korea Men's average height 173cm, 180cm is 12% of the distribution

2. The average human IQ is 100. IQ 148 than 2%

2. Poisson distribution[7)] $f(x) = \frac{e^{-\lambda} \cdot \lambda^x}{x!} (\lambda > 0, x = 0, 1, 2..)$

Poisson distribution is very frequently used in mathematical statistics

- What caused the page to complete a single incidence of typo.

ex:) Which one page paper will occur on average five times a typo. On page 8 is a single typo is a probability that

$$P(X=8) = \frac{e^{-5} \cdot 5^8}{8!} = 0.0652 = 6.5\%$$

- The number of persons born during the day caused
- What specific amount of radiation exposure to DNA mutations that occur when the number of

3. Gamma distribution[8)] $f(x) = \frac{1}{\Gamma(\alpha)} \lambda^\alpha x^{\alpha-1} e^{-\lambda x}$

α = The number of times a particular event occurs, λ= Average hours per case to occur the number of

ex:) global game of starcraft average number of connections per second, six people. 4 people have access to more than 1 second to wait until the odds?

$$P(X \geq 1) = \int_1^\infty \frac{1}{\Gamma(4)} 6^4 x^3 e^{-6x} dx = 0.1512 = 15.1\%$$

All three kinds of distributions are transformed with the principle of normal distribution.

$\sum_{k=1}^{n} k^x$ Derivation of the standard normal distribution

Principle: Bernoulli binomial distribution were induced to take limit. (Gauss)

12, 720, 30240 $\cdots \dfrac{s!}{2\sqrt{2\pi s}\left(\dfrac{s}{2\pi ie}\right)^s} = \dfrac{s!}{2\sqrt{2\pi s}}(\dfrac{2\pi ie}{s})^s = \dfrac{(2\pi i)^s}{2\cdot\zeta(s)}$ [9)]

$$= \frac{(2\pi i)^s}{2} = \frac{s!}{2}(\frac{2\pi i}{s})^s \frac{1}{\sqrt{2\pi s}} e^s$$

Normal distribution $f(x) = \dfrac{1}{\sqrt{2\pi\sigma^2}} e^{\frac{-(x-m)^2}{2\sigma^2}} \quad N(m, \sigma^2)$

Physical application

Molecular speed: Maxwell - Boltzmann distribution

$$f(v) = 4\pi(\frac{m}{2\pi kT})^{\frac{3}{2}} v^2 e^{-\frac{mv^2}{2kT}} \qquad => \quad \epsilon = \frac{1}{2}mv^2$$

$$f(v) = \frac{8\pi}{m}(\frac{m}{2\pi kT})^{\frac{3}{2}} \epsilon \cdot e^{-\frac{\epsilon}{2kT}} = \frac{2\epsilon}{kT}\sqrt{(\frac{\epsilon}{2\pi kT})}\, e^{-\frac{\epsilon}{2kT}}$$

9) $\lim_{n\to\infty} \zeta(n) = 1$

The boundaries of life and material

(source : Wikipedia http://ko.wikipedia.org/wiki/%EC%83%9D%EB%AA%85)

Total Current Biology in 2009 the definition of life

Biological view, the following attributes of life but is not as rigid.

Based on the metabolism definition

1. Grow
2. To metabolism
3. Adaptation
4. Reproduction
5. Response to stimuli

If the above criteria, strictly applied the following problems occur.

1. The fire can be alive.
2. Mules, so that fertility can not be alive.
3. The virus does not grow outside the host cell can reproduce, so that you can not really alive.

Biologists to study life on Earth a living creature that showed the following symptoms

Living the life of carbohydrates, lipids, nucleic acids, proteins, and possess the same ingredients.

To survive, living organisms require both energy and materials.

The living organisms are made up of one or more cells.

Should always maintain a living creature.

Species of living organisms to evolve.

Consisting of all life on Earth as an organism is comprised of carbon.

Some people are all creatures of the universe in all of these points would see things that others, the symptoms 'carbon chauvinism' is called.

If there are boundaries of material life and the universe, biological equations to express the esophagus, the substance is to create a separate equation.

However, the boundaries of life and matter are not clear.

■3. Cosmology

1. Applying a mathematical proof of the Riemann hypothesis

1. Using Bernoulli number

$$\sum_{k=1}^{n} k^x = \frac{1}{x+1} n^{x+1} + \frac{1}{2} n^x + \frac{{}_xC_1}{2}\frac{1}{6} n^{x-1} - \frac{{}_xC_3}{4}\cdot\frac{1}{30} n^{x-3} + \cdots$$

$$+ \frac{{}_xC_{n-1}}{n} B_n n^{x-n+1},\ -{}_xP_{n-1}\cdot\frac{2}{(2\pi i)^n}\cdot\zeta(n)\cdot n^{x-n+1}$$

1. $\zeta(n) = 1 + \frac{1}{2^n} + \cdots = 0,\quad f(x) = 1 + x^{-\log 2} + \cdots = 0$ Non-constant polynomial with real coefficients equation have conjugate complex roots

$f(\alpha)=0,\ f(\overline{\alpha})=0\ \ \alpha = a+bi\ \ (b \neq 0),\ \ \overline{\alpha} = a - bi.$ (Gauss)

2. Fundamental theorem of algebra : every non-constant single-variable polynomial with complex coefficients has at least one complex root

3. The surface area of the $(n-1)$sphere of radius 1 is $2\cdot\dfrac{\pi^{\frac{n}{2}}}{\Gamma(\frac{n}{2})}$ (scalar)

The volume of the n sphere of radius r is $\dfrac{\pi^{\frac{n}{2}}}{\Gamma(\frac{n}{2}+1)} r^n$ (scalar)

4. Riemannzeta Bernoulli number $:\zeta(n) = -\frac{1}{2}\frac{(2\pi i)^n}{n!} B_n\ \ (n \geq 2)$

$B_n = -n\cdot\zeta(1-n)\ \ (n \geq 1),\qquad \zeta(n) = \frac{1}{2}\frac{(2\pi i)^n}{n!}\cdot n\cdot\zeta(1-n)\ \ (n \geq 2)$

$$\zeta(n) - \frac{1}{2}\frac{(2\pi i)^n}{n!}\cdot n\cdot\zeta(1-n) = 0\ \ (n \geq 2)\ \ \Gamma(n) = (n-1)!$$

$$\zeta(n)-\frac{1}{2}\cdot\frac{(2\pi i)^n}{\Gamma(n)}\cdot\zeta(1-n)=0 \ (n\geq 2)$$

$$\zeta(n)-\frac{(2\pi i)^n}{2\cdot\Gamma(n)}\cdot\zeta(1-n)=0 \ (n\geq 2)$$

Fundamental theorem of algebra root $n=a+bi$

$$\zeta(a+bi)-\underbrace{\frac{(2\pi i)^{a+bi}}{2\cdot\Gamma(a+bi)}}_{\neq 0}\cdot\zeta(1-a-bi)=0$$

$$a\neq 0,\ b\neq 0^{10)}\ \frac{(2\pi i)^{a+bi}}{2\cdot\Gamma(a+bi)}\neq 0$$

Then $\zeta(a+bi)=0$, $\zeta(1-a-bi)=0$ $\alpha=a+bi$[11] $(b\neq 0)$, $\overline{\alpha}=a-bi$

$$\zeta(a+bi),\ \zeta(1-a-bi)\ \cdots\ ①$$

$$\zeta(a-bi),\ \zeta(1-a+bi)\ \cdots\ ②$$

$$\zeta(a\pm bi),\ \zeta(1-a\mp bi)\cdots ①,②$$

$$1-a=a\ \ 2a=1$$

$$\therefore a=\frac{1}{2}$$

If $a=\frac{1}{3}$ then $\zeta(\frac{1}{3}\pm bi)$ $\zeta(\frac{2}{3}\mp bi)$, $\overline{\frac{1}{3}\pm bi}\neq\frac{2}{3}\mp bi$

$\therefore$ all non-trivial zeros of the Riemann zeta function have real part $\frac{1}{2}$

$$\zeta(\frac{1}{2}\pm bi)\equiv 0$$

---

10) If $n=a+bi=0$ $\zeta(0)=\infty\neq 0$

If $b=0$ then $a=-2,-4,-6\cdots$ $\zeta(n)$ These are called the trivial zeros

11) $b=14.135, 21.022, 25.011\cdots$

If $n=\frac{1}{2}+bi$ $b=0$ then $\zeta(\frac{1}{2})=-1.4603545\cdots$

2. Using Jacobi theta function

$$\theta(\tau)=\sum_{n=-\infty}^{\infty}e^{\pi i n^2\tau}\quad \int_0^{\infty}e^{-\pi n^2 t}t^{\frac{s}{2}}\frac{dt}{t}=\pi^{-\frac{s}{2}}\Gamma(\frac{s}{2})\frac{1}{n^s}$$

$$\xi(s)=\pi^{-\frac{s}{2}}\Gamma(\frac{s}{2})\zeta(s)=\int_0^{\infty}(\frac{\theta(it)-1}{2})t^{\frac{s}{2}}\frac{dt}{t}$$

$$\xi(s)=\frac{1}{s-1}-\frac{1}{s}+\frac{1}{2}\int_0^1(\theta(it)-\frac{1}{\sqrt{t}})t^{\frac{s}{2}}\frac{dt}{t}+\frac{1}{2}\int_1^{\infty}(\theta(it)-1)t^{\frac{s}{2}}\frac{dt}{t}$$

$$\theta(-\frac{1}{\tau})=\sqrt{\frac{\tau}{i}}\,\theta(\tau)$$

$$\xi(s)=\frac{1}{s-1}-\frac{1}{s}+\int_1^{\infty}(\theta(it)-1)t^{\frac{1-s}{2}}\frac{dt}{t}+\frac{1}{2}\int_1^{\infty}(\theta(it)-1)t^{\frac{s}{2}}\frac{dt}{t}$$

$$\xi(s)=\xi(1-s)$$

$$\xi(s)=\pi^{-\frac{s}{2}}\Gamma(\frac{s}{2})\zeta(s),\quad \xi(1-s)=\pi^{-\frac{(1-s)}{2}}\Gamma(\frac{1-s}{2})\zeta(1-s)$$

$$\pi^{-\frac{s}{2}}\Gamma(\frac{s}{2})\zeta(s)=\pi^{-\frac{1-s}{2}}\Gamma(\frac{1-s}{2})\zeta(1-s)$$

$$\left[\pi^{\frac{-s+1-s}{2}}\Gamma(\frac{s}{2})/\Gamma(\frac{1-s}{2})\right]\zeta(s)=\zeta(1-s)$$

$$\left[\pi^{\frac{1}{2}-s}\Gamma(\frac{s}{2})/\Gamma(\frac{1-s}{2})\right]\zeta(s)=\zeta(1-s)$$

$$\left[\pi^{\frac{1}{2}-s}\Gamma(\frac{s}{2})/\Gamma(\frac{1-s}{2})\right]\zeta(s)-\zeta(1-s)=0$$

Fundamental theorem of algebra root $s=a+bi$

$$\zeta(s)\quad s=a+bi$$

$$\left[\pi^{\frac{1}{2}-a-bi}\Gamma(\frac{a+bi}{2})/\Gamma(\frac{1-a-bi}{2})\right]\zeta(a+bi)-\zeta(1-a-bi)=0$$

$$\overline{\Gamma(z)}=\Gamma(\overline{z}) \text{ If } a=\frac{1}{2}$$

$$\Gamma(\frac{\frac{1}{2}+bi}{2})=C+Di,\ \Gamma(\frac{\frac{1}{2}-bi}{2})=C-Di$$

$$C\neq 0, D\neq 0$$

$$\frac{C+Di}{C-Di}=\frac{C^2-D^2+2CDi}{C^2+D^2}\neq 0\left[\pi^{-bi}\Gamma(\frac{a+bi}{2})/\Gamma(\frac{1-a-bi}{2})\right]\neq 0$$

Then $\zeta(a+bi)=0$ $\zeta(1-a-bi)=0$

$\zeta(\alpha)=0$ $\alpha=a+bi,$ $\overline{\alpha}=a-bi,$[12] $(b\neq 0)$

$$\zeta(a+bi),\ \zeta(1-a-bi)\ \cdots\ ①$$

$$\zeta(a-bi),\ \zeta(1-a+bi)\ \cdots\ ②$$

$$\zeta(a\pm bi),\ \zeta(1-a\mp bi)\cdots ①,②$$

$$a\ =\ 1-a\quad 2a=1$$

$$\therefore a=\frac{1}{2}$$

If $a=\frac{1}{3}$ then $\zeta(\frac{1}{3}\pm bi)$ $\zeta(\frac{2}{3}\mp bi)$ $\overline{\frac{1}{3}\pm bi}\ \neq\ \frac{2}{3}\mp bi$

$\therefore$ all non-trivial zeros of the Riemann zeta function have real part $\frac{1}{2}$

$$\zeta(\frac{1}{2}\pm bi)\equiv 0$$

---

12) $b=\ 14.135, 21.022, 25.011\cdots$

If $n=\frac{1}{2}+bi$ $b=0$ then $\zeta(\frac{1}{2})=-1.4603545\cdots$

2. $\sum_{k=1}^{n} k^x$ Apply human activity

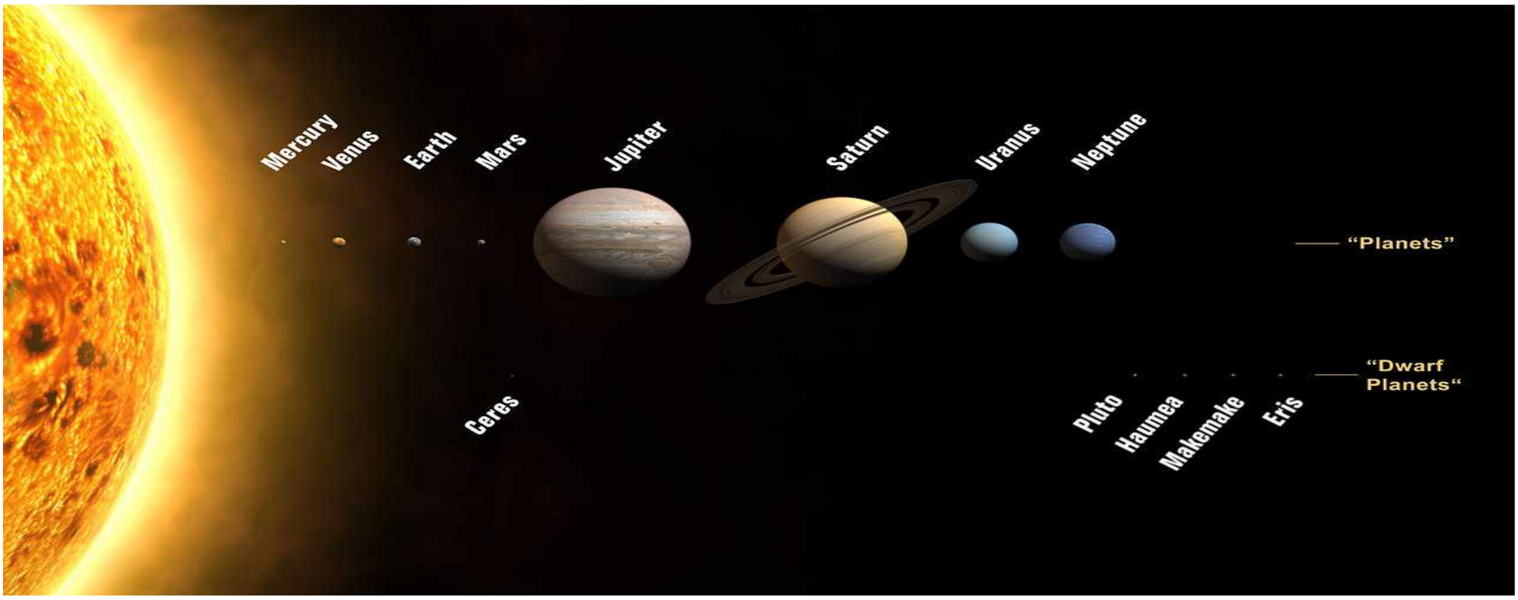
Configuration of water molecules, the position and momentum of a particle is indeterminate. But the chance of the attributes of the water molecule is deterministic. (Boiling point of water, molecules combined angle, specific heat, etc.)

Of the freedom of individual human being is contingent, but the majority of their activity pattern is confirmed as a probability.

6 of 6 pairs of quarks and the energy conversion antiquarks conflict
Sound 6 is the disagreement music chords (ex, Do & Fa #, Le & Sol #…)
Sound 4 is the most harmonious music chords (ex, Do & Mi, Le & Fa#…)
East fortune is the worst couple the difference in the 6-year-old
East fortune is the best couple the difference in the 4-year-old

Western and oriental ancient civilization, without identifying the vast data accumulated from the generalization of Astrology 2 (Male, female distinction), 12, 720 through the periodic nature of scientific evidence will prove. Uncertainty principle applied, to the moment you find out your fortune, change your fortune.

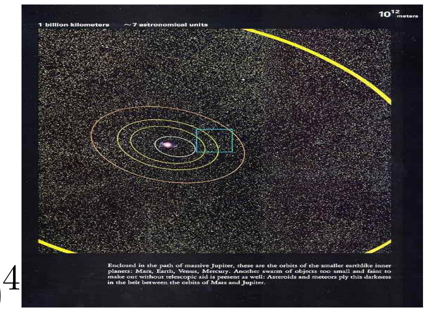
Until now, only a probability measure due to the speculation was becoming regarded as being unscientific, but as countless cases have maintained for thousands of years of existence.



Representation of human free will to use nuclear weapons on the planet to change the rules of the cycle will look even more insignificant in the results of macro-galactic scale, but man do such a thing as the solar system, the probability that the behavior is indeterminate.

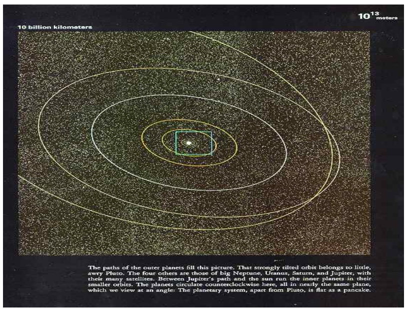
$*10$

$*10^4$

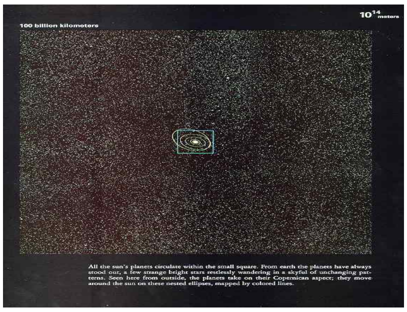


$*10$

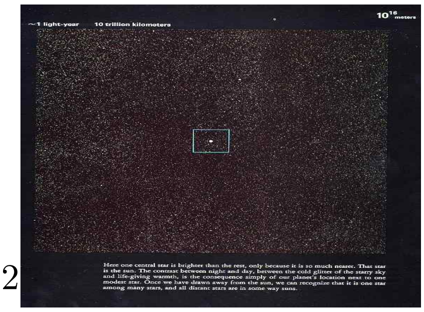
10,000km Earth 10^7m 100,000km Earth 10^8m 10^9km(7AU) -Jupiter$10^{12}m$



$*10$

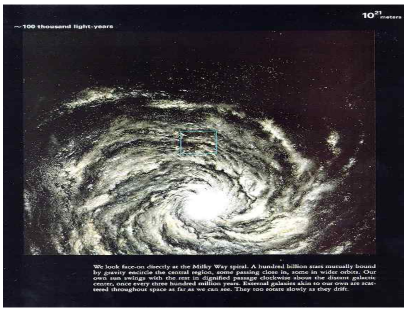


$*10^2$



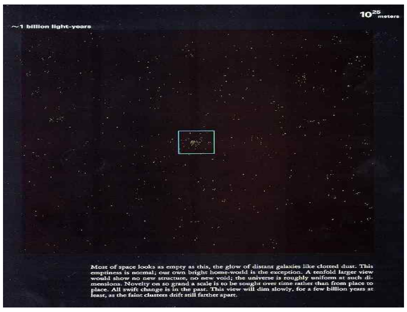
$*10^5$

$10^{10}km$. Jupiter-Pluto$10^{13}m$ $10^{11}km$. $10^{14}m$ $10^{13}km$ (1 light year)$10^{16}m$



$*10^2$

$*10^2$



10^5 light-year Galaxy$10^{21}m$ 10^7 light-year 3Mpc $10^{23}m$ 10^9 light-year $10^{25}m$

Power of ten by Philip Morrison, Phylis Morrison, Office of Charles & Ray Eames

3. Apply engineering

1) Kepler's hypothesis[9)]

How can a ball of the same size could be the most densely concentrated? Orange or apple fruiterer empirically if anyone will answer.

First, a single line of fruit, fruit and arrange next to it when he arranged vertically side by side without an array of fruit in between the recesses between the two sets. So they arranged the floor filled with the fruit after defeat, the row of 3 that make fruits and put the fruit on the way home pile. This one fruit, the fruit is located around 12.

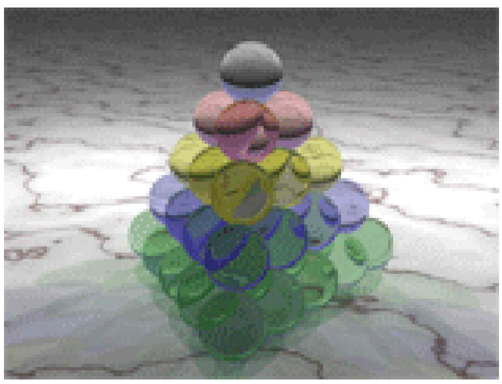
Cubic face centered structure of atoms FCC, 74% Charge percentage (space efficiency), 74% dark energy

But mathematicians seriously worried. Genius of the German mathematician and astronomer Johannes Kepler, who (1571-1630) abandoned. Newton, Lagrange, Gauss called mathematics the emperor, Axel Thue, Laszlo Fejes-Toth, David Hilbert and guess ultimately proved Thomas Hales (1998), ranging from the Fermat's last theorem did not work with mathematics, up to the longest attempt of conundrum continued.

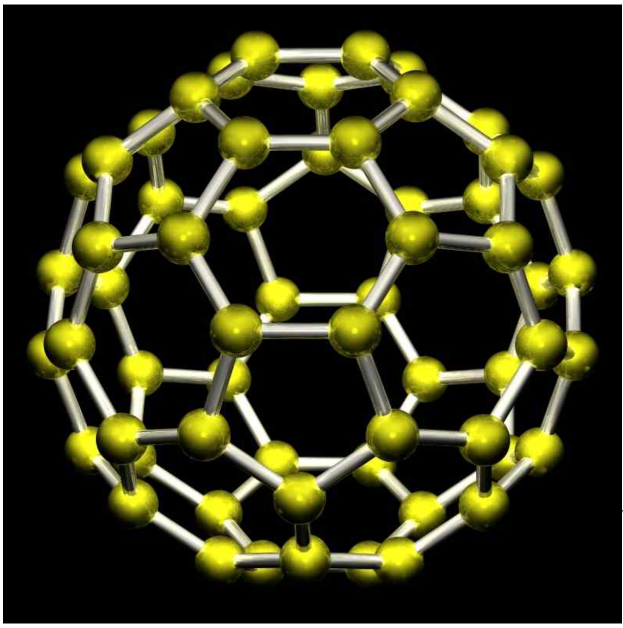
Apples to oranges in town merchant to the empirical fact that everyone knows the probability of a genius many years invested a whopping 387 years and 250 side to bring up a large computer files containing evidence Abstract of the evidence came up.

dimensional analysis through a simple interpretation $\sum_{k=1}^{n} k^x$

$$\frac{1}{2!}\cdot B_2 = \frac{1}{2}\cdot\frac{1}{6} = \frac{2}{(2\pi)^2}\zeta(2) = \frac{2}{(2\pi)^2}\frac{\pi^2}{6} = \frac{1}{12}$$



2) C_{60}Fullerene[10)]



C_{60}Molecular structure found Curl, Kroto, Smalley received a Nobel Prize in 1996.

Carbon nanotubes and superconductors are listed C_{60} long, flat panel display, a 2 car batteries and hydrogen storage, super-capacities (capacitors), high-density memory devices, biotechnology and possess a wide range of economic value.

C_{60} a diameter of 0.4nm (0.4 × 10-9m) of space, and higher fullerenes, because the larger space, the introduction of alkali metal fullerene metal than the conventional organic superconductors, high temperature superconductivity in the castle has been shown to take a interest.

Fullerene molecules consisting of carbon allotropies, so the mass spectrometer if the peak value of 720, 60 Fullerene molecule is composed of carbon. Going to the mass of carbon 12, about six nuclear Neutrons and Protons, the combined value of 6 is defined will.

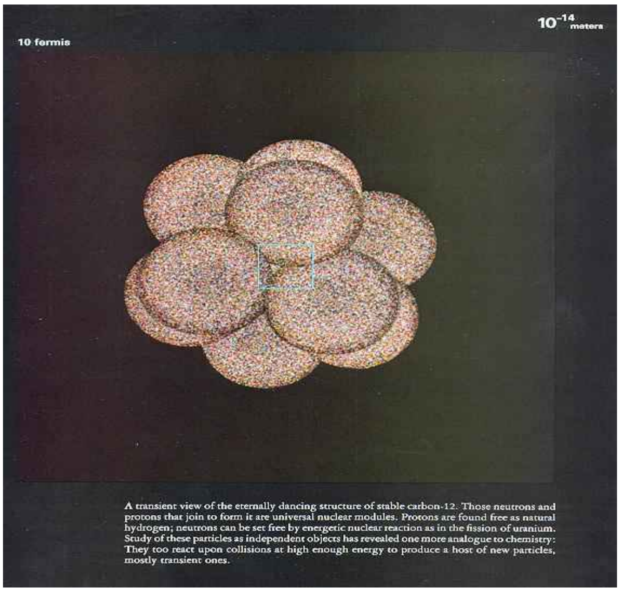
출처 http://blog.khan.co.kr/suk5kyu/5865569

$\sum_{k=1}^{n} k^x$dimensional analysis through a simple interpretation

$$\frac{1}{4!}\cdot B_4 = \frac{1}{2\cdot3\cdot4}\cdot\frac{1}{30} = \frac{1}{720}$$

$$\frac{2}{(2\pi)^4}\zeta(4) = \frac{2}{(2\pi)^4}\frac{\pi^4}{90} = \frac{1}{720}$$

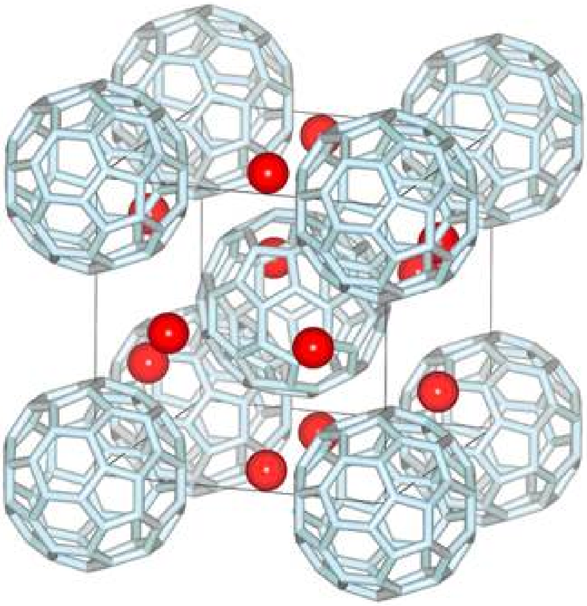
$$\frac{2}{(2\pi)^6}\zeta(6) = \frac{2}{(2\pi)^6}\frac{\pi^6}{945} = \frac{1}{30240}$$



Carbon nuclei 0.01 Pico-meter $10^{-14}m$

$$C_{60} => C_{2520} => C_{100800} => C_{39916800} => \cdots$$

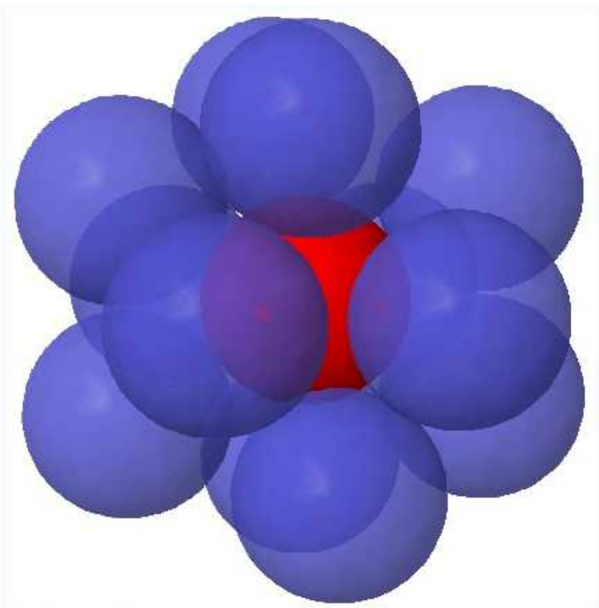
C_{2520} Identify principles of fullerene superconductors

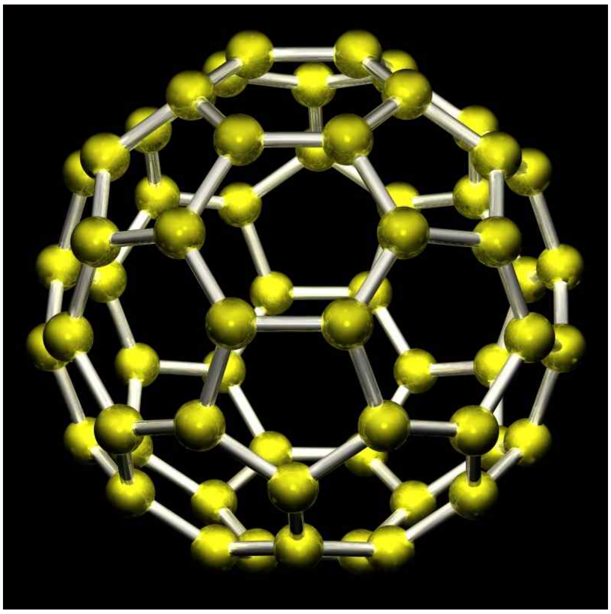


To help you understand, but the attached picture C_{2520} of $C_{60}\times 42$ circle, sphere placed in the form So is the pictures and other structures.

Galaxy 1 is shown in the macroscopic world of atoms to like particles in the universe $\sum_{k=1}^{n} k^x$ induced to form any geometric configuration can be represented by Riemannian geometry

C_{2520} Superconductors, flat panel displays, a secondary cell and hydrogen storage, Super capacities (capacitors), high-density memory devices, biotechnology, etc. can be implemented





$$C = \frac{2}{(2\pi)^2}\frac{(2\pi)^2}{24} = \frac{1}{12}$$

Protons, neutrons 12 = 1 carbon atom

$$C_{60} = \frac{2}{(2\pi)^4}\frac{(2\pi)^4}{1440} = \frac{1}{720}$$

60 carbon atoms = 1 Fullerenes

$C_{60} \times 42 = C_{2520}$ Riemannian geometry Design

Circle and the ball shaped $C_{60}\times 42$

to be distributed on the surface of the ball

Space equation and the superconducting

Because no electrical resistance in superconducting superconductors made from one circuit, the power loss in the current begins to flow forever, current flows do not occur at all. According to the current in the superconductor experiment, at least 100,000 years of its life is over. Theoretically calculated value of $10^{10000000}$ seconds

Age of the universe (137×100 million years, 4×10^{17}s) can not compare more than long enough. Superconducting cable, so you create a very strong electromagnetic field can get.

Photon mass in a superconductor could not get the process and particles interact with the Higgs particle mass to obtain essentially the same process. And in order to achieve this, both gauge symmetry must be destroyed. Superconducting behavior with the principles of particle mass in the universe that we get is essentially the same principle.

So we live in a universe that We'll be one giant superconductor would be comparable.

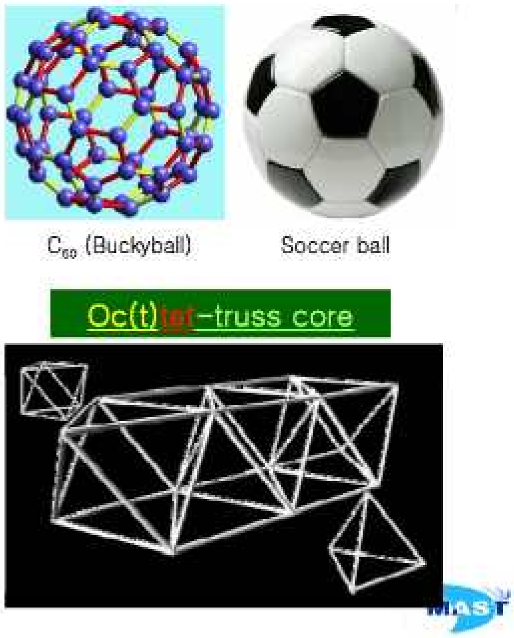
Electron ready to make one of two Cooper pairs move as particles having a remarkable effect. In a separate e could not see any kind of 'orientation' is to happen. If so, all Cooper pairs behave as if they were one lump. Cooper pairs with the same direction and they go down quite a bit of obstacles continue to maintain that status. As a result, the electrical resistance completely disappears.

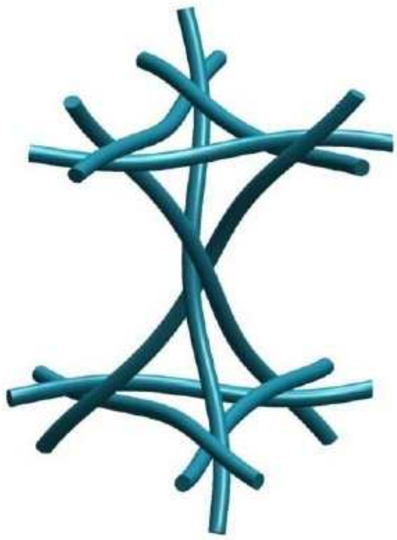
Conclusion, universeis below the critical temperature, betide Cooper-pair state symmetry is broken. As a result of small particles and particles created by the mass of the world and everything will be obtained.

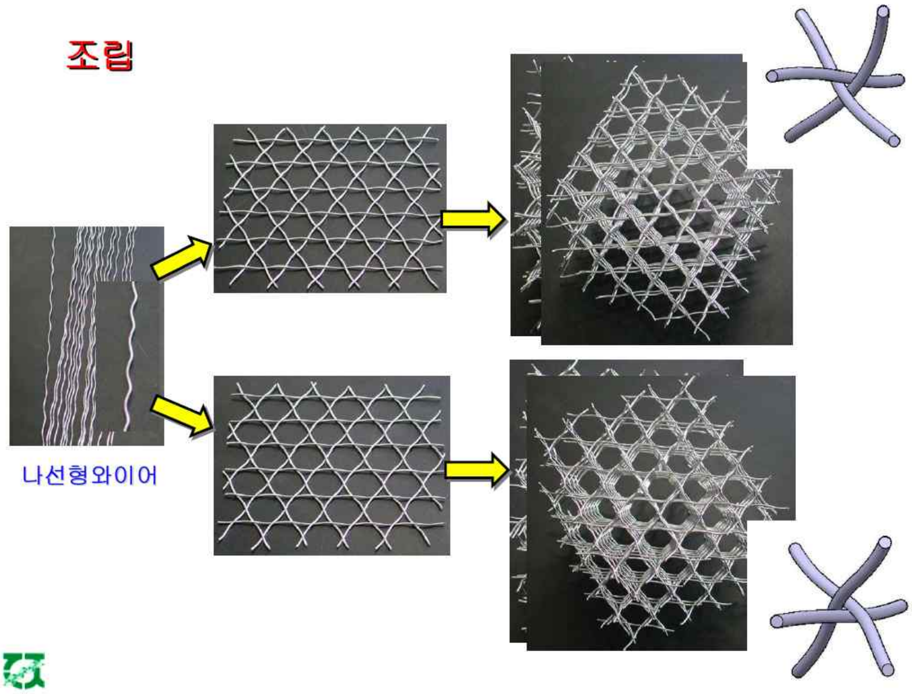
source : Navercast Physical Sciences Research 이종필

3) W B K

suggested by Buckminster Fullerine







W B K with a high strength engineering structure.

6 through a wire-like truss structure has Octet Truss.

source : http://sciencetouch.net/html/guide/vod.php?id=216#

$\sum_{k=1}^{n} k^{x}$ dimensional analysis through a simple interpretation

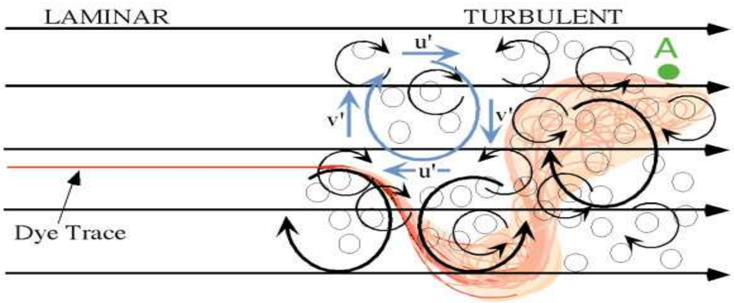
$$\frac{1}{2!} \cdot B_2 = \frac{1}{2} \cdot \frac{1}{6} = \frac{2}{(2\pi)^2} \frac{\pi^2}{6} = \frac{1}{12}$$

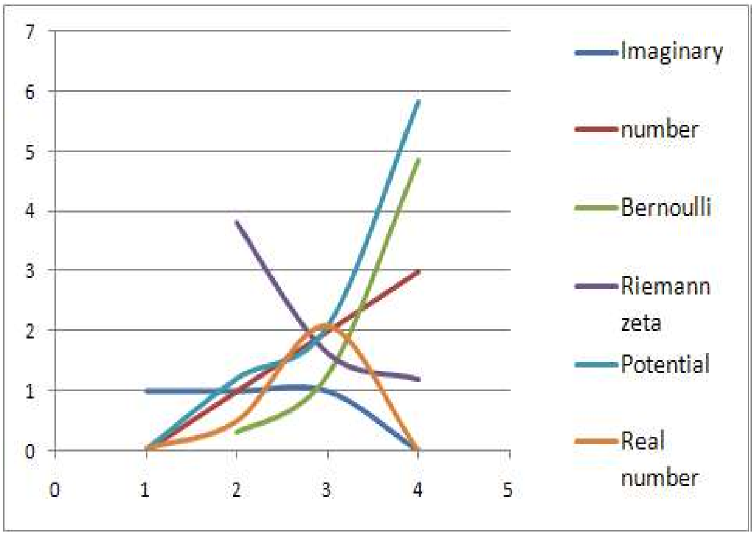
2-way off the wire, spiral wire 6 consist

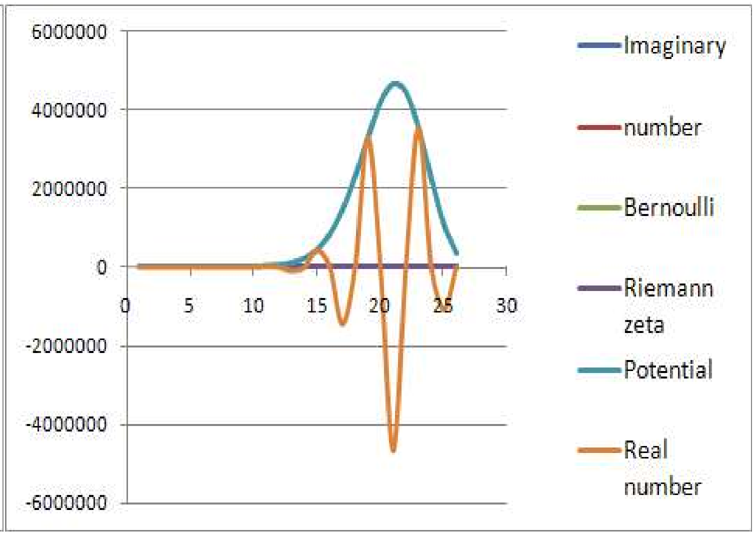
4. Physical Applications

1) Turbulent Flow of the Interpretation[11]

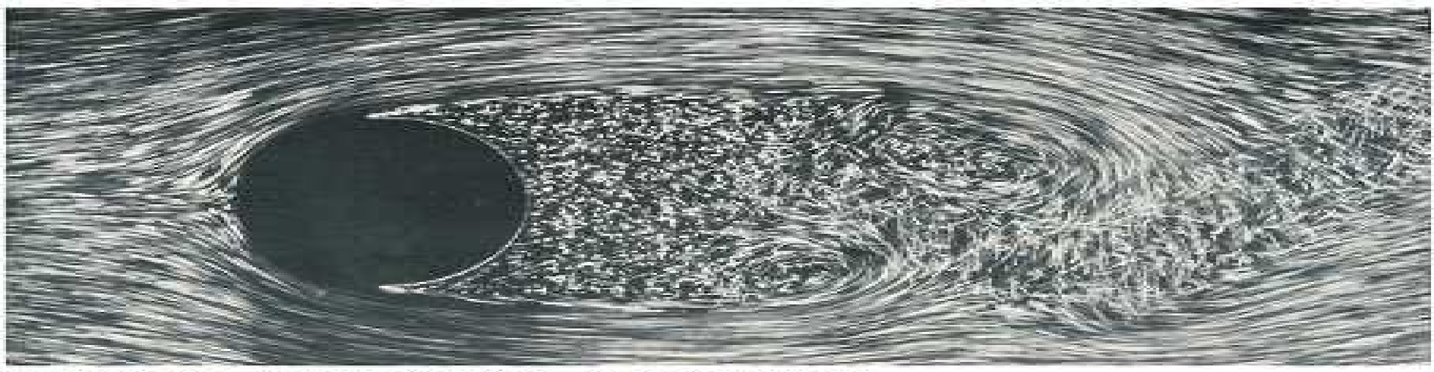
Since the Lagrangian and Eulerian $\sum_{k=1}^{n} k^x$ through a new approach to the analysis of turbulent flows look







(a) Visualizing turbulent cylinder wake at Re = 10000
[Courtesy: Thomas Corke and Hassan Nagib; *from An Album of Fluid Motion by van Dyke (1982)*]

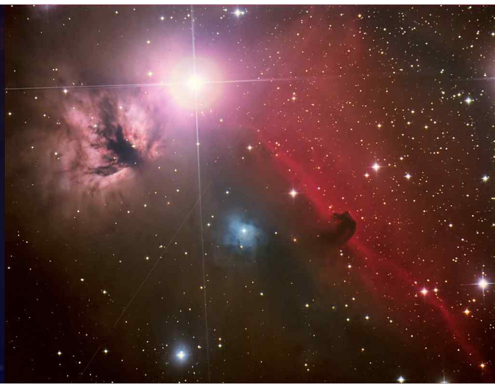


(b) a closer look at Re = 2000 - patterns are identical as in (a)
[Courtesy: ONERA pic. Werle & Gallon (1972) *from An Album of Fluid Motion by van Dyke (1982)*]

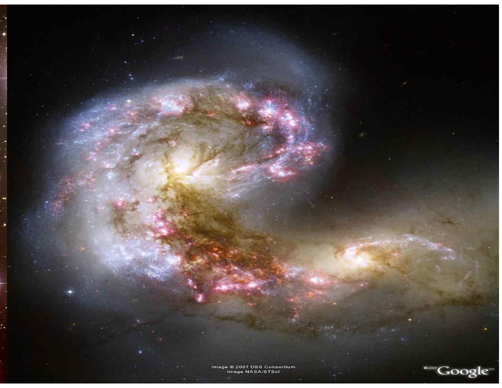
2) Turblent hypothesis extension - Nebular hypothesis -[12]

Planets in the universe are composed of compacted dust is a hypothesis.

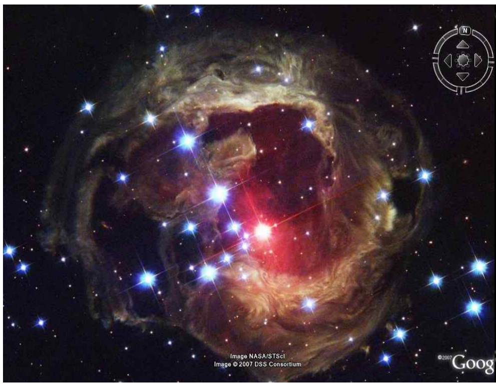
Imagine a hypothetical primitive nebula



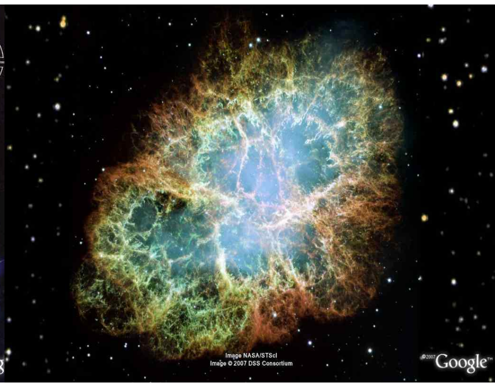
Horsehead Nebula



Antenna galaxies



Light Echoes Nebula



Crab Nebula

Jewelry Box Nebula

Pierre-Simon_Laplace

Total recognized in the current astronomical theory of galaxy stand Immanuel Kant in the 18th century, Pierre-Simon Laplace advocated since that has been refuted. The main reason was ignored snow cloud that the sun than the planet's angular momentum was because too small.

Early 1980s, young stars, but the results of these observations made with the cold gas and dust disk has been found in the enclosed. After than theory has been received.

source : http://en.wikipedia.org/wiki/Formation_and_evolution_of_the_Solar_System

3) Superstring theory[13] of the complement

Limits the size of the test subjects string theory very small (10^{-35}m) experimental verification of the theory is having problems.

Through this experiment is based on proven scientific methods is the nature of the problem.


오는 10일 첫 가동에 들어갈 '거대강입자가속기(LHC)'의 대형 검출기 모습. /CERN 제공

Particle Group 1		Particle Group 2		Particle Group 3	
Particle	Mass	Particle	Mass	Particle	Mass
Electron	0.00054	Muon	0.11	Tau	1.9
Electron Neutrino	$< 10^{-8}$	Muon Neutrino	<0.0003	Tau Neutrino	<0.033
Up Quark	0.0047	Charm quark	1.6	Top - quark	189
Down quark	0.0074	Strange quark	0.16	Bottom Quark	5.2

1, based on the mass of the proton

Through the neutrino experiments (neutrino) mass of an accurate way to know yet

"Each particle families in the order of the array with the rules of some sort Sounds, One or two points the whole, is questionable."
Brian R. Greene, the elegant universe, 31 (1999)

If the point of Superstring theory black holes as particles in a very small area, put a very large mass to infinity, but points out the value of the string to replace the microscopic theory of relativity and quantum mechanics can be integrated in the area, and Euler's beta function through the experimental Very Superstring theory and the exact value, but,

Why is string, why Euler's Beta function is consistent with experimental values, 6 quarks and 6 antiquarks what has been done, all of those questions, questions is Superstring.[14]

Gamma function[15] $\Gamma(z) = \int_0^\infty t^{z-1} e^{-t} dt$

Euler Beta function[16] $B(x,y) = \int_0^1 t^{x-1}(1-t)^{y-1} dt$

${}_nC_k = \binom{n}{k} = \frac{1}{(n+1)B(n-k+1,k+1)}$ Euler Beta function can be expressed as a generalization of the binomial coefficients can be expressed as in $\sum_{k=1}^{n} k^x$.

The Superstring theory 'The universe is a symphony and the like.'
All material is the basic unit of the string is vibrating like strings

Einstein to express the universe, so was looking for equations
Superstring scholars find the equations to unify four kinds of strength
That is the equation.

4) Zero Zone theory[17)]

Yang dong-bong

July 2007 South Korea Yang dong-bong standard theory of anti-quantum physics researchers zero zone Superior units, all units of the International Time (s) has been integrated.

The theory of the $299792458m = 1s$ as the length of time to convert the extremely accurate experimental and theoretical values was obtained.

Zero Zone theory

Name	Unit	Dimensionless number	Uncertainty	Based on units with a constant integration
Length	m	$\frac{1}{299792458}$s	0	c=1, 299,792,458m=1s
Time	s	1s	0	
Kelvin	K	$2.0836644[36]*10^{10}$s	$5*10^{-8}$	k=Hz=1, k/h=$2.0836644[36]*10^{10}$Hz/K K=$2.0836644*10^{10}$
Mole	mol	$6.02214179[30]*10^{23}$s	$2.9*10^{-8}$	NA=$6.02214179[30]*10^{23}$/mol mol=$6.02214179[30]*10^{23}$s
Candela	cd	$2.20964927[11]*10^{30}$s	$1.7*10^{-6}$	cd=$\frac{1}{683}$W/s, W=$kg{\cdot}m^2/s^3$ cd=$2.20964927*10^{30}$s
Ampere	A	$7.71194675[23]*10^{33}$s	$5*10^{-8}$	e=$1.602176487*10^{-19}$C A=C/s, A=$7.71194675[23]*10^{33}$s
Mass	Kg	$1.356392733[68]*10^{50}$s	$5*10^{-8}$	h=1, $6.62606896*10^{-34}kg{\cdot}m^2/s$=1 $kg = \frac{(299792458)^2}{6.62606896*10^{-34}}s$ kg=$1.356392733*10^{50}$s

source :
http://news.naver.com/main/read.nhn?mode=LSD&mid=sec&sid1=001&oid=262&aid=0000001923&

5) $\sum_{k=1}^{n} k^x$ with a constant speed of light derivation

Unrelated to the relative velocity of a light source, $299792458m/s$ at the speed of light (m, s) 2 unit is a relative concept, so 1.2 seconds to 1 second, 1.4m and 1m to be able to decide the speed of light through a simple count in itself does not make sense to encourage is.

However, the human unit of length (m), time (s) rather than arbitrary units Radius of the Earth, operate with planets was attributed to an absolute standard. (Ancient Civilizations of the calendar)
Astro station using one year cycle was calculated as 12, 60. Space rotation to follow the $\sum_{k=1}^{n} k^x$ nature constant, and the mathematical constant absolute time reference unit (m), (s) are available through the link.

1 years 360 days set the physical constants (the number of Earth's rotation), the mathematical constant $(360 = 2\pi)$ of the switch to turn the sun and the earth rotates 360 times when a unit of math is a physical unit conversions.

$\sum_{k=1}^{n} k^x$ of the natural constants (mathematical constant) is a multiple of human time-scale (physical constant) is a mathematical constant multiples of the 12 Normalization for the length of time based on the value of the speed of light to find the nearest value

$$
\begin{aligned}
\sum_{k=1}^{n} k^x = & \frac{1}{x+1} n^{x+1} + \frac{1}{2} n^x + {}_xP_1 \frac{1}{12} n^{x-1} + 0 \cdot n^{x-2} \\
& - {}_xP_3 \frac{1}{720} n^{x-3} + 0 \cdot n^{x-4} + {}_xP_5 \frac{1}{30240} n^{x-5} + 0 \cdot n^{x-6} \\
& - {}_xP_7 \frac{1}{1209600} n^{x-7} + 0 \cdot n^{x-8} + {}_xP_9 \frac{1}{47900160} n^{x-9} + 0 \cdot n^{x-10} \\
& - {}_xP_{11} \frac{691}{1307674368000} n^{x-11} + \cdots
\end{aligned}
$$

and put on 11 to n, $\frac{(2\pi)^s}{2\cdot\zeta(s)}$ $\frac{(2\pi)^{11}}{2\cdot\zeta(11)}=301116106$ And the difference between the speed of light $\frac{299792458}{301116106}\cdot 100\% = 99.56\%$

Mathematical constant speed of light and 1 seconds based on physical constants 360days$=31104000$, based on the Julian calendar is based on the speed of light 365days 6hours$=31557600$s

$$\frac{C_{math}*360days}{C_{physics}*365days}=\frac{301116106*31104000}{299792458*31557600}*100\%=99.01\%$$

Derivation equation, the speed of light through space, the Julian calendar

$$\frac{C_{math}*360days}{365days}=\frac{301116106*31104000}{31557600} = 296{,}787{,}948m/s$$

1m from the North Pole to the equator around the earth and 1 / 10 million defined in the 1m

$\frac{1}{2}\pi r_{RadiusEarth}*\frac{1}{10{,}000{,}000}=1m$. From $\frac{1}{2}\pi r$ to $2\pi r$, From $60s$, 60min to $120s$, 120min the conversion to Based on the length, time value multiplied by each of the 4

$$\frac{R_{physics}/t_{physics}}{R_{Math}/t_{Math}}=\frac{\left[\frac{1}{2}\pi r\right]m/60\text{sec}*60\text{min}*24hour*360day}{[2\pi r]m/120\text{sec}*120\text{min}*12hour*720day}=1$$

The Earth is ellipsoid. Earth's average radius defined by the IUGG in $6{,}371.0072km$ assumes a complete circle around the earth to obtain the polar-equator and the length of $10{,}007{,}554m$ divided by 10^7 to 1m in $7{,}554m$ as the base line of the longer distances are listed as the criterion measure than before numbers are small. Should be calibrated is the value. Small amount of measured increases.

$$\frac{C_{math}*360day_{math}}{C_{physics}*365day_{physics}}*\frac{10000000}{10007554}=\frac{301116106*31104000}{299792458*31557600}*99.9246\%$$

The speed of light can be like $1{,}079{,}252{,}848km/h$ value of all the 2π multiples of light speed and nature constant means, such as Planck's constant. (Excel file attached)

$$\frac{C_{math}*360day_{math}}{365day_{physics}}*99.9246\% = 296787948*0.999246$$

$$=296{,}564{,}170m/s$$ (C of 98.9232% 1.08%error)

Error of 1.08% : Earth's rotation, the orbital speed bumps, and in fact one year the figures reduction has been 27 years revealed 22 seconds. Earth is 4.5 billion years old, when considering the

360days$=31104000$, 365days 6hours$=31557600$, $\frac{31104000}{31557600}\times 100 = 98.56\%$

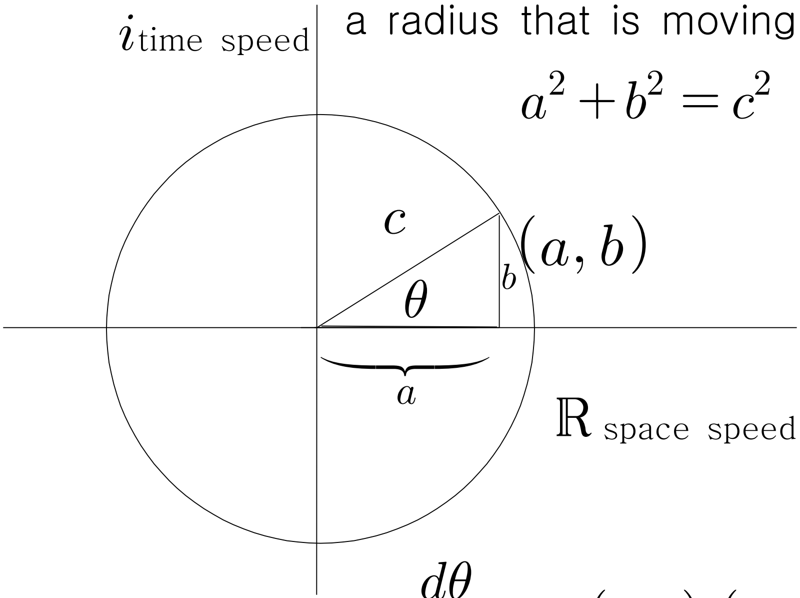
If 1 years is 361days 7hours 36minutes 28seconds, to measure the speed of light is 100%consistent with the human.

In other words, the light of the error rate of the Earth 4.5 billion years orbiting the time rate of change of less than 1 times.

- Bernoulli number and geometry of the connection speed of light

"All objects in space-time the speed of light moves." -Albert Einstein

The object is to follow Einstein's thinking about the speed of light (c) with a radius that is moving in a circle around.



$$a^2+b^2=c^2$$ (c is speed of light : m/s)

$$\frac{d\theta}{dx}=1 \ (0,1),(-c,0),(0,-1),(c,0)$$

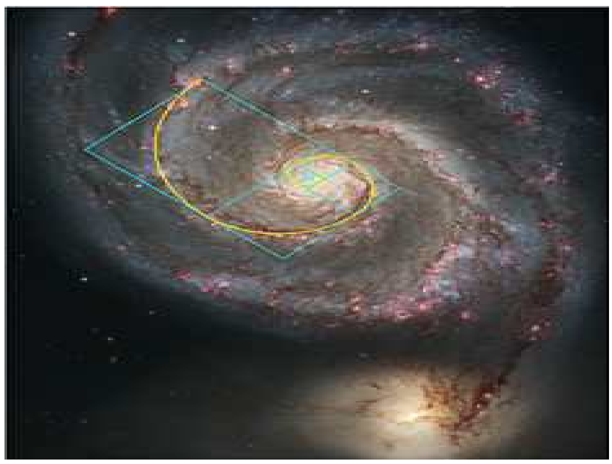
$$\tan x = x+\frac{x^3}{3}+\frac{2x^5}{15}+\frac{17x^7}{315}+\cdots=\frac{b}{a}$$

Infinite series representation $\tan x = \sum_{n=1}^{\infty}\frac{(-1)^{n-1}2^{2n}(2^{2n}-1)B_{2n}}{(2n)!}x^{2n-1}$

$$\tan x = \sum_{n=1}^{\infty}\frac{2^{n+1}(2^n-1)}{(2\pi i)^n}\zeta(n)(1+\frac{1}{12n}+\frac{1}{288n^2}-+)x^{n-1}$$

Understanding of geometry and sequence

Geometric representation of the Fibonacci sequence

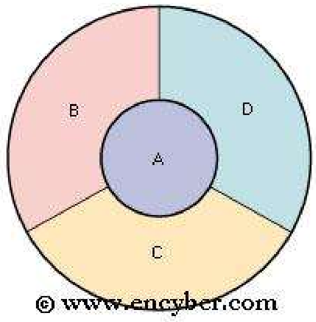


$$r=a\theta \ f(x,y)=\tan^{-1}\frac{y}{x}$$

$$F(n)=\frac{\varphi^n-(1-\varphi)^n}{\sqrt{5}},\ \varphi=\frac{1+\sqrt{5}}{2}$$

- The minimum number of 4

1. Lagrange's four-square theorem : All natural numbers at least four of the sum can be expressed as a sum $x_1^2+x_2^2+x_3^2+x_4^2=n$
2. To recognize the human dimension : $x_1^2+x_2^2+x_3^2+x_4^2 \leq r^2$
   4-Dimensional space-time



3. Four color problem : To distinguish between the two neighboring countries on a map, the minimum required in four colors
4. To distinguish at least four kinds of the kinds of forces: gravity, weak interaction, electromagnetic force, strong interaction
5. DNA, RNA Each of the four kinds of bases
6. length, time, energy, mass

- Prime number and quantum mechanics

Heisenberg uncertainty principle and the sequence of prime number links

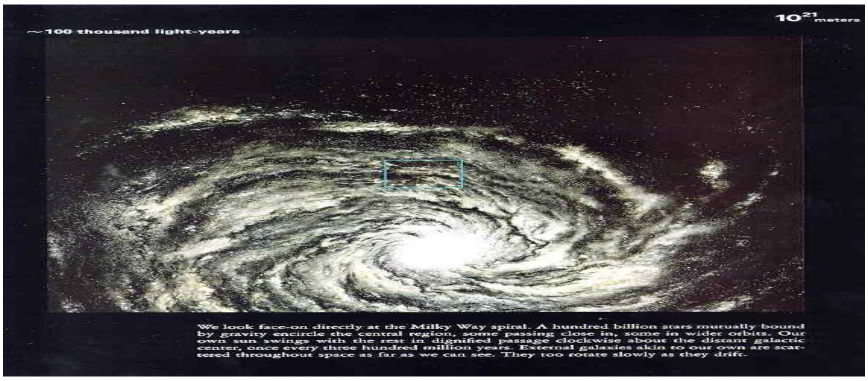
$\Delta x \Delta p \geq \dfrac{h}{2\pi}$: Location(Δx)and Momentum(Δp) both do not know exactly.

- Prime number of the sequences : N Smaller than the number of prime number approaches $\dfrac{N}{\ln N}$.

However, the exact value of the Prime number of the larger value of the sequence ($n \rightarrow \infty$), If do not know the value $f(n-1)$ then, $f(n)$ is unknown.

5. The new cosmology

1) Error of Big Bang[18]



10^5 light-year Galaxy $10^{21}m$

1. Based on the Hubble constant, one big bang, expanding universe, according to the age of the universe is 15 billion years to about 10 billion years. 1st galaxies rotate as it takes approximately 200 million years, the universe since the birth of galaxies will be rotating about 50 times or so. The shape and the rotation speed of the galaxies that look for a very small number.

http://en.wikipedia.org/wiki/Big_Bang

If the universe follow expression

$$0 = -{}_xP_0\frac{2}{(2\pi i)^1}\zeta(1)n^x - {}_xP_1\frac{2}{(2\pi i)^2}\cdot\frac{(2\pi)^2}{24}n^{x-1}$$

$$-{}_xP_2\frac{2}{(2\pi i)^3}\cdot\zeta(3)n^{x-2} - {}_xP_3\frac{2}{(2\pi i)^4}\cdot\frac{(2\pi)^4}{1440}n^{x-3} - \cdots$$

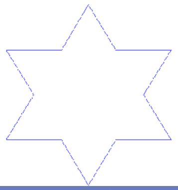
$$-{}_xP_{s-1}\cdot\frac{2}{(2\pi i)^s}\cdot\zeta(s)\cdot n^{x-s+1}$$

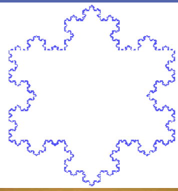
that is the age of the universe ∞

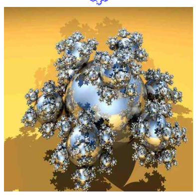
The time of the universe 15 billion years is only part of the fractal.

Nothing and existence is one.

2) Fractal cosmology[19)]







For fractal objects can greatly expand even keep the original appearance of this phenomenon is the bands self-similarity. Mandelbrot set in a statistical self-similarity has expanded his own whenever he appears in two variations. (Ex, coastlines, clouds, turbulence, mountain, lightning, cells, leaves, life pattern ……)

$$0 = -{}_xP_0\frac{2}{2\pi i}\zeta(1)n^{x} - {}_xP_1\frac{2}{(2\pi i)^2}\cdot\zeta(2)n^{x-1} - {}_xP_2\frac{2}{(2\pi i)^3}\cdot\zeta(3)n^{x-2}$$

$$-{}_xP_4\frac{2}{(2\pi i)^5}\cdot\zeta(4)n^{x-3} - {}_xP_5\frac{2}{(2\pi i)^6}\cdot\zeta(5)n^{x-4} - \cdots$$

$$-{}_xP_{s-1}\cdot\frac{2}{(2\pi i)^s}\cdot\zeta(s)\cdot n^{x-s+1}\cdots$$ =>section=>whole=>section=>…

Microscopic: particles - nuclei - atoms - molecules - material - cell - People
Macroscopic: star - Galactic Center - Galaxy - Local Group - Cluster - the universe - ?
Microscopic: particles - nuclei - atoms - molecules - material - cell - People

Micro-macroscopic world	Micro-macroscopic Rate	1 of Rate
Particles : the sun (radius)	$10^{-22}m$: $7*10^{8}m$	$1 : 7*10^{30}$
Nuclei : galactic nucleus (radius)	$1*10^{-15}m : 3.12*10^{15}m$	$1 : 3.12*10^{30}$
Atom : Galaxy (radius)	$1*10^{-10}m : 2.84*10^{20}m$	$1 : 2.84*10^{30}$
Molecules : Local Group (diameter)	$5*10^{-10}m : 1.42*10^{22}m$	$1 : 28.4*10^{30}$
Polymer : Cluster (size)	$3*10^{-8}m : 9.46*10^{22}m$	$1 : 3.15*10^{30}$
Organelle : supercluster (size)	$5*10^{-6}m : 4.73*10^{24}m$	$1 : 0.95*10^{30}$
Cell: Space (Radius)	$2.5*10^{-5}m : 1.42*10^{26}m$	$1 : 5.68*10^{30}$
Person : ? (Size)	$1m : 1.28*10^{30}m$[13)]	$1 : 1.28*10^{30}$
Atom : Galaxy (spin cycle)	$2.22*10^{-15}s$:200million years	$1 : 2.84*10^{30}$
Molecules : Local Group(vibration cycles)	$10^{-13}s : 4.72*10^{17}s$	$1 : 4.73*10^{30}$
Candela	Zero Zone theory	$2.20964927[11]*10^{30}$s

source : Fractal cosmology http://www.fractalcosmology.com/korean

13) 觀無量壽經 ?

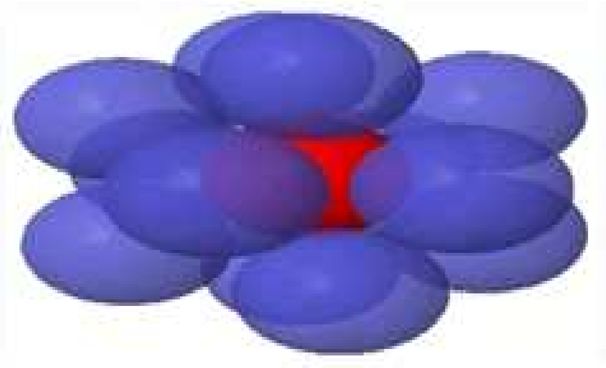
$$80*10^{12}*10^{12}*16km=1.28*10^{30}m$$

3) Dark energy, Dark mass[20] of identity

Nuclei cubic face centered (FCC) of the charge percentage **74%** $= \dfrac{\pi}{\sqrt{18}} \times 100\%$

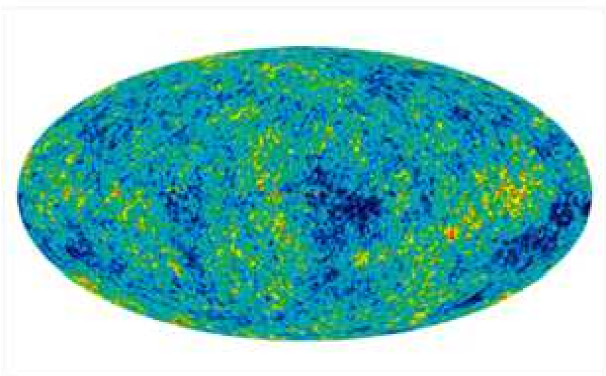
$=$ Dark energy 74%

Fractal cosmology, the universe is the galaxy nucleus and nucleus-like structure.

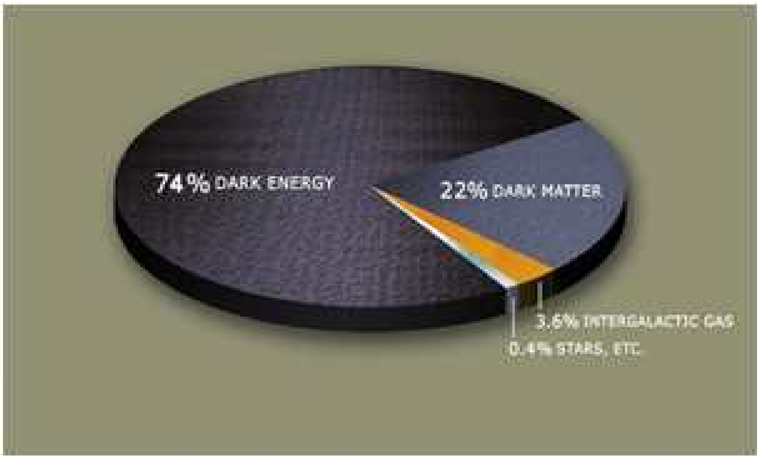


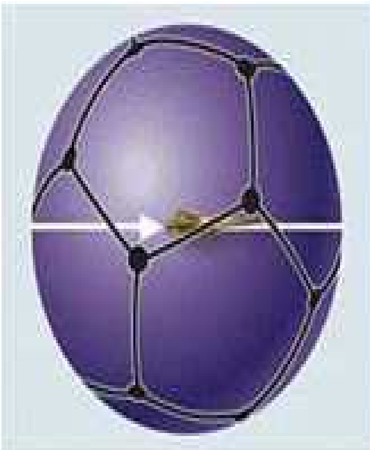
$$C = \frac{2}{(2\pi)^2}\frac{(2\pi)^2}{24} = \frac{1}{12}$$

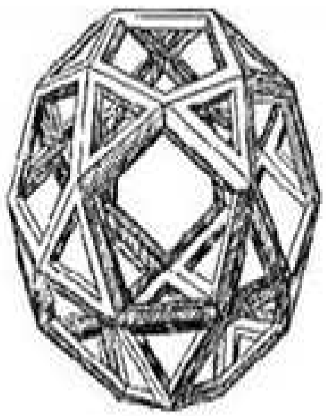
Carbon nuclei 0.01 Pico-meter $10^{-14}m$



처음 5년간 WMAP의 관측을 바탕으로 작성된 우주배경복사의 온도지도
출처:NASA





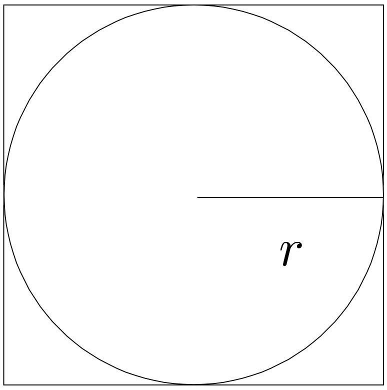


74% of the universe is dark energy that fills the center of the Milky Way galaxy is distributed in the nucleus Spherical galactic nuclei, filled with dark energy the universe is 74% of the charging rate Our galaxy is filled with dark energy is 26% between the Galactic Center Space is located.

(Cosmic background radiation observations Space is a 12 Tetrahedron)

■4. Understanding Appendix

▲1. Natural Constants π. Algebra, geometry, probability of a meaningful integration. 1.Geometry and Algebra[14]



$2r$

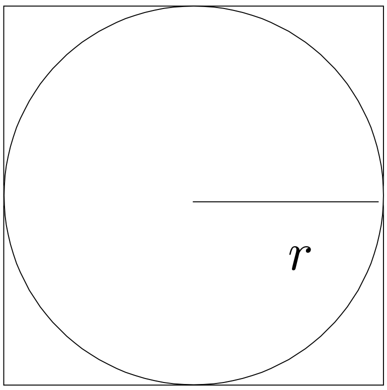
$$A = 4r^2$$

$$S = \pi r^2 = \frac{\pi A}{4}$$

$$\pi = \frac{1}{2n}\left(\frac{e}{n}\right)^{2n}(n!)^2$$

$$S = \frac{1}{2n}\left(\frac{e}{n}\right)^{2n}(n!)^2 A = \frac{2r}{n}\left(\frac{e}{n}\right)^{2n}(n!)^2$$

2.Probability and geometry (needles of Buffon, Monte Carlo techniques)



$2r$

When the needle dropped on the center of the circle Probability of the end of the needle enters the circle

$$A = 4r^2$$

$$S = \pi r^2 = \frac{\pi A}{4}$$

$$\frac{S}{A} = \frac{\pi r^2}{4r^2} = \frac{\pi}{4}$$ [15]

10000 times drop the needle within 1% error range

$$\int_{-\infty}^{\infty} e^{-x^2}dx = \sqrt{\pi}, \quad \prod_{n=1}^{\infty} n = \sqrt{2\pi}, \quad \text{Entropy } \ln(\sigma\sqrt{2\pi e})$$ [21]

---

[14] Stirling formula $n! = \sqrt{2\pi n}\left(\frac{n}{e}\right)^n\left(1 + \frac{1}{12n} + \frac{1}{288n^2} - \frac{139}{51840n^3} - + \cdots\right.$

[15] the relative error tolerance is proportional to the $1/\sqrt{N}$ number 10000 times ship to grab a sample of 1 / 100, which is the range of error of 1%.

▲2. Understanding of infinite series

Maclaurin series (Taylor series)

$$f(x)=f(0)+xf'(0)+\frac{x^2}{2!}f''(0)+\frac{x^3}{3!}f'''(0)+\cdots$$

$\sum_{k=1}^{n}\frac{1}{k}$	$B_n=-n\cdot\zeta(1-n)$	$\zeta(1)=-\frac{\pi}{2}i$
$\sum_{k=1}^{n}k$	$B_2=-2\cdot\zeta(-1)=\frac{1}{6}=-2\cdot\sum_{k=1}^{n}k$	$\zeta(-1)=-\frac{1}{12}$
$\sum_{k=1}^{n}k^3$	$B_4=-4\cdot\zeta(-3)=\frac{1}{30}=-4\cdot\sum_{k=1}^{n}k^3$	$\zeta(-3)=-\frac{1}{120}$
$\sum_{k=1}^{n}k^5$	$B_6=-6\cdot\zeta(-5)=\frac{1}{42}=-6\cdot\sum_{k=1}^{n}k^5$	$\zeta(-5)=-\frac{1}{252}$
$\sum_{k=1}^{n}k^7$	$B_8=-8\cdot\zeta(-7)=\frac{1}{30}=-8\cdot\sum_{k=1}^{n}k^7$	$\zeta(-7)=-\frac{1}{240}$
$\sum_{k=1}^{n}k^9$	$B_{10}=-10\cdot\zeta(-9)=\frac{5}{66}=-10\cdot\sum_{k=1}^{n}k^9$	$\zeta(-9)=-\frac{1}{132}$
$\sum_{k=1}^{n}k^{11}$	$B_{12}=-12\cdot\zeta(-11)=\frac{691}{2730}=-12\cdot\sum_{k=1}^{n}k^{11}$	$\zeta(-11)=\frac{691}{32760}$
$\sum_{k=1}^{n}k^{13}$	$B_{14}=-14\cdot\zeta(-13)=\frac{7}{6}=-14\cdot\sum_{k=1}^{n}k^{13}$	$\zeta(-13)=-\frac{1}{12}$
$\sum_{k=1}^{n}k^{15}$	$B_{16}=-16\cdot\zeta(-15)=\frac{3617}{510}=-16\cdot\sum_{k=1}^{n}k^{15}$	$\zeta(-15)=\frac{3617}{6120}$
$\sum_{k=1}^{n}k^{17}$	$B_{18}=-18\cdot\zeta(-17)=\frac{43867}{798}=-18\cdot\sum_{k=1}^{n}k^{17}$	$\zeta(-17)=\frac{43867}{14364}$
$\vdots$	$\vdots$	$\vdots$

$$0=\frac{1}{2}n^x-{}_xC_1\zeta(-1)\cdot n^{x-1}+{}_xC_3\zeta(-3)\cdot n^{x-3}-{}_xC_5\zeta(-5)n^{x-5}$$

$$+{}_xC_7\zeta(-7)\cdot n^{x-7}-{}_xC_9\zeta(-9)\cdot n^{x-9}+\cdots+{}_xC_s\zeta(-s)\cdot n^{x-s+1}$$

Laurent series

In mathematics, the Laurent series of a complex function f(z) is a representation of that function as a power series which includes terms of negative degree. It may be used to express complex functions in cases where a Taylor series expansion cannot be applied.

The Laurent series for a complex function f(z) about a point c is given by: $f(z)=\sum_{n=-\infty}^{\infty} a_n (z-z_0)^n$ where the an are constants, defined by a line integral which is a generalization of Cauchy's integral formula:

$$a_n = \frac{1}{2\pi i}\oint_\gamma \frac{f(z)dz}{(z-c)^{n+1}}$$

which traces out the unit circle, and then the path integral $\oint_C \frac{dk}{k} = 2\pi i$

$$0 = -{}_xP_0 \frac{2}{(2\pi i)^1}\zeta(1)n^x - {}_xP_1 \frac{2}{(2\pi i)^2}\cdot\frac{(2\pi)^2}{24}n^{x-1} - \cdots$$

$$-{}_xP_{s-1}\cdot\frac{2}{(2\pi i)^s}\cdot\zeta(s)\cdot n^{x-s+1}$$

$$0 = -{}_xP_0 \frac{2}{(\oint_C \frac{dk}{k})^1}\zeta(1)n^x - {}_xP_1 \frac{2}{(\oint_C \frac{dk}{k})^2}\cdot\frac{(2\pi)^2}{24}n^{x-1} - \cdots$$

$$-{}_xP_{s-1}\cdot\frac{2}{(\oint_C \frac{dk}{k})^s}\cdot\sum_{k=1}^{\infty}\frac{1}{k^s}\cdot n^{x-s+1}$$

▲3. Numerical of Dimension

$\sum_{k=1}^{n} k^2$ Understanding of the geometry (the Riemann hypothesis, assuming the solution Poincaré)

N-dimensional ball of radius r is interpreted ($-r \le x \le r$)			
Name		Formula	Volume
Point	0	$0 \le r^2$	0
Line	1	$x^2 \le r^2$	2r
Circle	2	$x^2 + y^2 \le r^2$	πr^2
Sphere	3	$x^2 + y^2 + z^2 \le r^2$	$\frac{4}{3}\pi r^3$
Nothing	4	$x_1^2 + x_2^2 + x_3^2 + x_4^2 \le r^2$	$\frac{\pi^2}{2} r^4$
⋮	⋮	⋮	⋮
n - sphere	n	$x_1^2 + x_2^2 + x_3^2 + x_4^2 \cdots + x_n^2 \le r^2$	$\frac{\pi^{\frac{n}{2}}}{\Gamma(\frac{n}{2}+1)} r^n$
Nothing	n	$x_1^3 + x_2^3 + x_3^3 + x_4^3 \cdots + x_n^3 \le r^3$	Geometric mean loss
⋮	⋮	⋮	⋮
Universe	n	$x_1^k + x_2^k + x_3^k + x_4^k \cdots + x_n^k \le r^k$ $= 1^x + 2^x + \cdots + n^x \le r^x$	Geometric mean loss

▲4. Properties of Bernoulli numbers and Prime number

$$B_m = \frac{N_m}{D_m} \ (N_m, D_m \text{ disjoint})$$

$D_m = p-1|m$ To satisfy all the prime factorization.

$$D_4 = 30 = 2\times3\times5$$

$$D_{10} = 66 = 2\times3\times11$$

$$D_{12} = 2730 = 2\times3\times5\times7\times13$$

$$\frac{te^{xt}}{e^t-1} = \sum_{n=0}^{\infty} B_n(x)\frac{t^n}{n!}$$

$$\triangle B_n(x) = nx^{n-1},\ \frac{1}{n}\triangle B_k(x) = B_{k-1}(x)$$

$$B_0 = 1$$

$$B_1(x) = x+\frac{1}{2}$$

$$B_2(x) = x^2+x+\frac{1}{6}$$

$$B_3(x) = x^3+\frac{3}{2}x^2+\frac{1}{2}x$$

$$B_4(x) = x^4+2x^3+x^2-\frac{1}{30}$$

$$B_5(x) = x^5+\frac{5}{2}x^4+\frac{5}{3}x^3-\frac{1}{6}x$$

▲5. Kissing Number problem

Minkowski-Hlawka Theorem : There exist lattices in $n$dimensions having hypersphere packing densities satisfying $\eta \geq \dfrac{\zeta(n)}{2^{n-1}}$

Dimension	Kissing number		η rate of Packing
	low bound	upper bound	
1	2		
2	6		$\frac{\pi}{2\sqrt{3}} \simeq 0.9069.$
3	12		$\frac{\pi}{\sqrt{18}} \simeq 0.74048.$
4	24		
5	40	44	
6	72	78	
7	126	134	
8	240		$\frac{\pi^4}{384} \cong 0.25367.$
9	306	364	
10	500	554	
11	582	870	
12	840	1357	
13	1154	2069	
14	1606	3183	
15	2564	4866	
16	4320	7355	
17	5346	11072	
18	7398	16572	
19	10688	24812	
20	17400	36764	
21	27720	54584	
22	49896	82340	
23	93150	124416	
24	196560		$\frac{\pi^{12}}{12!} \approx 0.001930$
⋮			⋮
n			0

※ Footnotes

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