"Brownian Motion, Asymptotic Freedom, D–instantons, Psion J|Ψ (November Revolution), Heterotic Superstring Theories."

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Abstract: These widespread redistribution phenomenons play the main role on all fields of Modern Physics, namely as The Superstring Theory, M–Theory, D–branes Theory, Elementary Particles Standard Model Theory, Quantum Field Theory (QFT), Conformal Field Theory (CFT), Quantum Mechanics, Quantum chromodynamics (QCD), Quantum electrodynamics (QED), Quantum flavourdynamics (QFD), SUSY (SUPERSYMMETRY THEORY), SUGRA (SUPERGRAVITY THEORY), QUANTUM THEORY, THEORY OF RELATIVITY, LOOP GRAVITY, TOE (THEORY OF EVERYTHING).

The first strategic focus is concentrated on Brownian Motion, which was discovered with the law of Photoelectric effect by young Albert Einstein 1921 Nobel Prize Winner for Physics, he received his Nobel Prize one year later in 1922 of Brownian Motion resp. diffusion. The Einstein–Stokes equations described in this article are practically useful on these days, when the All Planet suffered by Coronavirus SARS-Cov2 resp. COVID 19 and namely older died. By this Einstein–Stokes equation we can calculate velocity of diffusion of virus µm – nm (10^{-6} – 10^{-9} m) virion particles, which can potentially diffused and infected fresh air or water or soil or blood, these four surroundings so strategic and important for Man and Mankind and all life on the Planet Earth.

Asymptotic freedom is very important in QCD for so called hypercharge or color or flavor of quarks and elementary particles. Calculation of Asymptotic freedom is realized by β Function and is different in QCD, QED, and in Non Abelian Gauge Theory.

In this text are incorporated Figures of Concept and Evidence of Asymptotic Freedom from LEP (CERN).

D–instantons are connected with a geometric understanding of the non–perturbative sector of a wide range of gauge theories (D–branes). D–instantons have significance in the BRANE PHYSICS WORLD.

Psi|J Particle is also called PSION (OR MESON Ψ|J) and was discovered in November 1974, when the Elementary Particle Physics and Standard and Quark Model of Particles were on the top of world science interest. Psion is composed from charm quark and antiquark, so called "charmonium" like a "bottomium" – beauty or bottom quark and antiquark –and were the first steps to SUSY (SUPERSYMMETRIC THEORY OF PARTICLES), which says "that each particle has his own antiparticle (superpartner) for example electron e^- has positron e^+."

Heterotic string theory is connected with 11 DIMENSIONAL SUPERGRAVITY (SUGRA), BRANE GAS, MULTIDIMENSIONAL BRANES, known for the name of Czech Physicist Petr Hořava and Ed Witten (M–Theory).

Keywords: Brownian Motion, D–instanton, Asymptotic Freedom, SUGRA, GUT, QFT, CFT, QED, QCD, QFD, TOE, SUSY, PSION (MESON PSI), BRANE WORLD, M–THEORY, SUPERSTRING THEORY.

15.7.2020, Brno

Content

1. Introduction

Ancient Greeks like Aristoteles, Platón, Tháles from Milétos, Eratosthenés, Hipparchos, Pythagoras, Anaximandros, Appolonius from Perga, Hypatia, Claudius Ptolemaios and many more saw the Universe like ideal geometric bodies [sphere, hexaedre, dodekaedre, hexaoktaedre] seek an origin of the life and world like for example Thales from Miletos hylozoism [from Greek hylé = materia, zoe = life from water (sea, ocean)], Apollonios from Perga, mathematician and astronomer, friend of Hypatia – the most intelligent woman in Alexandria University and Library, here is origin of physics, astronomy (C. Ptolemaios – Megale Syntaxis, Almagest, Tetrabiblos, Geografic hyfégesis, geography and Geocentrism). During the Ages were superknown sir Isaac Newton (Founder of Classical Mechanical Physics, Gravitational field and forces and founder of Infinitesimal Calculus with Leibnitz, Galileo Galilei and his Accademia del Cimento, Galileian Moons the first observed by G. Galilei and Copernicus Heliocentrism Revolutions. Significant was work of James Clerk Maxwell (electromagnetic field and forces), James Watt, Helmholtz, Edison, Nikola Tesla, Thomson, Lord Kelvin, Fraunhofer.

The most outstanding was work and life of genial Albert Einstein, Erwin Schrödinger (wave function and equation), Werner Heisenberg and his uncertainty principle (during the Wars), P. A. M. Dirac, Wolfgang Pauli and Landau, Lifšic, Kapica. Hungarians: Leo Szilard, Loránd Eötvös, Eugene Wigner, John von Neumann – his exclusion principle, B. Pontecorvo (neutrino oscillations), J. Bahcall and R. Davis, Jr. (Detector of elusive particles neutrinos) in 60–ties.

In 70–ties Leon Max Lederman, Jack Steinberger, Melvin Schwartz, George Zatsepin, Martin Perl, Clyde Cowan, Yang–Mills, V. A. Kuzmin, Tamm, Sacharov, A. M. Polyakov, Hideki Yukawa, electroweak interaction.

In 80-ties QUARK MODELS (Gell–Mann, Murray), Leon Max Lederman, STANDARD PARTICLE MODELS – LEPTONS, MESONS, QUARKS, BOSONS, HADRONS.

In Early 90–ties SIX QUARK MODEL (up/down, charm/strange, top/beauty), Ed Witten and Petr Hořava – HETEROTIC STRING THEORY.

The Modern Physics included namely work of Juan M. Maldacena and after year 2000 Ed Witten with Loop Gravity Theory (Carlo Rovelli) and AdS/CFT correspondence – HOLOGRAPHIC PRINCIPLE OF UNIVERSE – MALDACENA.

2. Brownian Motion (The Einstein – Stoke's Equation for Diffusion)

Brownian motion (from Ancient Greek "leaping" is the random motion of particles of small substances suspended in fluid (a liquid or a gas) resulting from their collision with the fast moving molecules or atoms in the fluid.

Comment no. 1. Robert Brown

*21.12.1773 (Montrose, UK) – +10.6.1858 (Soho Square, London, UK)
was scottish botanist and paleobotanist who make important contribution to microbotany largely through the pioneering use of microscope, one of the earliest detailed descriptions of the cell nucleus and cytoplasmatic streaming. He was botanicist, medicine assistant of surgery in 1827 the first noticed motion on pyle grains on molecules of water was called after him Brownian motion. Principles of this effect was explained by Albert Einstein 1905 explicit from KINETIC THEORY OF MATTER. R. BROWN IS ALSO KNOWN FOR CELL THEORY.

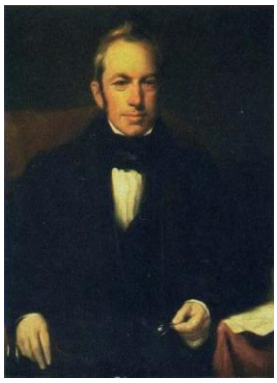

Fig. 1. Robert Brown (Wikipedia).

Comment no. 2. Antonie van Leeuwenhoek

*24.10.1632 (Delft) – 26.8.1723 (Delft, Netherlands)
Dutch scientist and pioneer of microscopy, merchant with textile, constructer of microscopes, discover of microorganism, blood cells, semens, sperms, muscular fibres "known like a father of microbiology."

Fig. 2. Antonie van Leeuwenhoek (Jan Verkolje, public domain).

2.1 Brownian Rotational SPIN ZIG-ZAG MOTION – BY OSCILLATING D-instanton / wavicles (ncp theory) – neutrino composed photon theory by Prof. Joseph Weber

According Authors of this text is Brownian motion cause by oscillation of neutrino photons, or other elementary and atomic particles (nanoparticles, micro particles) quanticles.

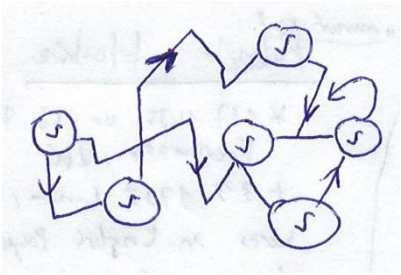

Fig. 3. Briefly illustration of Brownian motion,
by Authors.

Superstring explanation of interactions of waveparticles or quanticles (photons, phonons, neutrinos) with atoms or molecules of matter suspended in water, blood or air.

Explanation: Brownian motion of Diffusion of micro–nano particles in interaction with waveparticles, wavicles or quanticles (photons, neutrinos, positrons) with atoms or molecules of matter suspended in water or air (gas, liquid, soil).

a) The term stationary increments means that $Wt_2 - Wt_1$ has some distribution as $Wt_2 + \alpha - Wt_1 + \alpha \approx N(U.\ t_2 - t_1)$.
b) The term independent increments means that for every choice of $t_0 < t_1 < t_2 < t_3 < t_4$ the increment random variables $Wt_1 - Wt_2$, $Wt_3 - Wt_4$, $Wt_n - Wt_{n-1}$, are jointly independent.

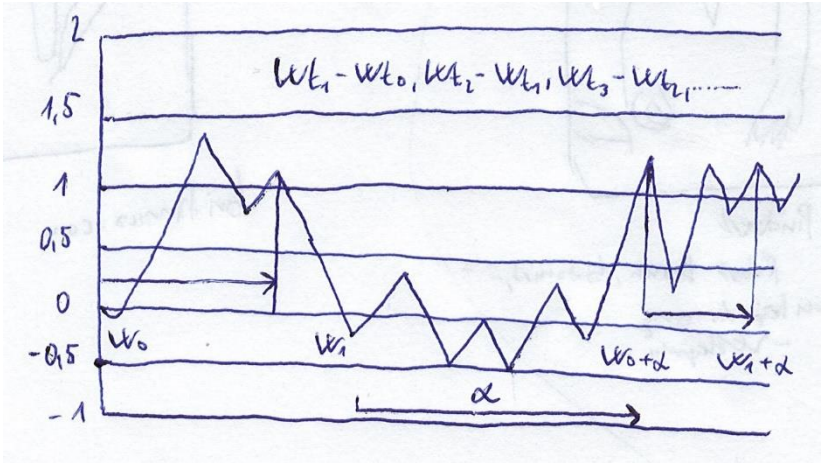

Fig. 4. The Einstein–Smoluchowski equation (Explanation description is above the figure a, b).

D–Brownian diffusivity or diffusion coefficient which relates the gas properties and the particles through fluid drag, can be evaluated by the Stokes–Einstein expression:

$$D = \frac{kTC_C}{3\pi\mu dp}, \tag{1}$$

$$\langle \Delta x2 \rangle = 2Dt\ .\langle \Delta y_2 \rangle = 2Dt,$$
$$\langle z^2 \rangle = 2Dt,$$
Brownian motion

$$^1/_2\, mv^2 = 1{,}5 k_B T. \quad (2)$$

k_B is Boltzmann constant, D is diffusivity [$m^2 . s^{-1}$], T absolute temperature, D is described by the Stokes–Einstein equation for translational diffusion.

$$D = {}^{\Delta^2}/_{2t'} \quad (3)$$

$$D = {}^{R_T}/_N \cdot {}^1/_{C'} \quad (4)$$

$$\Delta = {}^{2R_T}/_N \cdot {}^t/_C. \quad (5)$$

Where R is the gas constant, N Avogadro's number.

2.2 Asymptotic Freedom: Concept of Partons or Bits

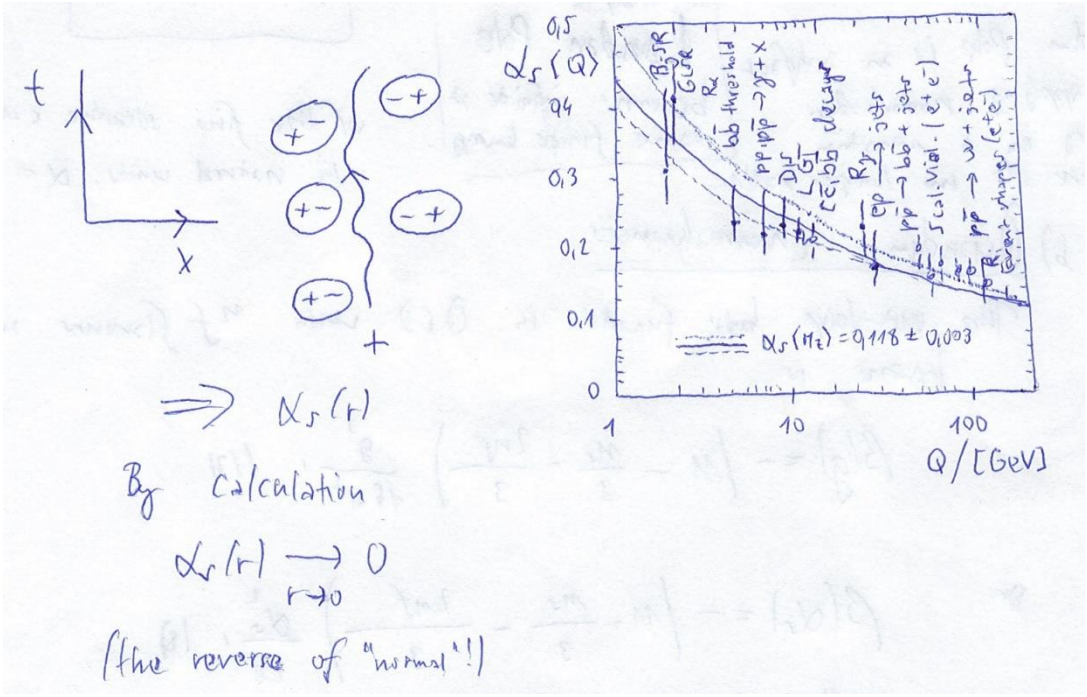

Fig. 5. Asymptotic Freedom in QCD (Quantum Chromodynamics) on the left and an experimental datas' confirm decrease of effectively colour hypercharge (exactly his second exponent) with decreasing distance r between quarks (on the right) on horizontal axis is extrapoled value Q symmetrically distort value $^1/_r$, small r correspond with big Q).
Authors Sketch according:
Pokroky matematiky, fyziky a astronomie, roč. 50 (2005) č. 1.

β Function – study of beta function is important for understanding the behaviour of running coupling constant of a theory. For the calculation of QED and QCD beta functions using the counterterms of renormalized perturbation theory calculated five–loop beta function one loop β(g) functions for QCD.

In the theoretical physics, specially quantum field theory, a beta function underlying renormalization group, it has no explicit dependence on μ, so it only depends on μ implicitly through g. The beta fucntion, $\beta(g)$, encodes the dependence of a coupling parameter, g, on the energy scale, μ, of a given physical process described by quantum field theory.

$$\beta(g) = \frac{\partial g}{\partial log(\mu)}, \quad (6)$$

Their dependence on the energy scale thus specified is known as the running of the coupling parameter, a fundamental feature of scale–dependence in quantum field theory, and its explicit computation achievable through a variety mathematical techniques.

2.3 Brownian Rotational Motion (ZIG – ZAG MOTION)

Stokes–Einstein expression

$$D = \frac{kTC_C}{3\pi\mu dp}, \tag{7}$$

where *k* is Boltzmann's constant (1,38 x 10^{-23} J K^{-1}), *T* is the Absolute temperature in K, μ is dynamic viscosity of air, *dp* is particle diameter and C_C is a slip correction factor for small particles (< 0,1 µm), Brownian diffusivity, depends on the particle size and fluid suspension, for instance, the diffusivity of a 0,01 µm aerosol paricle is 20,000 times higher than that of a 10 µm aeorosol particle.

$$^1/_2\, mv^2 = 1{,}5k_BT \tag{8}$$

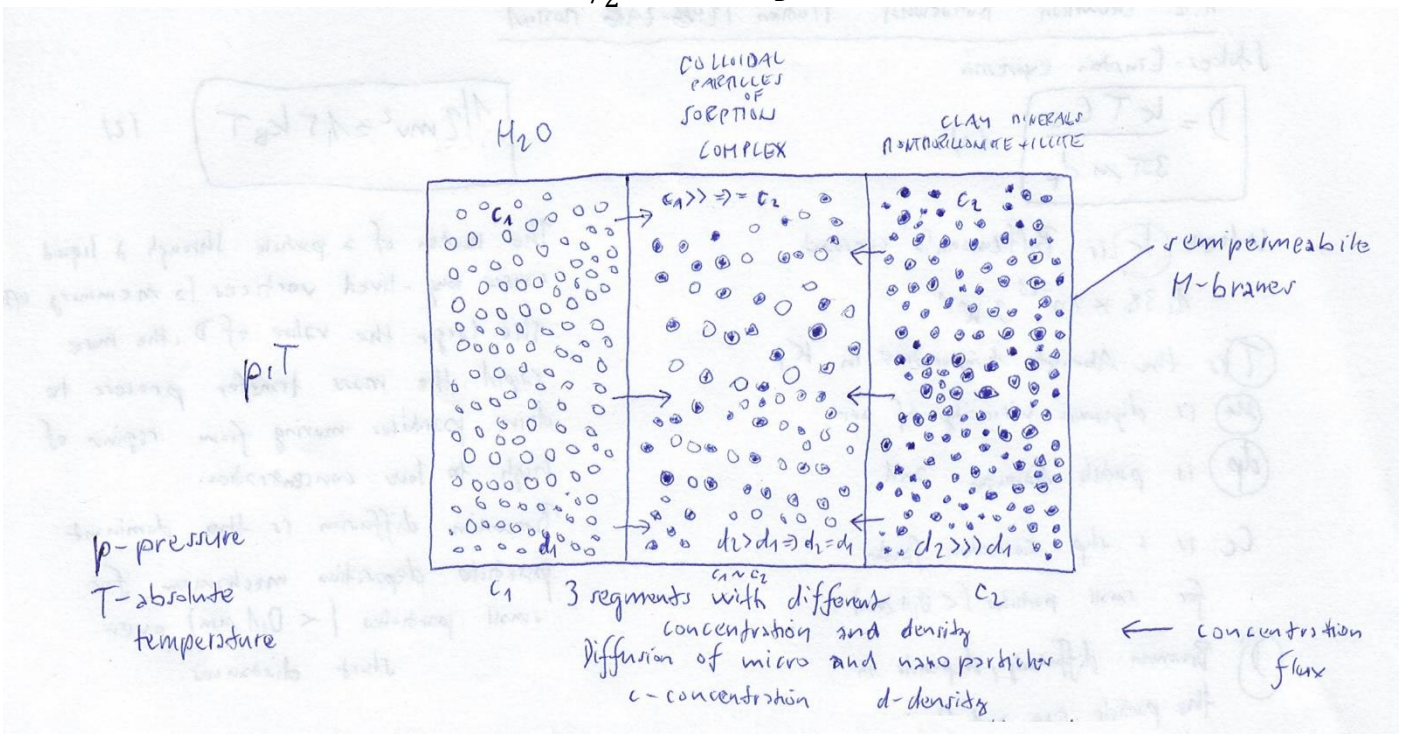

Fig. 6. Briefly illustration of Brownian motion and Diffusion by Authors on example water + soil similar is increase and decrease of concentration of dark matter and dark energy in Cosmos, Diffusion of Sars-Cov-2.
Authors of Sketch: Imrich Krištof, M.Sc.,
Josef Pokorný, Ing.

The motion of a particle through a liquid causes long–lived vortices (a memory effect). The larger the value of *D*, the more rapid the mass transfer process to drive particles moving from regions of high to low concentration.

Brownian diffusion is the dominant particle deposition mechanism for small particles (< 0,1 µm) over short distances.

2.4 Asymptotic Freedom: CONCEPT OF PARTONS AND BITS (RESP. QUBITS viz. quantum teleportation)

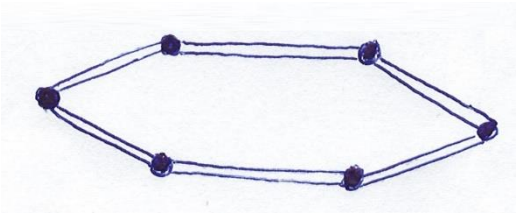

Fig. A. Glueball–like bound state of six partons.

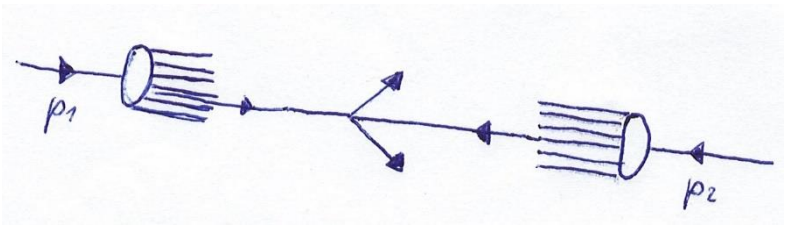

Fig. B. Parton–parton collision.

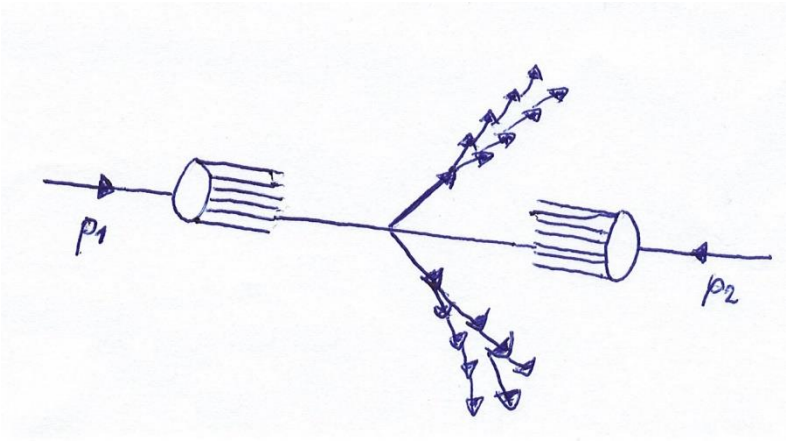

Fig. C. Parton fragmentation into jets.

a) Quantum electrodynamics
The one–loop beta function in QED is

$$\beta(e) = \frac{e^4}{24\pi^3}, \tag{9}$$

of the fine structure constant or equivalent:

$$\beta(\alpha) = \frac{2\alpha^2}{3\pi}, \tag{10}$$

in natural units, $\alpha = {e^1}/{4\pi}$.

Resulting in Landau Pole becomes infinite at some finite Energy. Landau Pole is an artifact of applying perturbation theory in a situation where it's no longer valid.

b) Quantum chromodynamics
The one–loop beta function in QCD with n_f flavours and n_S scalar colored bosons is

$$\beta(g) = -\left(11 - \frac{n_s}{3} - \frac{2n_f}{3}\right)\frac{g^3}{16\pi^2}, \tag{11}$$

or

$$\beta(\alpha_S) = -\left(11 - \frac{n_s}{3} - \frac{2n_f}{3}\right)\frac{\alpha_s^2}{2\pi}, \tag{12}$$

written in terms of $\alpha_S = {g^2}/{4\pi}$.

If $n_f \leq 16$ the ensuing beta function dictates that the coupling decrease with increasing energy scale, a phenomenon known as the asymptotic freedom. Conversely the couplings increase with decreasing energy scale.

This means that the coupling becomes large at low energies, and one can no longer rely on perturbation theory.

Perturbation theory – where one assumes that the coupling parameters are small. One can then make an expansions of the coupling parameters and truncate the higher order terms (also known as higher loop constributions, due to the number of loops in the corresponding Feynman graphs.)

c) SU (N) Non–Abelian gauge theory
Yang–Mills gauge group of QCD is SU(3) and determines 3 colors, we can generalize to any number of colors N_C, with gauge group G=SU(N_C).
Then for this gauge group, with Dirac fermions in a representation R_f of G and with a complex scalars in a representation R_S the one–loop Beta function is

$$\beta(g) = -\left(\frac{11}{3}C_2(G) - \frac{1}{3}n_S T(R_s) - \frac{4}{3}n_f T(R_f)\right)\frac{g^3}{16\pi^2}, \tag{13}$$

where $C_2(G)$ is the quadratic Casimir of G and $T(R)$ is another Casimir invariant defined by $Tr\left(T_R^a T_R^b\right) = T(R)\delta^{ab}$ for generators T_R^{aib} of the Lie algebra in the Representation R (For Weyl or Majorana fermions, replace ${4}/{3}$ by ${2}/{3}$, and for real scalars, replace ${1}/{3}$ by ${1}/{6}$.)

For gauge fields (i.e. gluons), necessarily in the adjoint of G, $C_2(G) = N$ for fermions in the fundamental (or anti–fundamental) Representation of G, $T(R) = {1}/{2}$. Then for QLD, with $N_C = 3$, the above equation reduces to that listed for quantum chromodynamics beta function.

2.5 Asymptotic freedom: Evidence of Partons or Bits

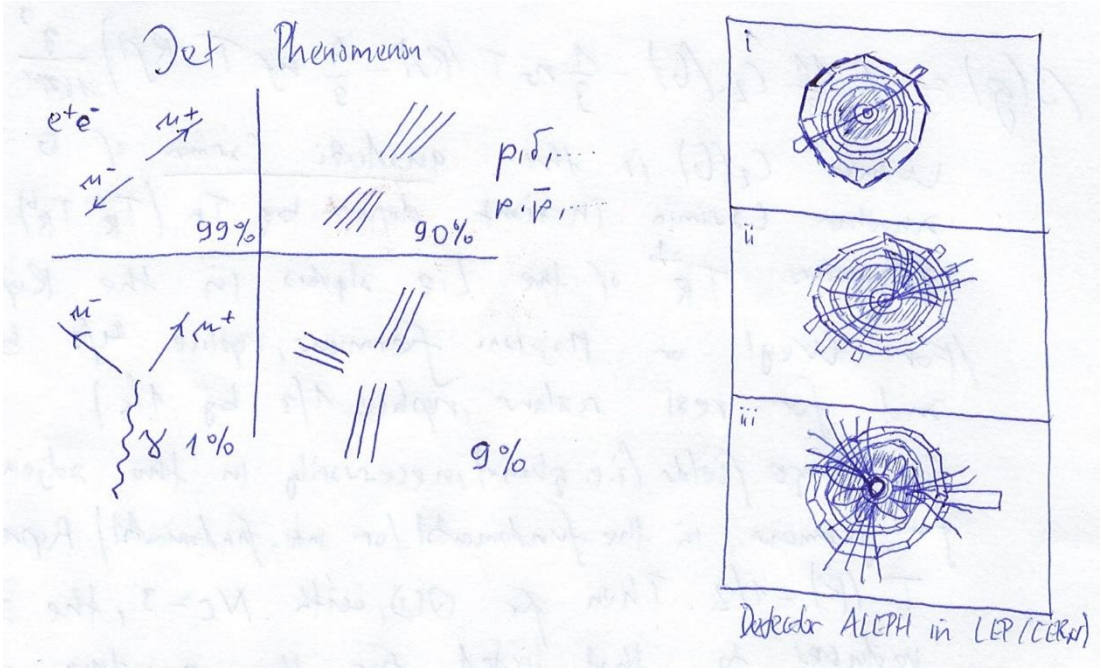

Fig.7. Comparation of production of muons and jets incollisions of electrons and positrons (their annihilation is evident like photons).
Authors Sketch According Pokroky matematiky, fyziky a astronomie, roč, 50 (2005) č. 1.

A story about a discovery of asymptotic freedom have also yet one peripety, what about is significantly said, because it brings important instruction. Gross, Wilczek and Politzer were not at the reality, the first who on the phenomenon antishielding have had observed.

The factically discover was young scientist Gerard ‘t Hooft from Utrecht, who with his supervisor of doctor’s work (dissertation) Martinus Veltman they discovered mathematically conzistention of weak forces, they were Nobel Prize Winners in Physics in 1999.

Comment no. 3. Gerard ‘t Hooft
Dutch Physicist, Professor of Theoretical Physics at the University of Utrecht, the Netherlands.
*5.7.1946 (74 years), Den Helder, Netherlands.
Quantum Field Theory, Quantum Gravity, ‘t Hooft–Polyakov monopole.

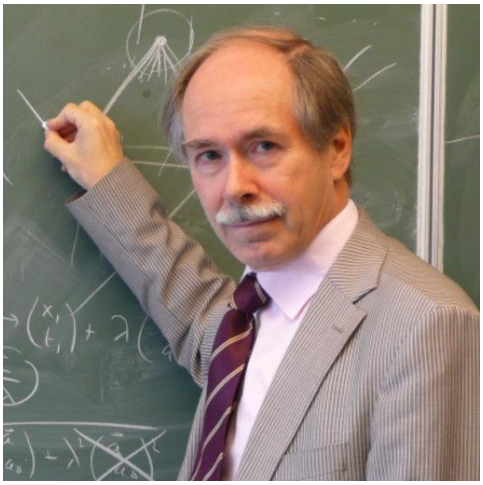

Fig. 8. Gerard ‘t Hooft (Utrecht University), Google images.

3. D–instantons

Non–perturbative formulation of energy leading to a vacuum (virtual particle matrix) created gravitational pair of (33)–brane by a Poincaré dual higher form U(1) gauge theory on a D4–Brane.

We argue that a D–instanton can be viable candidate to incorporate the quintessence correction hidden to an emergent (3+1) dimensional Brane Universe.

It’s shown that a dynamical non–perturbative correction hidden over the moduli space of Riemann surfaces.

Mukawa couplings, Majorana mass terms for right–handed neutrinos of Polonyi terms, relevant for supersymmetry breaking. Infinite series of D–instanton contribution by lifting the one–loop calculations to the M–Theory picture, we obtain a geometric understanding of the non–perturbative sector of wide range of gauge theories.

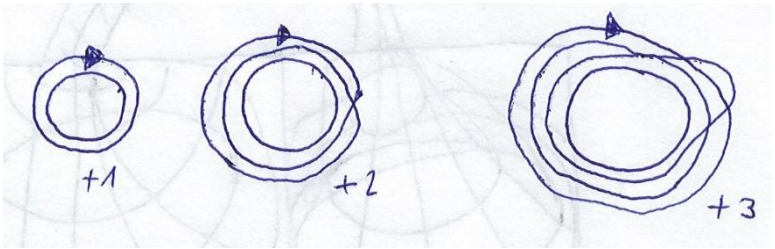

Fig. 9. Best Instanton.

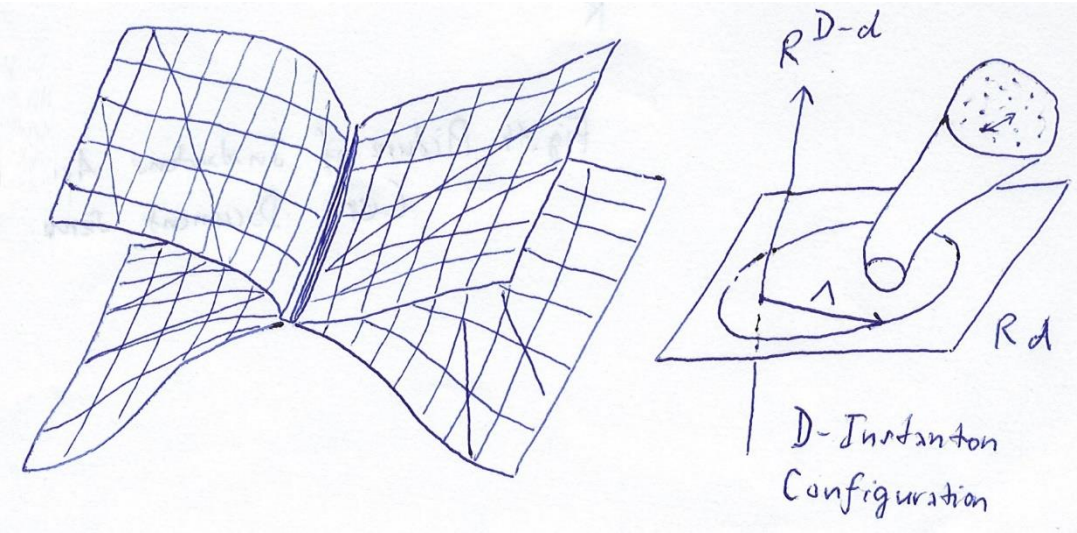

Fig. 10. D–instanton picture.

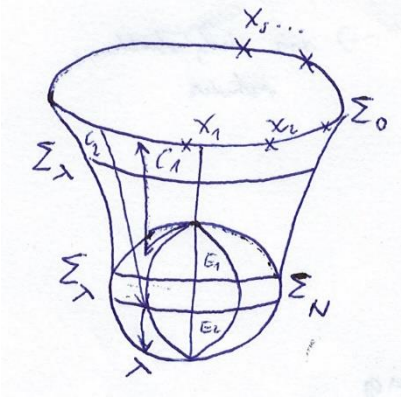

Fig. 11. A 4–Dimensional CDL Instanton.
Authors of the Sketches:
Imrich Krištof, M.Sc.,
Josef Pokorný, Ing.

3.1 Incarnations of Instantons

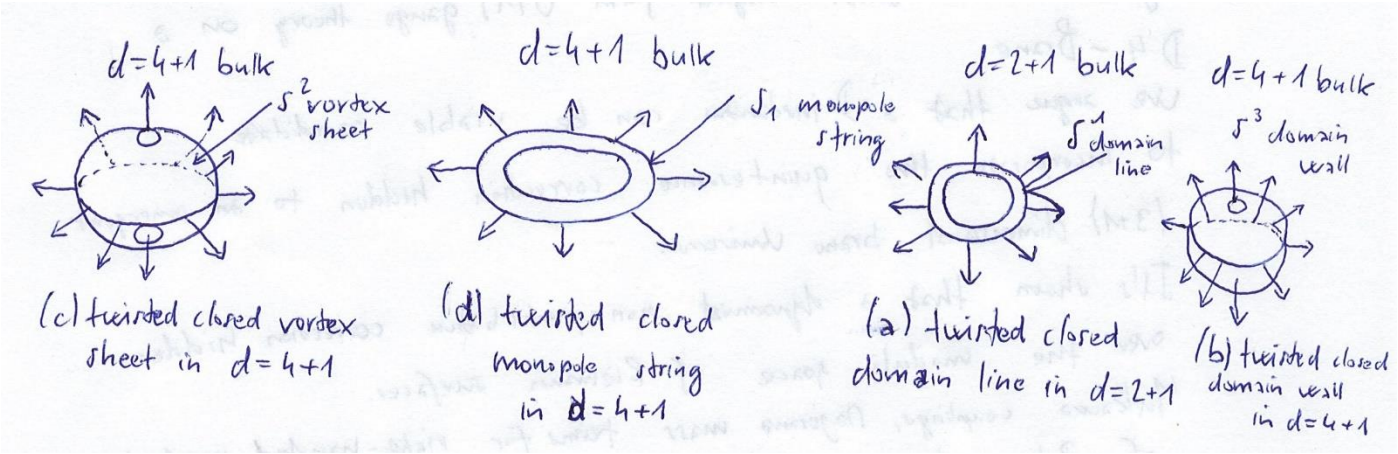

Fig. 12. Incarnations of Instantons.

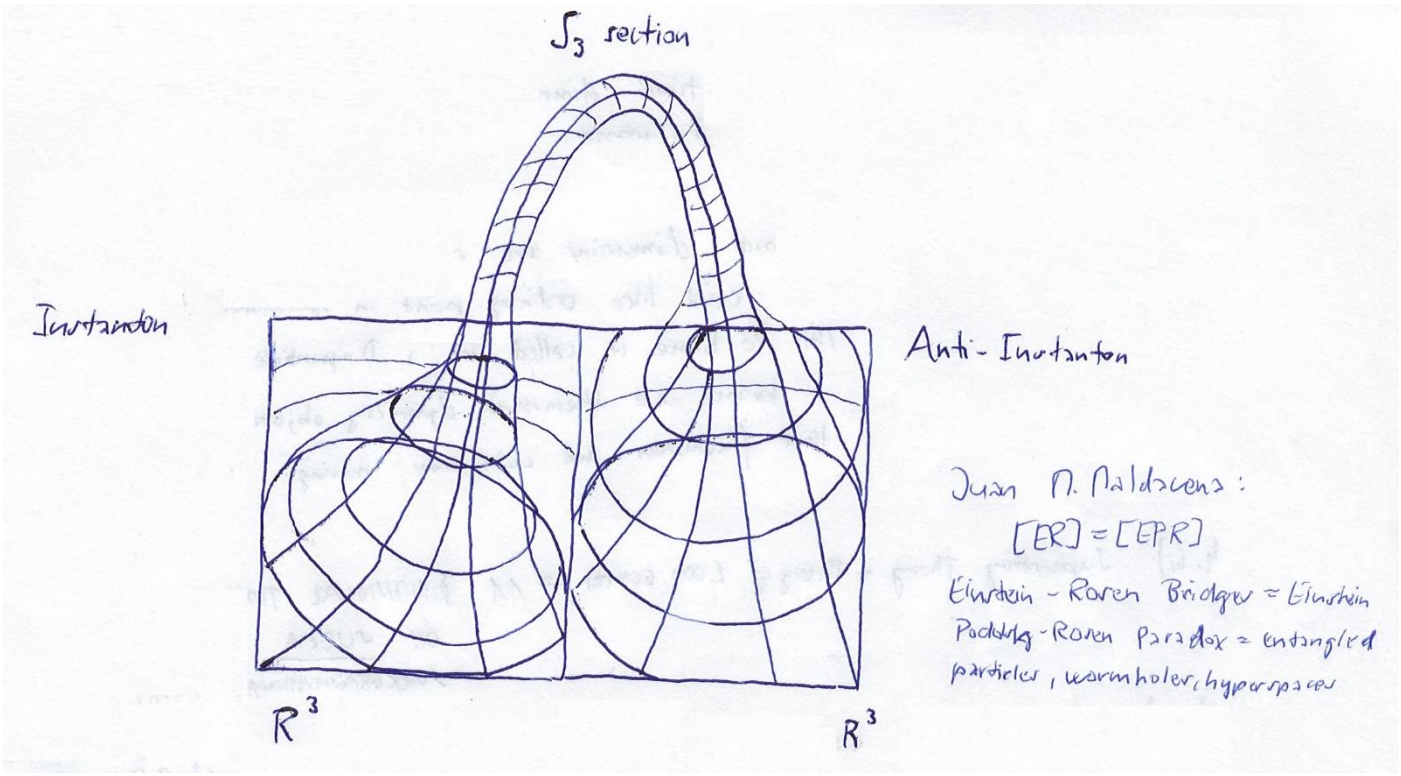

Fig.13. Picture of Instantons According CERN Document Server,
Sketch of Authors.

4. Heterotic String Theories E_8xE_8 and SD(32) Heterotic Superstring

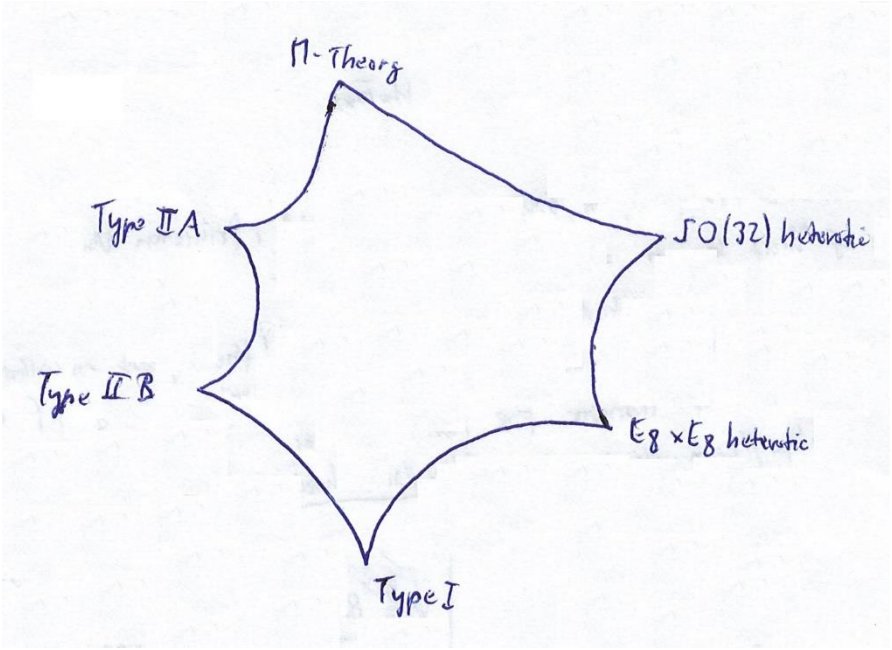

Fig. 14. Superstring and String Theories (general scheme).

In Klein–Klein
momentum of motivity resp. spin $\boxed{p = wR}$, $(w = 0,1,2, \dots)$. (14)
M–Theory 9 space dimensions + 1 Time.

Superstring Theories D–branes (10 dimensions + 2D Spacetime Superstring),
(9 Space Dimensions, 1 Time Dimension).

4i.) example $p = -1$ all space–time dimensions are stable
This is D–instanton.

4ii.) If $p = 0$ all space dimensions are stable and ending point of string does exist like ordinary in spacetime. This D_0 brane is called like a D–particle. D branes are themselves dynamically objects, have had their fluctuation and could have moving.

4iii.) Superstring Theory + Theory of LOOP GRAVITY – 11 DIMENSIONAL TIMESPACE OR SUGRA SUPERRAVITATIONAL THEORY.

4iv.) AdS-CFT correspondence (Argentinian physicist JUAN MALDACENA) → GRAVITATIONAL SUPER STRING MIRACLES.
Classical gravity on Anti– de Sitter background with CONFORMAL FIELD THEORY ON ITS BOUNDARY → BRANE WORLDS.

4v.) DILATON GRAVITY → SUPERGLIDE ENDING
EXTENSION (EXPANSION) FROM THE SAME SINGULARITY LIKE A CONTRACTION OF COSMOS → SUPERSTRING COSMOLOGICAL MODEL.

Heterotic M–Theory of Ed Witten and Petr Hořava.

Comment no. 4. Edward Witten
*26.8.1951 (69 years) Baltimore, Maryland, U.S.A., Princeton University,
is one of the most known and the most significant physicist and most cited physicist in the World (the highest so called Hirsch index of citation),
“ARCHITECT OF SECOND SUPERSTRING REVOLUTION”,
PROFESSOR OF INSTITUTE FOR ADVANCED STUDY.

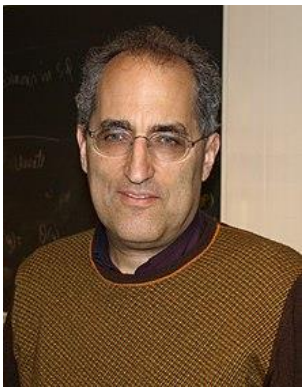

Fig. 15. Edward Witten, Wikipedia.

Comment no. 5. Petr Hořava (Physicist)
*1963 (57 years old) Prostějov, The Czech Republic.
The String Theory Physicist, UNIVERSITY OF CALIFORNIA, BERKELEY,
2015 AWARDED THE CZECH PRIZE NEURON,
KNOWN FOR "THE HOŘAVA–WITTEN DOMAIN WALL",
"ELEVEN–DIMESIONAL SUPERGRAVITY".

Fig. 16. Petr Hořava, autor: Martin Svozílek/Economia.

4.1 Heterotic M–Theory of Ed Witten and Petr Hořava

This Theory is explicit from compactification 11–DIMENSIONAL SUPERGRAVITATION ON ORBIVARIET (ORBIFOLD) S^1/Z_2 supposed compactification of 6 dimensions on special type of Calabi–Yauio orbifold and exist where group of E_8 calibration supermultiplets on each plain of orbifold. E_8 is calibration theory with group E_8. It's necessary for existence of chiral fermions.

$$\boxed{R = g^{2/3}G^{1/6}}, \tag{15}$$

is radius of 11 DIMENSIONAL SUPERSTRING THEORY, *G* is Newton constant in 11 DIMENSIONAL SPACETIME, *g* is coupling constant of THEORY OF STRINGS.

→2D BRANES → M–THEORY
11 DIMENSION IS BY SMALL *g* infinitesimally shortly.

Terminal theory is dual to E_8xE_8 heterotic theory with strong bound Brane Gas → MULTIDIMENSIONAL BRANES.

In these days is very attractive group of scenarios of BRANE WORLD – STARTING POINT IS THAT ALL MATTER FIELDS IS CONNECTED WITH 3–BRANES INCORPORATED INTO MULTIDIMENSIONAL (ORDINARY – 5 DIMENSIONAL SPACETIME).

If we use matrix theory it seems that final spacetime theory will be in string scale non–comutativly.

Restrictions of nowadays matrix theory so fast that is defined only in coordinates of light–cone.

4.2 AdS/CFT correspondence of JUAN MALDACENA

"holographic principle of Universe"

JUAN MALDACENA
*10.9.1968 (52 years) Buenos Aires, Argentina,
Harvard University from 1999 Professor of Physics,
from 2001 Professor of Institute for Advanced Study in Princeton.

Fig. 17. Juan Maldacena, Wikipedia.

5. J|Ψ (PSION) Revolution 1974

J|Psi meson or psion is a subatomic particle discovered at the time have become collectively known as the "November Revolution".
Mass: 5,5208 x 10^{-27} kg, 3,096916 GeV/c^2,
Spin: 1,
Electric charge: 0e,
Composition: $c, \bar{c}$ (charmonium).

Consisting of charm quark and charm antiquark. Mesons formed by a bound state of charm quark and a charm antiquark are generally known as "charmonium".

In the 1960's the first quark models of elementary particles physics were proposed, which said that protons, neutrons, and all other baryons, and also all mesons, hyperons and hadrons, are made from fractionally charged particles, the "quarks", which come in three or more "flavours", called up, down, strange.

Starting in 1969, deep inelastic scattering experiments at SLAC (STANFORD LINEAR ACCELERATOR), on the theoretical front gauge theories with broken symmetry became the first fully viable contenders for explaining the weak interaction after Gerard 't Hooft discovered in 1971, how to calculate with them beyond tree level.

One announcement would come from a research group led by MIT physicist Sam Ting at Brookhaven National Laboratory in New York.

The other was to come from a team headed by physicist Burton Richter and Martin Perl at SLAC National Accelerator Laboratory, then called the Stanford Linear Accelerator Center and William Chinowsky, Gerson Goldhaber and George Trilling of Lawrence Berkeley National Laboratory.

Ting called the new particle the J particle, Richter called it Psi Ψ. It became known as J|Psi, the discovery that sparked the November Revolution. Also to propose that all of these different types of hadrons were actually made up of the same building blocks, called quarks.

This included three types of quark: up, down, and strange.

Other theorists – Sheldon Lee Glashow, James Bjorken, and then also John Iliopoulos and Lucciano Mainmi, ("the Gin mechanism"), proposed the existence of fourth quark.
In 1976, Ting and Richter were awarded the Nobel Prize for the achievement.

In 1977, scientists at Fermilab discovered the fifth quark, the bottom (beauty), resp. (bottomium or beautium) quarks by Leon Max Lederman is elementary particle and one of quark's flavours.

In 1995, was discovered the top or truth (sixth) quark is the most massive of all observed elementary particles by CDF and D0 collaborations at Fermilab.

Mass of TOP(TRUTH) QUARK is 173,0 ± 0,4 GeV/c^2 which is close to the rhenium atom mass, mass coupling to the Higgs boson.

Decays into	beauty (bottom) quark	(99,8%)
	strange quark	(0,17%)
	down quark	(0,007%)
	electric charge	$+\frac{2}{3}e$
	spin	$\frac{1}{2}$ (fermion)
	Topness	1
	mean lifetime	5x10^{-25} s (hadron, gluon).

In 1973, MAKOTO KOBAYASHI and TOSHIHIDE MASKAWA predicted the existence of a third generation of quarks to explain observed CP violation in KAON DECAY. The names top and bottom were introduced by Haim Harari in 1975.

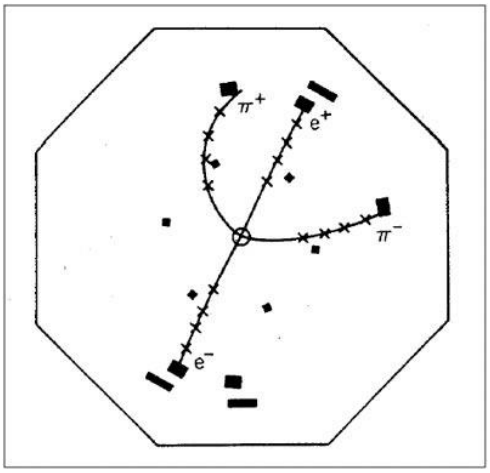

Fig. 18. A November revolution 1974, https://cerncourier.com.

6. Conclusion and Summary

This paper has tried to provide a reasonably detailed review of the original claim by Hořava–Witten, Maldacena that the strongly coupled limit of E_8xE_8 heterotic and M–theory and SO(32) heterotic string and Brane World theory the significance same as Anti– de Sitter / Conformal Field Theory Correspondence with visions of holographic Universe of JUAN M. MALDACENA.

Not in the end we mentioned not low significant work of Gerard 't Hooft and Martinus Veltman asymptotic freedom of elementary particles with Authors' Sketches of results from LEP CERN.

Not without significance is nowadays application of Brownian motion and Diffusion of SARS–COV–2 virus caused disease COVID–19 on AIR, WATER, BLOOD AND SOIL.

On the top of Science was particle physics probably in 70–ties, like an example we may accord the 1974 November particle Revolution, with discoveries of J|Ψ particle (PSION – PSI MESON).

According the one of the most known and significant physicist of last few decades is theoretist of AdS/CFT correspondence → holographic Universe JUAN MARTIN MALDACENA, Argentinian–American Scientist at Advanced Study in Princeton, who says thesis $[ER] = [EPR]$, it means Einstein–Rosen Bridges are equivalent to Einstein–Rosen–Podolsky Paradox, entangled particles, wormholes, hyperspaces, multiversum, brane worlds, instantons.

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