World-Universe Cosmology: Summary

Key Innovations WUC-commentary by Bogdan Jacek Góralski
Ad.1 The Big Bang was the beginning of our virtual world and the scope of its observation grows with our growing knowledge enabling observation of the Universe. Matter is a product of the virtual world that exists only in our eyes. Its true appearance is not perceptible to our senses and brain. Energy is a product of the Solar System created in the virtual world.
Ad.2. Our world is dimensionless, and time is a human concept defining different stages of transformation and energy reproduction.

Ad.3. Gravity is a measure of the attraction of virtual objects - everything strives for unification, for love that unites everything and everyone. Virtual objects disperse and re-focus in the rhythm of transforming energy into virtual matter, the virtual biological world, and then into the energy of love - i.e. gravity that leads to the unification of virtual objects. Dispersion and concentration is a natural process of manifestation of virtual entities subordinated to the principle of conservation of energy, which is self-renewing.
Ad.5. I agree that the Universe is constantly producing virtual matter, which is transforming into a society that is creating a new virtual world in many points of the Universe.

There is no Cosmic Medium - there is only a void filled with boundless eternal love, which exists to recreate itself, supporting the eternal existence of the Universe.

The past, present, future go in circles and are interdependent.

Everything is subordinated to the principle of conservation of energy.

Bogdan Jacek Góralski

Warsaw, April 18, 2025, 9:38 p.m.

Kluczowe innowacje WUC-komentarz Bogdana Jacka Góralskiego
Ad.1 Wielki wybuch był początkiem naszego wirtualnego świata i zakres jego obserwacji rośnie wraz z naszą wzrastającą wiedzą umożliwiającą obserwacje Wszechświata. Materia jest produktem wirtualnego świata, który istnieje tylko w naszych oczach. Jego prawdziwy

wygląd nie jest dostrzegalny przez nasze zmysły i mózg. Energia jest produktem Systemu Słonecznego utworzonego w wirtualnym świecie.
Ad.2. Nasz świat jest bezwymiarowy, a czas to ludzkie pojęcie wyznaczające różne etapy przeobrażanie się i odtwarzania energii.
Ad.3. Grawitacja jest miarą przyciągania się wirtualnych obiektów- wszystko dąży do zespolenia, do miłości która łączy wszystko i wszystkich. Obiekty wirtualne rozpraszają się i ponownie skupiają w rytm przekształcania energii w wirtualną materię, wirtualny biologiczny świat, a potem w energię miłości-tj. grawitacji która prowadzi do zespolenia obiektów wirtualnych. Rozproszenie i skupienie jest naturalny procesem objawiania się wirtualnych bytów podporządkowanych zasadzie zachowania energii, która samoistnie odnawia się.
Ad.5. Zgadzam się, że Wszechświat ciągle produkuje wirtualną materię, która przemienia się w społeczeństwo kreujące nowy wirtualny świat w wielu punktach Wszechświata.
Nie ma żadnego Kosmicznego Medium-jest tylko pustka wypełniona bezgraniczną wieczną miłością, która istnieje po to aby się odtwarzać, podtrzymując wieczne trwanie Wszechświata.
Przeszłość, teraźniejszość, przyszłość toczą się w kole i są współzależne.
Wszystko jest podporządkowane zasadzie zachowania energii.
Bogdan Jacek Góralski

Warszawa, dnia 18 Kwietnia 2025 roku, godzina 21:38

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Abstract
World-Universe Cosmology (WUC) presents a transformative cosmological framework that

challenges
and revises the standard Big Bang Model (BBM). By addressing and resolving key paradoxes in contemporary
cosmology, WUC offers a fresh perspective on the origins, evolution, and structure of the World.
Key Innovations of WUC include:
1. No Big Bang Singularity – WUC rejects the idea of an initial singularity (t = 0) and instead envisions
the Eternal Universe that perpetually generates new Matter in the World. This concept bears similarities to
Fred Hoyle's Steady-State Theory, which posits that while the universe expands, its large-scale structure
remains unchanged over time. In this view, the universe has neither a beginning nor an end, requiring a
continuous creation of matter to maintain a constant density. As Hoyle stated: "By introducing continuous
creation of matter into the field equations of general relativity a stationary universe showing expansion
properties is obtained without recourse to a cosmical constant. Creation process is likely to be of an
essentially quantum character." While WUC shares key features with the Steady-State Theory —such as the
Eternal Universe, elimination of an initial singularity, and continuous matter creation—it introduces
fundamental differences, including: 1) A distinct concept of the Beginning of the World. 2) A unique
mechanism for matter creation. 3) A decreasing energy density of the World inversely proportional to the
cosmological time. 4) The expansion of the World's Nucleus in the fourth spatial dimension, leading to the
stretching of the Hypersphere World. These distinctions set WUC apart as a novel framework for
understanding cosmic evolution beyond the classical Steady-State model.
2. A Finite, Boundless World – Unlike BBM's practically infinite universe, WUC describes the World as the
Hypersphere of the 4D Nucleus. It introduces a Patchwork Quilt structure of the Observable World, where
major superclusters form in different regions at different cosmological times.
3. Emergent Gravitation – Departing from general relativity, WUC explains gravity as an

emergent
phenomenon arising from Weak interactions between Universe-Created Particles and Matter, aligning with
the Le Sage’s mechanism of gravitation.
4. Time and Cosmological Evolution – WUC introduces Cosmological Time, a continuously progressing
parameter governing the evolution of primary cosmological parameters, including the Gravitational and
Hubble’s parameters, both of which are inversely proportional to cosmological time.
5. Matter Creation and Galactic Formation – Rather than originating from a primordial inflation, galaxies,
stars, and planets emerge through an ongoing process of Universe-Created Matter production. This
innovative approach resolves several key gaps in understanding the World's evolution, paving the way for a
more comprehensive cosmological paradigm.
1. Problems WUC Addresses and Solves
WUC eliminates fundamental issues, including:
• Initial Singularity with infinite energy density of the total Matter of the universe.
• The need for the universe to begin at $t=0$, avoiding a temporal singularity.
• Singularities leading to black holes.
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• The formation of supermassive black holes.
• Extremely rapid expansion of spacetime (inflation).
• The need for dark energy to explain cosmic expansion.
• The geometric theory of gravitation.
• The matter-antimatter asymmetry.
• The magnetic monopole problem.
• Nebular hypothesis.
WUC provides solutions for numerous cosmological challenges, including:
• The Hubble tension.
• The missing baryon problem.
• The origin of Fermi bubbles.
• The age of the Universe discrepancy.
• The coronal heating problem.
• Internal heating and diversity of gravitationally-rounded objects in the Solar system.
• The presence of Plutonium-244, with the 80-million-year half-life, in nature.
• Faster core rotations of the Sun and Earth compared to their surfaces.
• The faint young Sun paradox.

• The black-body spectrum of Cosmic Microwave Background Radiation (MBR).

2. Hypotheses Revisited by WUC

Le Sage's theory of gravitation is a kinetic theory of gravity originally proposed by Nicolas Fatio de Duillier in 1690 and later by Georges-Louis Le Sage in 1748. The theory proposed mechanical explanation for Newton gravitational force in terms of streams of tiny unseen particles (which Le Sage called ultra-mundane corpuscles) impacting all material objects from all directions. According to this model, any two material bodies partially shield each other from the impinging corpuscles, resulting in a net imbalance in the pressure exerted by the impact of corpuscles on the bodies, tending to drive the bodies together. He called the gravitational particles ultra-mundane corpuscles because he supposed them to originate beyond our known universe. It was a genius prediction of Universe-Created Particles XIONs in WUC!

In papers published in 1918 and 1925 W. D. MacMillan suggested that the universe maintains a steady state in its large-scale astronomical features, as a result of a balance between matter-to-energy conversion in stellar interiors and creation of atoms from radiant energy in empty space. No mechanism for the atom creation process in space was suggested [1]. Similarities between the MacMillan and Bondi-Gold-Hoyle steady-state theories are noted.

In 1928, J. Jeans conjectured a steady state cosmology based on a hypothesized continuous creation of matter in the universe. In his book “Astronomy and Cosmogony” [2], he stated: "The type of conjecture which presents itself, somewhat insistently, is that the centers of the nebulae are of the nature 'singular points' at which matter is poured into our universe from some other, and entirely extraneous spatial dimension, so that, to a denizen of our universe, they appear as points at which matter is being continually created." It was a genius prediction of the creation mechanism of the Universe-Created Matter (UCM) in the 4D Nucleus of the World in WUC. Universe-Created Particles (UCPs) carry new UCM into the Hypersphere

World. He also
analyzed the breakup of rapidly spinning bodies under the stress of centrifugal force and concluded that the
nebular hypothesis of Laplace, which stated that the planets and Sun condensed from a single gaseous cloud,
was invalid.
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In 1937, P. Dirac proposed the Large Number Hypothesis and the Hypothesis of Variable Gravitational
Constant [3], later (1974) incorporating the concept of Continuous Creation of Matter in the universe [4].
Luminiferous Aether was abandoned in 1905 by Special Relativity. In later years there have been classical
physicists who advocated the existence of Aether:
• N. Tesla declared in 1937: All attempts to explain the workings of the universe without recognizing the
existence of the aether and the indispensable function it plays in the phenomena are futile and destined
to oblivion.
• P. Dirac stated in 1951 in an article, titled "Is there an Aether?" that we are rather forced to have an aether.
A Cosmic Medium (CM) proposed by WUC could be considered a revival of this concept, acting as a savior
for Classical Physics.
In 1983, P. Wesson developed 5D Space-Time-Mass theory that associates the fourth spatial coordinate
with the rest mass of particles. The gravitational constant serves as the dimension-transposing parameter
[5]. According to J. Overduin and P. Wesson (1994): “Metrics which do not depend on $x4$ can give rise only to
induced matter composed of (massless) photons (this is the case of BBM);while those which depend on
$\Box$
$\Box 4$ give back equations of state for fluids composed of massive particles” [6]. WUC supplies this “fluid,” which
consists of “massive” particles with rest energy: protons, electrons, photons, neutrinos, and UCPs.
A very general statement of Mach's principle "Local physical laws are determined by the large-scale

structure of the universe" has been developed by P. Dirac in 1938.
WUC builds on these ideas, introducing a distinct mechanism for Matter creation by the Eternal Universe.
This paper is based on the published articles by Journal of High Energy Physics, Gravitation and Cosmology.
Interested readers are encouraged to view the referenced papers for detailed explanations.

3. Abbreviations

BBM – Big Bang Model.
CM – Cosmic Medium.
ESS – Extrasolar Systems.
JWST – James Webb Space Telescope.
MBR – Microwave Background Radiation.
MOs – Macroobjects.
OW – Observable World.
UCF – Universe-Created Fermions.
UCM – Universe- Created Matter.
UCPs – Universe-Created Particles.
WUC – World-Universe Cosmology.

4. Principal Points of WUC

Beginning. The World was started by a Fluctuation in the Eternal Universe, and the Nucleus of the World,
which is the 4D ball, was born. An extrapolated Nucleus radius at the Beginning was equal to the basic size
unit of a = 1.7705641× 10−14 m . The Finite Boundless World is the Hypersphere of the 4D Nucleus. All
points of the Hypersphere are equivalent; there are no preferred centers or boundaries of the World.
Stretching of the World. The 4D Nucleus is expanding along Its imperceptible fourth spatial dimension so
that the radius of the Nucleus R is increasing with speed c (a gravitodynamic constant that is identical to
the electrodynamic constant c in Maxwell's equations), resulting in the even stretching of the World. There
is no need for dark energy!

Creation of Matter. The surface of the Nucleus is created in a process analogous to sublimation.
Continuous creation of Matter is the result of this process. Sublimation is a well-known process that happens

when surfaces are intrinsically more energetically favorable than the bulk of a material, and hence there is a
driving force for surfaces to be created. The Universe creates Universe-Created Matter (UCM) in the 4D
Nucleus. Universe-Created Particles (UCPs) carry new UCM into the World. Ordinary Matter is a byproduct
of UCPs self-annihilation. The proposed 4D process is responsible for the 4D Nucleus Expansion, the World's
Stretching, Creation of Matter, and Arrow of Time, which does not depend on any physical phenomenon in
the World. It is the result of the Nucleus expansion due to the driving force for surfaces to be created. It
constitutes the prime hypothesis of WUC. Creation of UCM occurs homogeneously in all points of the World.
Content of the World. The World consists of the Cosmic Medium (CM) and Macroobjects (MOs). Total
energy density of the World equals to the critical energy density (calculated using Hubble's Law) throughout
the World's evolution. The energy density of CM is two-thirds of the total energy density and MOs – one-third
in all cosmological times. The relative energy density of UCPs is about 92.8% and ordinary particles about
4.8% in CM and 2.4% in MOs.
Homogeneous and Isotropic Cosmic Medium, consisting of protons, electrons, photons, neutrinos, and
UCPs, is an active agent in all physical phenomena in the World. WUC belongs to Classical Physics. In WUC,
classical notions can be introduced only when the very first ensemble of UCPs was created at an extrapolated
cosmological time $\tau \cong 10{-}18\ s$ and the notion "Cosmic Medium" can be introduced. The Finite, Boundless
Hypersphere World is a Container of CM and MOs. Classical Physics deals with ensembles of quantum objects!
Time, Space and Gravitation relate to the Impedance, Gravitomagnetic parameter, and Energy density of
CM, respectively. It follows that neither Time, Space nor Gravitation could be discussed in absence of CM.
There is no Cosmic Medium – there is Nothing!
Cosmological Time τ marches on at the constant pace from the Beginning of the World up to

the present
Epoch along with time-varying Cosmological parameters, including Hubble's parameter H , which are
inversely proportional to τ ($H = \tau^{-1}$). The value of H should be measured based on the Cosmic MBR data.
Rotational Fission. The mechanism that can provide Angular Momenta to MOs is the Rotational Volcanic
Fission of overspinning (surface speed at equator exceeding escape velocity) Prime Objects, which are
transferring some of their rotational angular momentum to orbital and rotational momenta of MOs. In WUC,
prime objects are UCM Cores of Superclusters, which must accumulate tremendous rotational angular
momenta before the Birth of a Luminous World. It means that it must be some long enough time in the history
of the World, which we named "Dark (invisible) Epoch." The Eternal Universe provides the angular momenta
to Prime Objects through the flux of UCM along the fourth spatial coordinate of the Nucleus of the World.
Dark (invisible) Epoch spans from the Beginning of the World 14.226 Byr ago to 0.44 Byr (for Laniakea
Supercluster that is a home to the Milky Way galaxy) when only UCM Macroobjects existed.
Luminous Epoch has lasted ever since 13.787 Byr when Luminous MOs emerged due to the Explosive
Volcanic Rotational Fission of Overspinning UCM Supercluster's Cores. It looks like a Firework of UCM cores
of satellites at the same time, so that the direction of the sum of satellites angular momentum coincides with
the angular momentum of the Prime Object. There are no preferences of directions of satellites rotations at
any level: galaxies, Extrasolar Systems (ESS) vs random rotation direction. UCM Cores of Prime Objects
detonate at critical points of their stability.
Observable World is the 3D Hubble Bubble with the radius R = 14.226 Bly .
Two fundamental parameters in various rational exponents define all macro and micro features of the
World: dimensionless Rydberg constant α = $(2aR\infty)1/3$ (that is named the fine-structure constant now and

$/$=0.759972×1040 that is the Dirac's Large
Number. We stress that the best theory is the one which is based on the minimum number of dimensionless
parameters. According to WUC, the following parameters depend on Q (*h* is the Planck constant):
• Newtonian parameter of gravitation G : $G = a2c4$
$8\pi hc$
• Hubble's parameter H : $H=c$
a
$\times Q-1$
$\times Q-1$
• Age of the Observable World $A\tau$:
• The Radius of the Nucleus of the World R :
• Critical energy density ρcr :
$\tau = t0 \times Q$
$= a \times Q$
$cr = 3hc$
$a4$
• Concentration of Intergalactic plasma $nIGP$: $nIGP = 2\pi 2$
$\times Q-1$
3
• Minimum energy of photons Eph : $Eph = (me$
mp
me
mp
$\times Q-1$
$)1/2E0 \times Q-1/2$
• Temperature of MBR $TMBR$: $TMBR=E0$
kB
$(15\alpha$
$2\pi 3$
me
mp

• Temperature of Far-Infrared Background Radiation (FIRB) peak $TFIRB$:

$$TFIRB = E0 \; kB \; (15 \; 4\pi 5 \;)1/4 \times Q-1/4 \;)1/4 \times Q-1/4$$

where $t0 = a/c$ is basic time unit, $me\ mp$ $/$is electron-to-proton mass ratio, kB is the Boltzmann constant.

In WUC, Local Physics is linked with the large-scale structure of the Hypersphere World through the dimensionless quantity Q . The proposed approach to the fourth spatial dimension agrees with Mach's principle: "Local physical laws are determined by the large-scale structure of the universe." Applied to WUC, it follows that all parameters of the World depending on Q are a manifestation of the Hypersphere Worlds' curvature in the fourth spatial dimension.

Leveraging the Inter-Connectivity of primary cosmological parameters revealed by WUC, we demonstrate that the gravitational parameter $Gexp$, which can be measured directly, enables the determination of all other cosmological parameters that are not directly measurable. Using $Gexp$, we calculate the radius R as follows:

$$Gexp \rightarrow Qexp \rightarrow R = a \times Qexp = 1.3459 \times 1026\ m = 14.226\ Bly$$

and Absolute Age of the World:

$$Gexp \rightarrow Qexp \rightarrow A\tau = t0 \times Qexp = 14.226\ Byr$$

All physical laws are determined by CM, which is both homogeneous and isotropic. Indeed, the Cosmic Medium emerges as the cornerstone of Classical Physics – a savior of its principles. According to WUC, we can use the well-known equations considering time-varying physical parameters. Let us not discard this profound concept CM with the tide of modernity: we must not throw the baby out with the bathwater!

5. Universe-Created Particles

Observable World (OW) consists of particles of Ordinary Matter: protons, electrons, photons, neutrinos.

On the other hand, there are particles created by the Universe – UCPs of a new kind of UCM, which have

following characteristics: UC Fermions (UCF) or Bosons, Rest Energies (see Table 1), Weak Interaction, and

Self-annihilation, like Majorana fermions. Ordinary particles are a byproduct of UCPs self-annihilation.

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It is worth noting that the rest energy of electron Ee equals to: $Ee = \alpha \times E0$ and the Rydberg unit of

energy is: $Ry = 0.5\alpha 3 \times E0$ ($E0$ is a basic energy unit: $E0 = hc\ a$ $/$=70.025252 MeV). Considering these

two well-known equations and the main goal of WUC – two dimensionless parameters only (α and Q), we

proposed for UCPs the values of rest energies, which must be constant (created by the Universe) and

therefore are proportional to rational exponents of α .

WUC proposes multicomponent UCPs system consisting of two couples of co-annihilating UCPs: a heavy

fermion UCF1 (1.3 TeV) and a light spin-0 boson – DIRAC (70 MeV) that is a dipole of Dirac's monopoles with

charge $\mu = e\ 2\alpha$ $/$(e is an elementary charge); a heavy fermion UCF2 (9.6 GeV) and a light spin-0 boson – ELOP (340 keV) that is a dipole of preons with electrical charge e/3; fermions UCF3 (3.7 keV) and UCF4 (0.2

eV), and boson XION (5.3 μeV).

Table 1. Universe-Created Particles.

Fermion Particle	Boson Rest Energy Value	Particle
UCF1	Rest Energy	
$\square$	$\square - 2E0$	
1.3149948 TeV	DIRAC	

Value
UCF2
$\square$
$\square 0E0$
$\square$
$\square -1E0$
9.5959804 GeV
ELOP
70.025252 MeV
UCF3
$2/3\alpha 1E0$
$\square$
$\square 2E0$
3.7289394 keV
XION
340.66596 keV
UCF4
$1\ 2/\alpha 6E0$
$\square$
$\square 4E0$
0.19857107 eV
5.2870895 μeV
In 1931, P. Dirac demonstrated that if magnetic monopoles exist anywhere in the universe, then electric
charge must necessarily be quantized. Since electric charge is indeed observed to be quantized, this finding
is consistent with—but does not conclusively prove—the existence of monopoles. According to WUC, the
quantization condition arises from the presence of particles DIRACs, which are conceptualized as dipoles
formed by Dirac's magnetic monopoles. In this view, the so-called auxiliary magnetic field intensity H
represents the current density of these magnetic dipoles. This interpretation provides a possible explanation
for large-scale magnetic structures, such as the Milky Way's magnetic field, the Dark magnetic field, and other
magnetic phenomena that are only partially correlated with matter visible in conventional spectral ranges.
These effects could arise from the motion and distribution of DIRAC's dipoles throughout

space.
UCPs are “dark,” optically invisible when astronomers observe OW with telescopes only. The contemporary Astronomy allows us to observe OW on wavelengths from radio waves up to gamma rays.
Then, they are not "dark" at all! J. Michell was the first person known to have proposed in 1783 the existence
of “Dark Stars.” He proposed that astronomers could detect "dark stars" by looking for star systems which
behaved gravitationally like two stars, but where only one star could be seen. It was an extraordinarily
accurate prediction of binary systems. The first known binary star system with optically invisible partner
was Cygnus X-1(1971) that is typically the brightest persistent source of hard X-rays with energies up to 60
keV . In 2000, R. Minchin, et al. discovered binary galaxy system VIRGOHI 21 with NGC 4254, which has a 21
cm emission. The reason for this multicomponent UCPs system was to explain:
• The diversity of Very High Energy gamma-ray sources in OW.
• The diversity of UCM Cores of Macroobjects in OW (Superclusters, Galaxies, and ESS), which are Fermion
Compact Objects and UCM Reactors fueled by UCPs.
The signatures of UCPs self-annihilation with predicted rest energies (see Table 1) are found in spectra
of diffuse gamma-ray background and the emissions of various MOs in OW.
These two kinds of Matter have different origin of radiations:
• Ordinary particles radiate Electromagnetic waves by electrons outside nuclei.

• UCPs radiate Gamma rays, which are emitted by nuclei, as a result of self-annihilation of UCPs with rest
energies, covering eighteen orders of magnitude (see Table 1).
6. Gravity
In WUC, the time-varying Gravitational parameter $G \propto \tau^{-1}$ is proportional to the energy density of CM
$\rho_{CM} \propto \tau^{-1}$. It is not constant. That is why WUC aligns gravity with Le Sage’s theory of gravitation. Le Sage
proposed quantitative estimates for some of the theory's parameters and called the gravitational particles
ultramundane corpuscles because he supposed them to originate beyond our known universe.

It was a genius
prediction of Universe-Created Particles XIONs in WUC that gives for Le Sage's theory following parameters:

• XIONs (5.3 μeV) are ultra-relativistic UCPs ("ultramundane corpuscles"), which created by the Universe.

• Proposed Weak interaction between XIONs and UCPs and Ordinary particles of MOs provides mass
proportionality. Energy density of XIONs in the World is about 64% of the total energy density and
provides high intensity of their flux.

We emphasize that the Gravitational mass is a classical notion that defines Gravity – emergent phenomenon.

An inertial mass that is a coefficient between a force and an acceleration, has nothing to do with it.

7. Predictions

Summary of the calculated by WUC in 2013 cosmological parameters [7] and measured parameters are
presented in Table 2.

Table 2. Calculated and measured cosmological parameters.

Parameter	Calculated (2013)	Measured	Year
Gravitational	6.67420 ×10−11$m3kg$−1s−2	6.674184×10−11$m3kg$−1s−2	
Hubble's	68.733 $km\ s$−1Mpc−1	68.7 ±1.3 $km\ s$−1Mpc−1	2018
Ionized Baryons	4.8 %	4.9 ±1.3 %	2021
Minimum Photon Energy	1.87433 ×10−14 eV	≲ 2.2×10−14 eV	2016
MBR Temperature	2.725245 K		

2017
FIRB Temperature Peak
2.72548 ±0.00057 K
28.955 K
2009
Absolute Age of the World
29 K
14.226 Byr
1998
We emphasize that WUC allows for precise calculation of values that were only measured experimentally
earlier and makes verifiable predictions.
“The Discovery of a Supermassive Compact Object at the Centre of Our Galaxy” (Nobel Prize in Physics
2020) made by R. Genzel and A. Ghez is a confirmation of one of the most important predictions of WUC in
2013: “Macroobjects of the World have cores made up of the discussed DM (UCM) particles. Other particles,
including DM (UCM) and baryonic matter, form shells surrounding the cores.”
JWST discoveries in 2022-2025 confirm the most important predictions of WUC in 2018:
• Absolute Age of World is 14.226 Byr.
• Dark (invisible) Epoch (spanning for Laniakea Supercluster from a Beginning of the World for 0.44 Byr)
when only UCM Macroobjects form and evolve.
• Luminous Epoch (ever since, 13.787 Byr) when Luminous MOs (superclusters, galaxies, ESS) emerge.
• Transition from Dark Epoch to Luminous Epoch is due to Explosive Rotational Fission of Overspinning
UCM Supercluster’s Cores and self-annihilation of UCPs.
• MOs of the World form from top (Superclusters) down to Galaxies and ESS in parallel around different
Cores made up of different UCPs.
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8. Problems Explained by WUC
WUC solves a number of problems in contemporary Cosmology through UCPs and their interactions:
• Angular Momentum problem in birth and subsequent evolution of Galaxies and ESS explained by
Explosive Volcanic Rotational Fission of Overspinning UCM Supercluster’s Cores.

• Missing Baryon problem, related to the fact that the observed amount of baryonic matter did not match
theoretical predictions, solved by the calculation of the concentration of Intergalactic plasma.
• Fermi Bubbles—two large structures in gamma-rays above and below Galactic center—are stable clouds
of UCPs (UCF1, UCF2, and UCF3) containing uniformly distributed UCM Objects, in which UCPs self
annihilate and radiate gamma rays.
• Galaxies are ellipticals and spirals due to Explosive Volcanic Rotational Fission of their Overspinning
UCM Cores.
• Coronal Heating Problem relates to a question of why the temperature of the Solar corona is millions of
degrees higher than that of the photosphere. According to WUC, the origin of the Solar corona plasma is
not coronal heating. Plasma particles (electrons, protons, multi-charged ions) are so far apart that plasma
temperature in the usual sense is not very meaningful. Plasma is the result of the self-annihilation of
UCPs. The Solar corona made up of UCPs resembles a honeycomb filled with plasma.
• Cores of Sun and Earth rotate faster than their surfaces despite high viscosity of the internal medium.
WUC explains the phenomenon through absorption of UCPs by UCM Cores. UCPs supply not only
additional mass ($\propto \tau 3/2$), but also additional angular momentum ($\propto \tau 2$). Cores irradiate products of self-
annihilation, which carry away excessive angular momentum. Solar wind is the result of this mechanism.
• Internal Heating of Gravitationally-Rounded Objects in the Solar system is explained by UCM Reactors
inside of all MOs fueled by UCPs. Internal Heating is due to UCPs self-annihilation.
• Diversity of Gravitationally-Rounded Objects in the Solar system is explained by UCM Reactors inside of
MOs fueled by UCPs. All chemical elements, compositions, and radiation are produced by MOs themselves
as the result of UCPs self-annihilation in their different UCM cores.
• Plutonium-244 with half-life of eighty million years exists in Nature. It is not produced by the nuclear fuel
cycle, because it needs extremely high neutron flux environments. Any Pu-244 present in the

Earth’s crust
should have decayed by now. In WUC, all chemical products of the Earth including isotopes K-40, U-238,
Th-232, and Pu-244, are produced within the Earth as the result of UCF1 self-annihilation. They arrive in
the Crust of the Earth due to convection currents in the mantle carrying heat and isotopes from the
interior to the planet’s surface.
• Expanding Earth hypothesis asserts that the position and relative movement of continents is at least
partially due to the volume of Earth increasing. In WUC, the Earth’s UCM core absorbs new UCPs, and its
size is increasing in time $\propto \tau 1/2$. Hence, there is an expansion of UCM core, and its surface (the Upper
mantle with Crust) is stretching. Due to UCPs self-annihilation, new chemical elements are created inside
of the Upper mantle with Crust. As a result, the relative movement of continents is happening.
• Faint young Sun paradox describes the apparent contradiction between observations of liquid water
early in Earth’s history and the astrophysical expectation that the Sun’s output would be only 70% as
intense during that epoch as it is during the modern epoch. In WUC, all MOs of the World were fainter in
the past. As their UCM cores absorb new UCPs, the sizes of MOs ($\propto \tau 1/2$) and thus their luminosity are
increasing in time $\propto \tau$. Considering the age of the World $\cong$ 14.2 Byr and the age of the Solar system $\cong$ 4.6
Byr, it is easy to find that the young Sun’s output was 67.6% of what it is today.
• Matter-Antimatter Asymmetry problem. Ordinary Matter is a byproduct of UCPs self-annihilation. This
problem does not arise since antimatter is not created by UCPs self-annihilation.

• Black-body spectrum of Cosmic MBR is due to thermodynamic equilibrium of photons with Intergalactic
plasma.
• Unidentified IR Discrete Emission Bands with peaks 3.3, 6.2, 7.7, 8.6, 11.2, and 12.7 μm explained by a
self-annihilation of UCF4 (0.2 eV).
• Solar Corona, Geocorona and Planetary Coronas made up of UCPs resemble honeycombs

filled with
plasma particles (electrons, protons, multi-charged ions), which are the result of UCPs self-annihilation.
• Lightning Initiation problem and Terrestrial Gamma-Ray Flashes are explained by the self-annihilation
of UCPs in Geocorona.
• Ball Lightnings are objects that have cores made up of UCPs surrounded by electron-positron plasma
shells contaminated by chemical elements of soil and air as the result of Terrestrial Gamma-Ray Flash
strikes of the ground. WUC predicts a new phenomenon—a generation of Ball Lightnings according to
the proposed model. Once we master their creation in a controlled environment, we can concentrate our
efforts on harvesting that energy from a practically infinite Source—the CM of the World with UCPs.
• Wave–Particle Duality dilemma. In physics, the Observer Effect refers to the disturbance of a system
caused by the act of observing it. A well-known example of this occurs in quantum mechanics, particularly
in the double-slit experiment. Physicists have observed that when detectors are used to monitor quantum
phenomena in this experiment, the very act of observation alters the outcome. When detectors are placed
at the slits, they find that each photon passes through only one slit, behaving like a classical particle,
rather than through both slits, which would indicate wave-like behavior. Crucially, when the path of the
particle is observed, the characteristic interference pattern—typical of wave behavior—does not form,
illustrating the principle of wave-particle duality. Richard Feynman famously noted that the wave-particle
duality in the double-slit experiment is impossible, absolutely impossible, to explain in any classical way
and that this mystery lies at the heart of quantum mechanics. However, according to WUC, the concept of
wavelength is classical, not quantum. Wavelength, in this view, is a property of an ensemble of quantum
objects (such as photons or electrons), all of which possess four-momenta only but no

individual
wavelength. When the gravitostatic charge of particles is equal to their momentum pDB, the
gravitomagnetic flux ϕDB is defined as:
$$\lambda DB = h\, pDB$$
This is known as the de Broglie wavelength. Thus, in WUC, wavelength is considered a macroscopic
phenomenon, representing gravitomagnetic flux of particles characterized solely by their four-momenta.
This implies there is no wave-particle duality in WUC, as wavelength is an emergent phenomenon. The
act of observation (through detectors) disturbs the observed system (an ensemble of particles), causing
the emergent wavelength to disappear. Consequently, the interference pattern no longer forms.
• The “Axis of Evil” refers to a controversial correlation between a plane of the Solar system and certain
anomalies in MBR. Specifically, the motion and orientation of the Solar system’s ecliptic plane appear to
align with certain features observed in MBR. In WUC, the black-body spectrum of MBR is explained by
the thermodynamic equilibrium between photons and the Intergalactic plasma, the existence of which
has been experimentally supported by observations of Fast Radio Bursts. The Solar wind, which consists
of charged particles (primarily protons and electrons) emitted from the Sun’s corona, has a plasma
density distribution that varies with distance from the Sun:
Radial Distribution:
• Close to the Sun (~0.1 AU): The particle density is high, ranging from 100 to 1000 particles/cm3.
• On Earth’s orbit (1 AU): The density averages between 5 to 10 particles/cm3.
• Beyond 1 AU: The density decreases with the inverse square of the distance, reaching as low as 0.001
particles/cm3 between 80 to 120 AU, before rapidly increasing near a heliopause to 0.2 particles/cm3.

Latitude Distribution:
• Near the Solar equator: The Solar wind is denser and slower, known as the “slow Solar wind,” with
speeds of 300 – 500 km/s.
• At higher latitudes (near the Sun’s poles): The Solar wind is faster and less dense, referred to as the
“fast Solar wind,” with speeds of 700 – 800 km/s.
This distribution of Solar wind plasma exhibits cylindrical symmetry relative to the plane of the ecliptic.
The interaction of photons from MBR with this plasma may account for some of the anomalies associated
with the “Axis of Evil.”
9. Hubble Tension
The Hubble Tension refers to the significant discrepancy in the measured values of the Hubble constant
(H_0), which defines the rate at which the universe is expanding. Different methods yield conflicting results:
measurements based on MBR data suggest a lower value of H_0, while those relying on observations of Type
Ia supernovae in the nearby universe indicate a higher value. This disagreement far exceeds the expected
measurement uncertainties and suggests that our current understanding of cosmology might be incomplete.
Recent observations using both JWST and the Hubble Space Telescope have confirmed that this tension is not
due to measurement error. According to A. Riess, “With measurement errors negated, what remains is the
real and exciting possibility we have misunderstood the universe” [8].
In framework of WUC, the Hubble Tension is interpreted differently from the standard BBM. In standard
cosmology, Hubble’s law assumes that all galaxies originated from a single point — the Initial Singularity —
implying that tracing their motion backwards in time leads to an infinitely dense state at $t = 0$. However, this
assumption is challenged by WUC, which proposes that galaxies are gravitationally bound within their
respective superclusters and did not originate from a single point.
According to WUC, the Observable World is a three-dimensional "Patchwork Quilt" of

luminous
Superclusters (≳ 103), each emerging at different locations and cosmological times. This framework better
accounts for the observed redshift variations among galaxies.
For example, the redshift of the center of the Laniakea Supercluster is measured as z = 0.0708 . However,
this does not necessarily mean that it is receding from MW. Instead, it is the MW that is moving within the
supercluster. Some galaxies within Laniakea are moving toward MW (blue-shifted), while others are moving
away (red-shifted). Thus, redshift is relative and depends on the galaxy's position and motion within its
supercluster.
The situation becomes more complex when considering galaxies in adjacent superclusters. Supporting
this, in 2009, S. Gupta reported the discovery of over 8,300 blue-shifted galaxies located beyond the Local
Group. Notably, the Andromeda Galaxy — the nearest major galaxy to MW — is also blue-shifted. Standard
cosmology struggles to comprehensively explain such findings. Under the WUC framework, the Hubble
constant should be derived solely from the cosmic MBR. The calculated value in 2013 was:
$$\hat{H}_0 = 68.73\ km\ s^{-1}/Mpc$$
This aligns remarkably well with the 2021 measurement based solely on MBR data:
$$\hat{H}_0 = 68.7 \pm 1.3\ km\ s^{-1}/Mpc$$
This consistency reinforces the argument that a re-evaluation of cosmological models may be necessary,
potentially favoring a model like WUC over BBM in explaining the full complexity of cosmic expansion and
structure formation.
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10. Physical Meaning of the Fourth Spatial Coordinate
According to J. M. Overduin and P. S. Wesson: "a fifth dimension might be associated with rest mass via
$$\hat{}$$

$\hat{\Box}4 = Gm/c2$." In WUC, there are following parameters:

Gravitational $G=a2c4$

$8\pi hc$

Surface energy density $\sigma 0 = hc$

$a3$

$\times a$

R

$= h$

$a2t0$

$= Jh$

that is, in fact, an angular momentum flux density Jh. Then the total energy of the Observable World EOW:

$\hat{\Box}$

$\hat{\Box}OW = 4\pi R2\sigma 0 = 4\pi R2 \times Jh = Ih = 4\pi R2$

$a2$

$\times h$

$t0$

$= 4\pi E0 \times Q2$

where Ih is a total angular momentum flux that is a vector along the fourth spatial dimension and $E0 = h$

$t0$

is, in fact, a basic angular momentum flux unit. The fourth spatial coordinate is associated with EOW via:

$\hat{\Box}$

$\hat{\Box}4 = 2G$

$c2$

$\times EOW$

$c2$

$= 2$

$c2$

$\times a2c4$

$8\pi hc$

$\times a$

R

$\times 4\pi R2$

$c2$

$\times hc$

$a3$

$= R = a \times Q = c\tau$

The Eternal Universe continuously generates ensembles of "massive" UCPs, whose angular momenta
resemble "air vortices." Notably, the creation of UCPs occurs uniformly at every point within the
Hypersphere World. This implies that for any Cosmic Bubble (CB) with radius r , the following holds:
$\square$
$\square CB = 4\pi r2\sigma 0$. Moreover, WUC supports Nikola Tesla's postulate regarding the energy source in the
Observable World: There is no energy in matter except that which it receives from the environment
(specifically, from the fourth spatial dimension).

11. Most Direct Observational Evidence of Validity of WUC

1. Cosmic MBR, Intergalactic Plasma, and the Far-Infrared Background Radiation all provide compelling
evidence for the existence of a pervasive Cosmic Medium—a foundational component of WUC.
2. The Laniakea Supercluster with a binding mass ~ 1017 $M\odot$ encompasses the Milky Way and ~ 105
neighboring galaxies. The spatial distribution and motion of these galaxies indicate they did not originate
from a common Initial Singularity, challenging the standard Big Bang assumption and favoring the
framework proposed by WUC.
3. The Milky Way is gravitationally bound to the Virgo Supercluster, and it possesses significant orbital
angular momentum, estimated based on a distance of 65 million light-years and an orbital speed of ~400
km/s. This orbital momentum greatly surpasses the galaxy’s intrinsic rotational angular momentum. In
the study “The Distribution of Galaxy Rotation in JWST Advanced Deep Extragalactic Survey” , analysis of
263 spiral galaxies near the northern Galactic pole revealed that galaxies rotating opposite to the Milky
Way outnumber those rotating in the same direction by ~50%. This asymmetry becomes more
pronounced at higher redshifts (0.5 < z < 2) [9]. Notably, the Laniakea Supercluster center is located at
z = 0.0708. Within the WUC framework, this observed asymmetry is interpreted as evidence of

distinct
angular momentum orientations across superclusters: galaxies with $z < 0.5$ likely belong to Laniakea,
while those with $z > 0.5$ belong to more distant superclusters beyond the Milky Way's immediate cosmic
neighborhood.
4. The mass-to-light ratio of the Virgo Supercluster is ~300 times that of the solar value, consistent with
values observed in other superclusters. Such high ratios support the existence of vast amounts of
Universe-Created Matter, a key element of WUC.
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5. Astronomers have discovered the most distant known galaxy—JADES-GS-z14-0, about 13.5 Bly away, as
well as F200DB-045, a candidate galaxy located at 13.7 Bly. These discoveries push the observational
limits of the World and reinforce the need for a comprehensive cosmological model like WUC.
Conclusion:
The Cosmic Medium, Universe-Created Matter, and Angular Momentum form the Three Pillars of WUC.
To the best of our knowledge, WUC is the only cosmological model that inherently aligns with the Law of
Creation and Conservation of Angular Momentum, offering a coherent and observationally grounded
alternative to prevailing models.
Conclusion
WUC is consistent with all fundamental concepts of the Observable World. The model successfully
describes primary cosmological parameters and their relationships, allowing for precise calculations of
values that were previously determined only through experimentation. Moreover, its verifiable predictions
and remarkable agreement with observational data reinforce confidence in its validity. Rather than claiming
to explain all cosmological data or presenting a fully developed theory, it serves as a foundation for a New
Cosmology—one originally envisioned by Paul Dirac in 1937. While further refinement by the global physics
community is essential, WUC's insights, combined with the groundbreaking discoveries of

JWST and Dirac's
proposals over the past 87 years, underscore the need for a fundamental transformation in Astronomy,
Cosmology, and Classical Physics.

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