

Development of Hypersphere World-Universe Model

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Abstract

Hypersphere World-Universe Model (WUM) is the only cosmological model in existence that is consistent with the Law of Conservation of Angular Momentum. To be consistent with this Fundamental Law, WUM discusses in detail the Beginning of the World. The Model introduces Dark Epoch (spanning from the Beginning of the World for 0.4 billion years) and Luminous Epoch (ever since for 13.8 billion years). Big Bang discussed in Standard Cosmology is, in our view, transition from Dark Epoch to Luminous Epoch due to Rotational Fission of Overspinning Dark Matter (DM) Supercluster's Cores and self-annihilation of Dark Matter Particles (DMPs). WUM envisions Matter carried from the Universe into the World from the fourth spatial dimension by DMPs. Luminous Matter is a byproduct of DM self-annihilation. WUM solves a number of physical problems in contemporary Cosmology and Astrophysics through DMPs and their interactions: **Angular Momentum problem** in birth and subsequent evolution of Galaxies and Extrasolar systems – how do they obtain it; **Fermi Bubbles** – two large structures in gamma-rays and X-rays above and below Galactic center; **Mysterious Star KIC 8462852** with irregular dimmings; **Coronal Heating problem** in solar physics – temperature of Sun's corona exceeding that of photosphere by millions of degrees; **Cores of Sun and Earth** rotating faster than their surfaces; Diversity of **Gravitationally-Rounded Objects** in Solar system and their **Internal Heat**; **Lightning Initiation problem** – electric fields observed inside thunderstorms are not sufficient to initiate sparks; **Terrestrial Gamma-Ray Flashes** – bursts of high energy X-rays and gamma rays emanating from Earth. Model solves **Missing Baryon problem** related to the fact that the observed amount of baryonic matter did not match theoretical predictions. WUM reveals **Inter-Connectivity of Primary Cosmological Parameters** and calculates their values, which are in good agreement with the latest results of their measurements. In 2013, Model predicted the values of the following Cosmological parameters: gravitational, concentration of Intergalactic plasma, relative energy density of protons in the Medium, and the minimum energy of photons, which were experimentally confirmed in 2015 – 2018.

Keywords

“Hypersphere World-Universe Model”; “Law of Conservation of Angular Momentum; Dark Epoch”; “Rotational Fission”; “Luminous Epoch”; “Multiworld”; “Dark Matter Particles”; “Macroobject Shell Model”; “Dark Matter Core”; “Medium of the World”; “Mysterious Star KIC 8462852”; “Dark Matter Fermi Bubbles”; “Solar Corona”; “Geocorona”; “Planetary Corona”; “Galactic Wind”; “Solar Wind”; “High-Energy Atmospheric Physics”; “Lightning Initiation Problem”; “Terrestrial Gamma-Ray Flashes”; “Gamma-Ray Bursts”; “Gravitational Bursts”; “Ball Lightning”; “Intergalactic Plasma”

Introduction

Today, a growing feeling of Physics' stagnation is shared by a large number of researchers. In some respects, the situation today is similar to that at the end of 19th century, when the common consensus held that the body of physics is nearly complete. The time may be ripe to propose new Physical models that will be both simpler than the current state of the art, as well as open up new areas of research (Paper 7).

Hypersphere World-Universe Model (WUM) is proposed as an alternative to the prevailing Big Bang Model of Standard Cosmology. WUM is a natural continuation of Classical Physics (Paper 16). The Model makes use a number of Hypotheses proposed by classical physicists from the 17th until the beginning of 21st century. The presented Hypotheses are not new, and I don't claim credit for them. In fact, I am developing the existent Hypothesis and proposing new Hypothesis in frames of WUM. The main objective of the Model is to unify and simplify existing results in Classical Physics into a single coherent picture (Paper 12).

There were a few principal steps in the development of WUM:

- **In 2013:** *According to the Model, the World is a Black Hole. Residing inside of a black hole, we can conduct no observations of the outside Universe, and learn nothing about its characteristics. The World is expanding in the Universe without limit with the speed equal to the electrodynamic constant c . The Universe serves as an unlimited source of energy that the World is consuming as it grows (Paper 1).*
- **In 2015:** *This paper aligns the World-Universe Model (WUM) with the theoretical framework developed by Prof. P. S. Wesson, albeit assigning a new physical meaning to the fifth coordinate. In the World-Universe Model, the fifth dimension is associated with the total energy of the Medium of the World (Paper 3).*
- **In 2016:** *The 3D World is a hypersphere that is the surface of a 4-ball Nucleus. All points of the hypersphere are equivalent; there are no preferred centers or boundary of the World. In 1854, Georg Riemann proposed the hypersphere as a model of a finite universe [48]. WUM follows the idea of a hypersphere World, albeit proposing that the World is expanding and filled with Medium consisting of stable elementary particles (Paper 7).*
- **In 2018:** *Dark Epoch started at the Beginning of the World and lasted for about 0.4 billion years. Light Epoch spans from 0.4 billion years up to the present Epoch (during 13.8 billion years). The Big Bang discussed in the standard cosmological model is, in our view, the transition from Dark Epoch to Light Epoch (Paper 13).*
- **In 2019:** *Hypersphere World-Universe Model (WUM) envisions Matter carried from Universe into World from fourth spatial dimension by Dark Matter Particles (DMPs). Luminous Matter is byproduct of Dark Matter (DM) annihilation (Paper 15).*
- **In 2020:** *WUM predicted in 2013 the values of cosmological parameters G , n_p , Ω_p , E_{ph} (Gravitational, Concentration of protons in the Medium, Relative energy density of protons, Minimum energy of photons) that were confirmed experimentally in 2015 – 2018 (Paper 17).*

WUM does not attempt to explain all available cosmological data, as that is an impossible feat for any one manuscript. Nor does WUM pretend to have built an all-encompassing theory that can be accepted as is. The Model needs significant further elaboration, but in its present shape, it can already serve as a basis for a new Physics proposed by Paul Dirac in 1937. The Model should be developed into the well-elaborated theory by all physical community (Paper 16).

Collected Works

1. [World-Universe Model](#)
2. [Fundamental Parameter Q. Recommended Values of the Newtonian Parameter of Gravitation, Hubble's Parameter, Age of the World, and Temperature of the Microwave Background Radiation](#)
3. [5D World-Universe Model Space-Time-Energy](#)
4. [5D World-Universe Model. Multicomponent Dark Matter](#)
5. [5D World-Universe Model. Neutrinos. The World](#)
6. [5D World-Universe Model. Gravitation](#)
7. [Overview of Hypersphere World-Universe Model](#)
8. [Burst Astrophysics](#)
9. [Mathematical Overview of Hypersphere World-Universe Model](#)
10. [Astrophysics: Macroobject Shell Model](#)
11. [Analysis of Maxwell's Equations. Cosmic Magnetism](#)
12. [Hypersphere World-Universe Model. Tribute to Classical Physics](#)
13. [Solar System. Angular Momentum. New Physics](#)
14. [High-Energy Atmospheric Physics: Ball Lightning](#)
15. [Dark Matter Cosmology and Astrophysics](#)
16. [World-Universe Model—Alternative to Big Bang Model](#)
17. [World-Universe Model Predictions](#)
18. [World-Universe Model. Self-Consistency of Fundamental Physical Constants](#)

Acknowledgements

I am a Doctor of Sciences in Physics. I belong to the school of physicists established by Alexander Prokhorov–Nobel Prize Laureate in Physics. I am Laser Physicist by education, having published over 150 papers in the field of “Interaction of Laser Radiation with Matter”. I’m eternally grateful to Prof. A. M. Prokhorov and Prof. A. A. Manenkov, whose influence on my scientific life has been decisive.

18 years ago, I’ve developed an interest in Cosmology. I have been elaborating a model I dubbed the World-Universe Model, and published a series of papers in the [Journal of High Energy Physics, Gravitation and Cosmology](#) (JHEPGC). I am much obliged to Prof. C. Corda for publishing my manuscripts in JHEPGC. I am grateful to anonymous referees for valuable comments and important remarks that led to an overall improvement of the manuscripts.

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