An alternative to the Empirical Physics of Motion and Gravity in Explaining the Big Bang

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# ABSTRACT

This paper is based on a proposition concerning the origins of the universe that would not hold without the following principles: (1) the big bang did not emerge from nothing, without a primordial cause; (2) the unempirical nature of Isaac Newton’s laws of inertia are unempirical lead to the conclusion that motion is inherent in the universe (3) gravity is a function of celestial objects falling and rotating around other objects as their natural motion gets obstructed; (4) Albert Einstein’s curvature of spacetime is not uniform. It follows that the massive cosmic explosion from the singularity event neither started spacetime, nor did it generate matter from nothing. The Spatial Discs Model (SDM) proposed here argues that all matter in our universe is finite, unstationary, and contained within interconnected spatial discs, that transfer the totality of the matter they contain to one other in a sequential manner. Hence, big bang explosions. Finally, because the nature of spatial discs is discrete and flexible, the universe will not expand forever.

## Author Keywords

Big Bang Theory; Inertia; Gravitation; Spacetime curvature.

# INTRODUCTION

The Big Bang Theory, frequently used by cosmologists who seek to answer the question where everything surrounding us came from, explains the origins of the universe with a massive cosmic explosion, which took place 13.7 million years ago (Leake, 2006). This theory has its shortcomings, as it neither accounts for what happened before the initial cosmic explosion, nor what caused it (Edwards, 2001). Was there space prior to the explosion? Did time exist inside the extremely hot, dense, and subatomic fireball referred to as the singularity event? The unsatisfying answer is that classical physics laws, as well as spacetime, break down at the level of the singularity event (Hawking, 2011). Another theory that explains the origin of the universe, the Cyclic Model of the Universe, portends that “the universe undergoes an endless sequence of cosmic epochs that begin with a ‘bang’ and end in a ‘crunch’” (Steinhardt & Turok, 2002). This theory is also unconvincing, since the cyclic retraction of matter in the universe -reaching a size less than an atom’s nucleus- does not conform to the laws of classical mechanics, especially causation. What is lacking is a sound cosmological theory of the universe that includes a natural cause to justify the origins of cosmic matter and its ongoing expansion. The Spatial Discs Model (SDM) fills this gap. For the universe to retract, there must have been an outside pulling force, which will be argued for through the sequential pumping of matter between spatial discs. But before we make any forays into the Big Bang Theory, let’s start by revising classical mechanics, modern formulations of spacetime, and then go back in time to explain what really happened prior to the big bang.

# Related work

## History of the Origins of the Universe

*The Big Bang Fallacy*

The Big Bang Theory does not conform to cause-and-effect relations, especially the observable law of nature that every action must have an agent (Bracken, 2013). Historically, cosmologists have advanced questionable theories to explain the big bang, ranging from cosmic inflation to explain the flatness of the universe, the infinite expansion of galaxies, the future collapse of the universe when all its energy is burned up, to the far-out idea that the universe started without a cause (Greene, 2004; Smith, 1988). The singularity event stands in stark contrast to the Newtonian laws of inertia, as all matter suddenly emerges from a point with zero volume (Woolfson, 2012, p.66). As Leon Lederman (1993) sarcastically puts it, “In the very beginning, there was a void—a curious form of vacuum—a nothingness containing no space, no time, no matter, no light, no sound” (p.1). In other words, spacetime, energy, matter, and the totality of natural forces that govern the whole universe, all sprang from a subatomic point, with zero energy (Das, 2017). Not only does this proposition contain irregularities, but the fact that the totality of celestial elements emerged from almost nothing weakens the core of the Big Bang Theory.

*The Cyclic Model of the Universe*

The Cyclic Model of the Universe argues that the end of universe expansion will be followed by another retraction, leading to a new explosion, and so on, in an endless cyclic cosmic process (Steinhardt & Turok, 2002). Neither a gravitational pull from the center of the universe nor a pushing force from outside the cosmos are provided to justify the cycle of these big bangs. The truth is that matter did not emerge from a subatomic fireball, neither did the big bang arise from nothing. Contrary to the idea that space originated with the big bang and had no existence before it, the Spatial Discs Model (SDM) argues that space has always been there, in the form of adjacent spatial discs. Because the heterogeneous spatial discs are changeless in nature, they are infinite and predate matter. In fact, matter is sequentially passed down from one special disc to another, creating explosions at each spatial disc. In other words, the cosmic explosion advanced by the Big Bang Theory simply took place when matter was pumped from one spatial disc to another. Before we delve into the geometry of these spatial discs, the nature of matter itself, as well as its motion, must be reformulated.

## Theories of Motion in the Cosmos

## *Newton’s Law of Inertia and Empiricism*

Classical mechanics was founded on Newtonian assumptions about space that are metaphysical in nature (Barbour & Pfister, 1995). While considering space to be absolute, Isaac Newton proclaimed that “An object at rest remains at rest, and an object in motion remains in motion at constant speed and in a straight line unless acted on by an unbalanced force” (Isaac, 1686). In the way it was formulated, Newton’s first law of motion cannot be empirically testable. To empirically determine whether matter possesses its own inherent motion or space is the one that moves matter through its continuous expansion, an object of a certain mass must be placed outside absolute space, where zero forces exist. This only can enable an empirical testing of matter’s accurate motion or rest. As Ryan Samaroo (2019) portends, “there are no truly force-free bodies: inertial motion is an ideal state and we have no “impressions”. It follows that the Newtonian conjecture that matter can be at rest has no empirical evidence to support it and is not based on scientific experimentation. One of the fiercest critics of Newton’s laws of motion, Ernst Mach (1879), summarized his criticism of inertia by saying that no one can “distinguish between relative and absolute motions by experience” (Barbour & Pfister, 1995, p.60). Considering the observable expansion of the universe, matter can never be at rest within a cosmic space that is in constant move. Although an object might appear to be at rest, the space within which it exists is in constant motion. Furthermore, Newton’s law of inertia decrees that “a body stays in motion, or stopped, unless something pushes it” (Clegg, 2009, p.26). Without placing matter outside space, Newton failed to verify the accuracy of this hypothesis through scientific observation. To validate the law of inertia, Newton relied on metaphysical interpretations, wounding up instead arguing that space is absolute (Green, 2004, p.8). Newton’s conceptualization of space as absolute discouraged any investigation into the nature of motion. Since it is impossible to send matter outside absolute space to test its nature and determine whether it moves on its own, or because of an external force such as expanding space, the logical conclusion is that all matter is inherently in motion. This deduction overturns Newton’s law of inertia and leaves room for Einstein’s curvature of spacetime, which cannot take place without movement of mass within space.

## *Einstein’s Curvature of Spacetime and Gravitation*

Newton’s law of inertia prepared the floor for a better understanding of gravitation (Barbour & Pfister, 1995). Basing his theorizing of the principle of gravity on Newtonian law of inertia, Albert Einstein (1967) stated that “A material particle upon which no force acts moves, according to the principle of inertia, uniformly in a straight line” (p.76). While making energy and mass the agents behind the gravitational field, Einstein described the role played in gravity by space as undifferentiated. The argument that gravity is a function of the warping of spacetime, as Einstein calculated, can be disputed. To explain gravitation, Einstein himself moved away from the classical view that between all objects there exists a static force called gravity. Motion inherent in all objects provides an alternative theorization of gravity. Indeed, moving objects get obstructed on their natural motion due to the orderly organizational shape of space. The explanation of why celestial objects fall towards surfaces or orbit around other objects can be explained with the inherent design of space. All kinds of matter have motion, whether be it an atom, an electron, a neutron, a proton, a planet, or a galaxy. At the subatomic level, moving protons get stuck to each other when they collide, not because of gravity, but because they were all naturally moving in empty space. Every congregation of colliding protons, when it reaches a certain mass, as controlled by the shape of subatomic space, its joined energy creates a circular surface around itself, which starts repelling any upcoming electrons. Obstructed in their forward motion, electrons start orbiting around the protons’ circular orbits. This takes place mechanically as a function of subatomic spatial structure. We observe this at the cosmic scale, too. In the scenario that earth is released from its orbit, it will continue its forward motion, until it hits a repelling orbit of a bigger celestial object and wound-up rotating around its orbital surface, so long as the object is there. It is the geometrical structure of space that causes objects to rotate; thus, generating the gravitational field theorized by Albert Einstein.

Whether as a function of the gravitational field, or a result of the movement of energy that warps spacetime, it is undeniable that Einstein’s law of gravity overturned classical physics (Hawking, 2011). Yet Einstein stopped short of applying his renowned relativity to the curvature of spacetime. To stop at his equations about the gravitational field as he left them, means to take it for granted that the warping of spacetime by objects of mass is uniform. Far from it, the curvature of spacetime varies depending on surrounding conditions and is itself relative. The inference that moving matter is the sole agent that warps spacetime is insufficient. Contrary to the passive role ascribed to the internal structure of space in Einstein’s calculations of gravitation, the composition of space informs the way spacetime is warped. First, the amount of the curvature of spacetime depends on the constitutive parts of matter involved. Two planets with the same mass and energy will warp spacetime differently. The difference emanates from the fact that each planet has distinctive combinations of atoms and molecules, shaping the way spacetime is warped around each one of them. So, to calculate the amount of spacetime curvature around each planet, their atomic and molecular compositions should be accounted for:

**(Atomic)⋅(Molecular) = K (Amount of curvature)**

**(Mass)**

Second, space with its distinctive composition determines the amount of spacetime curvature. If we take for granted that the two planets have the same atomic and molecular composition, the curvature of spacetime around them will vary depending on the composition of the space they are in. The planet that moves in a space whose composition is 60% antimatter, 10% void, and 30% dark matter will yield a different curvature of spacetime from the planet that moves in a space whose composition is 30% antimatter, 10% void, and 60% dark matter. This relativistic curvature of spacetime is a function of the composition of space. To calculate the amount of curvature, the composition of space should be accounted for:

**(Dark energy)⋅(Anti-matter) = K (Amount of curvature)**

**(Spatial void)**

It has been proved that the gravitational field is a function of spacetime curvature as Einstein claimed (1967). This leaves us with the conclusion that space predated the big bang. As all matter is a floater by nature, when objects of mass move through space, they warp spacetime, Einstein reasoned. There are, however, conditions that render this curvature of spacetime more relativistic in nature, depending on the composition of both space and matter.

# Discussion

## Spatial Discs Model (SDM)

*The Big Bang and the Nature of Space*

According to Big Bang Theory, the universe is a homogenous body, encompassing space, time, energy, and varying types of matter, which all emerged from a singularity event (Hawking, 2011). “This theory of nothing suddenly creating everything is perhaps the most surprisingly accepted theory within the scientific community” (Cunningham, 2012, p. 17). Albert Einstein’s theory of general relativity added up to the mix by unifying space and time, telling us much less about how spacetime operated within the singularity event (Gasperini, 2008). The Spatial Discs Model (SDM) argues that the cause behind the big bang is to be found in the geometry of space. Contrary to the argument that space emerged with the big bang, the SDM claims that space has always been there. Space is discrete, malleable, and has infinitely existed in the form of spatial pumping discs, interconnected with each other. When two spatial discs converge, with one of them retracting, matter is automatically transported between them via a connecting channel in their nuclei. This triggers cosmic explosions. Interconnected as they are, the discrete spatial discs feed each other, sequentially causing cosmic explosions of energy, like the one that produced our universe.

To cosmologists who attempt to explain the origins of the universe, space has always been a singular entity, appearing to go on and on, in a stretched continuum (Edwards, 2001). According to SDM, space has never constituted a homogenous, static continuum. Far from being singular, space exists in the form of spatial discs, each with its corresponding spherical boundary. One of such spatial discs encloses our universe and the totality of its energy. If you shoot a photon across space, it will not go on forever, but will eventually hit the boundary of our universe’s spatial disc. If you step outside such a spatial disc, it will appear circular in shape. Circularity of cosmic vessels is reflected in the circularity of their content, including celestial objects, planets, atomic cells, and quarks.

*Geometry of Spatial Discs*

The circular shape of planets, cells, atoms, and other subatomic elements follows the grand structuring design of spatial discs. The Spatial Discs Model argues that all energy and matter in the universe is contained within circular spatial discs. When matter reaches the edge of a spatial disc, the latter reaches its density limit, retracts, and pushes back matter towards its center. Every spatial disc has a nucleus that connects it with another spatial disc. In sync with each other, spatial discs possess coherence and unity. Each spatial disc has a distinctive composition. There is an infinite number of spatial discs, tightly packed together, forming the infinite universe. There is no void between spatial discs, but more dark energy, which explains their sequential expansion and retraction (Corda, 2007). In fact, all spatial discs are linked with each other through connecting channels. Because these spatial channels have no mass at all, it is nearly impossible to detect matter when it passes through them. That is why cosmologists, when they fail to detect dark matter when calculating the expansion of the universe, contend with calling the event the singularity (Leake, 2006). According to the SDM, dark matter, anti-matter, and energy get sequentially transferred from a retracting spatial disc to another spatial disc which is not retracing. While the totality of matter travels across a linking channel, with more than the speed of light, a massive energy is formed. After being injected into the adjacent spatial disc, this energy explodes, creating what cosmologists explain as a big bang. There are as many simultaneous big bangs as there are interconnected spatial discs. Cosmic matter is constantly dragged by the expansion of spatial discs. Time starts with each explosion of matter within a spatial disc, which makes its temporality more relative.

Furthermore, according to SDM, the geometry of cosmic space is all encompassing of all possible kinds of energy. On a more intergalactic scale, spatial discs have more dimensions than supersymmetry. Because it joins the quantum with cosmic scale, the SDM provides a unified theory of the origins of the universe. At the subatomic level, the vibrating strings described by String Theory (1987) merge with spatial vibrating waves to synchronically form bigger entities, reaching the size of celestial objects. The quantum structure of spatial waves is subject to entanglement with synchronized atomic vibrating strings. The combination determines the shapes of cosmic bodies and their counterparts in the quantum realm.

*Expansion of the Universe According to the SDM*

Historically, cosmologists have measured the expansion rate of the universe by focusing on its content, meaning its expanding matter. Edwin Hubble’s observation that “the further away these galaxies appeared to be…..the faster they were receding” (Elvidge, 2007, p.46) proved the validity of the expanding universe argument. The existence of dark energy corroborates the expansion of the universe (Corda, 2007), as redshifts of supernovae are being measured in alignment with general relativity. To calculate the expansion of the universe, the SDM focuses rather on space, and not its content. According to the model, dissociating space from its energy enables the accurate measurement of the universe’s expansion rate. Each spatial disc, host to its own energy, had its unique big bang. It follows that each spatial disc also has its own cosmic microwave background. Spatial discs inflate and deflate with constant speed. When it reaches its limit density, a spatial disc starts retracting, pushing back matter towards its center. The expansion rate of the universe can be accurately measured through the rate of retraction of binary spatial discs. This leads to the conclusion that the speed of expansion of the universe varies according to each spatial disc, and the stage of its retraction. It follows that space will not expand forever. When the density of a spatial disc is taken to its limit, matter is transferred to another spatial disc, by the medium of a spatial channel. Calculating the speed of the universe (p) depends on the retraction speed of spatial discs, not the expansion of matter.

## Conclusion

Everything we see around us emerged from nothing, from a singularity, constitutes the core argument behind the Big Bang Theory. As Michael M. Woolfson (2012) puts it, “at some time in the past all the energy in the Universe was concentrated at a point, a point with no volume that scientists refer to as a singularity” (p.66). Cosmologists who uphold the big bang rationale fail to answer the simple question, what preceded the cosmic explosion? They only contend to conclude that at the level of the singularity event all the laws of physics break down (Edwards, 2001). That an entire universe came into existence since the explosion took place, including the totality of cosmic matter, can be hard to absorb using classical lenses of experimentation (Hawking, 2011). The Spatial Discs Model argues that the big bang was caused by the sequential retraction of a spatial disc. It follows that space did not originate with the big bang. Neither can space be used to calculate the expansion of the universe. By focusing on form rather than content, the SDM illuminates the origins of our universe.

# References

1. Bracken, J., A. (2013). Actions and Agents: Natural and Supernatural Reconsidered. *Zygon, 48*(4), 1001–1013.

<https://doi.org/10.1111/zygo.12051>

1. Barbour J. B. & Pfister H. (1995). Mach's principle: from newton's bucket to quantum gravity. Birkhauser.
2. Clegg, B., (2009). Before the Big Bang: The Prehistory of Our Universe

https://books.google.com › books

1. Corda, C. (2008). An oscillating Universe from the linearized R 2 theory of gravity. General Relativity and Gravitation, 40(10), 2201–2212. <https://doi.org/10.1007/s10714-008-0627-3>
2. Einstein, A. (1967). The meaning of relativity (1st ed. 1922.). Chapman and Hall. <https://doi.org/10.1007/978-94-011-6022-3>
3. Edwards, R., B. (2001). What caused the big bang? BRILL.
4. Elvidge, J. (2007). The Universe--solved!. (n.p.): Alternative Theories Press.
5. Gross, D.J. (1987). An Introduction to String Theory. In: Ferbel, T. (eds) Techniques and Concepts of High-Energy Physics IV. NATO ASI Series, vol 164. Springer, Boston, MA. https://doi.org/10.1007/978-1-4684-5401-7\_2
6. Hawking, S. (2011). A brief history of time. Bantam Books.
7. Greene, B. (2004). The fabric of the cosmos : space, time, and the texture of reality. A.A. Knopf.
8. Gasperini, M. (2008). The Universe Before the Big Bang: Cosmology and String Theory (1. Aufl.). Springer-Verlag.
9. Jason Cunningham, S. (2012). Approaching Singularity: The Genesis of Creation. (n.p.): Reinhardt & Still Publishers.
10. Lederman, L., & Teresi, D. (1993). The God particle : if the universe is the answer, what is the question? Houghton Mifflin.
11. Newton, I. (1726 [1999]). The Principia: Mathematical Principles of Natural Philosophy, transl. I. B. Cohen and A. Whitman. Berkeley and Los Angeles: University of California Press.
12. Newton, I. (2016). The Principia: The Authoritative Translation and Guide: Mathematical Principles of Natural Philosophy. Berkeley: University of California Press. <https://doi-org.libproxy.umflint.edu/10.1525/9780520964815>
13. Smith, Q. (1988). The Uncaused Beginning of the Universe. Philosophy of Science, 55(1), 39-57. doi:10.1086/289415
14. Steinhardt, P., J. & Turok, N. (2002). A Cyclic Model of the Universe. Science (American Association for the Advancement of Science), 296(5572), 1436–1439. <https://doi.org/10.1126/science.1070462>
15. Samaroo, R. (2019). Newtonian Mechanics and its Philosophical Significance.

http://philsci-archive.pitt.edu/id/eprint/16521 (accessed 2022-09-02).

1. Woolfson, M., M. (2012). Time, space, stars and man: the story of the big bang (2nd ed.). Imperial College Press. <https://doi.org/10.1142/p863#t=toc>