What Was Before Universe

Abstract

Before multiverse and physical things, only mathematical Ideas can exist. Mathematical Ideas include all mathematical objects and operations. Specific abstract space Ideas, corresponding exactly with specific hypercomplex-number-array Ideas, have physical-thing characteristics and so began physical things and multiverse.

Keywords

What Was Before Universe

The universe began 13.72 billion years ago. What existed before multiverse and physical things?

Multiverse

Outside of universe {non-universe} is multiverse. Multiverse space-time contains all universes that were, are, or will be, over all time. Multiverse space is infinite. Multiverse-space local regions have all possible dimensions. Multiverse space-time local regions have all possible physical laws and constants.

There is only one multiverse, because multiverse includes all physical things. Outside of multiverse is nothingness and void.

Universe Beginning

Universe began at a point in multiverse space-time, as the "Big Bang".

The Non-Physical

Before physical things, only the non-physical (non-spatial, non-temporal, and non-energetic) can exist. The non-physical has no beginning or end because it exists outside of time. Because it is not temporal, the non-physical cannot be before or after multiverse. The non-physical has no location or extension because it exists outside of space. Because it is not spatial, the non-physical cannot be outside or inside multiverse.

The non-physical has no substances, structures, properties, states, or processes. The non-physical has no space, time, mass, force, field, energy, or quanta. The non-physical has no boundaries, phases, or gradients. The non-physical has no changes, movements, translations, vibrations, rotations, flows, or waves. The non-physical has no entropy, because it has no parts, forces, or spatial volume. The non-physical has no information, because it has no code and no channels. The non-physical has no causes, effects, or physical laws.

The non-physical has nothing physical and so has only one type and is homogeneous. The non-physical has no time and so has only one unchanging state. The non-physical has neither parts nor relations and so has unity.

Possible Non-Physical Things

Universe empty space has virtual particles. Perhaps, non-physical things are abstract particles or quanta.

Universe empty space has weak-force Higgs field. Perhaps, non-physical things are abstract fields or forces.

Universe empty space has quantum-mechanical waves. Perhaps, non-physical things are abstract waves or perturbations.

Universe empty space has space-time. Perhaps, non-physical things are abstract space and time.

Universe empty space has entropy, negentropy, information, order, and pattern. Perhaps, non-physical things are abstract patterns.

Non-physical things can be non-spatial, non-temporal, and non-energetic substances, structures, properties, states, or processes.

Ideas

Plato's Parmenides [Plato, -370] describes non-physical things: the Ideas or Forms. The Ideas are unified wholes that do not move, do not change, have no cause, have no possibilities, and have no purposes. The Ideas are immaterial, indivisible, a priori, perfect, absolute, unqualified, independent, eternal, necessary, and sufficient. The Ideas are abstract and never have concrete symbols or representations.

Before multiverse, there is nothing physical, so Ideas like Chair-ness or Tree-ness cannot exist. Before multiverse, there is nothing mental, so Ideas like Goodness, Beauty, or Truth cannot exist.

Mathematical Ideas

Mathematical things are not physical, because they have no location, exist before time, never end, and have non-contingent truth. Mathematical things are abstract, non-physical, non-spatial, non-temporal, and non-energetic. Mathematical things are not mental, because they exist before brain or thought (and thoughts, language, and pictorial images require space and time).

Mathematical Ideas have reality [Penrose, 2004]. They are not abstractions or concepts that people derive from perception, language, logic, or thought. However, because Ideas can be both mental categories and object essences, people can discover or intuit mathematical Ideas [Brouwer, 1927].

Before multiverse and physical things, only mathematical Ideas can exist, so non-physical things can only be mathematical things. Mathematical things can be substances, structures, properties, states, or processes.

Number Ideas

Number Ideas are about quantities and their relations. The number Idea "zero" is like nothingness and the empty set. The number Idea "one" is like one information bit, one empty set, or one number Idea zero. Number Ideas include integers, real numbers, imaginary numbers, and complex numbers. (Using only the number Ideas "zero" and "one", abstract Gödel numbering can represent any abstract number.)

Set Ideas

Set Ideas are about non-dimensional grouping relations of abstract elements. The set Idea "empty set" has no elements with no groupings. The set Idea "universal set" has all elements with all groupings. Set Ideas include set groupings (sets of sets).

Set Ideas relate to number Ideas, because numbers can represent any element, grouping, and number of set elements.

Geometric-Figure Ideas

Geometric-figure Ideas are about dimensional grouping relations of abstract elements. The geometric-figure Idea "point" is a zero-dimensional unit element, with no relations. The geometric-figure Idea "line" is a one-dimensional connected-point grouping. The geometric-

figure Idea "space" is a multi-dimensional many-point grouping. Geometric-figure Ideas include all geometric-figure-combination Ideas and topological Ideas. Because both are about groupings, geometric-figure Ideas relate to set Ideas. Geometric-figure Ideas relate to number Ideas, because numbers can describe points, groupings, and number of points.

Mathematical-Operation Ideas

Mathematical-operation Ideas are about relations of abstract mathematical objects. Mathematical-operation Ideas can be unary, binary, ternary, and so on. The mathematical-operation Idea "addition" groups two number Ideas into one number Idea. The mathematical-operation Idea "union" groups two set Ideas into one set Idea. The mathematical-operation Idea "translation" relates a geometric-figure Idea to the geometric-figure Idea "space". The mathematical-operation logic Idea "and" relates two Ideas to one Idea. Mathematical-operation Ideas include mathematical-group Ideas.

Number-Array Ideas

Number-array Ideas combine number, set, geometric-figure, and mathematical-operation Ideas. Number arrays are about element relations along (non-spatial) orthogonal or dependent dimensions. Numbers represent array elements. Sets group rows and columns. Geometric figures describe square and other-shape arrays. Mathematical operations make ordered rows, columns, depths, and so on. Number-array Ideas include hypercomplex-number-array Ideas.

Abstract-Space Ideas

Abstract-space Ideas combine number, set, geometric-figure, and mathematical-operation Ideas. Abstract spaces are about elements and their relations along dimensions. Dimensions are non-spatial, continuous or discrete, orthogonal or non-orthogonal, independent or dependent, and finite or infinite. Numbers represent space points. Sets group points into lines, areas, and other geometric figures. Mathematical operations translate, rotate, vibrate, and transition points and geometric figures.

Number-Array Ideas and Abstract-Space Ideas

Both abstract spaces and number arrays combine numbers, sets, geometric figures, and mathematical operations. Abstract spaces and number arrays have elements and element relations. Abstract spaces and number arrays have dimensions. Abstract spaces and number arrays have topological features, such as warps, holes, or tears, or crystal-like flaws, insertions, omissions, translations, and rotations. Abstract spaces and number arrays have element, set, geometric-figure, topological, and operational changes. Specific number arrays correspond exactly with specific abstract spaces.

What Was before Multiverse and Physical Things

Before multiverse and physical things, only mathematical Ideas can exist. Mathematical Ideas include all mathematical objects and operations.

Specific abstract space Ideas, corresponding exactly with specific hypercomplex-number-array Ideas, have physical-thing characteristics and so began physical things and multiverse.

Bibliography

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