Our Universe

By J.A.J. van Leunen, a retired physicist

April 2, 2022

Abstract
The essence of our universe will intrigue many. It seems almost impossible to fathom this creature. Nevertheless, it manages to get a grip on it.

1 *The essence of our universe*

Simple space is a container. A location is a point-like representation of a position. Our universe is an ongoing show of possible coverages of the simple space with locations. People cannot reason or communicate about topics without giving these topics an identification and a concise description. Reasoning about the coverage of the simple space by locations requires the identification of these point-like positions. This can be achieved with coordinate markers identified with numbers. Numbers can be positioned in the form of a coordinate marker by attaching the value of the number to the coordinate marker. The arithmetic of the number system links the value to the position. The problem with this procedure is that arithmetic does not regulate all freedom of choice. Another problem is that there are different number systems, each of which has its own arithmetic. For example, there are real numbers that together cover one dimension of space and there are spatial numbers. Spatial numbers are often called imaginary numbers. They exist in one- and three-dimensional coverage of space. Real numbers and spatial numbers can be mixed into two-dimensional complex numbers and four-dimensional quaternionic number systems. The one-dimensional real numbers, the two-dimensional complex numbers, and the four-dimensional quaternions are the only associative division rings that exist. A division ring exists in many versions that distinguish between the coordinate system that establishes the freedom of selection that arithmetic does not settle. The remaining geometric choices lie on the axes of the coordinate system.

2 Vector space

The simple space can also be covered by vectors. A vector consists of a base point and a pointer. These points are connected by a directional line. A scalar represents the length of the vector. Shifting a vector parallel to the direction line does not change the integrity of the vector. Vectors obey simple arithmetic, which allows them to reach any position in simple space. Vectors can be used to generate number systems.

3 Hilbert space

Paul Dirac designed a bra-ket combination that turns the vector space into a separable Hilbert space. The bra-ket combination uses a version of an associative division ring. Separable Hilbert spaces can archive countable subsets of a selected version of a division ring. The entire selected version of the division ring forms the private parameter space of the Hilbert space and turns the Hilbert space into a function space.

4 System

A system of separable Hilbert spaces that all apply the same underlying vector space can archive all possible coverages of that vector space with locations. The system only allows division rings that have the axes of their coordinate systems in parallel. This makes it possible to determine differences between geometric symmetry. This limitation reduces the separable Hilbert systems to a small number of types that differ in the symmetry of the chosen version of the division ring. One of the vectors from the underlying vector space is the status vector of the separable Hilbert space. The path of the state vector in the parameter space is stored by the Hilbert space as an ongoing string of quaternions. This path regularly generates a swarm of landing locations. This swarm is described by a stable location density distribution.

5 Background

One of the separable Hilbert spaces acts as a background platform. Differences in symmetry with this background platform cause symmetry-related charges that are located in the geometric centers of the floating platforms. The floating platforms act as elementary modules that can generate conglomerates.

5.1 Screen

The background platform possesses a unique non-separable Hilbert space that encloses its separable partner. The non-separable Hilbert space can archive both discrete sets and continuums. In continuums, all converging series of locations end in a limit that is a member of the continuum. That makes the continuum changeable. Differential calculus acts as the arithmetic of changes of continuums. If the continuum is not disturbed, it does not change. If the continuum is disturbed, it tends to restore its undisturbed state. The embedding of numbers that break the symmetry can disrupt the continuum. This can happen when certain content from floating platforms becomes embedded in the background platform. That content concerns the locations in the path of the status vector of the floating platform. Embedding in a continuum can be interpreted as an imaging process. The symmetry-related charges manifest as sources or wells of symmetry-related fields.

6 Standard Model

The mentioned location density distribution is equal to the square of the modulus of what physicists would call the wave function of the floating platform. The density distribution has a spatial spectrum and can therefore be seen as a wave package. The collection of floating platforms is very similar to the Standard Model of fermions, which is part of the Standard Model that experimental particle physicists maintain.

Details of this story are elaborated in "Advanced Hilbert space technology"; in https://vixra.org/author/j_a_j_van_leunen