Physical Creation Story

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Summary

The fundamental consideration of physical reality quickly leads to a story of creation, in which the whole course of creation of what occurs in the universe is told.

1 Introduction

This story is not about religion. It concerns the creation of the universe.

The universe is a field in which we live. The field can be deformed by the embedding of massive objects and is a carrier of radiation, of which a part can be observed with the naked eye.

The physical reality is represented by this field and what happens in this field.

What appears in this field is at the time of creation stored in an abstract storage medium. This storage medium is here called the Hilbert Book Model. The HBM consists of a large number of separate books that each describe the history of an elementary particle and a background platform that archives the history of the universe in another way. Each part of the model describes the genesis, the past, the present and the future of the described subject. The present is a window that runs across all the books.

2 Creation

This historiography gives the opportunity to speak about a story of creation. In fact, the model itself is the creator of the situation.

Elementary particles are described in a mathematical storage medium known as a quaternionic separable Hilbert space. A Hilbert space is a special vector space that provides an inner product for each pair of vectors. Quaternions are arithmetic numbers composed of a scalar and a three-dimensional vector. Therefore, they are ideally suited as a storage bin for a time stamp and a three-dimensional location. The quaternions give the number value to the inner product of the corresponding vector pair. The separable Hilbert space contains operators that describe the map of the Hilbert space onto itself and can store rational quaternions into storage bins that are attached to Hilbert vectors. The numbers are called eigenvalues, and the corresponding vectors are called eigenvectors. Together, the eigenvalues form the eigenspace of the operator.

Quaternionic number systems exist in many versions that differ in the way that Cartesian and polar coordinate systems rank their members. Each quaternionic separable Hilbert space chooses its own version of the number system and maintains that choice in the eigenspace of a special reference operator. In this way, the Hilbert space owns a private parameter space. The private separable Hilbert spaces of elementary particles hover with the geometric center of their parameter space over the parameter space of the background platform. By using this parameter space and a set of continuous quaternionic functions, a series of newly defined operators can be specified. The new defined operator reuses the eigenvectors of the reference operator and replaces the corresponding eigenvalue by the target value of the selected function by using the original eigenvalue as the parameter value. This newly defined operator contains in its eigenspace a field that is defined by the function. The field is a continuum. The eigenspaces of the operators are countable. Thus, the eigenspace of the new operator contains the sampled values of the field. In fact, the private parameter space is also a sampled continuum. The eigenspace of the reference operator contains only the rational elements of the selected version of the number system.

Nothing prevents all applied separable Hilbert spaces from sharing the same underlying vector space. We assume that the background platform is a quaternionic separable Hilbert space which contains infinitely many dimensions. This possesses a unique non-separable partner Hilbert space that supports operators, which possess continuous eigenspaces. These eigenspaces are therefore complete fields. Such eigenspaces are not countable. One of these operators owns an eigenspace that contains the field, which represents the universe. This field is deformed by the embedding of the hop landings of the elementary particles. The locations of the hop landings are stored in the eigenspace of the footprint operator in the private Hilbert space of the corresponding elementary particle. After sorting the timestamps, the footprint operator's eigenspace describes the entire lifecycle of the elementary particle as one continued hopping path. That hopping path recurrently generates a swarm of hop landing locations. A location density distribution describes the swarm. Because the particle is point-shaped, this is a detection probability density distribution. This is equal to the square of the modulus of the what physicists call the wavefunction of the elementary particle. The hop landing location swarm represents the particle.

3 Dynamics

At the time of the creation, the creator let a private stochastic process determine the hop landing locations of each elementary particle. This process is a combination of a Poisson process and a binomial process. A point spread function controls the binomial process. The stochastic process possesses a characteristic function that causes the production of a coherent swarm. It is the Fourier transform (the spatial spectrum) of the detection probability density distribution. As a result, the point spread function is equal to the location density distribution of the produced swarm. This design ensures that when the characteristic function becomes wider, the point spread function becomes narrower. In this way, the creator gives his creatures the impression that he does not determine the hopping path. He leaves some freedom to the objects that are formed by the elementary particles. However, in the beginning, the entire lifecycle of all elementary particles is already archived in their private storage medium. After that archival, nothing changes in this storage medium. The archive can only be read. Since the timestamps are stored together with the locations, the corresponding Hilbert book contains the entire life history of the elementary particle.

The version of the quaternionic number that the private Hilbert space of the elementary particle selects determines the symmetry of the private Hilbert space and of the elementary particle. This is characterized by an electric charge that houses in the geometric center of the particle platform's parameter space. The axes of all Cartesian coordinate systems must be parallel or perpendicular to each other. The geometric center may differ and may even move. Only the ranking along the axles may differ in direction. The electrical charge turns out to be a consequence of the difference between the symmetry of the gliding platform and the symmetry of the background platform. Because only a small number of versions of the quaternionic number are allowed, there exist very few different electrical charges. As a result, electrical charges can occur in the proportions -3,-2,-1, 0, 1, 2, and 3.

The separable Hilbert space of the background platform is naturally embedded in the non-separable Hilbert space. This is because both Hilbert spaces have the same symmetry. The embedding does not cause any disruption of symmetry. This does not apply to the embedding of the footprints of the elementary particles, because their Hilbert spaces possess a deviating symmetry. When embedding, only isotropic disturbances of the symmetry can cause an isotropic disturbance. Such a disturbance may temporarily deform the embedding field.

The swarm of hop landing locations can generate a swarm of spherical pulse responses. Only an isotropic pulse causes a spherical shock front. This shock front integrates over time into the Green's function of the field. This function has volume, and the pulse response injects this volume into the field. The shock front then spreads this volume over the field. As a result, the initial deformation of the field is rapidly flowing away. The stochastic process must continue to deliver new pulses to achieve a significant and permanent deformation. To get an impression of the deformation we have to convolute the location density distribution of the hop landing location swarm with the Green's function of the field. Convolution blurs the image of the swarm. This does not give a correct picture, because the overlap of the spherical shock fronts depends on the spatial density of the swarm and on the time that the shock fronts need to overlap sufficiently. Far from the geometrical center of the swarm, the deformation is similar to the shape of the Green's function. The two functions still differ in a factor. This factor indicates the strength of the deformation. The factor is proportional to the mass of the particle. In fact, this is the method by which the scholars determine the mass of an object.

4 Modularity

Elementary particles behave as elementary modules. Together they form all the other modules that occur in the universe. Some modules constitute modular systems.

The composite modules and the modular systems are also controlled by a stochastic process. This is a different type of process than the type of process that regulates the footprint of the elementary particle. This second type controls the composition of the object. This type of stochastic process also possesses a characteristic function. This characteristic function is a dynamic superposition of the characteristic functions of the components of the compound object. The superposition coefficients act as displacement generators. They determine the internal positions of the components. The characteristic function connects to an additional displacement generator that regulates the movement of the whole module. This means that the composed module moves as one unit. The binding of the components is reinforced by the deformation of the embedding field and by the attraction of the electrical charges of the elementary particles.

This description shows that superposition takes place in the Fourier space. So what a composite module or modular system determines, is captured in the Fourier space. Locality does not play a role In Fourier space. This sketches the phenomenon that scholars call entanglement. In principle, the binding within a composite module is to a large extent established in the Fourier space. The parts can, therefore, be far apart. For properties of components, for which an exclusion principle applies, this can have remarkable consequences.

All modules act as observers and can perceive phenomena. Elementary particles are very primitive observers. All observers receive their information through the field in which they are embedded. The observed event has a timestamp. For the observer that timestamp locates in the past. As a result, the information is stored in the Euclidean format in the storage medium in a storage bin that contains a timestamp and a three-dimensional location. By the observer, that information is perceived in spacetime coordinates. A hyperbolic Lorentz transformation describes the conversion of the Euclidean storage coordinates into the perceived spacetime coordinates. The hyperbolic Lorentz transformation adds time interval dilatation and length compression. The deformation of the embedding field also deforms the path through which the information is transported. This also influences the transported information.

5 Illusion

At the instant of creation, the creator fills the storage bins of the footprint operators. The contents of this store won't change anymore. The later events in the embedding field also have no influence on the archive. Since the creator uses stochastic processes to fill the footprint storage, intelligent observers will get the impression that they still possess free will. The embedding of the footprints follows step by step the time-stamped locations that were generated by the stochastic processes and were archived in the eigenspace of the footprint operator. The observer should not be fatalistic and think that his behavior does not matter because everything is already determined. The reverse is true. The behavior of each module has consequences because each perceived event affects the observer. This fact affects the future in an almost causal fashion. The stochastic disturbance is relatively small.

6 Cause

The driving force behind the dynamics of the universe is the continual embedding of the hop landing locations of the elementary particles into the field that represents the universe.

It seems as if the continuous deformation of the field seems to come out of nowhere and that the individual deformations then disappear quickly by the flooding away of the inserted volume.

The shock-fronts play an essential role because the spherical fronts spread the volume into the field. The one-dimensional shock fronts also carry extra movement energy. They move the platforms on which elementary particles travel through the universe.

Black holes are special phenomena. They are bordered areas in which volume can only be added by widening the border. No shock front can pass this edge.

The creator is a modular designer and a modular constructor. For his intelligent creatures, this makes an important example. Modular construction is very economical with its resources and provides relatively fast usable and reliable results. This method of working creates its own rules. It makes sense to have a large number and a large variety of suitable modules at hand. It even makes sense to create communities of module types. That then demands to secure the module communities of which one depends properly. This also applies to the community in which one is a member. And it even applies to the whole living environment.

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