The Cross-Dimensional Development of Angularity

1. Introduction

This paper describes the process of cross-dimensional development that is responsible for the closure of the subclassical space found in the model of the Impressionist Theory of Everything (IToE). The mechanism of this process is paradox. Under IToE, paradox is seen to exert a pressure on all locations in the universe and on the universe itself. This results in a cycle that generates both complexity and shape.

1.1 Impressionism

The concept of Impressionism is vital to provide the proper frame of reference for understanding the natural place of paradox in the universe. The Impressionist stance is counterposed to Academism and these two formats are complementary in an absolute sense.

The Impressionist stance is vital to IToE because it mixes elements that are not associative for conclusion under the terms of reference of pure rationalism. This is also the basis of relationship found in fundamental structures present under the model of IToE. An absolute dualism arises at the limit for observation. A common basis of rational properties is not found across the dualism. Impressionism is based on the mixing of properties that cannot be linked directly or literally for the calculative depiction of Nature. Thus, IToE presents an unusual mixing of elements. On one hand, this theory is intended to be definitive, yet on the other, it does not focus on calculative definition.

One of the central themes of IToE is that, for the creation of a final understanding of the nature of the universe (for the universe's largest divisions), calculative rationalism alone cannot answer important questions and must fail in its goal. It is for this reason that the Impressionist perspective is required. The Impressionist stance is inherently narrative in its descriptive form because comparisons are made of noncommon rather than common structures. How dualistic elements are noncommon is inherently beyond the limits of any single academic format of representation. The mechanism across such fundamental structures is the systemic and generic presence of paradox. Only by adoption of this narrative format can the final barriers to understanding the universe be resolved (albeit in qualified terms for rationalism).

Under IToE the mechanism of paradox is responsible for a natural process of development of dimensional complexity. This is a generic process of cycle that is found within all structure and begins from an observationally noncomplex (nonformed) domain referred to as a *null state.* A space of increasing dimensional complexity accumulates and is superposed on previous levels such that all parts of the developing state affect all other parts. The shape of the developing null state does not rely on an outside structure for either its energy or format. Rather, pressure and organization is internally generated and, in fact, outside influence is prohibited.

2. The development of shape within the unit circle

The development of shape refers to the development of <u>angular complexity</u>. This process inherently has a cross-dimensional nature, and it is examined as it applies to the limit of the two dimensional plane. The infinitely symmetrical shape found at this level of dimensional complexity is the unit circle. Under IToE, the unit circle is composed of two absolutely separate and infinitely symmetrical spaces.

Once these structures have evolved across dimensional levels, the overall structure that emerges is the classical unit circle. In this process of development, two separate structures are subsumed into one on a fixed classical plane. The term *fixed plane* in this application means that the two distinct structures have been joined as one, and they no longer display the dimensionally hidden development from which their common and singular domain is formed.

3. Spaces of complex preexisting structure

To the classical observer, the universe is an infinitely complex and preexistent domain. This is the case across the entire range of its evolution through time. The development of the universe is, then, a process of re-distribution of the potential found in the initial condition at the instant of the Big Bang. Under the strict concept of the Big Bang theory, any period that would precede the beginning of the universe is not defined. Some form of vacuum that has its own type of potential to produce the universe must be incorporated to the pre-Big bang period. Thus, the Big Bang theory breaks down in this area, and physicists are forced to consider objects such as virtual particles and virtual universes that are only describable in quantum mechanical terms.

As the universe evolves from its initial condition, the phenomenon of entropy causes a local coalescing of the initial energy potential of the universe, and matter forms. The energy of the universe that was initially evenly distributed is then contained disproportionately in localized structures having mass.

4. The universe as a two-dimensional structure

The Impressionist Theory of Everything (IToE) presents a new theory on the nature of fundamental boundary, the theoretic representations that apply for its description, and the strongly linked issue of the process of observation. The Impressionist Theory of Everything (IToE) uses a unique perspective of analysis. The term *universe* stands for the limit of boundary in the largest sense, and IToE considers how this boundary develops. The description of this development is limited to two dimensions. The premise is that all of the complexity beyond two dimensions is hidden but still contained in the two-dimensional structure.

The above approach allows simple identification of the fundamental principles that apply for the construction of the universe as a whole. The entire complexity of an infinite structure is reduced to just two dimensions so that its development, which is considered a cross-dimensional process, can be represented in the simplest of formats. This extremely limited perspective is vital so that the issues of boundary that apply globally in structures that are far more complex can be analyzsed.

The description under IToE begins at a point where there is neither definable quantum mechanical nor classical structure. Rather, all such complexity of space must develop, and as this occurs, the dimensional basis of the state changes. Complexity develops at every location as the hidden and larger state evolves and expresses more complexity. The structure that is the basis of this process of development for the null state condition is the Russell set object, *R*. The term *R* is coined to refer to the generic and systemic process of cross-dimensional development of a space. *R* is both a mechanism and a structure for the natural, generic, and systemic expression of paradox.

The concept of self-developing complexity can be referred to as a bootstrap scenario. A space displays development, but the potential for this development comes from no domain. The space raises itself without influence from any contained or outside observable structure.

5. The outward pressure of *R*

Dynamic structures feed on the accumulation of some potential, and change occurs. The Russell paradox uses the formalism of language to describe two paradoxical possibilities, and it does not overtly contain any mechanism identified as dynamic. Nevertheless, *R* is a dynamic structure for change and the mechanism and shape of its dynamic process can be identified.

The concept that *R* supplies a pressure is based on the fact that there are two conditions (called locations) for *R*, and each is paradoxical to the other. In this theoretic geometry of location, the first position for *R* is that it is found within itself, and the second position is that *R* is not found within itself. An action of cycle is suggested. Specifically, if it were possible to observe *R* in this relationship of locations and the process of development was unrestrained, then successive locations would be generated over cycle. Through the mechanism of paradox, this process of change would be nonresolvable, self-perpetuating, and result in the accumulation of cycle. It is exactly this process that is seen to have fundamental presence in the structures and actions found in Nature. The properties that naturally arise over this process of cycle are distance, location, and shape, and they have both rotational and linear formats of expression. As successive cycles accumulate and the structure is subsumed within itself, the dimensional complexity of the expression of these properties increases.

Each instantaneous location of *R* is subsumed in the next instantaneous location, and these locations are necessarily mutually imaginary, or simultaneous, since they have paradoxical properties. Accordingly, it cannot be concluded that, in observable terms, cycle repeats across just the same two perspectives of position. No such observable, rational relationship of locations exists because the structure includes the mechanism of paradox. If the locations generated by this force cannot return to any predefined state for location, then *R* must wander.

This wandering is a force on a path, and now the shape of the path can be considered. When such complexity is interpreted spatially and temporally, extension has occurred. The spatial component is the succession of locations of the observationally closed cycle, and its temporal component is the period at each location. For the initial structures that develop, this entire process is subclassical. This means that the overall shape that develops, and the sense that periods of cycle accumulate at locations, cannot be observed.

6. The accumulation of potential

The observance of dynamic accumulation of domain, in classical terms, refers to the transfer of potential between external and internal regions for some property of the state. There is no simpler example for this than the accumulation of distance, velocity, and momentum when an object falls. In whatever respect it is considered, a domain that is the property of the object (between some initial condition and its state at the instant of measurement) has accumulated. Some dynamic property, which was imaginary for the state of accumulation in its initial condition, is subsumed in respect to the action of the falling object over time.

Thus, under the Impressionist Theory of Everything (IToE), R takes on a physical presence. Over time, an accumulation of distance, velocity, and kinetic energy for the object builds. The object in its initial state, before it is released to fall, contains a constrained null state for the process of accumulation. This signifies the first subclassical location of R. Once the object is released, the expression of paradoxical subclassical cycle of the state has become nonconstrained and begins to build across dimensional levels that are generated in a subclassical and nonobservable format. This nonobservable process has simultaneous expression in classical terms through the mechanism of collapse of the state. In general terms, the relationship established between the subclassical format and its collapse to classical expression is the relationship between rotational (wave mechanical) and linear structure. Some form of transformation is required, such as the application of the constant pi.

Cycles are successively superposed on R and expressed as the accumulation of various properties associated with the falling object such as distance, velocity, and energy. Since the object and its observed properties are classical, cycle that is defined at the subclassical level is observationally interpreted as linear at the dimensionally higher classical level, according to the transformations that have been described above. This mechanism of accumulation is a bootstrap process because the values that accumulate subclassically do not require reference to any outside structure or mechanism for the process of accumulation and the values for property that result. The manner in which shape develops in the geometric model substantiates the bootstrap nature of the process.

7. Angular direction and shape

As direction accumulates, angular structure begins to be expressed, and R takes on physicality. This shape is based on how form is <u>randomized</u> for the direction of R. The Russell set object (R) is closed to outside influence because it is a nonrational (imaginary) domain in terms of the <u>outside</u> rational universe, and therefore the mechanism for the formation of shape can only be defined in self-referencing terms. In other words, there can be no exchange of information across the boundary between the developing shape and the rational universe. From the reverse perspective, there is no common basis by which the more complex detail of organization of the rational universe can be transferred across the boundary of *R*.

Note: The rational universe is *outside* of the subclassical state in the sense that the dimensional construction of the classical state is higher and contains more detail. In reverse perspective, the individual locations of the classical state represent less order, as they are smaller segments of the overall state than are the individual locations of the subclassical state.

At each instantaneous site for period, the property of outward direction displayed for *R* must not display organization or order relative to any of the preceding instantaneous periods. In other words, if direction were repeated in the sequence of periods it would indicate that a nonrandom order had been imposed within the development of the state, and this would contradict the requirement that the structure that develops is randomized for its properties.

This process of randomization can be explained through the simple example of flipping a coin. Here the probabilistic structure is restrained to two possible results that correspond to a potential for two directions in space at 180 degrees. As long as the system of tosses is closed to outside influence, a pattern of 1:1 heads and tails will develop and both sides of the coin (directions) will be expressed equally. The difference between this format and the randomization for the structural development of *R* is that *R* is not restrained to two sides of a coin or directions in space. Thus, at each instantaneous location on the closed development of outward direction, a new angle (displaying new potential) must apply for normalization of the structure.

8. The geometry of the first curve

Based on the above rationale, and if the observation of the development of angularity is restricted to a two-dimensional plane, then the boundary which develops under the requirements of this process is a smooth uniform curve across a null state. For the developing angularity, the completion of cycle is the return-to-origin. However before this return-to-origin is complete, the first location to be identified as an undivided symmetry is the far point of extension for semi-circumference. From this point the curve continues development as return-to-origin.

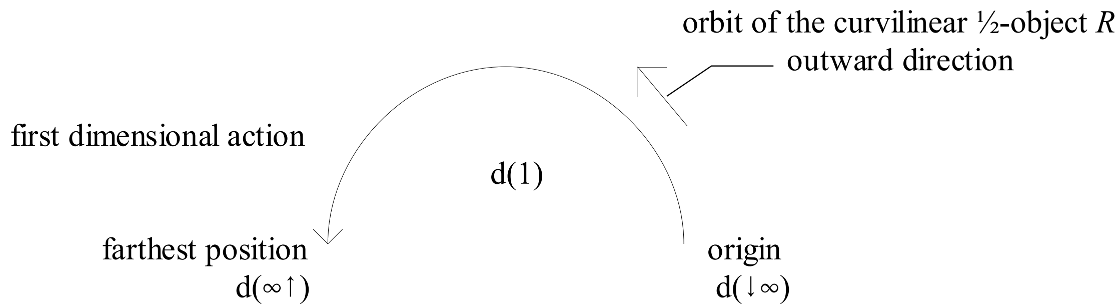

Figure 1. The first plane of dimensional development from an absolute null state location is illustrated. The angular space is contained by the indicated lower and upper limits, which are true infinities for the space. The structure is a ½-orbit around a developing null state domain.

The far point of the first half-circumference meets the definition of an infinity because it represents the development of direction at a limit before the break of return-to-origin. From this point, angularity repeats at 180 degrees. The end of the half-curve for the unit circle is an infinity in subclassical terms for the development of direction and angularity in a state in which these properties do not preexist. This structure is represented in Figure 1.

The symbols $d(\downarrow\infty)$ and $d(\infty\uparrow)$ represent the lower and upper limits of the subclassical space (d), which is a half-circumference displayed in its observationally open format. Thus, $d(\downarrow\infty)$ is the lower point of infinity for this subclassical space d, and $d(\infty\uparrow)$ represents the upper limit for the same space. The letter 'd' in small case indicates that the dimensional level precedes the emergence of a classical perspective on dimension. None of this structure is classically observable.

The angular distance that naturally develops is a curvilinear one-half orbit (½-orbit). The locations on this orbit are infinitesimal, dimensionally hidden cycles of *R*, and the direction found at each location on the curve is defined as the instantaneous tangent. The curve is generated by the random accumulation of tangents to the curve.

The set of tangents to *R* inflates along the curvilinear ½-orbit to the upper limit that is identified by the symbol d(∞↑). The curvilinear ½-orbit is an infinite structure within its dimensional frame of reference. From the point d(∞↑) a second curvilinear ½-orbit generates back to origin.

9. The second dimension of the subclassical structure

The second dimension represented in the development of the subclassical space under the Impressionist Theory of Everything (IToE) is based on the process of return-to-origin for *R*. In classical terms, the space defined once this return is complete is the unit circle. However, the space under consideration along the curve is not classical since it must develop and involves two distinct infinities created across two subclassical dimensions. The two structures have their own unique properties.

9.1 ½-spin and ½-orbit

The second ½-orbit is a mirror image of the first. However, because the relationship of the two half-structures is across a dimensional infinity, they do not together form a circumference in classical terms, as would be the case if the space were not conceived as a process of dimensional development. Rather, the first ½-orbit is observationally collapsed relative to the second, and is defined as a dimensionless ½-point. That which was a ½-orbit in its natural evolution is interpreted as a ½-spin from the dimensional level of the second ½-orbit (see Figure 2).

The first ½-orbit is carried forward as a dimensionally lower √½-spin object on the second curve as it develops in return-to-origin. Thus, the second half-circumference is the second subclassical, curvilinear dimension formed in the generation of the space of the model. A cross-dimensional transformation exists between these two dimensional levels. The first space, [d(↓∞)→ d(∞↑)], is <u>collapsed</u> in respect to the open structure of the second space.

$$\tfrac{1}{2}\text{-orbit} \equiv 2\sqrt{\tfrac{1}{2}}\text{-spin} \qquad (5.1)$$

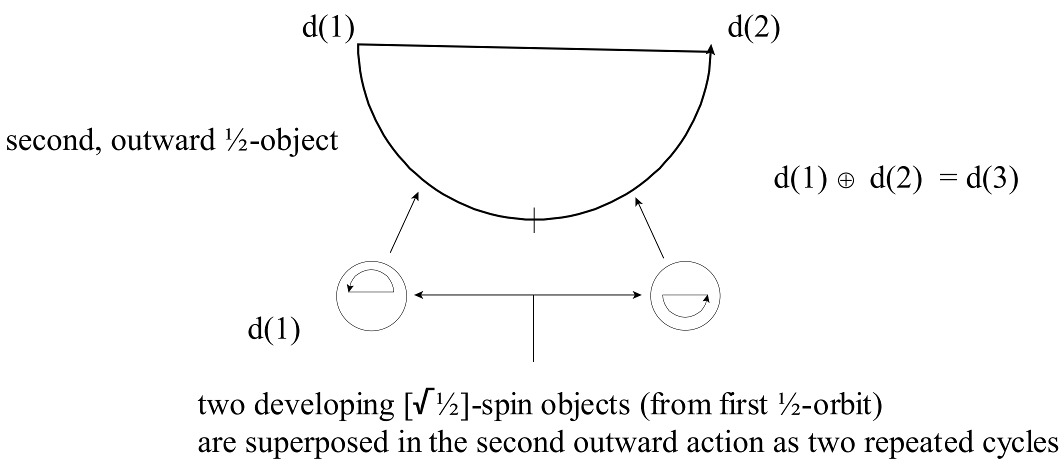

Figure 2. Development of the second ½-orbit object is illustrated. The entire summation of the structure has the symbol d(3) at its upper infinity and remains subclassical. This is an Impressionist perspective, which combines elements of quantum mechanical and classical representation.

The ½-spin object is <u>superposed</u> within the second ½-orbit and carried outward (back to origin) in the developing space (see Figure 2). This is an Impressionist interpretation of the way the subclassical space develops its dimensional complexity. Parts of the description are inherently subclassical (quantum mechanical) in their format, and other parts are at odds with this representation; they are classical in format. For example, the concept that just two dimensions play a role in this action is an arbitrary restriction created for the purposes of visualization. The description is an attempt to show the manner in which structure successively becomes superposed as it develops the complexity required to support the emergence of the classical plane. This process is reflected in all phenomena, observable and nonobservable.

The entire object that forms the return-to-origin consists of the superposed complexity of d(1) and d(2). This structure has the symbol d(3). The symbol ⊕ indicates that the structures are superposed. The outward development of *R* has enveloped a null state domain; however, the canopy of subclassical structure required to support the emergence of classical location is still incomplete. None of these ½-objects has physical presence at the level of the classical observer. Note: The representation of the absolute point of origin is entirely arbitrary since relativism is always expressed between the position of the observer and the observed structures.

10. The outward development of vectors from the site of d(1) ⊕ d(2)

The representation of the d(3) shell, formed from dimensional spaces d(1) ⊕ d(2) as a circumference in Figure 3, is a purely classical interpretation because the cross-dimensional structure of the two spaces involved in this subclassical format of return-to-origin is hidden.

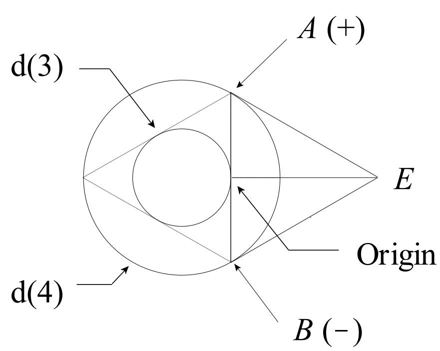

Figure 3. The tangent to the d(3) shell projects and reflects to produce the circumference of the d(4) shape. The origin of the tangent on the d(3) shell is eccentric. The domain within the d(3) shell is a null location. No shape or direction exists within it. Tangents that focus beyond d(4) to the point *E* are also shown.

By showing d(3) as a circumference, the complexity that forms d(3) has been collapsed (represented at a higher dimensional level). In other words, the structure that has developed (in cross-dimensional terms) is interpreted as if it all existed on a fixed classical plane (one in which dimensional structures preexist and do not develop). This is important because it highlights the relationship between dimensionally developing and dimensionally fixed formats of description as represented by the Impressionist Theory of Everything and the formalisms for calculative prediction, respectively.

Under the logical imperative of IToE that the development of structure must be random without reference to any preexistent state of angularity the shape that develops from d(3) must incur the highest degree of nonrelation to the previously developed shapes (classically represented as the half-circumferences in Figure 3). This new shape is a linear rather than curvilinear projection. In other words, for the developing curvilinear boundary, the highest degree of nonrelation refers to the continuous change of direction associated with the curved plane, and for the linear planes shown, the highest degree of nonrelation refers to nonchanging direction. In correspondence with the key principle of IToE, the properties of the two spaces are reversed.

The structure that develops from the outward extension of the tangent is shown in Figure 3. The curvilinear and linear structures each play a unique role for the annulled predominance of angularity represented in the overall shape. This prevents any single part of the structure from having an undo presence in the overall space, and accordingly the development is randomized. The developing space must leave the curvilinear surface or else the first two half-circumferences will take on a special and nonrandom status. Figure 3 includes projection of the eccentric tangent around the inner space of the d(4) shell.

The circumference of the outer d(4) shell is twice that of the inner shell. Directions within the d(4) shell project both radially and tangentially. The eccentricity established by the inner null state permits a focusing of projection between the d(3) and d(4) concentric shells. There also exists a d(5) shell that is reciprocally flipped on the horizontal plane. The structures d(4) and d(5) form d(6) illustrated in Figure 4.

11. The role of eccentricity

Eccentricity is naturally displayed in Figure 3 for the location defined as return-to-origin as the plane circumscribes a path around a central null state. This eccentricity for origin clearly establishes that domain contained by this version of the unit circle is not classical (origin is not (0, 0) or (0, *i*0)). The eccentric structure is responsible for the hexorthogonal property of the space.

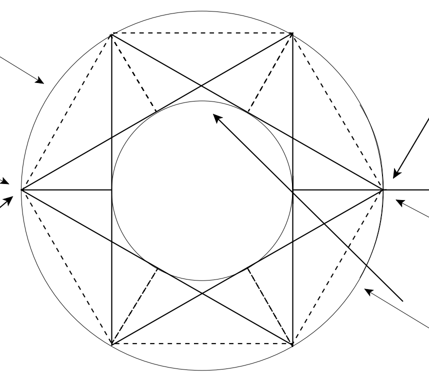

Figure 4. The interior structure required to support the canopy or shell of a classical point is illustrated. The internal structure is subclassical. In 360°, there are six locations on the circumference. The space is hexorthogonal. This structure is displayed in a classical format in which all the contributing dimensional levels are displayed on a fixed plane.

Thus, the unit circle contains three formats within its common enclosure, one classical and two subclassical. Each arrangement has unique properties. This is a fundamental demonstration of the manner in which two absolute structures (defined relativistically within a single domain) form a dichotomy for singularism and dualism under IToE. The common space of the singularism houses the dualism of two fundamentally complementary, nontransformable, and absolute arrangements for property. In Figure 4, the angularity required to support the emergence of a point location at the classical level has evolved. No classical interior exists because the property of angularity within the d(6) shell is not internally classical since the space is hexorthogonal.

13. Conclusion

The structures identified within the unit circle in this chapter are based on the characteristic identified for the Russell set, that a common domain contains two structures for property that are not members of themselves. The concept of cycle is then applied to this. The logical imperatives that follow give rise to features that include superposition and the cross-dimensional development of a space. In any manner that the parts are examined, the transformation across them is not rational as there is no common basis of structure. The only way to analyse this structure is to adopt an Impressionist approach. In the Impressionist stance, singular rational conclusion does not apply. Rather, conclusion is based on the comparison of elements that, as a minimum, form an absolute dualism.

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