

Visualizing Inherent Boundaries of Existence (VIBE)

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Abstract

Time is like a stair or ladder or string with two end t_0 and t_1 . The time human breath for the first time starts their living journey from point's t_0 towards t_1 . Human travels towards point t_1 string. Point t_0 is folding forward and point t_1 is folding backward as human pass through the time towards the end t_1 point, which is folding towards the individual (s) or say for instances, inward folding, symbolically represented by $t_0 \diamond \zeta \diamond t_1$ meaning “the being t_0 undergoes through a transition phase i.e., t_1 ”. When both the ends came closer to touch each other, this is called transformation which can be represented by the term “ ζ ” (the kink like symbol; threshold tipping point, bifurcation or critical point) is actually the “transition event” an intermediate between dead and living. The transition event is a decisive irreversible and non-linear event triggered by the system instability (like a situation) arise from aging, biological, stress, sudden accident, loss of blood, neurological issues, to name a few, leading to change the trajectory of the being from one state to another. Thus, in simple words “ ζ ” is the moment of change or becoming into something new. For instance, in the language of visual blueprint, it can be the moment where something is rupture, a glass is break or the ultimate decision at the interface of jumping, a snake bite, collapse of geometrical shape/or symmetry, to mentioned a few. For more comprehension at this point *being* act as bubble ready for transformation (eventually die) when the time ladder or stair or string is snatched from the being. The time is unseen created thing disappears for that particular subject/ being.

Keywords: Time, bubble, transformation, Boundaries, Existence

Introduction

When time is separated from the space a new demission is open. There could be infinite numbers of time threads (the concept of time perception is another thing that will be separately treated) for living beings, a single thread for a single living being. The transition symbol “ ζ ” below (Figure 1) is referred to as “zigzag” looks like a fully stretched loaded arrow base (kink) indicate the point at which when or how rapidly transform state or coordinate or curves state change in response to a cause or more specifically an “interface factor/line/point” between two realms (transitions), where one is visible and the second is invisible and thus, the zigzag “ ζ ” is regarded as Umar Bacha Phase-Transition Mark-UBT. In the language of Islamic metaphysics, as described by a famous Islamic scholar “Ibn Arabi” described it as a transition or state event. This scholar (Ibn Arabi) further elaborates the definition of transition or state event as a “between” meaning that at the interface between two states (unresolved reality) neither one side nor the other, but still connects both of the realms.

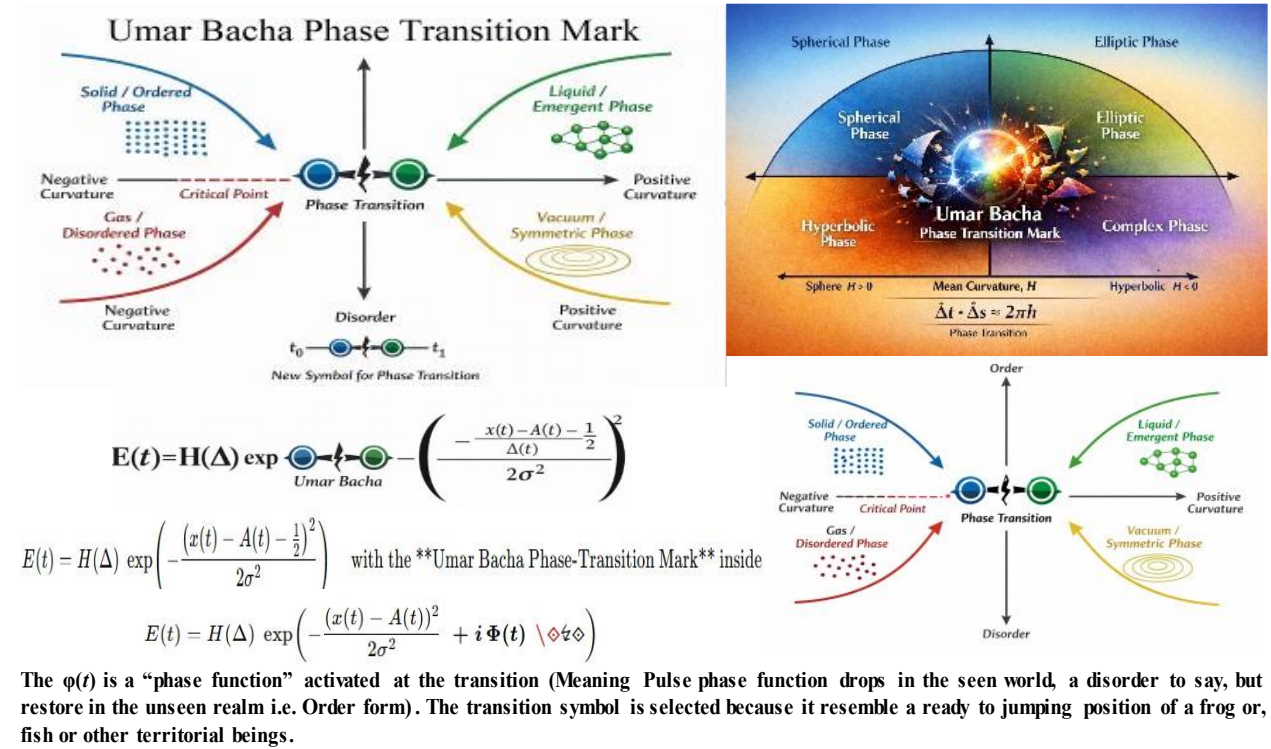


Figure 1: Overall conceptual framework of the time-string theory

In the Pashto language it is known as “na mar awo na Jawandi; نه مړ او نه ژوندي” which can be translated as “Neither dead nor alive”. While “Plato” illustrated it (human condition) a state between ignorance and knowledge or more precisely a transit between “mortal and divine”. Overall, the concept conveys a line or boundary or critical point or a Gaussian peak or geometrical shape with zero curvature, or such as in our case, a time-string between endpoints t_0 and t_1 (Point A and B) moving inwards (under tension) or point that split up and ties simultaneously but yet remains as unseen structure within space.

Biological Analogy: mature adult jellyfish (Before $\diamond \nabla \diamond$ transit to stable phase) upon aging inherently sense the need for rejuvenation. Particularly, jellyfish “*Turritopsis dohrnii*” escape death (biological) by mechanism that involve complex-radical changes in their body including tough and re-structuring, loss of form (phase degeneration, reverting from a mature medusa (At $\diamond \nabla \diamond$ towards biological & cellular de-differentiation leading to instability and fragments formation) and eventually arrives at a critical moment where the organism is in a state of suspension neither being nor destroyed designated by “ $\diamond \nabla \diamond$ ”, an unresolved reality. Then the Devine nature reactivate its ability to raise again i.e., back to a budding polyp stage which is stable transformation (After $\diamond \nabla \diamond \rightarrow$ new phase) and starts living a renewed life with full zeal.

This whole process triggers the collapse of jelly fish biological, molecular and cellular identity (not a gracefully measured aging in reverse) rather the back process shut down (collapse of cellular process or identity) the whole biological machinery re-structured into a new evolving phase. These three phases are fundamental to the immortality of jelly fish attune via the phase dynamics/transformation and can be referred to as a “Gaussian stability landscape punctuated by the -UBT ($\diamond \nabla \diamond$)”, describing the decisive moment where routine molecular, cellular and biological continuity disrupts followed by re-generation and a humble take off (a renewed being emerge, life begins and the cycle goes on).

The UBT ($\diamond \nabla \diamond$)” is a strong biological example of irreversible transformation (in-between) states in which the organism is neither alive in its previous form nor dead, but re-organize into a new true phase of existence (**Figure 2-3**).



Figure 2: The UBT ($\diamond \nabla \diamond$)” Mark



Figure 3: Gaussian stability landscape punctuated by the Umar Bacha Phase-Transition Mark (◇↗O)

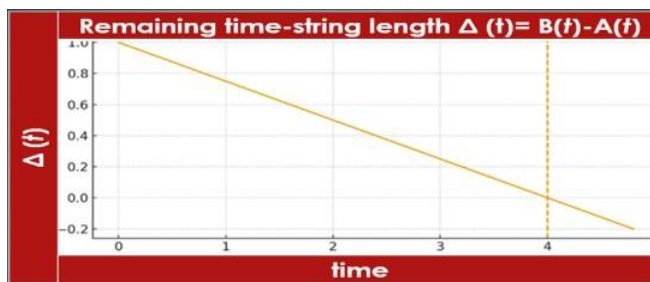


Figure 4: (Remaining timestring length $\Delta(t)$ vs t and Existence/bubble $E(t)$ vs t shows collapse as $t_0 \rightarrow t_1$)

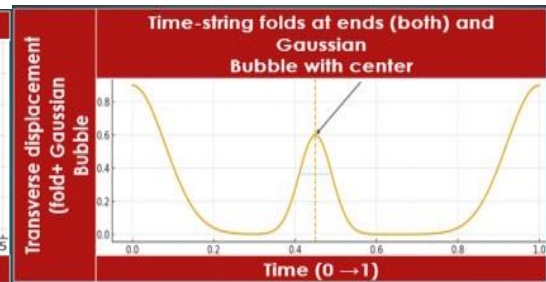


Figure 6: Gaussian bubble on a timestring that's folding from both ends

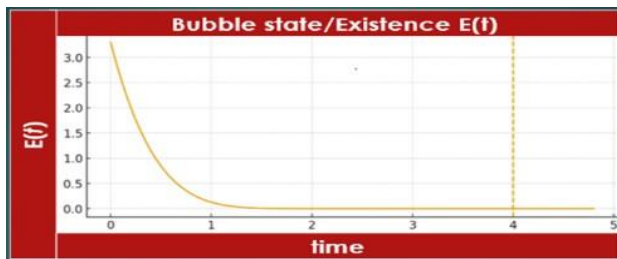


Figure 5: Gaussian bubble on a timestring that's folding from both ends

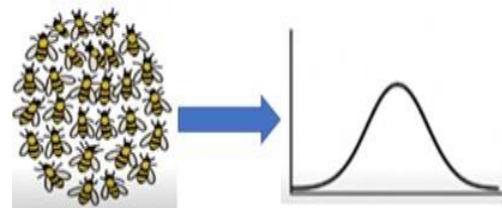


Figure 7: Natural example of Gaussian envelop

Figure 4 (Remaining time-string length $\Delta(t)$ vs t and Existence/bubble $E(t)$ vs t shows collapse as $t_0 \rightarrow t_1$). The simulation shows an explicit transformation “death tipping time” or “state” change or transformation from being to beingless or time to timeless $t_1 = L_0 / (v_A + v_B)$ and so Death time/transformation time t_1 is when $\Delta(t_1) = 0$, illustrating the idea of “endpoints folding, a “bubble” of subjective existence/transformation (Figure 5), and a death/tipping point when the ends meet and the behavior mechanics (Figure 6). Let L_0 be the initial length of the time-string, $v_A > 0$ be the speed the left end A folds forward (moves right), $v_B > 0$ be the speed the

right end B folds backward (moves left) while v_p be the person's travel speed (aging) from A toward B. Then $\Delta(t)=B(t)-A(t)=L_0-(v_A +v_B)t$ the remaining external time-string length (**Figure 4**).

Likewise, $x(t)=v_pt$ the person's position measured from A whereas, $H(z)$ the Heaviside step (1 for $z>0$, 0 for $z\leq 0$). The $\sigma>0$ (sigma or variance) a small "bubble width" parameter that controls how sharply the bubble collapses. Then the above equation $E(t)$ meaning "existence" as-bubble can be described (**Figure 4**). The above equation demonstrate that $H(\Delta)$ dumped the signal once the two ends meet (Death threshold tipping point/or transformation).

While the Gaussian factor ($e^{-x^2/(2\sigma^2)}$), given above, represent the shape associated with the bubble of existence or "core mathematical form" of the of the Gaussian curve or bell shape bubble) somewhere along the remaining string (**Figure 4**). The term ($e^{-x^2/(2\sigma^2)}$) controls bell-shape by that meaning $G(X)= (e^{-x^2/(2\sigma^2)})$ variations arise from the life events leading to transform the shape associated with Gaussian bubble shape.

The figure indicates as the ends approach towards each other over time, individual is growing with time (which is aging) string somewhere relatively $x=A/\Delta$ (0 at A, 1 at B) but also the bubble of existing is narrowing meaning compression near the ends leading to "bump" or collapse state of the bubble-life ($\Delta\rightarrow 0$ near the person's relative position). As Δt shrinks meaning when Δt reaches toward zero the "Gaussian factor/curve" also become zero meaning that Gaussian factor disappear revealing that in the absences of "time-string" or when the time-string is snatched from the person, existence ends/bubble disappear or silence arrives \rightarrow death tipping point. Likewise, existence ($E(t)$) is non-zero but the denominator Δ becomes so small $\Delta>0$ near the tipping point leading to $E(t)$ collapses such that Gaussian factor can't be maintained. This indicates the rapid loss of Gaussian or Gaussian decays.

The variables in the equation such as v_A, v_B, v_p , and σ plays critical role in bubble (life) characteristics/shape outcomes, seems like controlling them may determine the likelihood of the "degradation/death" of a person. Furthermore, these factors meant to indicate how they organizes and influence the alteration in the v_A or v_B that could also be associated with a person lifestyle, for instances, increasing the burden of stress may shaping the path for faster folding of the time-string. In parallel, living of several people (such a neighborhood or town) on the same time-string can contribute to social interaction which could take as several bubbles (life) (if co-operating) can make relatively large bubble and so the life-span can be amplified and the phenomena "coalescence of bubbles" can be perfectly emerged/achieved in this case. The opposite may also be true. Example of intelligent agents found in nature displaying coalescing:

1. Honeybee colony formation/cluster

Honeybees begin as individuals gathering near a branch or hive cavity. Gradually, through pheromone signaling and positional dancing, they cluster tightly into a single cohesive swarm — a living bubble like a Gaussian envelope. The characteristic features of coalescence include Local signals \rightarrow global order. Individual bee trajectories \rightarrow converging "flow lines". The

swarm literally behaves like a self-organizing bubble of life. When threatened or cold, bees compress → folding inward, like ends of a string. This analogy exactly shown in our simulated model that “each bee is a micro-Gaussian point while the swarm is a broader (macroscopic) Gaussian/cluster driven by coalescence (cooperation). The coalescence features can also be seen during cluster of honeybees hanging from a tree branch. Likewise, coalescence is also depicted when bees surround the queen in a harmonic way or during extreme weather conditions they gather around each other/ concentrated in the middle with a smooth shape but without sharp boundaries. This phenomenon is known as “honeybee-winter ball” the density of which is lower (fewer bees, outward) at the edges versus at the center aims at heat generation and protection. Among others organisms showing this feature/pattern include fish schools, bird flocks, microbial colonies, ant clusters. The Gaussian envelope ($G(\mathbf{X}) = (e^{-x^2/(2\sigma^2)})$ i.e, bell curve) as given above, presents almost similar spatial-density features meaning peak at the center (maximum density) then Smooth, continuous decrease in density away from center while wide support—the curve approaches zero but never sharply cuts off.

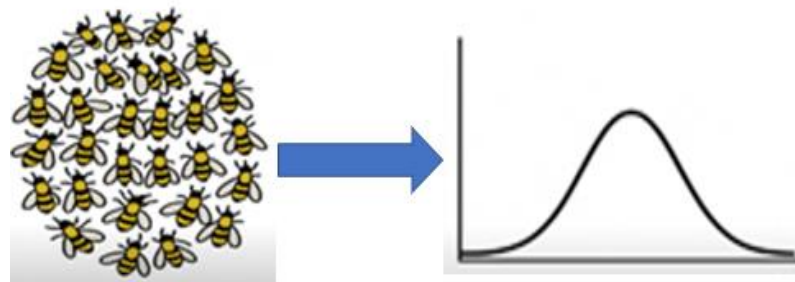


Figure 8: Gaussian envelop

The bee's cluster is not exactly a hard geometric shape rather it is a thermal, behavioural, and safety-driven probabilistic clustering → naturally Gaussian-like. Thermal optimization maintains the queen at ~34–36°C where heat diffuses outward in a smooth gradient also known as heat-distribution Gaussian (heat profile) where the bee arranges themselves for maintaining the temperature, which can be expressed by term $T(r) \sim e^{-\alpha r^2}$ that means bee density matches the heat profile (Gaussian) mechanics. At an individual level, every bee tries to reach out to the queen (center) leading to the phenomena of “gravitational” pull. However, as the conditions are normalized, they also push back each other to avoid overheating or crushing each other because of the too tight packing. This set the stage for generating a potential field which can be given by: $V(r) \propto r^2$. To attenuate overheating the cluster distribute by space/distance that actually resemble to a Gaussian-like equilibrium profile (**Curvature** $(x) \sim \exp(-x^2/R^2)$), meaning the bubble clusters and bee clusters resembles identity with respect to the mathematical expression (structure). Overall, queen is the central tendency of the honeybee cluster formation prompted by a peak at the center, thin at the edges and breathless at the outward realm (Gaussian bell). Thus, bee cluster is actually a Gaussian envelope/bell driven by the nature wherein heart is enriched (density), edges are soft-thin like a noodle, Fourier via peace and thermal dissipation”.

2. Soap Bubbles

Coalescing can be seen in the case of soap bubbles aim at reduction of surface tension where two soap bubbles came close and merge into bigger bubble. This phenomenon is essential physical process that derives to equalize pressure eventually form a single smooth “Gaussian-like curve”. Ironically, the intriguing part of this process is emergence of “Gaussian bumps” triggered by two bubbles →transformed into one larger bubble having completely different variance/new width and a new center. What can be learnt from this process is actually the conservation of energy via a relatively larger bubble versus numerous small bubbles that required high energy in-put to maintained individual bubbles. Principally, nature demands to operate at lowest possible energy state that provide relatively a smoother Fourier fingerprints or blue print of life (lower frequency-viewpoint).

3. Rain droplets (water) on leaves

Most often the leaves are hydrophobic in nature and when individual rain droplets reach to leaf surface, they gradually merge together (smooth formation can be visualized). The unique features that should be noted is that every rain droplet has its own “Gaussian-driven curvature”, indicating that in coalescence lies the rest (calm, peace) and so the nature encoded in the droplets to move to form larger droplet which has comparatively lower curvature, and again here the variance increase. Therefore, an increase in variance means following the path of wisdom and stability where merging of events set the stage for superposition and smoothing. This is exactly what can be seen in Gaussian factors when mathematically combined into a single equation such as above.

4. Bird collective escape, murmurations, compression of the swarm under the attack by a raptor

Birds like starling (*Sturnus vulgaris*; flocks’ formation) when alerted by a threat (predator like falcon) immediately flies from the scene. This behavior exactly mimics with numerous tiny droplets of spray, for instances, living aerosols. To the threat in the air, birds flock folds inward (compresses) making it difficult for the raptor to attack. However, upon the averting of danger flocks gradually unfolds (expands). The collective escape mechanism is divinely encoded in them, which can be visualized by their amazing compression followed by an expansion, leading to quick variation in density/shape (structural variation) of the flock over time. This mechanistic pattern is taken into account as “wave-like density/Gaussian waves or Gaussian bumps” matches a time-string travel through adopting dynamic Gaussian movements (ΔS).

Zohaib Ahmed: 5 May 2018: Common Starling ; Location: Taxonomy : S. v. humii (W. E. Brooks, 1876), S. v. nobilior (A. O. Hume, 1879), S. v. poltaratskyi (Finsch, 1878) and S. v. porphyronotus (Sharpe, 1888) (Birds of Gilgit -Baltistan - European Starling)
 Mirpur Sakro, Sindh. Date: 22-April-2018 : [Wildlife Of Pakistan](#) ([Wildlife Of Pakistan | Facebook](#)); date accessed 03 December 2025.



Wayne Bavin, BBC News, Suffolk and Helen Burchell, BBC News, Suffolk; 20 August 2024. Date accessed 03 December 2025 (<https://www.bbc.com/news/articles/c4ynxp4n59o>)

Purbita Saha, 2017. Hungry Raptors Make Murmurations Even More Beautiful to Photograph: Starlings are easy to find. But capturing their twisted formations as they evade predators takes commitment and vision. Audubon magazine. Date of access: 02/12/2025



<https://www.audubon.org/magazine/hungry-raptors-make-murmurations-even-more-beautiful-photograph>

Figure 9: Bird collective escape

5. Bacterial Macro-Colonies

A single bacterium is not always single, its division is rapid and when they become several millions in number only then a bacterial colony is visible to the naked eye known as colony forming unit (CFU). Each colony starts its journey of growth that exactly followed the Gaussian

pattern. However, when two colonies touch each other, a smooth single larger disc is formed a sphere like growth front called as Gaussian diffusion kernels.

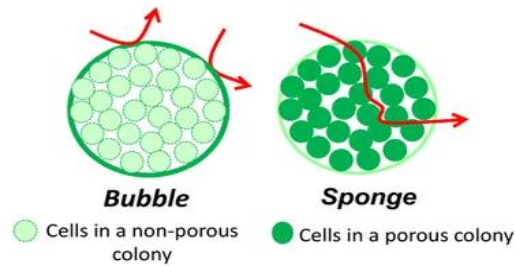
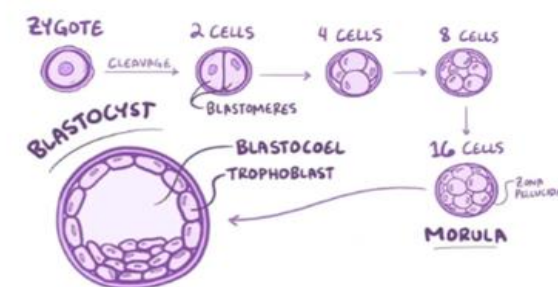


Figure 10. Illustration of bacterial colony. Adapted from Jeanson and Colleagues [1].

6. Embryonic cell Aggregation — Morula formation

blastomeres are the first unique individual cells that divide and re-divide (small random contributions combine). Also, during the division process they came closer making a compact and spherical shape known as “morula”. The morula formation is driven biologically like coalescence process where precise and accurate local passage of information between the cells and interactions take place. The morula imprint as a bubble (sphere/bubble has the least surface area) — a circular mass tightly folded and packed from all sides. Morula has low-energy states, well balanced, smooth, and symmetric in nature (Figure 11). This biological process gives us the notions that collective behavior can’t be enforced rather it rise (emerge) from natural physical laws (wave function equations) to form a perfect symmetry (without effort), driven by several tiny casual contributions accumulate over time (randomness) like a Gaussian envelope (mirror symmetry).



(Human development days 4-7: Video, Causes, & Meaning | Osmosis; date of access 6th December 2025).

Stretched drum shape/illustration for a given volume at lowest energy level leading to form “circular wave” designs which is (symmetry) crucial for the tension distribution in an even manner.

Figure 11: Embryonic cell aggregation (morula formation)

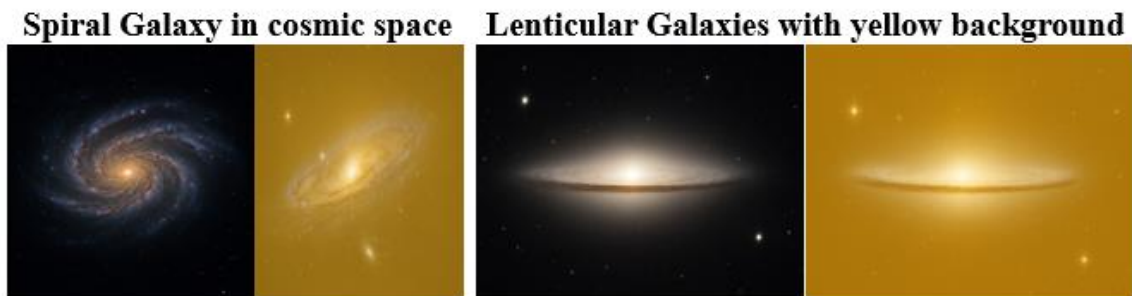
7. Convective Bubbles (Lava Lamp)

Lava lamp may not exactly match Gaussian like phenomena or process. However, upon heating of the transparent bottle that contain liquid and wax, melts at the bottom leading to rise small pieces of the wax to the surface like a “nanosized liposome” is continually forms (elastic modulus of Gaussian curvature [2]) and deforms upon cooling at the surface. The cooling at the surface of liquid water makes the tinny blobs wax dense (blobs touch and fuse together making larger weighty mass) leading to push back to the bottom in a Gaussian-shaped manners. The whole process (system/matrix) is an outstanding physico-biological mechanism represent oscillating versions of bubble coalescence. Moreover, saturated type of lipids/or waxes can be the ideal candidates owing to their inherited resilience against oxidative degeneration. It is of note, however, that natural matrix (lipids or wax systems) may not entirely composed of single type of fat/lipids/waxes. Instead, biological waxes/lipids *etc.* are in fact contain varieties of different substances in their membrane, for instances, glycol-proteins, phospholipids, and glycolipids [2]. Both kinetic and thermodynamic stability are important attributes of the blobs (waxes/lipid liposome vesicles).

8. Galaxy morphing into cosmic bubble & unity formation (merging)

The universe taken as a system composed of Three Kingdoms (planets, stars and galaxies) of objects organized via gravitation and shaped by the physical nature of the objects [3]. Within the awesome splendor journey of cosmic/space science the investigators finally reached the climax of celestial exploration. Galaxies are classified into elliptical, spiral, or irregular structures based on their appearance or shape [4], which in turn determine (shape/structure) the age and types of stars within the celestial’s system (galaxy).

Spiral galaxies form a spiral structure regardless of whether or not they are barred, for instances, Andromeda galaxy, Barred spiral galaxies such as the Milky Way. On the other hand, Elliptical galaxies appears as smooth ellipsoidal shape (large or giant spherical/elliptical ball of stars) much resemble to a pinwheel- Gaussian-like density profile.



Morgan, W.W., 1962. Some Characteristics of Galaxies. *Astrophysical Journal*, vol. 135, p. 1, 135, p.1.

Figure 12: Galaxy morphing into cosmic bubble

9. Bubble-threshold illustration from Quran (Gaussian curve)

Several *Quranic/Islamic* descriptions (metaphysical) well align with our time-string/folding/bubble-threshold simulation model (life and death events). For instances, “Every soul has an appointed-time (*ajal musamma*) that draws closer” (Quran 7:34). Likewise, “For every nation is a term; when their term comes, they cannot delay it nor advance it even for a moment.” This is perfectly match with our presented model which engraved the idea that time as a string or thread with end A and B come closer towards each other. Years ago, the Quran demonstrated “life as having a fixed limit” that gradually approaches (in a non-randomly fashion, with perfect precision). Moreover, the meeting or merging point of A and B *in Arabic* language is known “the *ajal musamma*” which can be translated into English as “appointed term or time”.

In parallel, life is illusion (Quran 57:20) demonstrating the fragility aspect of the life like a bubble is delicate and vulnerable to cracks and distortion. The temporary and transient state of life in a dynamic system (active or ever-moving) illustrates “existence” before permanent transforming *i.e.*, “from the life to the dust” is matching with our simulation model (described above) that humans as a bubble traveling along the time-string, eventually collapsing (not into debris or particles but rather a transformation occurs, towards a permanent state). Some of the classical scholars quoted that this world (*dunya*) is actually “a bubble on the surface of a stream” that can collapsed/disappear (shape distortion in a spiritual sense, because of the time disappearance) a bubble subject to collapse at a given time (folding).

The analogy of time as a string or scroll folding inward until two ends meet has been mentioned in the Quran (21:104) that “Time folds on the Day of Resurrection” by that meaning “The Day We will fold the heaven like the folding of a scroll for writings”, here of note is “folding of the scroll” describing the time = a stretched scroll/string match with collapse of the life bubble at threshold tipping point where timeline and Gaussian envelop/bubble reaches to zero [($t=1 \rightarrow 0$; ($G(X) = (e^{-x^2/(2\sigma^2)})$ where the Gaussian constant reaches to $K = 0$)]. This implies that Zero Gaussian curvature is in fact leads to the geometric freedom (assume human is in prison or humans are restrain to adopt its natural shape in this world, which is only possible when one attained the energetically favorable shape *i.e.*, $t=0$, $K=0$ that is only possible after death, a kind a freedom). As assumed when both terms are zero it is the lowest energy state (geometrical) that’s what can be seen in nature ($K \approx 0$) unless disturbed (forced) otherwise.

Moreover, Quran (50:22) described that “Between you and the unseen world is only a veil” by that meaning when “We removed your veil, and today your sight is sharp” the veil is removed (geometrical shape is changed to $t=0$, $K=0$) only then you will see the unseen, meaning death is the gateway where the time separates from space ($t=0$, folded) leading to (opening) a new realm of reality/dimension. The Quran illustrate death as the snatching of a veil (geometric space) because of the time unavailability, confirming or gives us the notion of a new domain/reality. These argumentations supported by the Quran back our model/imagination that the accessibility to the unseen reality is only possible when the bubble collapses (in a spiritual/energy field/geometric shape sense).

Quran (84:19) also describes that “You travel through stages (sequential) until the final point” supports our theory and mathematical, physics laws presented here as the person moves or travel from **A**→**B** along a cosmic ladder/string toward the final meeting point. Finally, various scholars (classical Islamic cosmologists), for instances, Al-Ghazali, Ibn Arabi, and Fakhr al-Razi agrees on the time as being created, and regarded it as stretched thread (khayṭ mamdud) that is subject to “fold” at death and at the end of the world. Thus, our *time-string model* theory provides scientific explanation and mechanism in mathematical way “When the time string is folded inward, the silence arrives (transformation/death).

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