PROBLEMS OF SCIENCE RESOLVED BY THE-ORIGIN AND ITS MEANING

COSMOLOGY AND PHYSICS

PROBLEM	RESOLUTION
■ Matter versus anti-matter in the universe.	
At the beginning of the universe there should have been equal amounts of matter and anti-matter which physicists expect should have mutually annihilated. Yet the universe exists.	- Physicists believe that there is negligible anti-matter in the universe because they would expect any significant amount of anti-matter to have mutually annihilated with corresponding matter. · They presume that there were, in fact, unequal original amounts of matter and anti-matter and have sought an explanation for that presumed imbalance without success. - Analysis of matter - anti-matter annihilation shows that it is not simple nor easily achieved, and therefore it is not common. · Most of the original amounts of matter and anti-matter in the universe did not mutually annihilate and the universe still consists of equal amounts of matter and anti-matter, minor portions of which occasionally mutually annihilate producing gamma ray bursts [GRB's].
■ "Cosmic inflation".	
The theory of cosmic inflation was developed to explain why all of the observable universe originated in a small causally connected region. Inflation answers the classic conundrum of the big bang cosmology: why does the universe appear flat, homogeneous and isotropic when one would expect, on the basis of the physics of the big bang, a highly curved, heterogeneous universe? Inflation also explains the origin of the large-scale structure of the cosmos.	- There is no basis for such a rapid expansion of the universe exceeding the natural speed of light limit. · Rather, the universe began, at the original "Big Bang" singularity, already at the radius to which inflation is deemed to have taken it, about $4 \cdot 10^7$ meters. · That resolves not only the inflation problem but also the problem of an initial "point", volumeless, singularity being unable to deliver anything, let alone an entire universe. - That raises the problem of what is a singularity. · A singularity is a location that is uniform throughout, permitting no determination of sub-locations within it; it is the same place everywhere within it. · Nevertheless it can occupy a volume and have a surface.

■ "Dark matter" and galactic rotation curves.

The rotational balance of gravitational central attraction and rotational centripetal force in galaxies appears to be out of balance according to "galactic rotation curves". A small additional centrally directed acceleration, independent of distance, and of unknown source appears to be needed and acting.

It has been hypothesized that a halo of undetectable "dark matter" exists in galaxies and provides that anomalous acceleration.

Such "dark matter" has never been actually detected.

- "Dark Matter" is an invalid hypothesis developed to account for the behavior of galactic rotation curves. The correct explanation of that behavior is the Universal Exponential Decay.

  · The entire universe has been and is undergoing a continuous Universal Exponential Decay of the length, $[L]$, dimensional aspect of all quantities in the universe [e.g. distance $[L]$, speed $[L/T]$, gravitation constant, G, $[L^3/M \cdot T^2]$ etc.] with a decay time constant of $\tau = 3.57532 \cdot 10^{17}$ sec [or about 11.3373 billion years].

- Rotational systems in orbital equilibrium such as our solar system or a galaxy have a balance of centrally directed inward acceleration and outward centrifugal acceleration. For such systems to experience inward shrinking per the Universal Decay there must be an additional centrally directed, distance independent, inward acceleration, the *decay acceleration*.

  · That decay acceleration is the additional acceleration shown by galactic rotation curves.

■ "Pioneer Anomaly".

The Pioneer spacecraft exhibit an anomalous, distance independent, sunward acceleration of unknown cause.

- The cause of the Pioneer Anomaly is the Universal Exponential Decay, the *decay acceleration*.

■ "Flybys Anomaly".

The calculation-predicted velocity of satellites after earth flybys is minutely different from that observed.

- The cause of the Flyby Anomaly is the Universal Exponential Decay, the *decay acceleration*.

■ "Dark Flow Anomaly".

A large scale flow of galaxy clusters toward "the edge" of the observable universe has been observed.

- The cause of the Dark Flow Anomaly is the Universal Exponential Decay, the *decay acceleration*.

■ Cosmic Acceleration and "Dark Energy".

Type Ia super novae distance measurements found their distance to be greater than expected and led to the conclusion that the expansion of the universe is accelerating rather than slowing down under the action of gravitation as was expected.

To explain how the expansion could be accelerating the existence of a "cosmological constant" or "Dark Energy" to support the expansion was hypothesized.

- There is no acceleration of expansion. The distance measurements are in error. The existence of the Universal Exponential Decay was unknown and the expectation of distances was based on the Hubble concept of the expansion of the universe.

  · That caused the calibration of the Type Ia supernovae behavior to be in error.

  · Furthermore, the object super novae are actually even more distant because the entire Hubble concept of the relationship of redshift to distance is in error.

  · That is because light from distant sources travels faster, appearing more redshifted, its speed being less decayed compared to local light and its more decayed speed.

■ Hubble's Law.

Hubble's law is the statement in physical cosmology that the redshift in light coming from distant galaxies is proportional to their distance from us observers. One of the more recent calculations of the proportionality constant yielded a value of 70.1 ± 1.3 (km/s)/Mega-parsec.

- The Universal Exponential Decay completely invalidates Hubble's Law and the concept of a Hubble Constant.
  - · While it is true that the material objects in the universe are moving outward so that light from distant sources is redshifted by the Doppler Effect of their recession velocity, that effect makes up only a very minor portion of the total value of each redshift, most of which is due to the Universal Exponential Decay.
  - · Thus the actual recession velocities are modest and that also resolves the problem of the otherwise immense and unreasonable recession velocities that result from Hubble's law.
  - · In turn, the problem of those recession velocities was a factor in the adoption of the concept that it is space itself which is expanding and now that factor is removed.
  - · It is not space, itself, which is expanding it is the distribution of the matter within space.
  - · Analysis gives the relationship

$$d = \frac{c}{H_0} \cdot \frac{[z+1]^2 - 1}{[z+1]^2 + 1} \quad [megaparsecs]$$

from which d is asymptotic to c/H_0 as z increases which is in contradiction to reality.

■ The universe's entropy and "the arrow of time".

Why did the universe have such low entropy in the past, resulting in the distinction between past and future ?

- Entropy is not a cause; it is an effect. The distinction between past and future is a result of cause and effect.
- A cause need not precede its produced effect; however, it must be an extant condition from the point of view of the effect.
- That results in the distinction that we perceive between past and future.

■ The age of the universe.

The estimated age of the universe was around 3 to 8 billion years younger than estimates of the ages of the oldest stars in our galaxy. Better estimates for the distances to the stars and the addition of dark energy into the cosmological model was deemed to have reconciled the age estimates.

- Both the dark energy concept and the Hubble cosmic distances relationship are in error as is the currently accepted age of the universe as about 13.7 gyrs.
  - · The problem of the age of the universe is far more complicated because of the effect of the Universal Exponential Decay and other effects.
  - · See "Hubble's Law" above.
- Taking account of the Universal Decay, the age of the universe is about 30 Gyrs.

■ The number of dimensions in material reality.

Contemporary cosmology considers that there may be a number of dimensions in addition to the four [3 - space, 1- time] with which we are familiar. Some suggested theories [e.g. string theory] require more dimensions.

- The boundary of a line is all points within the line. The boundary of a surface is all points within the surface. In both cases all of those points are adjacent to locations not within the line or surface.

- But, for a volume there are locations within it that are not on the boundaries, that are not adjacent to locations outside the volume.

  · Thus a volume, space of three dimensions, is capable of containing something and three-dimensional space is the least number of dimensions having that capability.

  · That is why our space is of three dimensions.

  · Space of more than three dimensions can be conceived of and treated mathematically, but it is an open question and it is unnecessary to the structure of material reality, its particles and its forces.

  · In any case space of more than three dimensions is less simple, less according to the principle of Occam's Razor.

■ The "anthropic principle".

Is the anthropic principle correct ?

- No. Anthropically speaking our universe is "tailored" to us, but the correct statement is that we are "tailored" to our universe.

- A different universe would produce different life forms.

  · In other words, our universe supports human life because we are a product of our universe.

  · We can conceive of the concept of other universes, which would support other forms of life.

PHYSICS

■ The flawed Particle focus of physics.

Ever since the discoveries of Planck [energy exchanges occur in discrete "quanta"], Bohr [the orbital model of the atom], and Einstein [his explanation of the photo-electric effect] all in the early 20th century, the physics community has been focused on and dedicated to a particle - oriented, quantum mechanics - ruled conception of material reality.

That conception is embodied in their "Standard Model", which includes a very large number of particles [some identified, some theoretical].

Most of the Standard Model particles do not occur naturally but only as products having extremely short lifetimes, products of artificial, extremely high energy collisions of the few naturally occurring particles.

- The fact of the Universal Exponential Decay requires, by its innate origin and mechanics of operation, the entire Model of Universal Physics as presented in the book *The Origin and Its Meaning*.

- In particular, and especially, it requires the model of matter as Centers-of-Oscillation, their spherical oscillation and propagation of U-waves [Universal waves], the Universal Field accounting for all electric, magnetic and gravitational field effects, and their interactions with other Centers-of-Oscillation.

- The "Standard Model" is not a valid description of material reality, which is fundamentally of a wave, oscillatory nature, not particulate.

  · Particles are centers-of-oscillation, spherical oscillations in space the center of which is the location of the particle, and the outward propagation of which is all "fields".

	· The only simple such particles having rest mass are the proton, the electron, and their anti-particles. · The other particles with rest mass are composites of two or more simple particles into a new, complex, center-of-oscillation. Its components cease as separate particles when so combined, e.g.: the neutron [*1 proton + 1 electron*], the atomic nuclei [*A protons + A–N electrons*], and their anti-particles. · The "particles" of artificial extremely high energy collisions are fragments of smashed centers-of-oscillation and not real natural entities at all. · The <u>fact</u> of the Universal Exponential Decay requires, by its innate origin and mechanics of operation, the entire model of Universal Physics.
■ The neutron.	
The neutron mass is a small amount greater than the sum of the masses of a proton plus an electron. Furthermore, a free neutron [outside of an atomic nucleus] radioactively decays into a proton and an electron with a half life of about *900 seconds*. What is the explanation of all of that ?	- For a neutron to radioactively decay the decay products, a proton and an electron, must depart with escape velocity from each other, a velocity that would take them to infinitely apart - A neutron must be the combination of a proton and an electron accelerated toward each other from just short of escape, the neutron mass being the sum of a proton mass, an electron mass, and the mass equivalent of their escape energy. · But, how close must they approach to combine ? Clearly not to zero separation because their escape energy would be infinite. · The mass excess of the neutron over a proton plus an electron is their joint escape energy. Their corresponding separation distance at merging correlates with analysis of the Lamb Shift based on analysis of Coulomb force change at very close separation distances.
■ Matter waves.	
Matter waves were discovered in the early 20th century from their wavelength, Planck's constant divided by the particle's momentum, predicted by DeBroglie; and were first observed by Davisson and Germer. But, the inability to account for a correct matter wave frequency [one that multiplied by the wavelength yielded the actual velocity of the matter particle] caused interest in matter waves to become minimal.	- The problem of matterwave frequency is that if it is based on rest energy it is too small and if on kinetic energy it is too large. The problem stems from contemporary physics' failure to develop the concepts of energy in rest form and energy in kinetic form. Energy in kinetic form yields the correct matter wave frequency. - Einstein in first developing his $E = m \cdot c^2$ relationship missed the concept of energy in rest and in kinetic form which nevertheless derive from the same equations as the $E = m \cdot c^2$ relationship. - With that issue resolved the importance of the matter wave can be addressed. The matter wave is fundamental to atoms' stable electron orbits. - The characteristics of atomic electron orbits, described by contemporary physics in terms of arbitrary quantum numbers are actually descriptions of how matter waves fit into various atomic electrons' shells structures.

■ The nuclear and fundamental forces models.

The "Standard Model" includes the concept of four fundamental interactions [forces]: electromagnetism, the strong nuclear force [nuclear binding], the weak nuclear force [pertaining to quarks and muons, non-naturally occurring particles, "particles that are not real natural entities at all"], and gravitation.

It seeks to explain "fields" [a "code name" for action at a distance] by particle exchanges involving some of the types of "particles that are not real natural entities at all".

- The "Standard Model" of the fundamental forces is defective in its treatment of the mechanisms of the forces and in including a weak nuclear force, an interaction of smash-created fragments of centers-of-oscillation.

  · Field, and its associated Forces are the effect of the outward propagation of spherical waves from centers-of-oscillation. Its effects of electric field, magnetic field, and gravitational field are different aspects of its interactions with encountered particles.

  · The weak nuclear force is no more real than the quarks and muons it is thought to operate on.

  · The nuclear binding force does not exist. The atomic nucleus is not a mélange of constituent particles, some mutually repelling each other. Rather it is a single complex spherical oscillation with no internal repulsions at all, and needing no binding force.

■ The fundamental constants.

What caused the values of the fundamental physical constants to be as they are ?

- The set of values of the fundamental physical constants is a chance random event; however together they are systematically interrelated through the laws of physics in which they operate.

Do the values of the fundamental physical constants vary with time ?

- The dimensionless fundamental constants [e.g. α, the fine structure constant] never vary having nothing capable of varying.

- Those having a length dimensional component vary per the Universal Exponential Decay [e.g. h, dimensionally $[M \cdot \boldsymbol{L}^2/_T]$.

■ Quarks.

Quarks are an invention of contemporary physics in its efforts to simplify the large body of product particles of high energy collisions.

- The "quark" hypothesis is faulty. Quarks are not fundamental particles of matter. Quarks only exist when matter is smashed with immense energies.

- Quarks reflect the high-energy smashing breakdown of the 3-dimensional spherical oscillation, centers-of-oscillation, that all particles having rest mass consist of.

  · Furthermore, spherical oscillations cannot have "spin". "Spin" is an attribution to represent observed behavior. It results from physicists' particle, as compared to wave / oscillation, understanding of the "particles".

■ Quantum mechanics.

- The entire Quantum mechanics hypothesis is largely invalid as a description of material reality. Its only applicability is that it is partially a way of describing the complex three dimensional interactions of "particles" that actually are centers of spherical oscillations that propagate those oscillations as spherical waves.

	- Those waves are the cause of electric, magnetic and gravitational effects. · Quantum mechanics initiated via a two-fold fundamental mistake in understanding atomic electron orbital behavior. 1st, the statement that the orbital electron's angular momentum is quantized, as in $m \cdot v \cdot R = n \cdot \frac{h}{2\pi}$ [n = 1, 2, ...] is merely a mis-arrangement of $2\pi \cdot R = n \cdot \frac{h}{m \cdot v} = n \cdot \lambda_{mw}$ [n = 1, 2, ...] the requirement that the orbital path, $2\pi \cdot R$, must be an integral number of matter wavelengths, λ_{mw}, long. 2nd, there is no mechanism, no cause for quantized orbital angular momentum, but there is for the λ_{mw} requirement.
■ Gravitation.	
Neither classical [Newton] nor modern [Einstein] physics treats the mechanism of gravitation – how it produces the effects that it does. The Einstein formulation error is especially egregious in that it contends that gravitation curves space which leaves the problem, "... relative to what" ? If space is curved than the curvature must be relative to some flat, uncurved reference. One cannot have relativity without relativity. Any change or effect must be relative to a previous unchanged reference or previous unaffected state. Otherwise the change or effect would be undetectable.	- As with the rest of physics, understanding the causes, the mechanics operating resolves all of the problems. - Gravitation's effect is a complex action of the oscillatory field flow propagated radially outward by other particles on the subject particle and its own oscillatory field flow propagated radially outward from itself. · Stated simply, the incoming flow has the effect of slowing the propagation of the encountered particle's own outward flow, and that effect forces the encountered particle to increase its velocity toward the particle that was the source of the incoming flow, and that velocity increase is required in order for the net velocity outward of the encountered particle's flow to remain at the value of the speed of light, the natural velocity of all particle's outward flow, one of the functions of that flow being as the "carrier" of light.
■ Inertial mass and gravitational mass and their equivalence.	
The Standard Model seeks to explain inertial mass by postulating another, never-detected particle as the carrier of mass, the Higgs Boson.	- A particle's inertial mass depends upon the amount of oscillatory field flow propagated radially outward by other particles that the subject particle intercepts and is acted upon by. · The problem of mass as addressed by the hypothesis of the Higgs Field and the Higgs Boson is entirely incorrect. [Furthermore, how can an effect as ubiquitous and common as mass be caused by a particle so rare and undetectable ?] - Neither classical [Newton] nor modern [Einstein] physics treats the mechanism of gravitation – how it produces the effects that it does. Understanding the causes, the mechanics of gravitation resolves all of these problems.

	- Gravitation's effect is a complex action of the oscillatory field flow propagated radially outward by other particles on the subject particle. It is fully explained and its laws derived in the book *The Origin and Its Meaning*. The development also includes analytic proof that inertial and gravitational mass are identical.
■ The photon.	
Einstein's conception of the photoelectric effect is not only that the energy exchange is in quanta of amount $W = h \cdot f$ but that the photon travels in space in a specific direction like a particle. The conception of the photon came from his analysis of the photoelectric effect [in which photons are absorbed] but without treatment of: - atomic electrons falling to inner orbits [in which photons are generated], and - photons exciting atomic electrons to higher orbits [again, in which photons are absorbed].	- The Einstein particle conception of the photon is entirely wrong. The photon energy, $h \cdot f$, is solely a quantization of energy exchange at the point of the exchange, which is an interaction between electromagnetic field and an electron bound into a material either as an atomic orbital electron or a more loosely bound "free" electron. - <u>Photon Generation</u> · It is impossible for an orbital electron to transmit in one specific direction all of the energy and angular momentum that it loses in falling to a more inner orbit. · It can only propagate that energy as a burst [actually a half wave cycle] of electromagnetic radiation spherically outward in all directions as a variation of its normal spherical wave outward flow. · Because the electron orbits the atomic nucleus as it spirals inward from an outer to an inner orbit, starting so in the plane of the outer orbit and the plane shifting during the transition to become the plane of the inner orbit, the pattern of the propagated electromagnetic burst is not spherically symmetrical to its source electron. · That "shapes" the field reflecting the orientation of the change in angular momentum. · The energy lost to the electron in the transition is propagated outward in all directions from the electron as it spirals inward. There can be no sending of a "photon" in one specific direction. · The electron travels about ½ of an orbit to about a full orbit in making the outer to inner orbit transition. - <u>Photon Absorption</u> · Photon absorption in terms of electron motion is the inverse of photon generation. However, just as photon generation sends the energy and angular momentum spherically outward, · So the arriving energy and angular momentum for a photon absorption must be the simultaneous [or sufficiently so] arrival of small intercepted portions of the total spherical wave front of propagated energy and momentum of a number of separate "photons". · The net arriving electromagnetic field must be strong enough and oriented sufficiently so as to change the encountered electron's orbit from its orbit when encountered to its outer destination orbit.

	· Perhaps the greatest contradiction in the Einstein photon theory is as follows. The wavelength of light is in the range of 10^{-7} meters. Atomic dimensions are on the order of 10^{-10} meters so that if a photon is to contain wavelength data relevant to the light that it represents, it must then have dimensions that are on the order of 1000 times the size of an entire atom. Clearly this is completely at variance with the photon explanation of the photoelectric effect and of line spectra of atoms. · Einstein would have, relatively speaking, *basketball* size photons interacting with grain of *sand* size atoms, the *basketball* - photon managing to focus its action solely on one *germ* size electron in the grain of *sand* size atom while not disturbing any of the rest of the atom. - Specific Orbits · The mechanisms presented in *The Origin and Its Meaning* that produce the stable orbits and control orbit changes automatically cause the energy exchanges to be exactly of $h \cdot f$ quanta in magnitude.
■ The neutrino.	
Contemporary physics treats the neutrino essentially as if it is a particle having a local location, yet has some wave characteristics, just as the electron is a particle having a local location, yet some wave characteristics. Contemporary has no explanation of the penetrating power of the neutrino and is confused as to whether or not it has rest mass.	- A photon is a half-wavelength piece of spherically outward propagated oscillation emitted by an electron when it falls from a higher to a lower energy atomic orbit. The photon carries angular momentum in the amount of the decrease in the source electron's angular momentum and it carries energy in the amount of the electron's energy decrease. The photon energy corresponds to the oscillation frequency as $W = h \cdot f$. - A neutrino is a half-wavelength piece of oscillation similar to a photon, but emitted by an energy-losing particle that is not in atomic orbit and consequently not carrying angular momentum. · Neutrino mass, as in the case of photon mass, is zero rest mass and $h \cdot f / c^2$ kinetic mass. As with the photon the neutrino has no anti-particle nor charge. · Lacking angular momentum the neutrino can only rarely interact with an atomic orbital electron which does have essential and specific angular momentum, which accounts for the passage of the neutrino through matter largely without interaction and therefore largely undetected.