Updated Theory of Everything (TOE)

Update of second article of

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by

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Introduction

- Worked on 10 to 12 complex electronic projects including: phased array radars, helicopter motion/visual simulators
  - Projects similar in cost/complexity to LHC, Manhattan atomic bomb
  - My projects needed approximately 50% new design requirements
    - Phased array beamsteering in $1x10^{-6}$ s (new)
    - Transmitter power, receiver sensitivity (old)
- Spent 3 years on each project learning 90% of it
  - Understanding 100% required one's total career (e.g. Don Smith, Bob Dancy on US Air Traffic Control System)
- My strategy evident after TOE start
  - TOE was several orders of magnitude more complex than my 10-12 projects
- Started my self-taught TOE work during retirement at age 66
  - Contrast to physicists performing work in early career (e.g. Peter Higgs)
- Totally deaf
  - Lost 99% of hearing at age 13
- Because of my engineering background and deafness
  - I am slow on my feet to answer questions, but created both original TOE and this Updated TOE
  - Astrophysicists ignored me and my communications with them
- Made assumptions and created this Updated TOE

TABLE I. Fundamental SM/supersymmetric matter and force particles

Symbol	SM	Matter	Force	Symbol	Supersymmetric	Matter	Force
p_1	graviton		x	p_{17}	gravitino	x	
p_2	gluon		x	p_{18}	gluino	x	
p_3	top quark	x		p_{19}	stop squark		x
p_4	bottom quark	x		p_{20}	sbottom squark		x
p_5	tau	x		p_{21}	stau		x
p_6	charm quark	x		p_{22}	scharm squark		x
p_7	strange quark	x		p_{23}	sstrange squark		x
p_8	muon	x		p_{24}	smuon		x
p_9	tau-neutrino	x		p_{25}	stau-sneutrino		x
p_{10}	down quark	x		p_{26}	sdown squark		x
p_{11}	up quark	x		p_{27}	sup squark		x
p_{12}	electron	x		p_{28}	selectron		x
p_{13}	muon-neutrino	x		p_{29}	smuon-sneutrino		x
p_{14}	electron-neutrino	x		p_{30}	selectron-sneutrino		x
p_{15}	W/Z's		x	p_{31}	zino	x	
p_{16}	photon		x	p_{32}	photino	x	

W/Z's

- Transient W^- matter associated with transient H force (Peter Higgs theory)
  - Half-lives of 10^{-25} s
- Higgs force (boson) proposed in 1964
  - Scientists confirmed its existence in 2012 at LHC
  - In 2013, Nobel prize awarded to Peter Higgs and Francois Englert
- Our universe's energy is 10^{54} kg
  - Dark energy represents 69% or .69 x 10^{54} kg
    - Higgs theory incapable of defining dark energy (transient particles)
  - My assumption – specifically look for permanent higgs forces to define dark energy
  - My assumption - dark matter 26%, zino and photino 13%, 3 permanent Higgsinos 13%
  - Atomic/subatomic matter (up quark, down quark, electron, electron-neutrino, muon-neutrino, tau-neutrino 5%)
- This Updated TOE includes both permanent matter particles (up quark) and transient matter particles (W^-)
  - Created during spontaneous symmetry breaking
  - Undersized porcupine (up quark) and its higgs force (overgrown spines)

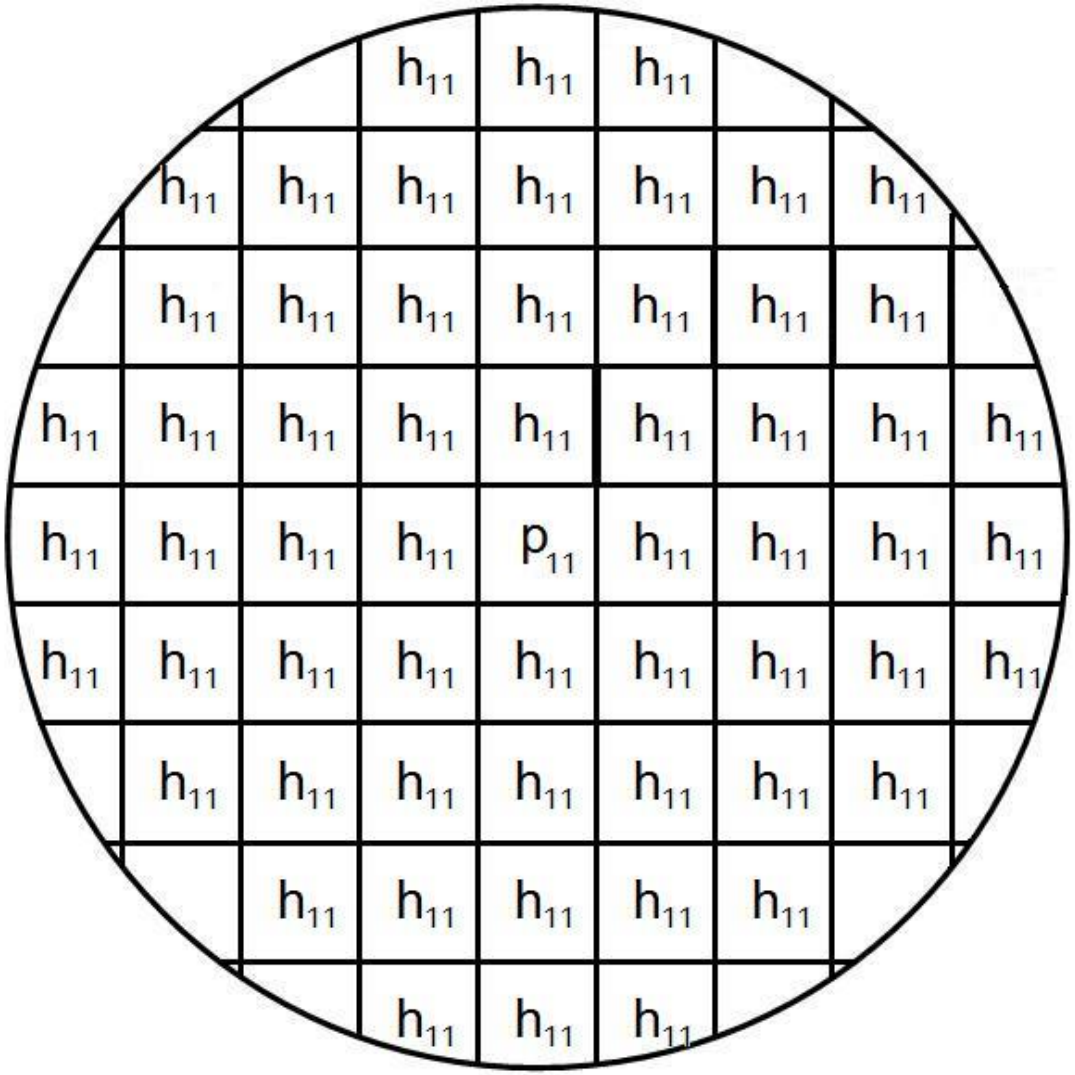
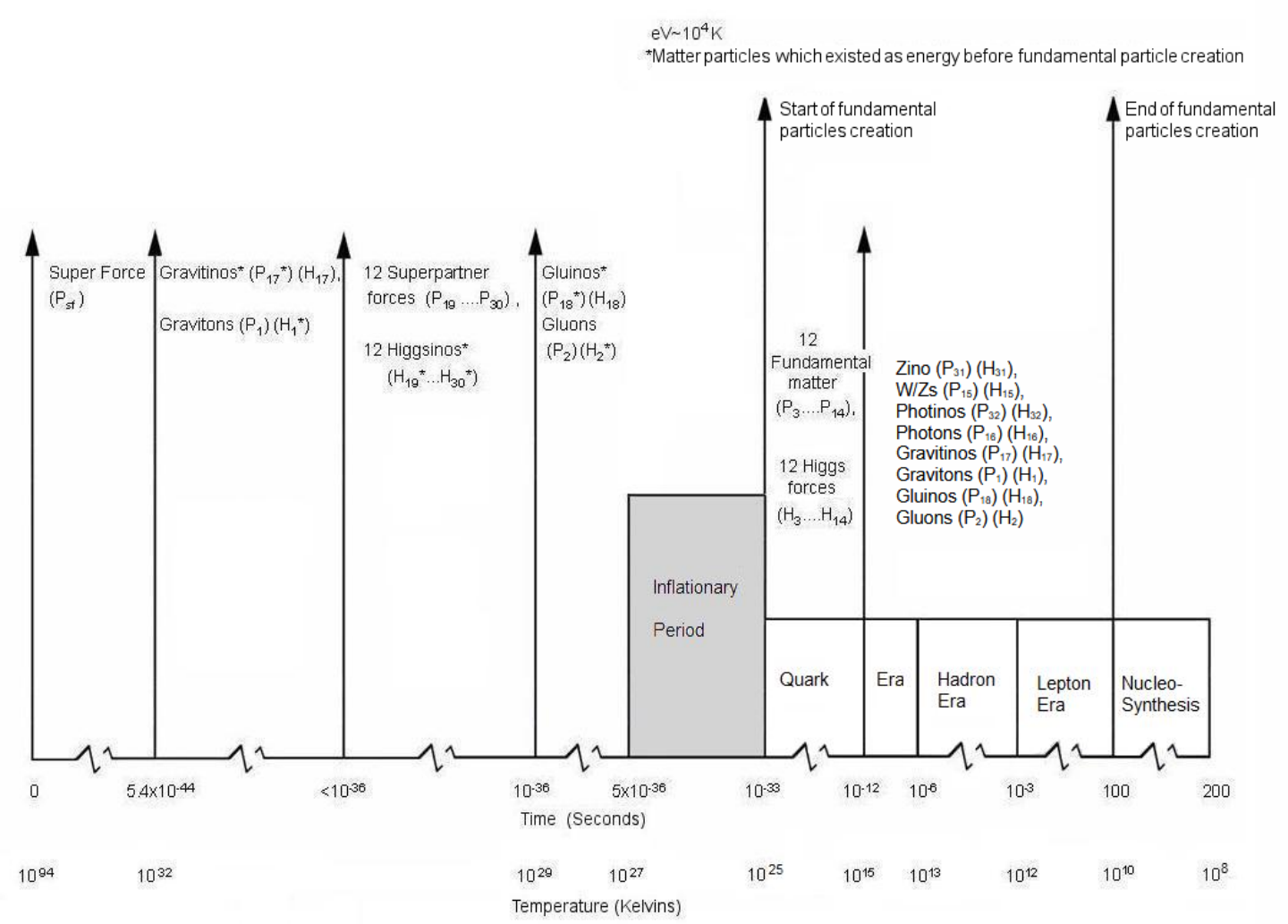


FIG. 13. Up quark with quantized higgs force particles (3 dimensional).

Particle Creation - Big Bang Timeline



12 Fundamental Matter Particles + 12 higgs Forces

- 6 permanent matter particles and their higgs forces
  - p_{11} up quark + h_{11} higgs force
  - p_{10} down quark + h_{10} higgs force
  - p_{12} electron + h_{12} higgs force
  - p_{9} tau neutrino + h_{9} higgs force
  - p_{13} muon neutrino + h_{13} higgs force
  - p_{14} electron neutrino + h_{14} higgs force
- 6 transient matter particles and their higgs forces
  - p_{3} top quark + h_{3} higgs force
  - p_{4} bottom quark + h_{4} higgs force
  - p_{5} tau + h_{5} higgs force
  - p_{6} charm quark + h_{6} higgs force
  - p_{7} strange quark + h_{7} higgs force
  - p_{8} muon + h_{8} higgs force

Baryogenesis and Spontaneous Symmetry Breaking

- After the start of fundamental particles creation
  - Baryogenesis occurred for both transient (W^-) and permanent particles (up quark)
- Followed by spontaneous symmetry breaking
  - Transient (W^-) and permanent matter particles (up quark)
  - Intimate relationship between creation time and energy/mass
    - W^- at 80 GeV, up quark 2.3 MeV
  - Created undersized porcupine (W^- and up quark) and their higgs forces (overgrown spines)
- 8 permanent higgs forces associated with 8 permanent matter particles was dark energy
  - 8 permanent matter particles were: up quark, down quark, electron, electron-neutrino, muon-neutrino, tau-neutrino, zino, photino
- 12 superpartner and 12 associated Higgsinos were X-bosons (E.J.Chaisson)
  - Latent energy which expanded our universe during inflationary period
  - 8 permanent higgs forces (dark energy) expanded our universe after the start of fundamental particle creation

References

- Alan Guth in his book “Inflationary Universe” 1997, Figure 12.1 on page 209 implied a relationship between a matter particle (up quark) and a Higgs Field A and a Higgs Field B
  - Represented as FIG. 10. Up quark baryogensis and spontaneous symmetry breaking function
- Gordon Kane in his article (Sci. Am. **293**,1 (2005))
  - Implied a relationship between a permanent matter particle (up quark) and a permanent higgs force
- Ambiguous results from Guth and Kane
- These two astrophysicists and others (Peter Higgs, Michael Turner, Rocky Kolb, Edward Witten ignored me and my communications with them)
  - I made assumptions and created both the original TOE and this Updated TOE

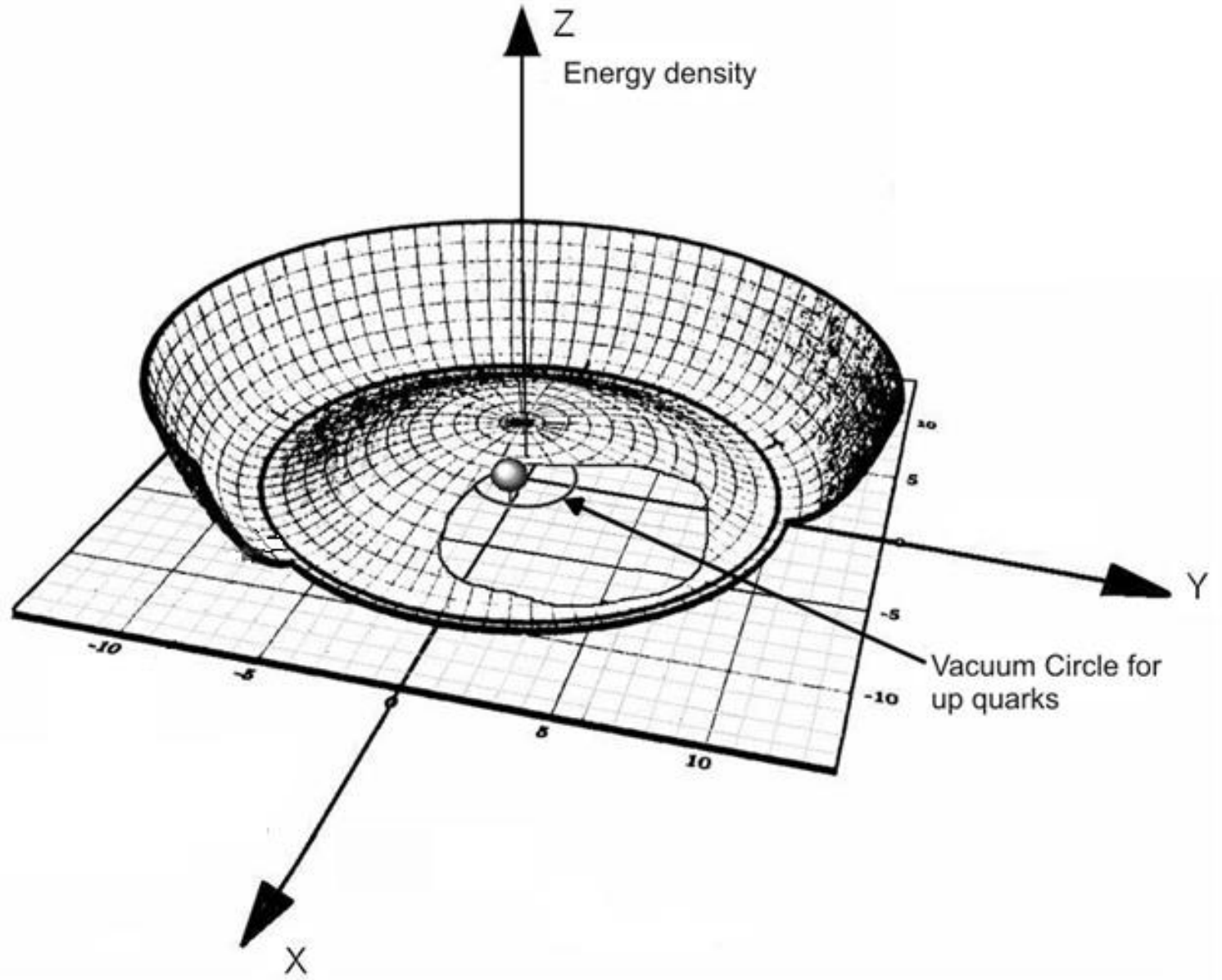


FIG. 10. Up quark baryogenesis and spontaneous symmetry breaking function.

FIG. 10. Description

- Z axis represented super force energy density allocated to all up quarks in our universe
  - X axis was associated with an up quark
  - Y axis was associated with an anti-up quark
- Up quark baryogenesis, began when the ball was at its peak position (x=0, y=0, z=2)
  - The ball moved down FIG. 10, equidistant between the X and Y axes
  - Super force particles condensed into up quarks and anti-up quarks
    - The ball returned to its peak position
  - After n of these condensation/evaporation cycles, the ball moved to the FIG. 10 ball position

FIG. 10. Description, cont.

- When the ball was in its peak position, baryogenesis had not occurred
  - When the ball was in FIG. 10 position, baryogenesis had occurred
- During fundamental particle creation, it took 13.8 billion years for the ball (all up quarks + higgs forces in our universe) to move vertically down to its current position just above the vacuum circle for up quarks
  - Approximately 3.28×10^{80} up quarks in our universe and their three dimensional higgs forces
- At $t=5.4 \times 10^{-44}$ s or Planck time, four forces (gravitational, electromagnetic, strong, weak) were unified
- At $t=10^{-36}$ s, three forces (electromagnetic, strong, weak) were unified

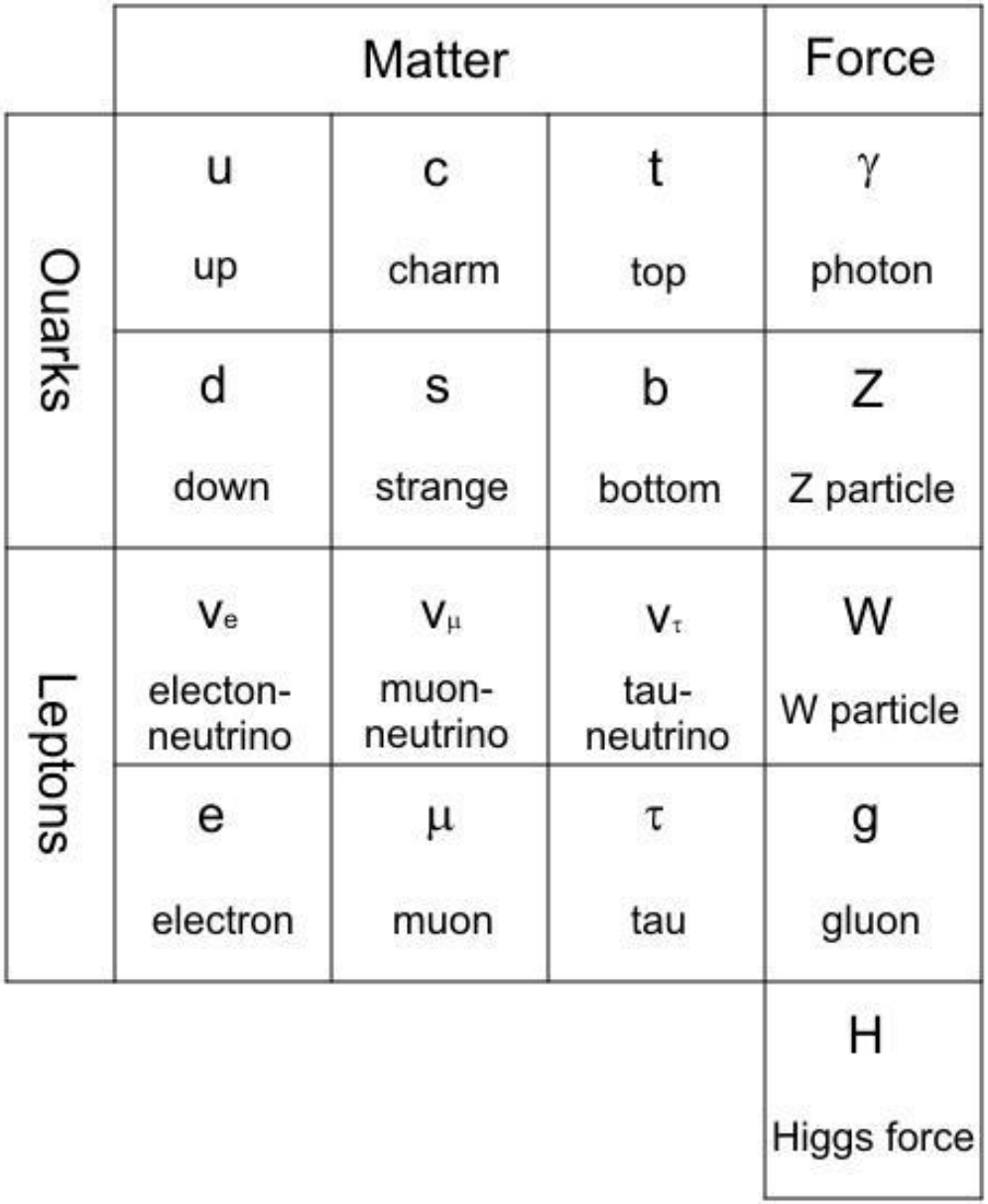


FIG. 11. SM matter and force particles.

Standard Model (SM)

- SM is gold standard of particle physics
- SM inadequately represents our universe's matter and force particles because it
  - Defines only a single higgs force (H) associated with a W^-
  - Does not include
    - Dark matter
    - Dark energy
    - Graviton and gravitino

FIG. 12. Beyond the SM Physics Solution

- Brian Greene – “Strings of string theory are as long as a Planck length and point like” (Elegant Universe, p. 136)
  - I interpreted this as a point particle in Planck cube
  - Point particles can represent anything in our universe: [average human, supermassive quark star (matter), galaxy, or entire universe]
- 64 particles of FIG. 12
  - 47 fundamental point particles or superstrings in a Planck cube
  - 17 are higgs forces (8 permanent, 9 transient)
    - Overgrown spines
- Emphasizes higgs particles’ supremacy
- Differentiates between important permanent and less important transient particles

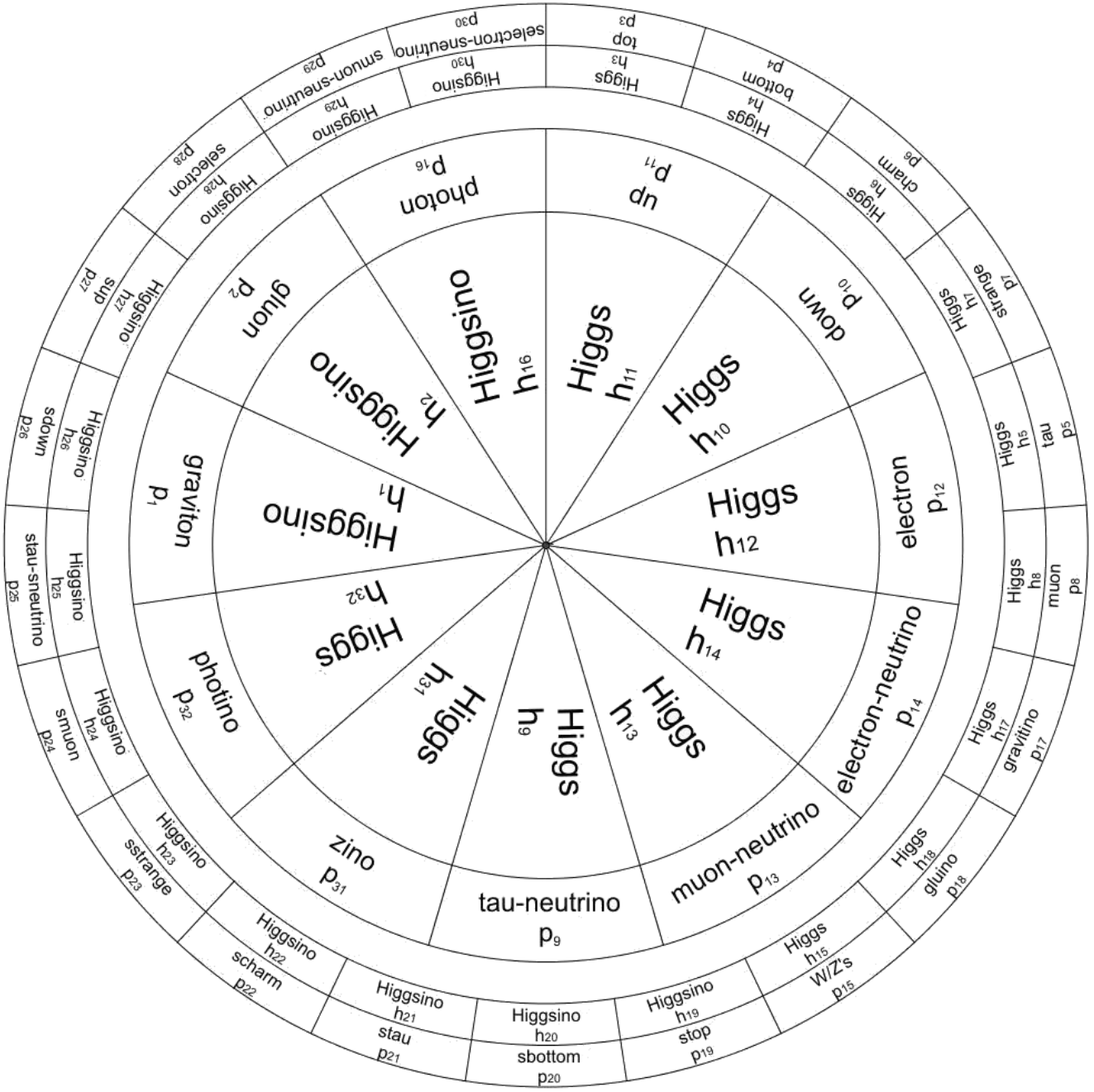


FIG. 12. Beyond the SM physics solution.

Super Supermassive Quark Star (matter) Formation Summary

- Stars formed via molecular cloud gravitational collapse, star accretion, and star merger
  - For a star mass < 8 $\mathrm{M}_{\odot}$, star collapses to white dwarf star
  - For a star mass > 8 and < 20 $\mathrm{M}_{\odot}$, star collapses to neutron star
  - For a star mass > 20 and < 100 $\mathrm{M}_{\odot}$, star collapses to quark star (matter)

Super Supermassive Quark Star (matter) Formation Summary, cont.

- My assumption was at the center of each galaxy in our universe, was a stable super supermassive quark star (matter)
  - There is extensive variation in sizes of stable super supermassive quark star (matter)
  - Variation is $6x10^6$
  - Sagittarius A is relatively small with a mass of 4 million M_Θ
  - Other galaxies harbor super supermassive quark star (matter) thousands of times more massive than Sagittarius A

Super Supermassive Quark Star (matter)

- 14 permanent matter/force particles are within event horizon volume
- 8 higgs forces (dark energy) are outside the 14 permanent matter/force particles volume and extend to edge of universe
- Super Supermassive Quark Star (matter) is a “black hole” which swallows matter/force particles
- Event horizon is a spherical boundary around a black hole where the gravitational pull is so strong neither matter or light can escape

Quantum Mechanics and Einstein's General Relativity

- There is a disconnect between quantum mechanics and Einstein's General Relativity
  - The quantum mechanics/general relativity boundary is
    - Start of inflation $t=5 \times 10^{-36}$s
  - General Relativity applicable all times between t=0 and t=13.8 billion years
  - Quantum Mechanics applicable for all times except between 0 and 5×10^{-36}s
  - Between 0 and 5×10^{-36}s, quantum mechanics not applicable
    - Our universe was a spherical singularity smaller than a Planck cube

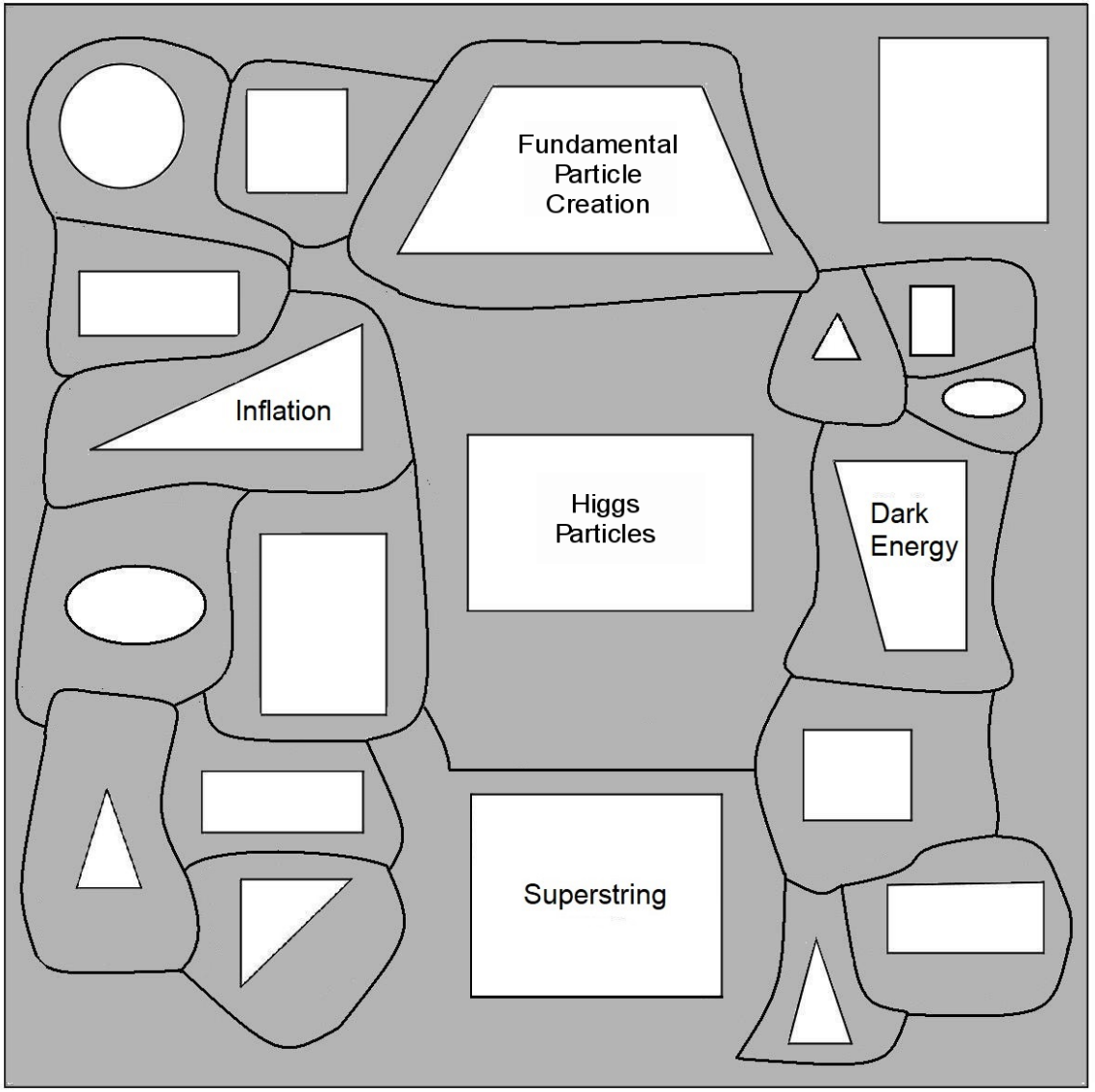


FIG. 22. A TOE physics solution jigsaw puzzle.

Einstein-Rosen Bridge (Wormhole)

- Brian Greene described a doughnut to beach ball transformation (Elegant Universe, p. 327)
  - Assumed transformation began after t=0 (our universe became spherically shaped)
  - Einstein-Rosen Bridge (wormhole or two doughnut physical singularities)
  - Misconception of wormhole
    - Not a tunnel where spacecrafts move through it in either direction
  - Wormhole consists of a black hole (energy) doughnut singularity and a white hole (energy) doughnut singularity
  - Black hole (energy) swallows matter/force particles, existed before t=0 in our precursor universe
  - White hole (energy) emits matter/force particles, existed after t=0 in our universe
  - Transformation from black hole (energy) to white hole (energy)
    - Decrease in entropy
  - Entropy increases in a closed system
  - Only possible if the increase in entropy in the precursor universe exceeds the decrease in entropy of the black hole (energy) to white hole (energy) transformation

Conclusions

- Higgs forces and particles (Higgsinos) constituted 82% of our universe's total energy
- Because of my engineering background, and deafness
  - Astrophysicists ignored my TOE solution of 12/01/2020
  - Solution of dark energy, dark matter, and point particles
- My TOE included both permanent matter particles (up quark) and transient matter particles (W^-)
- In superstring theory, a point particle in a Planck cube is the size of matter and force particles
- FIG. 12 Beyond the SM physics solution replaced the SM
  - Emphasized higgs particles' supremacy
  - Differentiated between important permanent and less important transient particles
- Thus, both the original TOE and this Updated TOE were created

Corrections

- TABLE I Fundamental SM/supersymmetric matter and force particles
  - Change p_{15} W/Z's to H force particle
  - Change p_{31} to W^-
  - Delete p_1 graviton and p_{17} gravitino
- FIG. 12. Beyond the SM Physics Solution
  - Change Higgs h_{15} to H
  - Change W/Z's p_{15} to W^-
- Original TOE page 59
  - Three supportive arguments for charge, parity, time (CPT) violation
    - CPT invalid at Planck scale (T. D. Lee)
    - Highly curved spacetime [black hole (energy)] violates CPT (N. E. Mavromatos)
    - Unitarity and entropy preservation not respected (F. Hulpke)