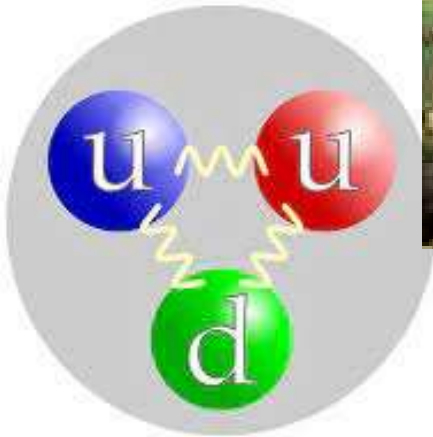


# Quarks to Quasars

## Or Science for Creationists

### I. Introduction



# Introduction – a preface

- ▶ I will unapologetically quote Scripture, but a major goal is to share science knowledge that favors Creation over Evolution
- ▶ No man has all the answers – including me
  - ▶ (but we can all have THE answer)
- ▶ Science changes; Scripture does not - Many things thought wise are now considered foolish
  - ▶ Eg blood letting, cause of stomach ulcers, sleeping babies prone
- ▶ I may have unintentional errors/oversights (Exod 23:1 – not raise false reports...)
  - ▶ Think and evaluate for yourself
  - ▶ Correct me when I am wrong
  - ▶ I am confident that the main conclusion will not change
- ▶ Each installment of “Quarks to Quasars” will depict its own monumental steps
- ▶ Caution: There are VERY smart people who oppose creation; I do not want myself, or us collectively, to denigrate or condescend. But, we can be in the conversation
  - ▶ 1Cor 8:1 - Now as touching things offered unto idols, we know that we all have knowledge. **Knowledge puffeth up, but charity edifieth.**

# Outline/Scope

- ▶ I. Introduction – importance, improbability, theory flaws
- ▶ II. Quarks and Atoms
- ▶ III. Molecules and Cells
- ▶ IV. Cells = Life
- ▶ V. Life to Man
- ▶ VI. Other creeping things
- ▶ VII. Earth and Geology
- ▶ VIII. Heavens
- ▶ IX. Human body
- ▶ X. Eyes by Design
- ▶ XI. History of Creationism vs Evolution
- ▶ XII. Scriptural Basis of Creationism

# Broad principles in studying science

- ▶ Wrong assumptions/biases commonly lead to wrong conclusions.
- ▶ Hierarchy of (un)certainty in science:
  - ▶ facts, provable theories, principles, hypotheses, thoughts, opinions
- ▶ Things are more complex than portrayed
- ▶ Faith to believe in evolution (>creationism)
- ▶ Knowledge is power
  - ▶ strive to know what we can to avoid being marginalized or intimidated by “experts”
    - ▶ John 8:32 - “and ye shall know the truth and the truth shall make you free”
    - ▶ Prov 24:5 - “A wise man is strong; yea, a man of knowledge increaseth strength.”

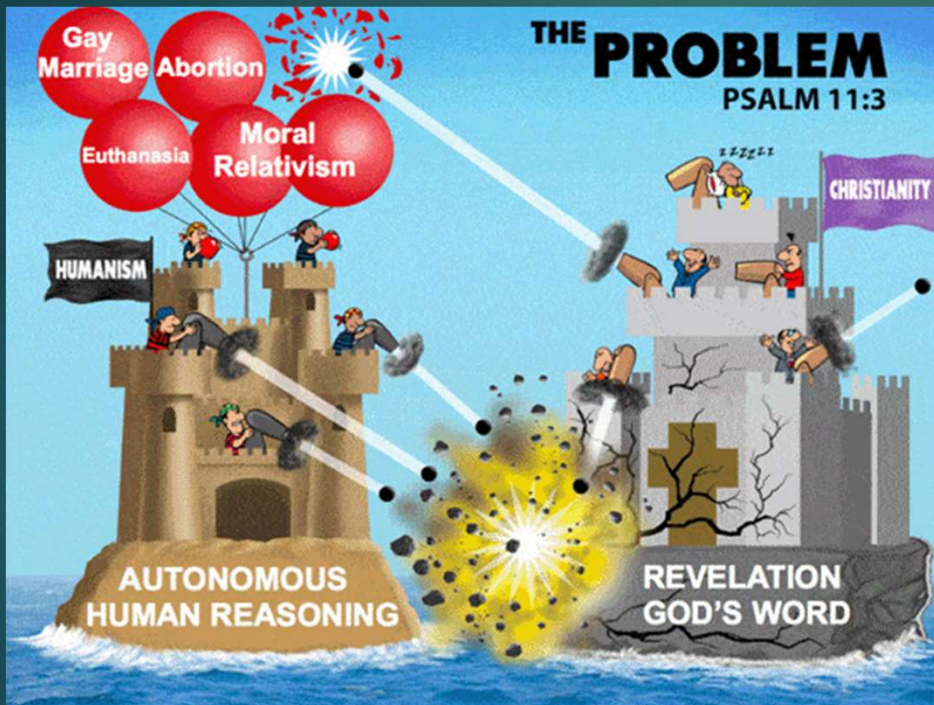
# Spoiler alert- I am Bible biased!

- ▶ There are truths
  - ▶ **1Pet 1:1-8** God gave us knowledge, called us to glory and virtue, gave us exceeding promises to partake divine nature, to escape world's corruption by diligence to add to your faith – virtue, knowledge, temperance, patience, godliness, kindness, charity- so as to be fruitful
- ▶ Some deny truths
  - ▶ **2Pet 3:5** willingly ignorant
- ▶ Beware of deniers and scoffers (false prophets)
  - ▶ **Matt 10:33** ...deny me before men, him will I also deny before my Father...
  - ▶ **Ecc 8:17** ...cannot find out (all)...a wise man think to know...yet (can't)

## So, why study creationism?

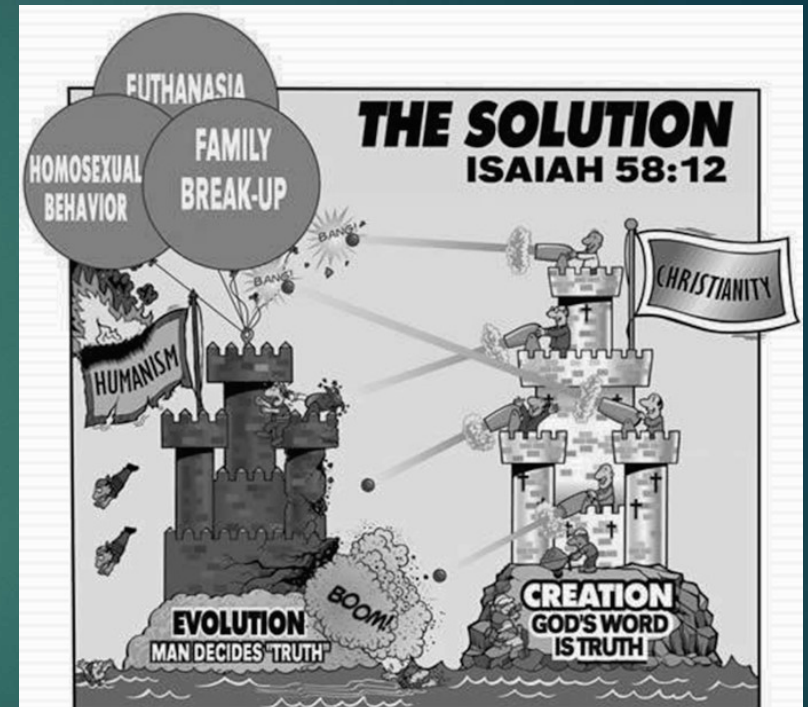
- Edification
- Be ready to give account (1Pet 3:15)
- It is interesting!

# Why is Creation an important topic? We need to defend “the foundation”!



Psa 11:3 – If the foundations be destroyed, what can the righteous do?

From ICR and Ken Ham, now AIG



Isa 58:12 And they that shall be of thee shall build the old waste places: thou shalt raise up the foundations of many generations; and thou shalt be called, The repairer of the breach, The restorer of paths to dwell in.

# God endorses and encourages us to study

- ▶ Psa 111:2 – The works of the LORD are great, sought out of all them that have pleasure therein.
- ▶ Prov 1:5-7 – A wise man will hear, and will increase learning; and a man of understanding shall attain unto wise counsels: <sup>6</sup>To understand a proverb, and the interpretation; the words of the wise, and their dark sayings.<sup>7</sup>The fear of the LORD is the beginning of knowledge: but fools despise wisdom and instruction.
- ▶ Prov 25:2 – It is the glory of God to conceal a thing: but the honour of kings is to search out a matter.
- ▶ Ecc 1:13 - And I gave my heart to seek and search out by wisdom concerning all things that are done under heaven: this sore travail hath God given to the sons of man to be exercised therewith.

# Scientific Creationism vs Evolution: Purpose

In the beginning: Both are theories!



- ▶ We can't observe it happening
  - ▶ Requires inferences from existing data
- ▶ Wide ranging implications: sociological, theological, scientific
- ▶ ***Which theory explains the facts best?***
- ▶ **WARNING:** Will cover a VERY broad scientific footprint (Quarks to Quasars)
- ▶ But provide a MOUNTAIN RANGE of evidence!

Francis Bacon (1561-1626)



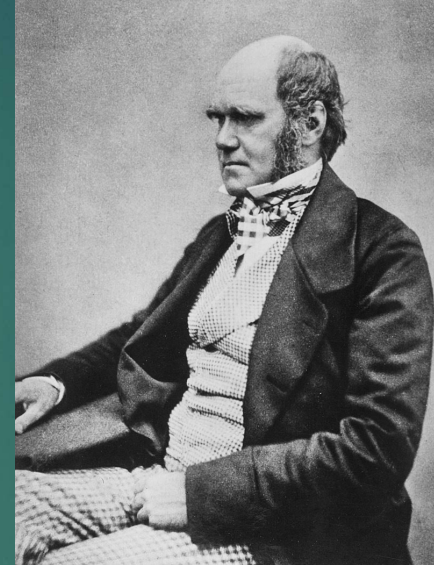


# What are tenets of evolution?

Basic Dogma: increasing complexity through chance driven by natural selection, over long time

- ▶ Big Bang=> space evolution to planets, etc; chemical evolution produced elements/planets
- ▶ Chance and change led to bigger molecules, organelles, cells, LIFE
- ▶ More advanced organisms => MAN
- ▶ “buried” in millions/billions yr
- ▶ “Devil/God is in the details!”

Single biggest problem: it does not require God!



12 February 1809 – 19 April 1882  
Origin of Species, 1859

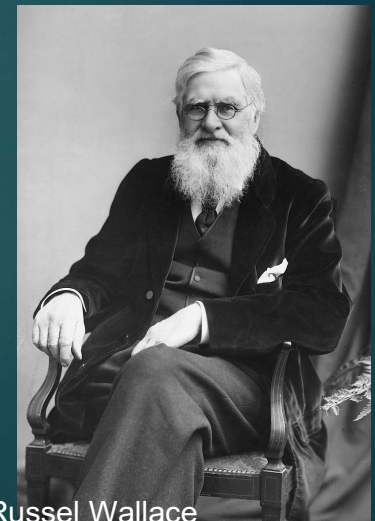
Others:

Asa Gray (theistic evolution)

Charles Lyell (geology)

Jean-Baptiste Lamarck (zoology)

Anaximander of Miletus in 550BC advanced the idea that life emanated from sea slime, and Empedocles in 450BC explained fundamentals of natural selection)



Alfred Russel Wallace  
8 January 1823 – 7 November 1913

# What would it take to prove evolution?

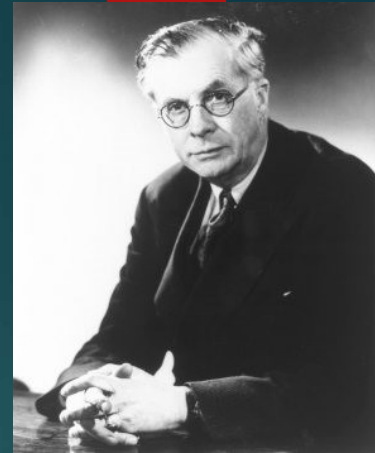
Should be easy

- ▶ Demonstrate stepwise progressions
  - ▶ Fossil record
  - ▶ Present day transitions
  - ▶ Chemistry, biology, astronomy

There is nothing even close to this offered

# Evolution is portrayed as fact: ("follow the science")

- ▶ "... (the highly unlikely odds of evolution of a horse) has happened, thanks to the working of natural selection" (Huxley, *Evolution in Action*, 1953, p46)
- ▶ Julian Huxley: "The first point to make about Darwin's theory is that it is no longer a theory but a fact... We are no longer having to bother about establishing the fact of evolution."
- ▶ R Dawkins: "The theory is about as much in doubt as the earth goes round the sun."
- ▶ Science textbooks- "Evolution is no longer a theory, it is simply a fact" (Mayr, *What Evolution Is*, 2001, p275)
- ▶ Press reports of fossils, etc.
- ▶ "(we) are so committed to the sea... because we all came from the sea" (JFK, comments 9/14/62)



1887-1975

# Critiquing Evolution dismissed

- ▶ critiquing the theory of Evolution without offering a more suitable alternative has been condemned in the 1984 position paper of the National Academy of Sciences, but it has been pointed out that such a position is akin to denying an accused criminal an alibi unless he could solve the crime- a serious violation of legal logic. (P Johnson, JD, Darwin on Trial p7-9).
- ▶ National Academy of Science advised against debating creationism
- ▶ Just because “the preponderance of sophisticated scientists” believe evolution does not make it true (Exod 23:2 - ...not follow a multitude to do evil)
- ▶ Sound familiar? Covid, Twitter, Facebook, etc...

In contrast...

# What is Scientific Creationism?

## Creationism

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1. God designed
2. Young Earth/Universe
3. 6 days to man
4. Sudden creation of universe and kinds
5. Consistent with literal Biblical interpretation

## Evolution

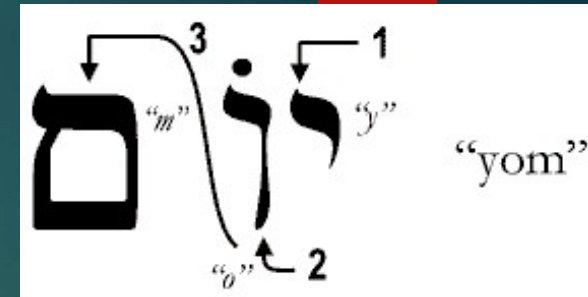
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1. Naturalistic, random, driven by natural selection
2. Long history
3. Man from apes, etc.
4. Slow process; life from nonlife
5. neoDarwinism-  
“punctuated equilibrium”

A common “problem”...

# The Creation in 6 days?

- ▶ Yom (= day) - can it not mean a literal day?
  - ▶ 1200 times outside of Genesis 1-2; is translated as “day”; 65 as “time”; 95% is uncontestably literal day; other 5% clearly used as indefinite (“day of adversity”, etc);
  - ▶ “evening and morning” (100x) never used besides 24 hrs
  - ▶ When ordinal or cardinal (5, 5<sup>th</sup>), always 24 hrs
  - ▶ Gen 1:14; Exod 20:8-11 – singular distinguished from plural days
    - ▶ *yanim* – used 700x, always in 24 hr context
  - ▶ There are other Hebrew words to signify long time but not used in Genesis: *qedem* (ancient/of old), *ad* (unlimited time), *olam* (everlasting/eternity/perpetual), *shanah* (year), *netsach* (forever), *eth* (time) *moed* (seasons/festivals); *dor* (age/rev of time)
- ▶ 2 Pet 3:8 – (Greek) (day as 1000 yrs) sometimes used to justify Day-Age Theory; rather meant to indicate the unfathomable (creative) power of God
  - ▶ There are other Hebrew words that parallel this linguistic rendering



# Evidences for a young Earth (more details later...)

- ▶ Decay of magnetic field- observed drift, decrease; unsustainable for billions of yrs
- ▶ Sun, stars- models c/w thousands yrs
- ▶ Thickness (thinness) of sediment layers
- ▶ Earliest writing/Recorded history (Mesopotamian cuneiform 5500 yrs ago; then Sumerian)
- ▶ Oldest tree rings 5K yrs- “Methuselah”- bristlecone pine
- ▶ Populations statistics-
  - ▶  $2(c^n) = 8$  billion after 4000 yrs ( $n=160$  gens of 25yrs;  $c=1.1$  female children/generation- less than current rate of 1.15); (if 40K generations =  $2 \times 10^{1656}$  = too many bones!- not to mention other animals, etc) ( $10^{25}$  skeletons = volume of earth)



# Radiometric dating – not “rock” solid

- ▶ Carbon-14: most accurate, but only to 30K yrs (5 half-lives)
- ▶ Rocks- index fossils, circularly defined
  - ▶ K-Ar/Ar-Ar very inaccurate due to conversion from muscovite under pressure or escape (experimentally- hours rather than billions yrs)
  - ▶ Rubidium/strontium- inconsistencies;
    - ▶ Cardenas Basalt is youngest, but quite deep
    - ▶ Mt. Ngauruhoe, NZ erupted 1839-1954- yield ages 3.5 my
- ▶ Assumptions may not be correct: closed system, no daughter isotopes, constant decay rate
- ▶ Creationism doesn't require old Earth, evolution does



# Physical evidence for a young Earth – examples of new looking old

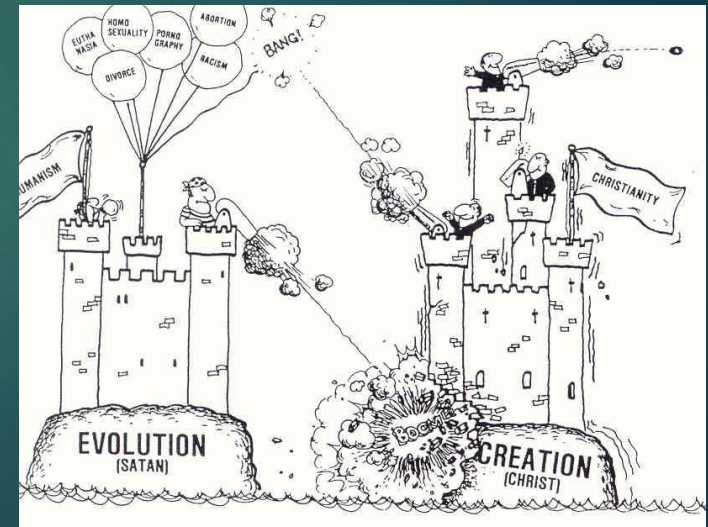
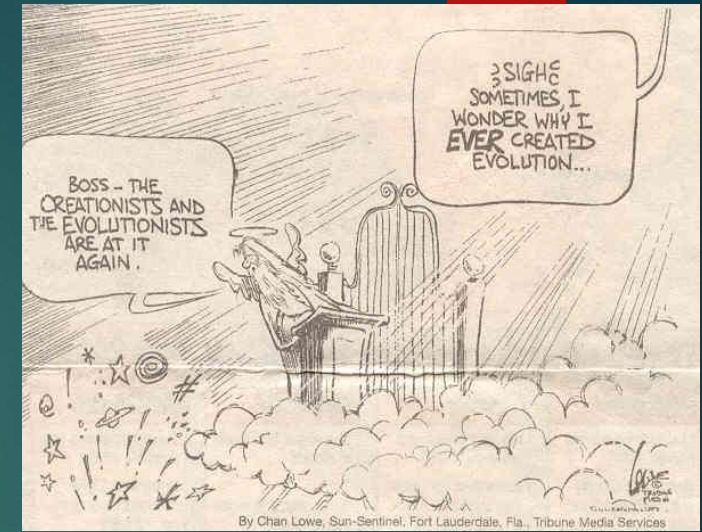
- ▶ Mt. St. Helen's
  - ▶ Known, rapid sedimentation
  - ▶ Appearance of age
- ▶ Observed formation of stalagmites in Australia
- ▶ Formation of Providence Canyon, GA
  - ▶ 9 canyons up to 160' deep, 600' wide, 1300' long; observed formed over past 150 years;
- ▶ “petrified” dated organic materials



# Creationism v. Evolution

## Biblical basis (more on this later)

- ▶ Gen 1:1 "In the beginning **God made** the heavens and the earth"
- ▶ Psa 121:2 "The Lord which **made** heaven and earth"
- ▶ Admonitions against unbelief
  - ▶ Rom 1:21 "vain in their imaginations"
  - ▶ Eph 4:18 "understanding darkened...blindness in their heart"
  - ▶ Rom 1:22 "professing themselves to be wise, they became fools"
  - ▶ 1Cor 1:20 "God made foolish the wisdom of the world"
  - ▶ John 12:43 "...loved the praise of men more than...God"
- ▶ Are mutually exclusive
  - ▶ 1Kings 18:21 –Ahab's prophets had no response for supernatural God
  - ▶ Matt 12:30 – "**He that is not with me is against me...**"
  - ▶ 2Tim 3:5 – "having a form of godliness...from such turn away."
- ▶ Satan delights in divisiveness, and recognizes Creation is foundational to belief



# Creationism is portrayed as ignorant, religion

- ▶ “Pretending to young minds that we cannot tell the difference between good science and bad...makes evident (we) don't care about the truth” (Neuraumont, The Triumph of Evolution: And the failure of Creationism, 2000)
- ▶ ...if you meet somebody who not to believe in evolution, that person is **ignorant, stupid, or insane**” Richard Dawkins“

## Microevolution is extrapolated/confused for macroevolution

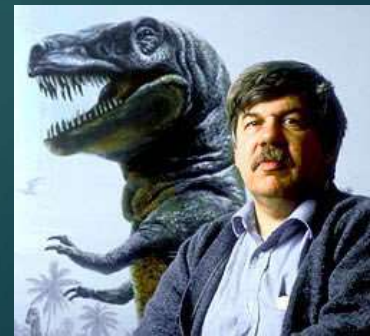
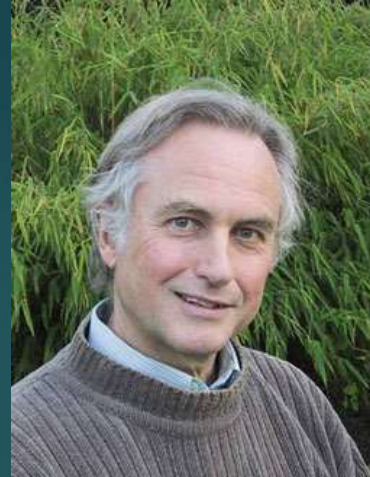
- ▶ ...we have abundant, direct, observational evidence of evolution in action...” Gould, “Hen's Teeth and Horse's toes”

## But believing evolution requires at least as much faith

- ▶ Desire to keep creationism out of school curricula- even block certification if taught along with evolution

## Note:

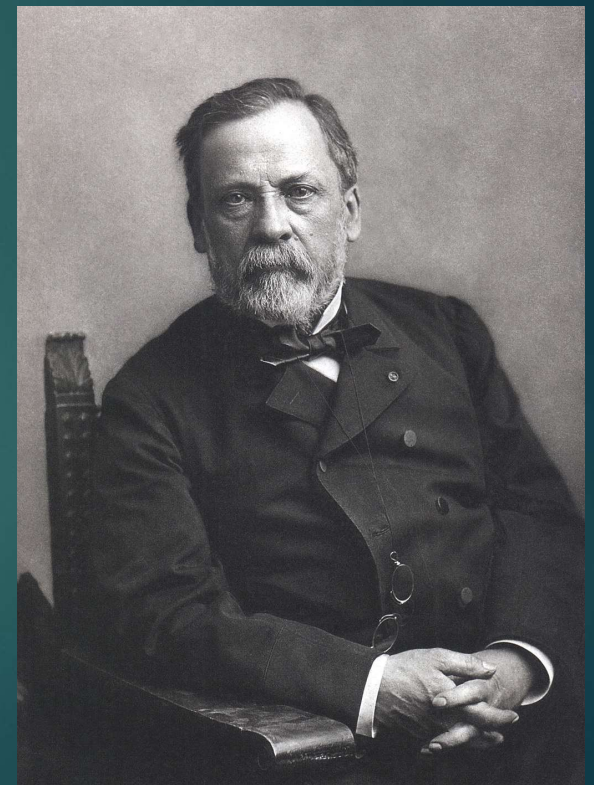
- ▶ “I am the alpha and the omega” (Rev 1:8, 17-18;21:6-7;Isa 44:6;48:12)
  - ▶ The most castigated books of Bible by secularists are Genesis and Revelation, what God says he is! No surprise!



# Testimonies of some really smart people...

## Louis Pasteur (1822-95)

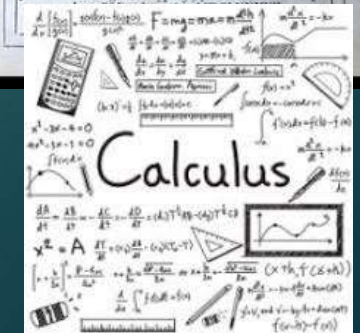
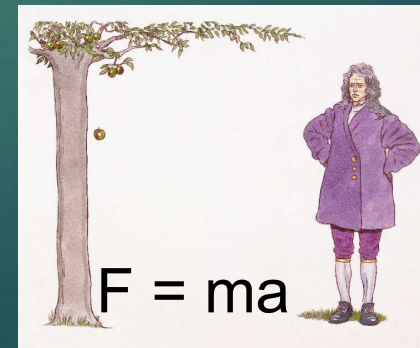
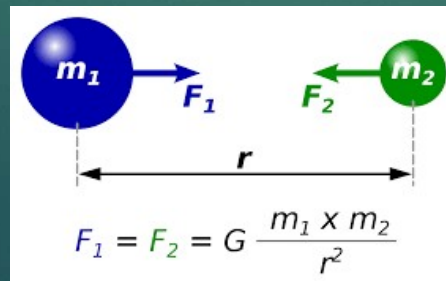
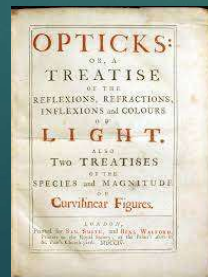
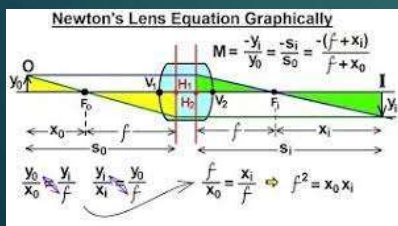
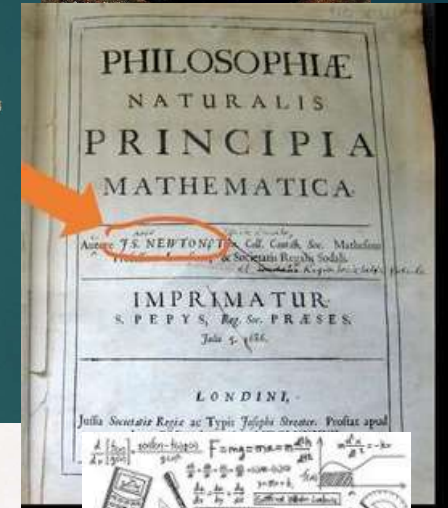
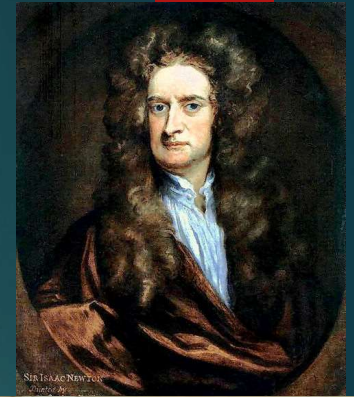
- ▶ Dedicated to finding truth via scientific method, experimentation
- ▶ Disproved spontaneous generation
- ▶ Chirality (tartaric acid in wine)
  - ▶ Major impact on pharma
- ▶ Pasteurization
- ▶ Fermentation- yeast alive, control- "Pasteur Effect"
- ▶ "The more I study nature, the more I stand amazed at the work of the Creator"



# Sir Isaac Newton

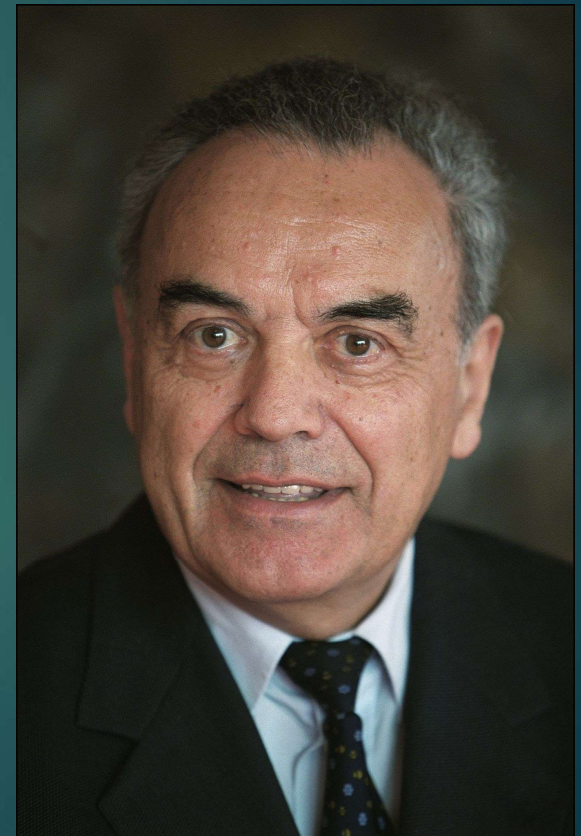
25 December 1642 – 20 March 1726/27

- ▶ “This most beautiful system of the sun, planets, and comets, could only proceed from the counsel and dominion of an intelligent and powerful Being.... This Being governs all things, not as the soul of the world, but as Lord over all; and on account of his dominion he is wont to be called Lord God... or Universal Ruler”



# Werner Arber, Nobel Laureate June 3, 1929-

- ▶ Swiss microbiologist
- ▶ 1978 Nobel with Hamilton Smith and Daniel Nathans (JHU) for discovering restriction enzymes (led to recombinant DNA tech) (methylases)
- ▶ Researched mutations in *E. coli*- rate of phenotypic change rapid for 2000 generations, then slower-  
*genetic variation has limits*
- ▶ “more intensive research is needed to understand the apparent *complexity of nature*” (from *Nobel lectures*)—euphemism for stating failure of current theory
- ▶ “More generally, these data show that the *genome is highly dynamic* even over a time scale that is, from an evolutionary perspective, very brief.” (PNAS 1999;96:3807)
  - ▶ Others corroborate: PNAS 2008;105:7899



A few examples, areas to whet  
your appetite...



A reminder...

# Recurring “proof” themes (evaluate these throughout)

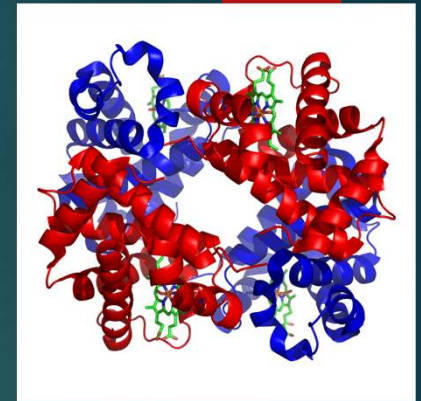
- ▶ Mathematical improbabilities
- ▶ Violations/misapplications of logic and scientific principles
- ▶ Supernatural design (vs results of natural selection)
- ▶ Contradictions of Scripture/theological bases



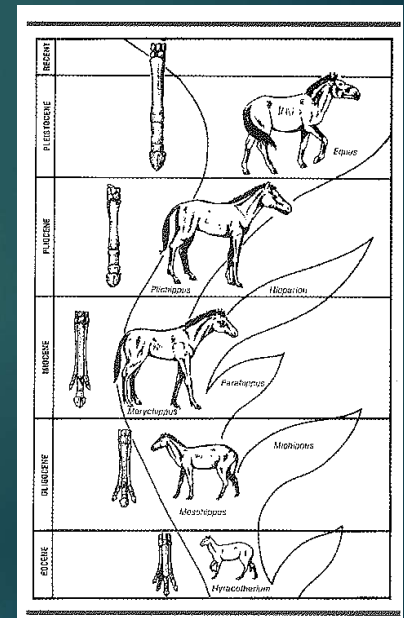
# Evidence against evolution

## Odds are (way) too low

- ▶ Presuppose you have the 100 parts of a medium sized object (e.g. 100 part molecule):  $100! = 10^{158}$ 
  - ▶ if  $10^{12}$  collisions/s (fastest known chemical reaction),  $10^{18}$  s (20B yrs),  $10^{78}$  particles (estimate of particles in universe); **odds are still  $10^{-50}$**
  - ▶ or even a very small 100 AA protein, 20 AA possibilities =  $20^{100} = 10^{137}$
- ▶ “Organic molecule” defined by NASA as larger, more complex combinations even more unfathomable: eg. 1000 nucleotide protein (4 nucleotide choices, some duplicates) =  $4^{1000} = 10^{600}$
- ▶ Huxley suggested  $10^6$  mutations for a horse; in 50K gens =>  $10^{300000}$



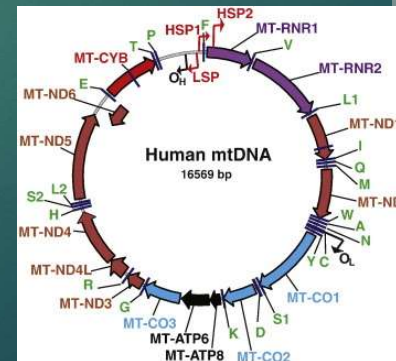
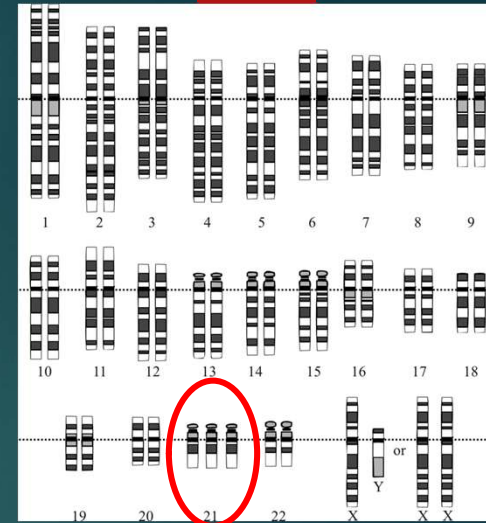
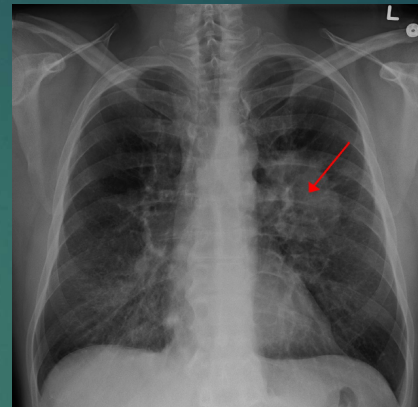
Hemoglobin: 2 alpha 141 and 2 beta 146  
Almost all organisms including fish use this



Moreover, mutations is not a great way to evolve...

# Evidence against evolution: Mutations

- ▶ usually lethal, almost always harmful
  - ▶ Eg somatic cell mutation harm: Cancer
  - ▶ Eg germ cell mutations – eg Down's syndrome
- ▶ only germ cell mutations are passed on
- ▶ about 1.6/person/generation - we should be extinct (Nature, Jan 28,1999, pp293-4,344-7)
- ▶ Fruit fly: 20,000 mutations and still a fruit fly!
- ▶ "Eve's" mitochondrial DNA calculations (ie human ancestor 70-800K yrs ago) might be off by factor of 20 (Trends in Ecology and Evolution, 12:422, 1997)



A reminder...

# Recurring “proof” themes (evaluate these throughout)

- ▶ Mathematical improbabilities
- ▶ Violations/misapplications of logic and scientific principles
- ▶ Supernatural design (vs results of natural selection)
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# Evidence against evolution

## Thermodynamics

First Law (energy is conserved)

- ▶ Where did energy originate?
- ▶ How to gain energy?

Second Law (increasing entropy)

- ▶ What is directing changes?
- ▶ What is the energy converter?
- ▶ What is the evidence that it does not apply to living systems, other parts of universe, other points in time?

[Third Law (entropy zero at absolute zero)]

### Gibbs Free Energy



Reactants

Products

$$\Delta G = \Delta H - T\Delta S$$

$\Delta G$  : Change in Gibbs free energy

$\Delta H$  : Change in Enthalpy

$\Delta S$  : Change in Entropy

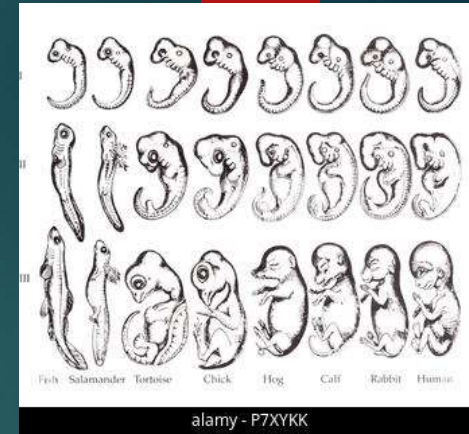
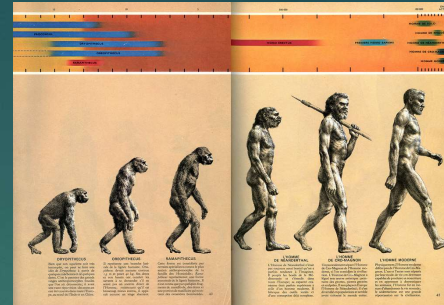
ChemistryLearner.com



# Other evidence against evolution

Transitional forms/missing links/fraud

- ▶ Examples of “extinct transitional forms”
  - ▶ Many subsequently found (eg. Coelocanth in Madagascar in 1938)
- ▶ Hoaxes:
  - ▶ Haeckel’s drawings, “phylogeny recapitulates ontogeny”;
  - ▶ Nat Geographic, Nov '99 *Archaeoraptor*- arms of bird, tail of dinosaur- was discredited
  - ▶ Peppered moths in England- they don’t land on trees in daylight; photos were taken by gluing moths to trees
- ▶ We should be wallowing in bones and fossils!



The Archaeoraptor amalgamation: multiple fossils and rocks crafted to perpetrate a fraud.  
Image Credits: Copyright © 1999 University of Texas High-Resolution X-ray CT Facility. Adapted for use in accordance with federal copyright (fair use doctrine) law. Usage by ICR does not imply endorsement of copyright holder.

# Just a few examples of other weaknesses/violations of logic in evolution

- ▶ Why would flight evolve >4 separate times (insects, birds, reptile, fish, & mammals)?
- ▶ Human ancestor fossils are usually based only on small # of fragments of (single) bone- has lead to many mistakes/hoaxes, eg. Piltdown Man, Nebraska Man
- ▶ Limited interbreeding, different chromosome #s
- ▶ Many inconsistencies in lineage: eg. Photoreceptors are on the surface of the octopus retina
- ▶ DNA homology not c/w morphology- eg. Chimp & gorilla DNA closer to human, but traits of orangutan closer; cytochrome c amino acid substitutions more in horse than kangaroo; insulin
- ▶ Craters on other planets' moons differ
- ▶ Inconsistencies in rock strata- eg Grand Canyon

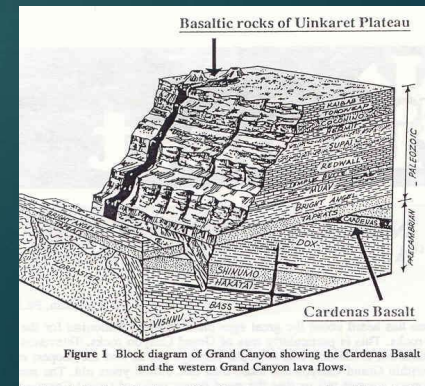
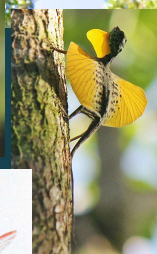
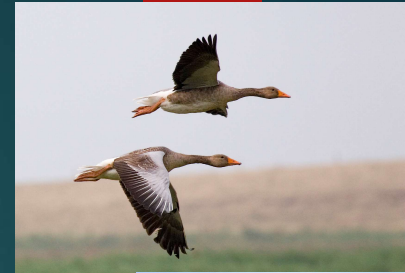


Figure 1 Block diagram of Grand Canyon showing the Cardenas Basalt and the western Grand Canyon lava flows.

A reminder...

# Recurring “proof” themes (evaluate these throughout)

- ▶ Mathematical improbabilities
- ▶ Violations/misapplications of logic and scientific principles
- ▶ Supernatural design (vs results of natural selection)
- ▶ Contradictions of Scripture/theological bases

# Evidences against evolution

## Irreducible complexity

- ▶ Genetic code/protein synthesis and its enzymes- 1g DNA= 6 trillion CDs ( $4 \times 10^9$  tB)!
  - ▶ RNA 1<sup>st</sup>? but cannot replicate itself
- ▶ Other systems: eg. Coagulation, complement
- ▶ Bacterial flagella – very complex
- ▶ Organ systems: “To suppose that the eye...could have been formed by natural selection, seems, I freely confess, absurd in the highest degree” (Darwin, Origin of Species, 1859, p133) ;“it gives me a cold shudder” (Darwin letter to Asa Gray)
- ▶ Language- incomplete grammar has no meaning; all languages have structure

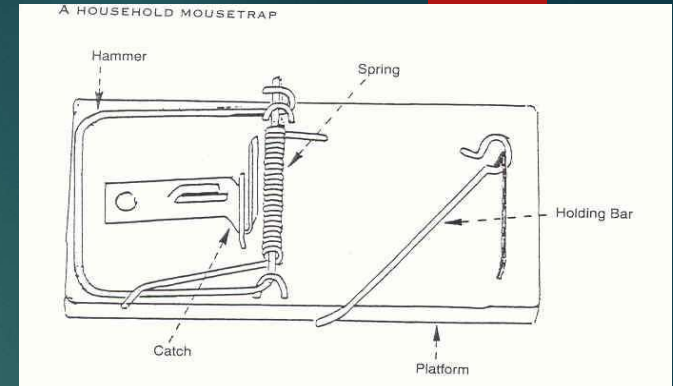
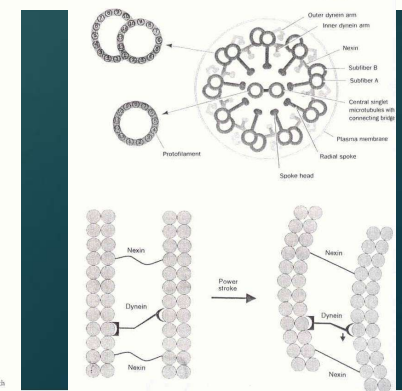
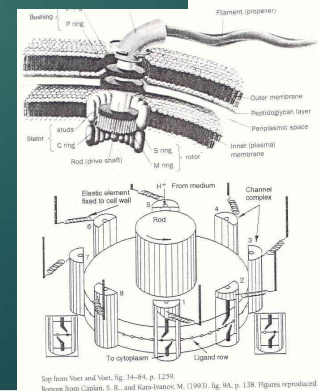
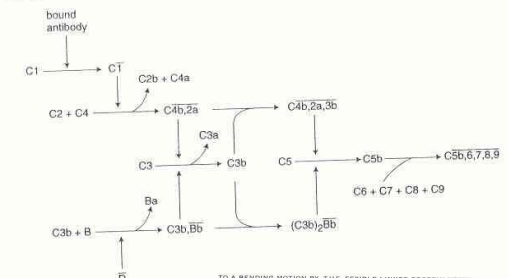


FIGURE 6-3  
THE COMPLEMENT PATHWAY.



Top from Voet and Voet, Fig. 34-84, p. 1259  
Bottom from Caplan, S. R., and Vane-Jones, M. (1993), Fig. 8A, p. 138. Figures reproduced with



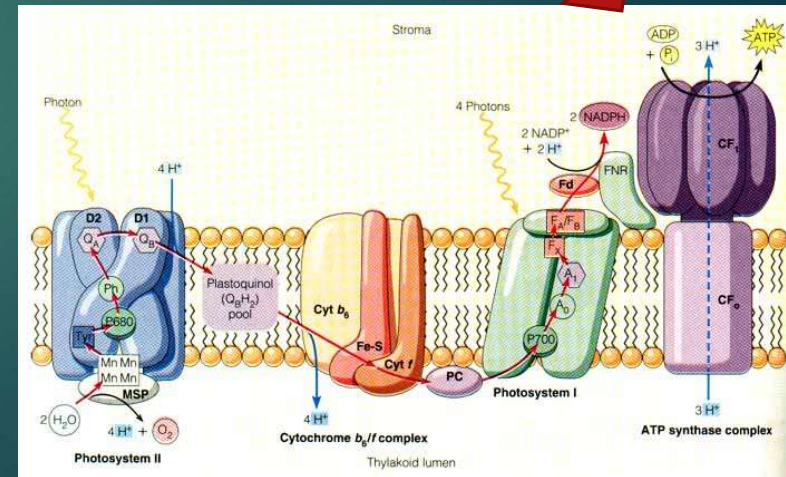
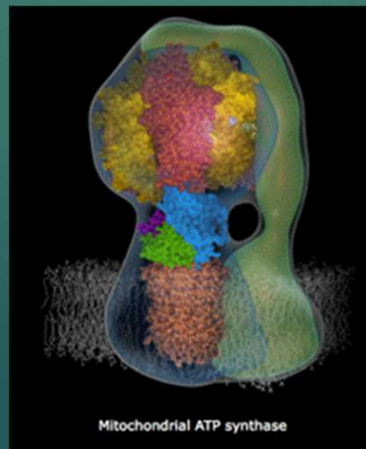
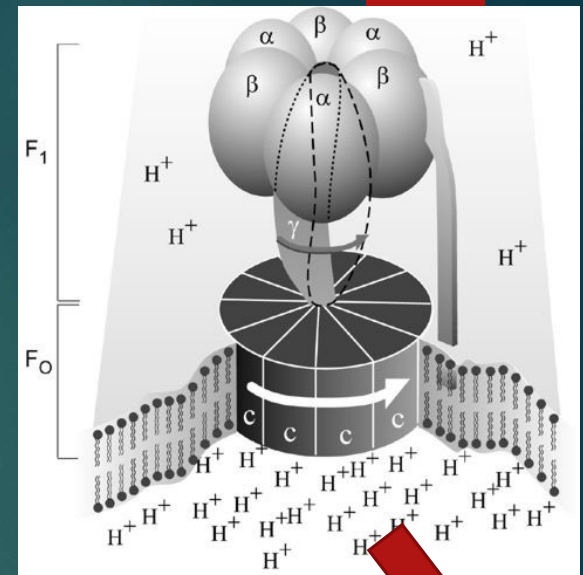
➤ But even most basic life has much more complexity:

# ATP Synthase



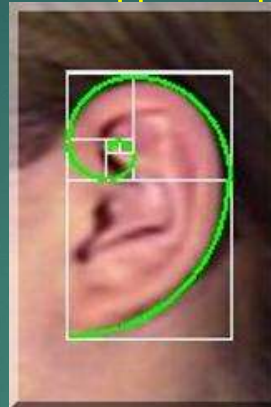
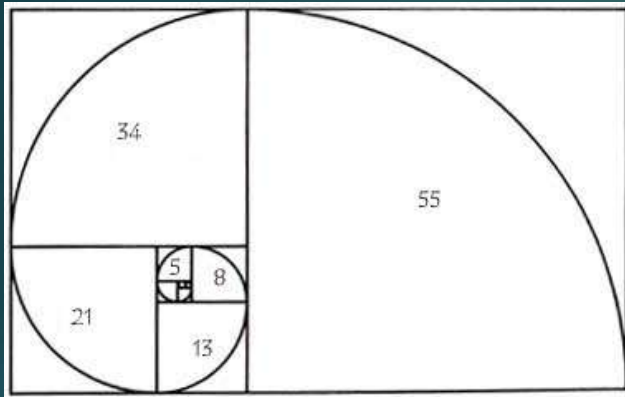
- ▶ Energy source (proton pump) for all cells (simplest bacteria)
  - ▶ 31 proteins working together,
  - ▶ mitochondrion membrane bound
  - ▶ work in concert with other complex cycles, eg Krebs
  - ▶ 1997 Nobel Prize in Chemistry (half) to Boyer and Walker

▶ yet is given as example of subunits coming together for new function



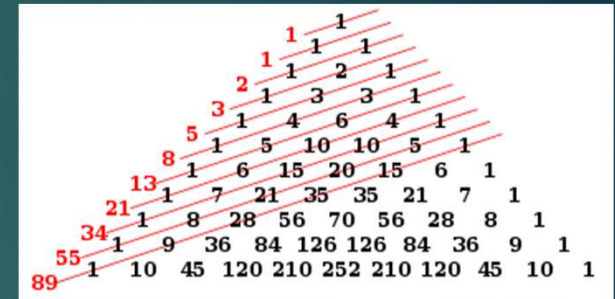
# Design/Patterns in Creation

Fibonacci Sequence:  $F_n = F_{n-2} + F_{n-1}$



**The Fibonacci Sequence**  
 1,1,2,3,5,8,13,21,34,55,89,144,233,377...

1+1=2	13+21=34
1+2=3	21+34=55
2+3=5	34+55=89
3+5=8	55+89=144
5+8=13	89+144=233
8+13=21	144+233=377



Also in hurricanes, spiral seeds, growing fern leaves, DNA Molecule, waves breaking, tornadoes, comet tail, whirlpools

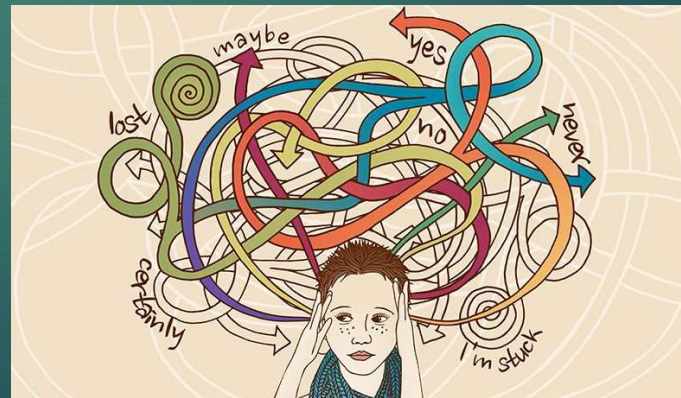
A reminder...

# Recurring “proof” themes (evaluate these throughout)

- ▶ Mathematical improbabilities
- ▶ Violations/misapplications of logic and scientific principles
- ▶ Supernatural design (vs results of natural selection)
- ▶ Contradictions of Scripture/theological bases

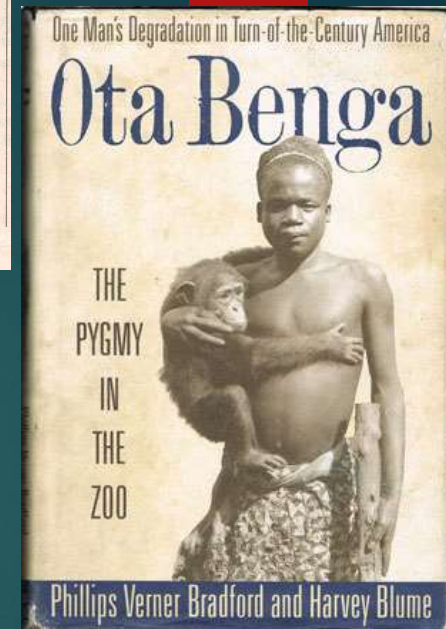
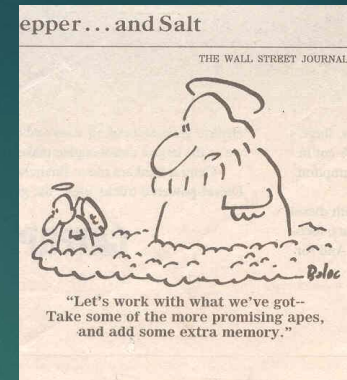
# Evolution= no purpose for life

- ▶ “That in the end nothing matters and everything is impermanent... If you really think about evolution and why we human beings are here, you have to come to the conclusion that **we are here for absolutely no reason at all**” Susan Blackmore, psychologist, disciple of Richard Dawkins, “The Independent” 21 Jan 2004 [www.susanblackmore.co.uk/journalism/World%20indy.htm](http://www.susanblackmore.co.uk/journalism/World%20indy.htm)
- ▶ Everything is a result of a series of chance chemical reactions



# Dangers of Evolutionism

- ▶ Doesn't need God; death before sin; man not special
- ▶ Racism (survival of the fittest)
  - ▶ Eg. Oto Benga- (c. 1883– March 20, 1916) Congolese pygmy put on display in St. Louis World's Fair, then Bronx Zoo 1904; succession of orphanages, etc; suicide
  - ▶ Hitler/*Mein Kampf* based strongly on Darwin – eugenics, racism
- ▶ Social policies- eg. Global warming, education, economics
- ▶ Educational (and others) system hijacked
  - ▶ Eg. Scopes Monkey Trial; 1925, Dayton, TN; C Darrow v WJ Bryan
    - ▶ Staged; Scopes was convinced to be test defendant; never actually did teach evolution (which was outlawed then by TN state Butler Act)
    - ▶ Darrow famously derided Bryan who took stand as Bible expert; modernist pastors' testimony used against TN
    - ▶ Bryan won, but had fatal MI days later; Scopes fined \$100

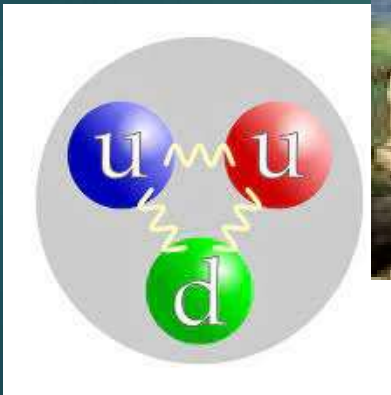


# Introduction to (Scientific) Creationism- Summary

- ▶ There are many facts- we all have the same facts
- ▶ Evolution and Creationism are theories
  - ▶ Which theory fits the facts better
  - ▶ Both can be considered (religious) beliefs
  - ▶ Which theory requires MORE faith?
- ▶ We are all subject to biases
- ▶ Evaluate as you would any unknown and draw your own conclusions!
- ▶ Knowledge is power- find out for yourself!

John 8:32 And ye shall know the truth, and the truth shall make you free.

# Quarks to Quasars Or Science for Creationists II. Quarks and Atoms



# Outline/Scope

- ▶ I. Introduction – importance, improbability, theory flaws, Scripture
- ▶ II. Quarks and Atoms –
  - ▶ Big Bang
  - ▶ string theory
  - ▶ atoms, relativity



# Purpose of this section

- ▶ (this is “hardest”, maybe driest/abstruse section)
- ▶ Introduce these arcane issues, uncertainties
- ▶ Emphasize the complexity, yet order of even the VERY most basic building blocks of matter/life
- ▶ How could everything come from nothing?
- ▶ How could this just happen to be the enduring design, within a tiny fraction of a second, by pure chance?

# Introduction

• “Physics to chemistry to biology”

• Composition of elements

- Protons (atomic number)
- Neutrons (P + N= atomic weight) (isotopes)
- Electrons (orbitals)

• Quantum Mechanics

• Subatomic particles

## Forces

■ Gravitational

- $F=ma$ ;  $F=Gm_1m_2/r^2$

■ Electromagnetic

- Maxwell's equations

■ Weak nuclear

- Radioactive decay  $10^{-18}$  m;

■ Strong nuclear

- Holds neutron/proton together via confining quarks;  $10^7$  coupling strength of weak;  $d$   $10^{-15}$  m

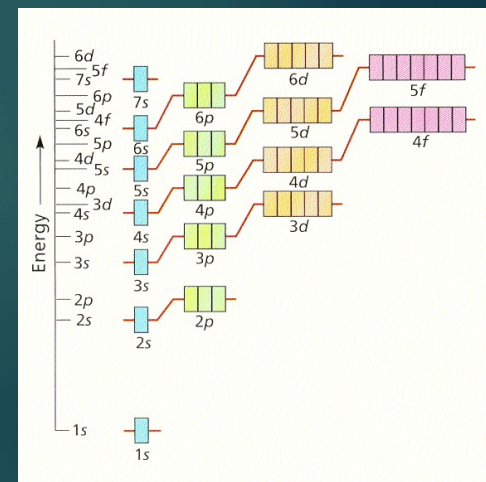
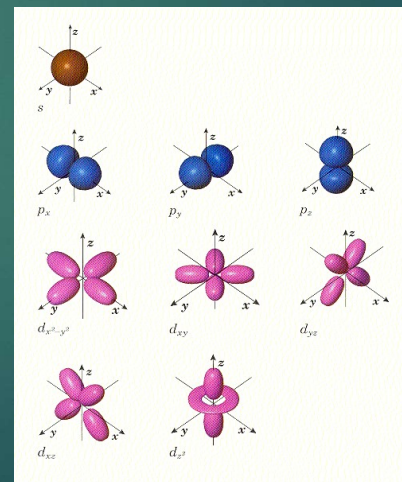
Conservation of energy, charge, quantum properties= design

Complexity – how can chance have yielded this?

# Atoms- “composite particles”

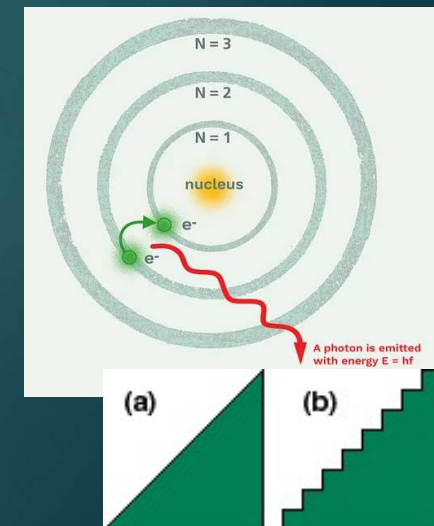
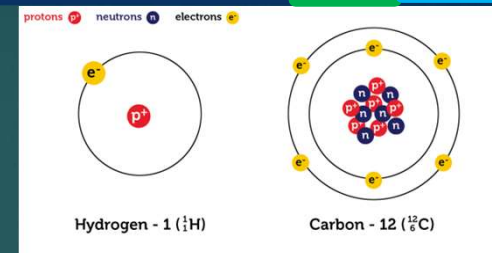
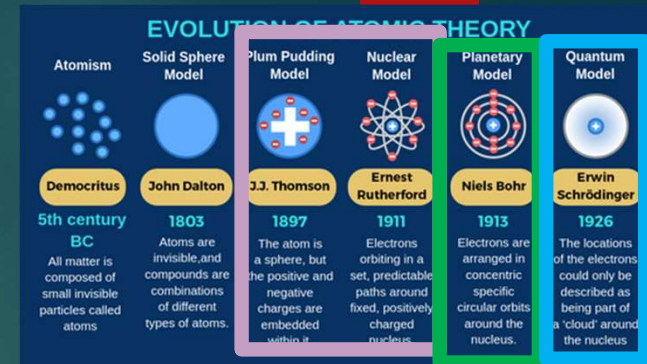
- Coined by Democritus c400BC
- Protons, neutrons, electrons
  - Charge, Mass, Spin (H dipole- basis of MRI-align with induced magnetic field)
- Periodic table 1870 -Mendeleev (1834-1907)
  - Valence - quantized
  - Electron energy levels
- Properties, chemistry determined
  - Eg. Redox

1	2											18																						
3	4											19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36					
11	12											13	14	15	16	17	18																	
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36																	
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71																		
87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	
89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120			



# Basics – the atom

- ▶ JJ Thomson (Nobel 1906)(plum pudding) model- discovered  $e^-$  and described it as a particle
- ▶ Rutherford (planetary) model (1911)(Nobel 1908)
- ▶ Bohr model – quantum orbits (1913)(Nobel 1922)
- ▶ But, classical physics fails to explain...
- ▶ Quantum mechanics
  - ▶ Shroedinger (Nobel 1933)- describes statistical description of wave equation
  - ▶ G Thompson (Nobel 1937)  $e^-$  wave properties
- ▶ Photon
  - ▶ Concept followed Einstein's photoelectric effect (Nobel 1921) - energy packet; particle/wave duality

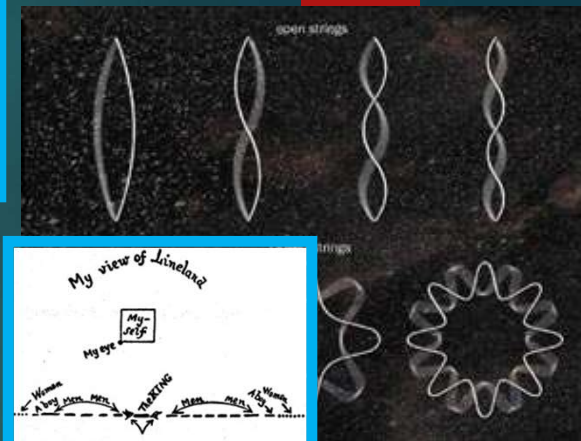
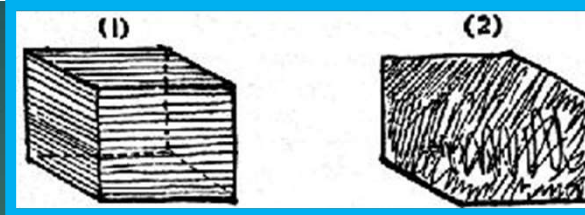


# Ramifications of Quantum Mechanics

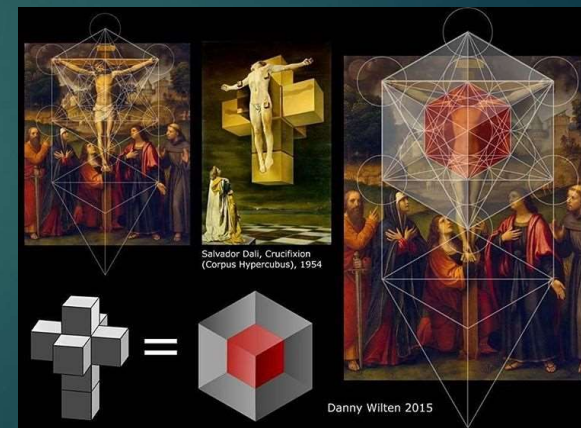
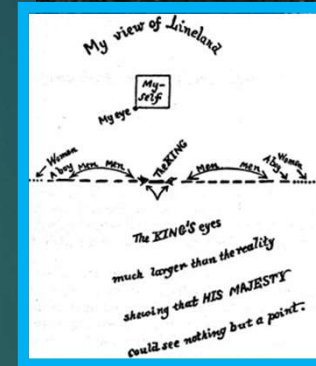
## Mind-blowing design!

- ▶ Can't fit classical physics or fully into relativity
  - ▶ Dark (anti-) matter (≈95% of mass of universe) suggests space is not "empty"
  - ▶ Objects transported to different locations without passing through subatomic particles with very specific properties
    - ▶ Objects may appear to occupy same location (Shroedinger's cat)
    - ▶ "entanglement", split a pair -action at a distance
- ▶ Protons should decay
- ▶ still can't explain/systematize the 4 different forces...
  - ▶ Einstein spent last 20 yrs on "unified field theory"

# String (M-) Theory

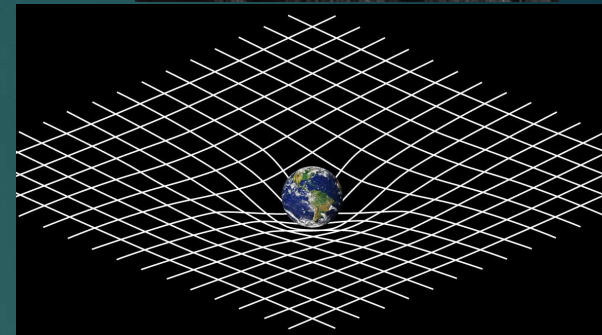
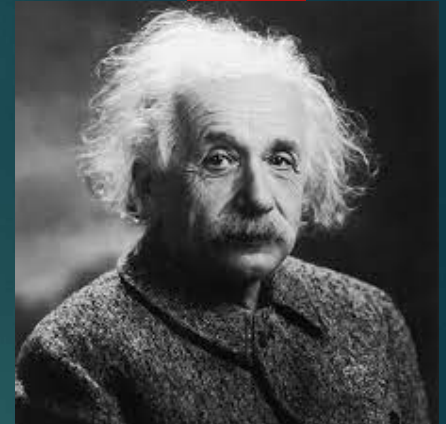


- ▶ Wave equations for each component (1990s)
- ▶ Equations to explain concept that there are **multiple dimensions** (more than 4- Rev 21:16); God outside of time – Isa 57:15; 42:9; 48:5 (wait a bit...)
  - ▶ 1921-1995, theory gradually expanded
- ▶ Requires 11 (7 **additional**) dimensions to incorporate quantum theory equations
  - ▶ ?describes angels/Jesus “appearing” - realm we cannot perceive-
    - ▶ Flatland (1884) Edwin Abbott; (2D world thought; and, briefly, 1D)
    - ▶ Salvador Dali (1954): Corpus Hypercubis
      - ▶ 1 John 3:2 - <sup>2</sup> Beloved, now are we the sons of God, and **it doth not yet appear what we shall be**: but we know that, when he shall appear, we shall be like him; for we shall see him as he is.



# Relativistic/theoretical Physics

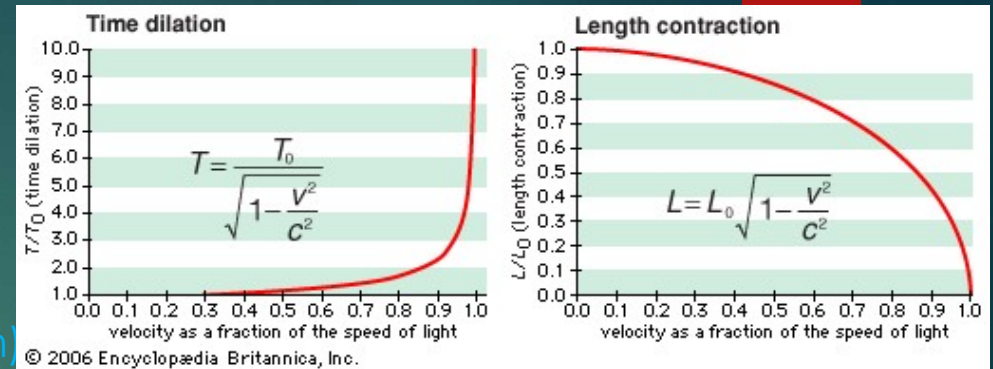
- ▶ 1905 – a very good year! (Annus Mirabilis) 4 MAJOR publications for Einstein (as a patent clerk!)
  - ▶ Special relativity (1905) [“equivalence principle”; (small) frame of reference, gravity-free]
  - ▶ photoelectric effect (e<sup>-</sup> release from metal by photons), Nobel 1922
  - ▶ Brownian motion – basis of statistical mechanics
  - ▶ Size of atoms (rewarded Doctrate for this, U of Zurich)
- ▶ General relativity (later codified in 1916)
  - ▶ Gravity warps time and space
  - ▶ Eg Mercury’s orbit precession; light bending seen at eclipse (1919 confirmed)
- ▶ Einstein – tried to unify with Newton; did not want to believe Quantum Physics because wanted to believe in certainty, not statistics (“God does not play dice with the universe”)



A slightly deeper dive into relativity...

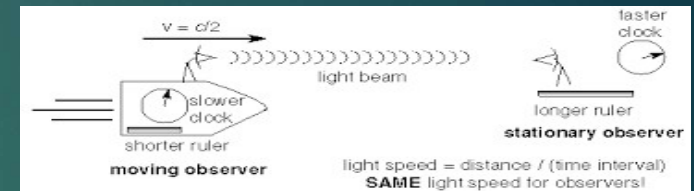
# Time (Relativity)

- ▶ Time slows near speed of light (time dilatation)
- ▶ Distance shortens near speed of light (to stationary observer) (space contraction)



- ▶ God is outside of time:

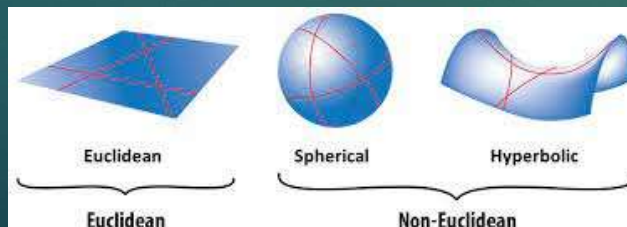
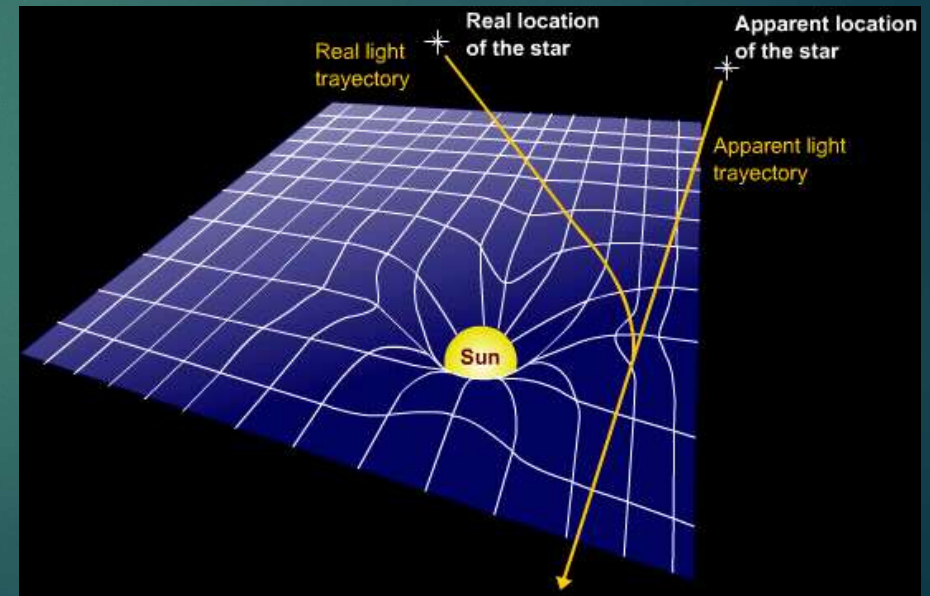
- ▶ Isa 57:15 - <sup>15</sup> For thus saith the high and lofty One that inhabiteth eternity, whose name is Holy; I dwell in the **high and holy place**, with him also that is of a contrite and humble spirit, to revive the spirit of the humble, and to revive the heart of the contrite ones.
- ▶ Isa 42:9 - <sup>9</sup> Behold, the former things are come to pass, and new things do I declare: **before they spring forth** I tell you of them.
- ▶ Isa 48:5 - <sup>5</sup> I have even from the beginning declared it to thee; **before it came to pass** I shewed it thee: lest thou shouldest say, Mine idol hath done them, and my graven image, and my molten image, hath commanded them.





# Space Time Distortion by Gravity

- ▶ A prediction of Relativity Theory
- ▶ Force of gravity on an object (especially if traveling near speed of light) can distort time and size relative to another's frame of reference
- ▶ Has been verified with Mercury eclipse and other
- ▶ Consider non-Euclidean geometry
- ▶ Describable using Tensor Calculus
- ▶ Theoretically time travel is possible.
- ▶ Postulate: particles that mediate the gravity wave? Gravitons...



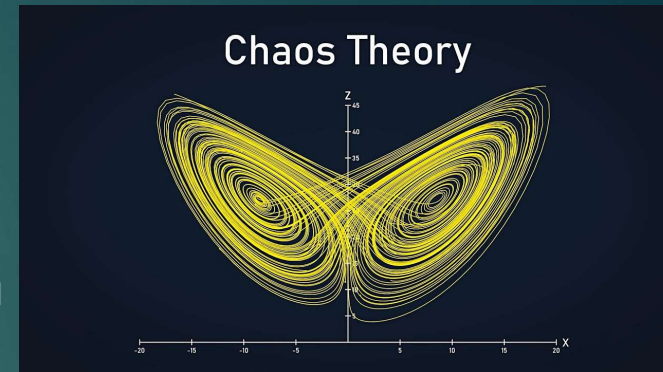
# Other interwoven concepts:

▶ “randomness” – mathematically impossible? Chance (God directed):

- ▶ Prov 16:33- <sup>33</sup>The lot is cast into the lap; but **the whole disposing thereof is of the LORD.**
- ▶ Urin/Thummim of high priest/prophet 1Sam 28:6- <sup>6</sup>And when Saul enquired of the LORD, **the LORD answered him not**, neither by dreams, nor by Urim, nor by prophets.

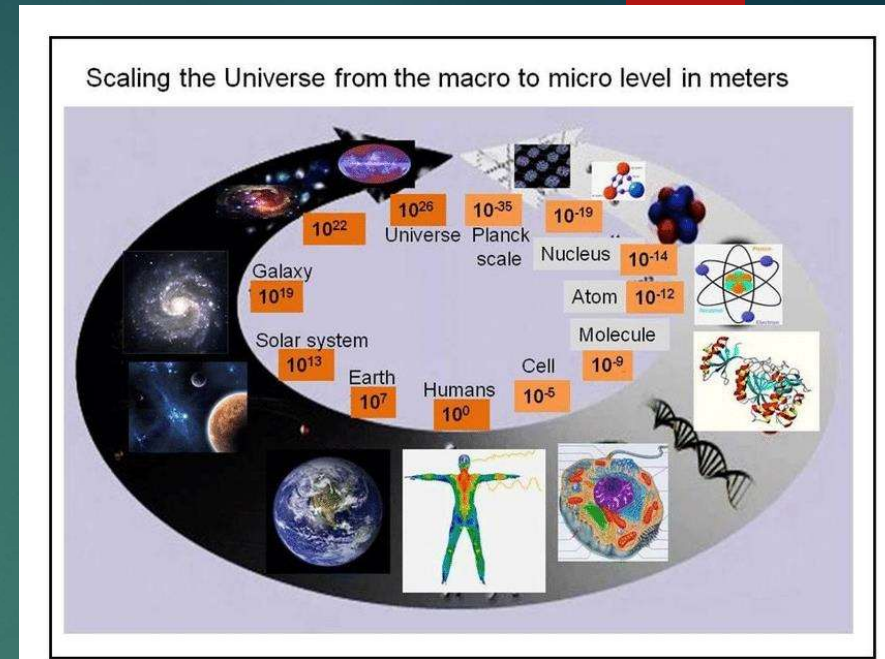
▶ Chaos Theory (butterfly/distant tornado effect)(Poincare 1880; E Lorenz 1960s )

- ▶ a small perturbation can ultimately result in big; complex/random events reducible to origin from deterministic events
  - ▶ Eg weather, stock market, crises, (drawn upon in evolutionary theory – punctuated catastrophism - to overcome low probabilities)



# Measurements

- ▶ Lord Kelvin: “until you can measure something you know very little about it.”
  - ▶ Eph 3:18 - <sup>18</sup>May be able to comprehend with all saints what is the breadth, and length, and depth, and height
- ▶ Heisenberg uncertainty (Nobel 1932, establishing Quantum Mechanics)
  - ▶ Can't measure velocity (momentum) without altering position (eg of e<sup>-</sup>)
- ▶ Shortest measured is a zeptosecond, about 10<sup>-21</sup> s, 247 zs = time for a photon to cross a H atom



Planck's constant

$$\Delta p \Delta x \geq \frac{h}{4\pi}$$

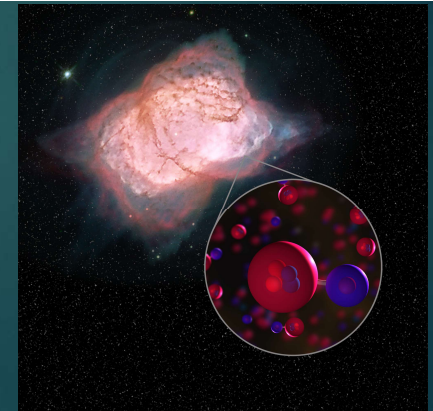
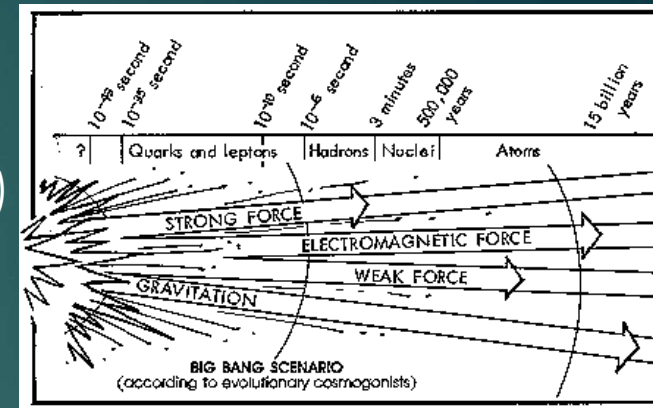
uncertainty in position

uncertainty of momentum



# How did nothing become subatomic particles and atoms?

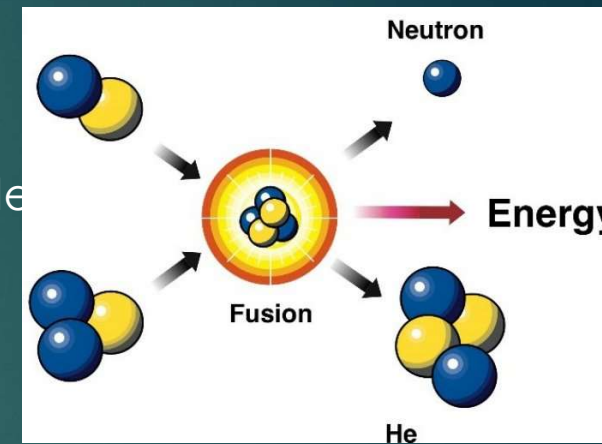
- ▶ Consider must have started with Hydrogen – one proton, no neutron (although usually a dimer) (75% of all matter) (?quarks)
- ▶ **Big Bang theory** suggests these formed in first 10 000<sup>th</sup> s (or less)
  - ▶ Hypothesized too hot for anything but nucleons
  - ▶ Rapid cooling led to H and He within few mins
  - ▶ Gravity and other forces appeared
  - ▶ 1Byr later, huge clouds of gas condensed (galaxies)
  - ▶ Continued “cooking” from cores – fusion to larger
- ▶ As far as I can tell, there is scant mathematical basis for these
  - ▶ Hubble’s Law (red shift), cosmic background radiation, “nucleosynthesis”; Friedmann-Robertson-Walker Metric
  - ▶ A helium-hydride nebula was discovered 2019 by SOFIA observatory



<https://www.nasa.gov/feature/the-universe-s-first-type-of-molecule-is-found-at-last>

# Chemical evolution

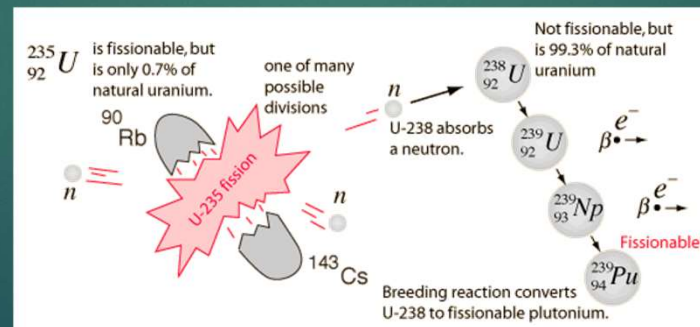
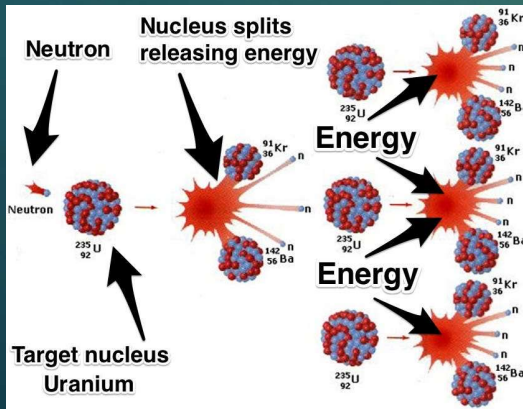
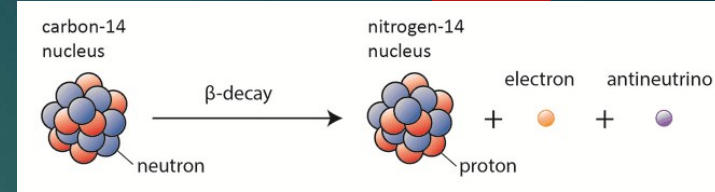
- ▶ Fusion of smaller atoms are “easier” to consider; larger ones are not
  - ▶ Secular postulate is nuclear fusion (eg up to ~Fe from 2 smaller) from supernovas, or collisions of neutron stars
  - ▶ But energy/temperature calculations do not seem to provide enough for this to occur beyond Fe (56 protons)
  - ▶ 4 orders of magnitude below necessary even in HOT supernovas
- ▶ Why is the distribution of these so varied in different celestial bodies?
- ▶ (and remember, where did all the energy, particles come from in the first place?)



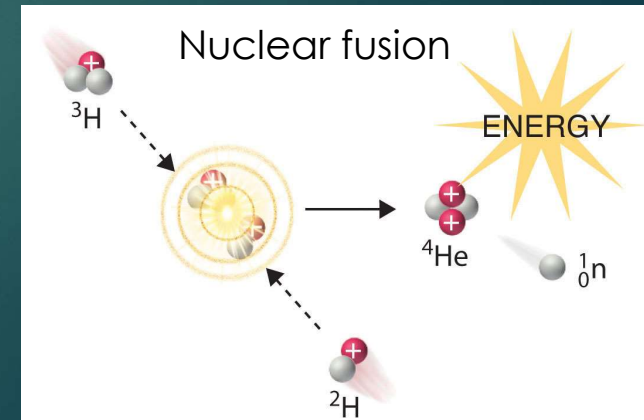
# Isotopes (different # neutrons); radioactivity

- ▶ #protons establish the element
- ▶ But, different #neutrons in proportions (MW)
  - ▶ Alpha decay – He nuclei shed; strong nuclear force (repulsive); 99% He in Earth is from mineral decay
    - ▶ eg bombs (also Plutonium) and power plants;  $^{235}\text{U}$  is 0.72% and smoke detectors!
  - ▶ Beta decay-  $e^-$  or  $e^+$  decays from a neutron (or proton) to transform to a proton (or neutron) and a neutrino (or antineutrino); not mass of neutron  $\sim$  proton and electron; involved
- ▶ Inducing nuclear fission (atomic energy/bomb) via chain reaction or fusion (H bomb)
  - ▶ Breeder reactors (more complete usage of energy, less radioactive waste; but harder to control (Na fires))

12.011	6	14.007	7
1086.5 2.33		1402.3 3.04	
C		N	
Carbon		Nitrogen	
$1s^2 2s^2 2p^2$		$1s^2 2s^2 2p^3$	

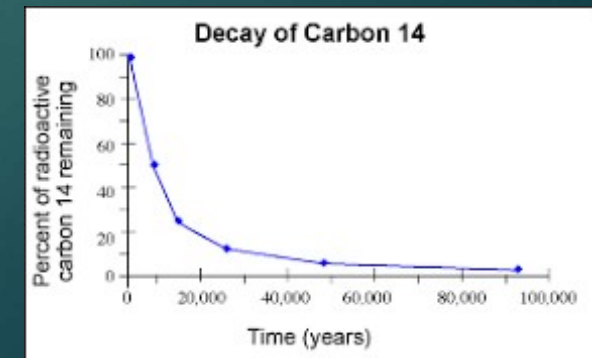
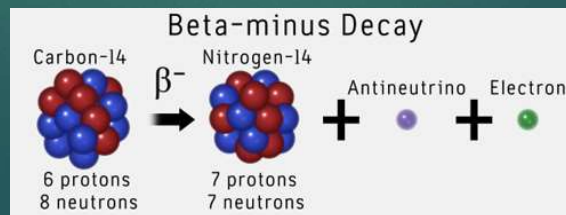
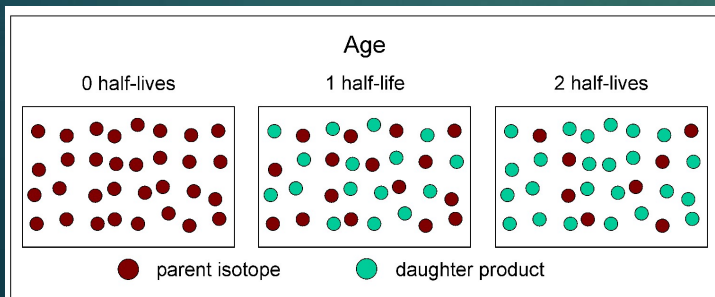
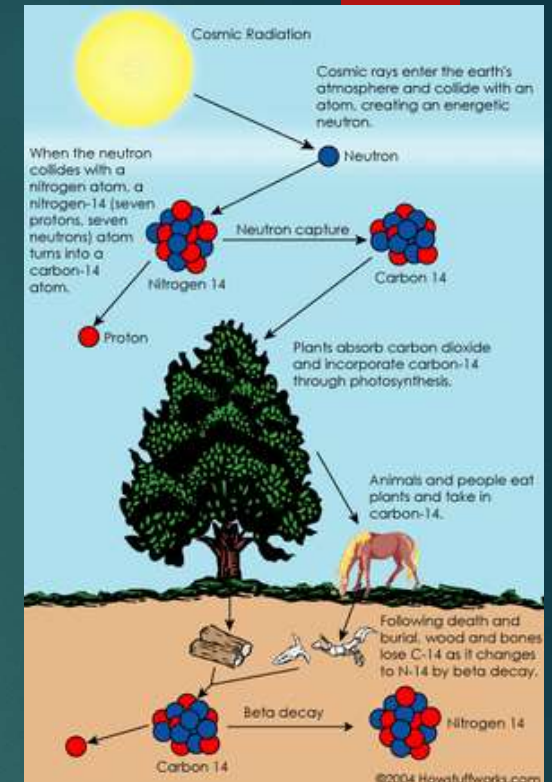


$$E = mc^2$$



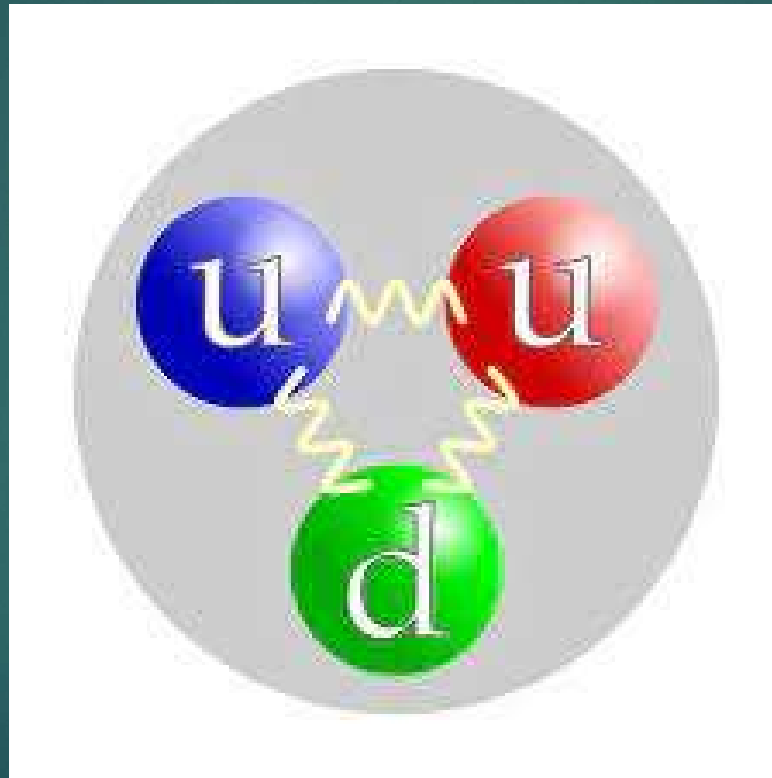
# Radiocarbon dating

- ▶ Radioactivity discovered by M Curie (and P Curie/A Becquerel)- Nobel Physics 1903; Chem 1911
  - ▶ Eg: beta decay of “unstable” elements with release of energy, resulting in new element or isotope (in dead tissue)
- ▶ Half-life – time it takes for half of the isotope to decay to natural state:
 
$$N = N_0 e^{-\lambda t}$$
- ▶ Radiocarbon dating (W Libby 1940s, Nobel Chem 1960)
  - ▶ N 14 makes C14 in atmosphere (proton to a neutron); equilibrium
  - ▶ Carbon 14 experiences decay to N14 (after mixing stops, ie death)
  - ▶ T ½ 5730 yrs; reasonably accurate to 5 T 1/2s ( so perhaps 30K yrs)
- ▶ Cannot be used for very long times
- ▶ Yet some "fossils" have contained some C14-containing materials (evidence against long ages)





But the title said “quarks”...



# Yet, it is even more complex...subatomic particles!

## THE STANDARD MODEL OF PARTICLE PHYSICS

### THE STANDARD MODEL

LEPTONS	UP u	CHARM c	TOP t	GLUON g	HIGGS BOSON H
	DOWN d	STRANGE s	BOTTOM b	PHOTON γ	
	ELECTRON e	MUON μ	TAU τ	Z BOSON Z	
	ELECTRON NEUTRINO ν <sub>e</sub>	MUON NEUTRINO ν <sub>μ</sub>	TAU NEUTRINO ν <sub>τ</sub>	W BOSON W	

### CONSERVATION LAWS

ENERGY, LINEAR MOMENTUM, ANGULAR MOMENTUM, CHARGE, BARYON NUMBER, LEPTON NUMBERS, TIME REVERSAL, WEAK FORCE, STRONG FORCE, ELECTROMAGNETIC FORCE, ISOSPIN, CHARGE CONJUGATION, STRANGENESS, Z COMPONENT, PARITY

### FORCE INTERACTIONS

INTERACT WITH THE ELECTROMAGNETIC FORCE, INTERACT WITH THE STRONG FORCE, INTERACT WITH THE WEAK FORCE, INTERACT WITH THE HIGGS FIELD

### ALL THE FUNDAMENTAL PARTICLES

UP	CHARM	TOP	GLUON	HIGGS BOSON
DOWN	STRANGE	BOTTOM	PHOTON	
ELECTRON	MUON	TAU	Z BOSON	
ELECTRON NEUTRINO	MUON NEUTRINO	TAU NEUTRINO	W BOSON	

### STANDARD MODEL INTERACTIONS

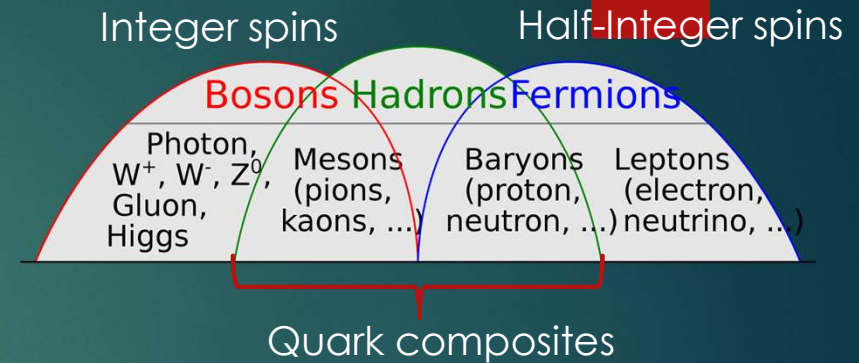
X IS ELECTRICALLY CHARGED, X IS ANY FERMION IN THE STANDARD MODEL, X IS A LEPTON AND Y IS THE CORRESPONDING NEUTRINO, X IS ANY QUARK, X IS A PHOTON OR Z-BOSON, U IS AN UP-TYPE QUARK, D IS A DOWN-TYPE QUARK, X AND Y ARE ANY TWO ELECTROWEAK BOSONS SUCH THAT CHARGE IS CONSERVED

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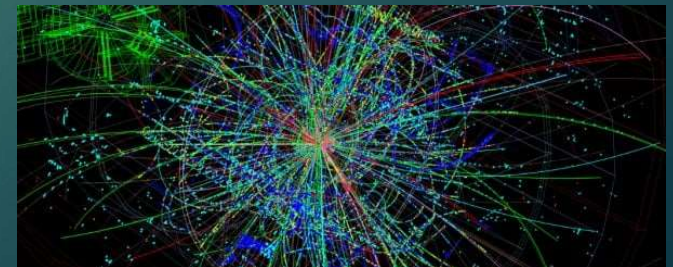
- 17 "elementary" particles
- Explains a lot
- Self-consistent
- BUT, does not explain gravitation or baryon asymmetry

# Subatomic Particles

- 2 overall categories:
  - Fermions-  $\frac{1}{2}$  spins
  - Bosons- integer spins
- Hadrons –composites of quarks (so SNF affects)
  - Baryons- “heavy”; odd# quarks
  - Mesons- even # quarks: unstable outside nucleus
- Leptons- not subject to strong nuclear force (weak nuclear force, EM, gravity) (not made of quarks)
  - Muons and relativity...
- Bosons (elementary; composites - some mesons)
  - Vector: force carriers - photon (EM), gluons- 8 types! (SNF), Z and W (WNF); gravity (graviton and tensor proposed, not detected)
  - Scalar: mass (Higgs)



CERN Large Hadron collider; Switzerland

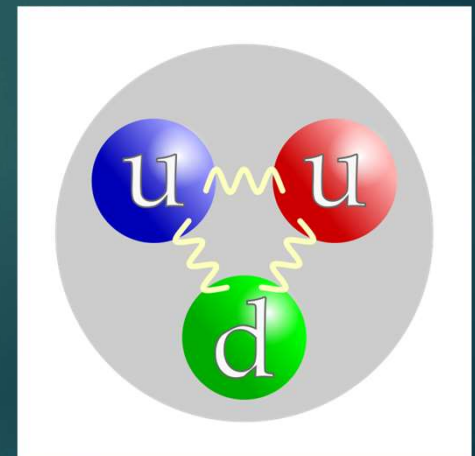
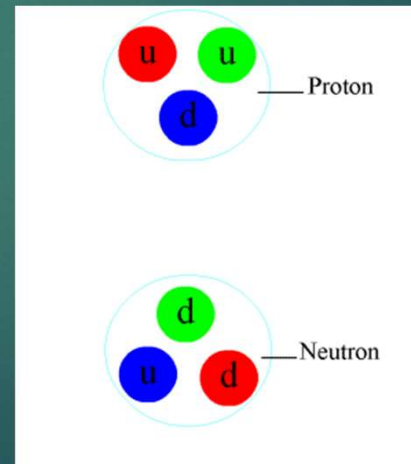


# Quarks- not in free existence

- Building blocks of hadrons (neutrons, protons); are “sociable”
- Model developed 1964 (Gell-Mann and Zweig)- “Standard Model”
- Governed by all forces including strong nuclear force ( $10^{-15}$  m)
- Subject to Pauli-exclusion principle (cannot occupy same state; cf bosons)
- 6 types (Flavors)- (up, down, charmed, strange, top, bottom) (accelerator now has detected all kinds predicted) (and “antiquarks”)
- 4 properties of quarks
  - Charge (+2/3,-1/3)
  - Color (R, G, B)
  - Mass
  - Spin (up, down) (all -1/2)
- Different physical characteristics
  - Half-life
  - Velocity
  - conservation

Complexity, yet order screams out DESIGN!

Standard Model of Elementary Particles					
three generations of matter (fermions)			interactions / force carriers (bosons)		
	I	II	III		
mass	$\approx 2.2 \text{ MeV}/c^2$	$\approx 1.28 \text{ GeV}/c^2$	$\approx 173.1 \text{ GeV}/c^2$	0	$\approx 126.97 \text{ GeV}/c^2$
charge	$2/3$	$2/3$	$2/3$	0	0
spin	$1/2$	$1/2$	$1/2$	1	0
QUARKS	<b>u</b> up	<b>c</b> charm	<b>t</b> top	<b>g</b> gluon	<b>H</b> higgs
	<b>d</b> down	<b>s</b> strange	<b>b</b> bottom	<b><math>\gamma</math></b> photon	
LEPTONS	<b>e</b> electron	<b><math>\mu</math></b> muon	<b><math>\tau</math></b> tau	<b>Z</b> Z boson	
	<b><math>\nu_e</math></b> electron neutrino	<b><math>\nu_\mu</math></b> muon neutrino	<b><math>\nu_\tau</math></b> tau neutrino	<b>W</b> W boson	
				GAUGE BOSONS VECTOR BOSONS	SCALAR BOSONS



# Gauge Bosons (force)- 5, plus Higgs

- Photons – EM force
- Gluons – strong nuclear force; mediates color charge of quarks
- W and Z – weak nuclear force
- Undiscovered
  - Gravitons (m, charge=0, spin=2)
  - (And others)
- Higgs (field) boson (“God particle”) predicted by Higgs 1964 (Nobel 2013)– NOT a gauge boson- “massive”, but unstable; sets mass of other particles; no effect on massless (eg photon, gluons); verified 2013

Particle	photon	W <sup>-</sup>	W <sup>+</sup>	Z <sup>0</sup>
Spin	1	1	1	1
Charge	0	-1	+1	0
Color Charge	none	none	none	none
Mass (GeV/c <sup>2</sup> )	0	80.39	80.39	91.19
Half-life (s)	∞	3x10 <sup>-25</sup>	3x10 <sup>-25</sup>	3x10 <sup>-25</sup>
Mediates Force	Electromagnetic	Weak Nuclear Force		

Particle	gluon	Higgs
Spin	1	0
Charge	0	0
Color Charge	1 of rgb & 1 of r <b>gb</b>	none
Mass (GeV/c <sup>2</sup> )	0	125
Half-life (s)	∞	1.08x10 <sup>-22</sup>
Mediates Force	Strong Nuclear	

Figure 1. The six elementary bosons of the Standard Model.

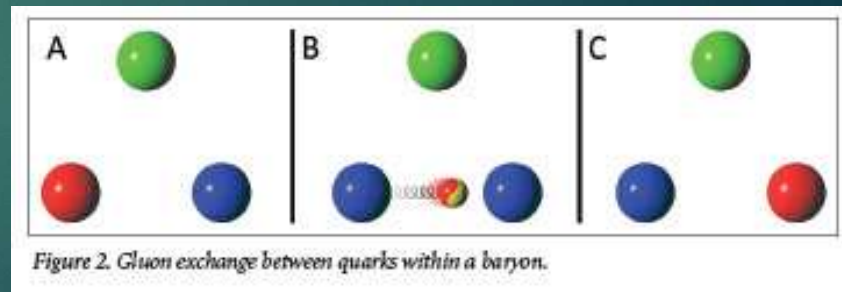


Figure 2. Gluon exchange between quarks within a baryon.

# Conclusion – Quarks and atoms

- Extreme complexity, yet incredible order:
  - adherence to very specific combinatorial patterns/constraints is undeniable evidence of design
- Statistical chances of any of these many components are infinitesimal- mathematically ZERO! (NASA defined zero as  $10^{-50}$ )
  - Combination of particles to subatomic particles to atoms to molecules
  - Small to larger molecules
    - All Governed by forces, speed limit of light, intangible nature
- Violation of logic (and scientific intuition)
  - Where did whatever the substrate originate?
  - We are told the “singularity” occurred within fraction of a second of the Big Bang, yet that theory cannot account for the distribution of particles (antiparticles, eg baryons) and has little basis
- We are limited by our perceptions or understanding- Much still “unseen”

**AND THIS HAPPENS IN EVERY SINGLE ATOM IN THE UNIVERSE!**