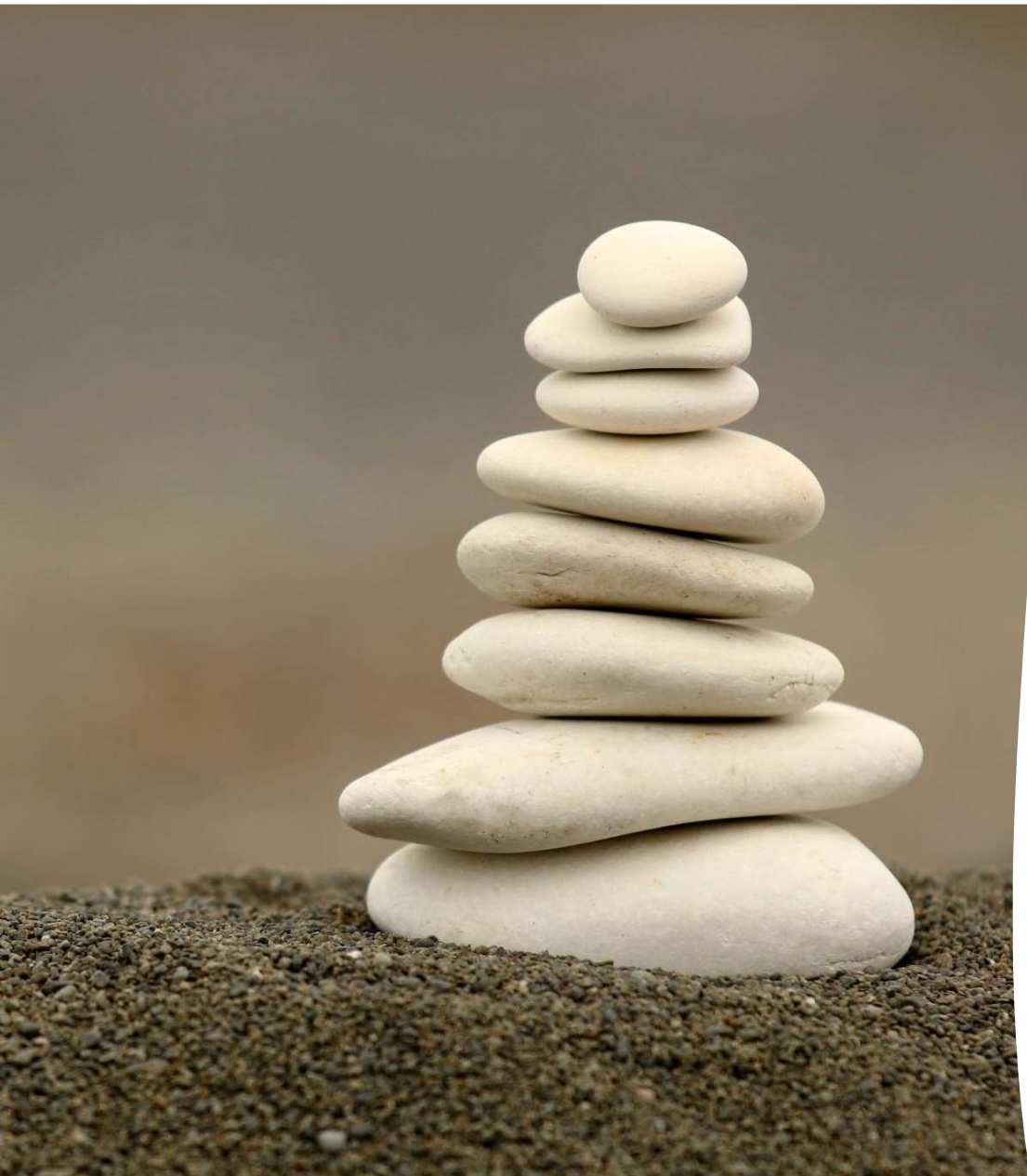


Levels of Consciousness

Laxmidhar Behera, IIT Mandi

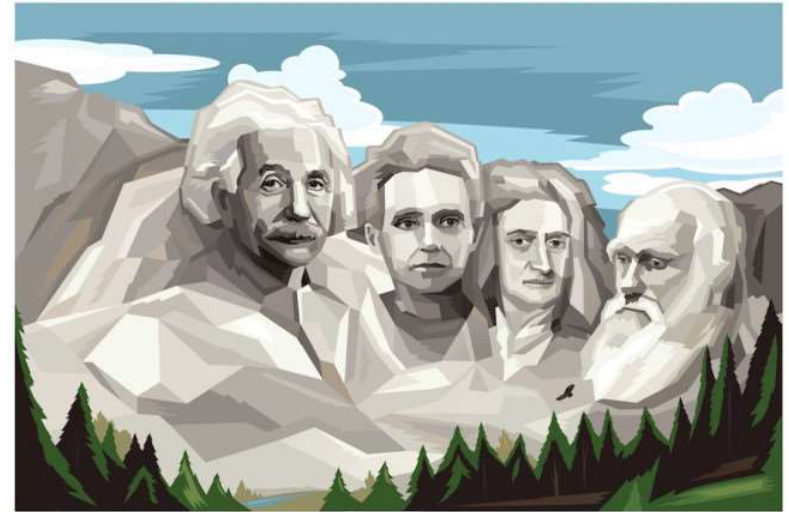
Prof. Laxmidhar Behera, Department of Electrical
Engineering, IIT Kanpur.



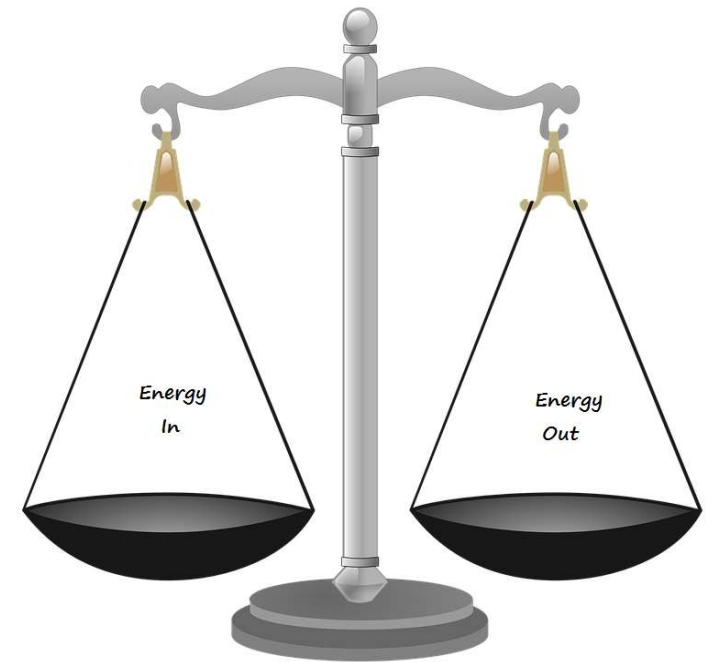
Philosophy of Consciousness

- Absolute Consciousness
 - That which exists always!
 - That which is **immutable, immovable, indestructible, un-burnt, un-cut, un-wet.....**
 - Freed from ignorance – always situated in knowledge and transcendental joy
 - It has no property that is observable in physical realm
- Did you ever contemplate on consciousness that you are?

Current world view in modern science



- **Everything is based on the primacy of energy i.e., Energy is the most fundamental.**
- **Energy is neither created nor destroyed.**
- **This energy being inert, this paradigm has caused biggest stumbling block in explaining human psychic nature.**



So, the quest is - what is that original form of energy that gives rise to all other variegated forms of energy ?

The modern science says it is quantum fields

The Vedantic literature talks about 3 categories of energy –

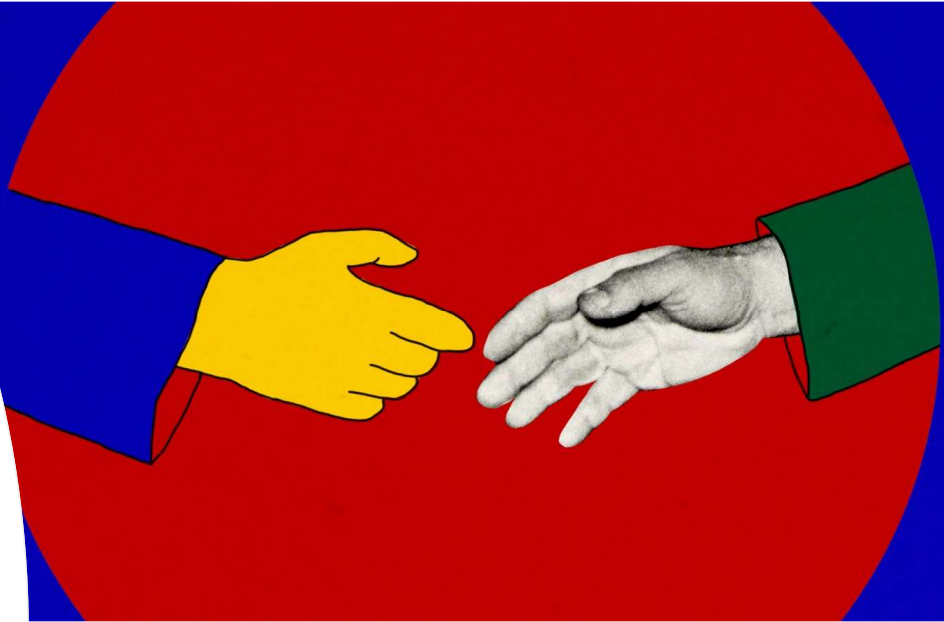
- **Divine energy,**
- **Material Energy**
- **Marginal energy**



Is there a meeting point?

Common subject matter

- Our quest for the subtlest form of cause is common in both the Vedantic world view and the modern scientific view.
- So, we must agree to an ontological form and causal structure at some point of time.





**What are the
fundamental
building blocks
of nature?**

One of the big questions of science – the question that goes back to at least 2500 years to the ancient Greeks

What are the fundamental building blocks of nature?

The first modern picture we had of what the universe is made of is the periodic table of elements – around 120 of them --- these were thought to constitute everything that existed in nature in 1800s

Periodic Table of the Elements

1 IA 11A	2 IIA 2A											13 IIIA 3A	14 IVA 4A	15 VA 5A	16 VIA 6A	17 VIIA 7A	18 VIIIA 8A
1 H Hydrogen 1.008																	2 He Helium 4.003
3 Li Lithium 6.941	4 Be Beryllium 9.012											5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180
11 Na Sodium 22.990	12 Mg Magnesium 24.305	3 IIIB 3B	4 IVB 4B	5 VB 5B	6 VIB 6B	7 VIIB 7B	8 VIII 8	9 VIII 9	10 VIII 10	11 IB 1B	12 IIB 2B	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.065	17 Cl Chlorine 35.453	18 Ar Argon 39.948
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.88	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.833	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.39	31 Ga Gallium 69.723	32 Ge Germanium 72.61	33 As Arsenic 74.922	34 Se Selenium 78.96	35 Br Bromine 79.904	36 Kr Krypton 83.80
37 Rb Rubidium 85.468	38 Sr Strontium 87.62	39 Y Yttrium 88.906	40 Zr Zirconium 91.224	41 Nb Niobium 92.906	42 Mo Molybdenum 95.94	43 Tc Technetium 98.907	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.906	46 Pd Palladium 106.42	47 Ag Silver 107.868	48 Cd Cadmium 112.411	49 In Indium 114.818	50 Sn Tin 118.71	51 Sb Antimony 121.760	52 Te Tellurium 127.6	53 I Iodine 126.905	54 Xe Xenon 131.29
55 Cs Cesium 132.905	56 Ba Barium 137.327	57-71 Lanthanide Series	72 Hf Hafnium 178.49	73 Ta Tantalum 180.948	74 W Tungsten 183.85	75 Re Rhenium 186.207	76 Os Osmium 190.23	77 Ir Iridium 192.22	78 Pt Platinum 195.08	79 Au Gold 196.967	80 Hg Mercury 200.59	81 Tl Thallium 204.383	82 Pb Lead 207.2	83 Bi Bismuth 208.980	84 Po Polonium [209]	85 At Astatine 209	86 Rn Radon 222.018
87 Fr Francium 223.020	88 Ra Radium 226.025	89-103 Actinide Series	104 Rf Rutherfordium [261]	105 Db Dubnium [262]	106 Sg Seaborgium [266]	107 Bh Bohrium [264]	108 Hs Hassium [269]	109 Mt Meitnerium [268]	110 Ds Darmstadtium [289]	111 Rg Roentgenium [272]	112 Cn Copernicium [285]	113 Nh Nihonium [284]	114 Fl Flerovium [289]	115 Uup Ununpentium [288]	116 Lv Livermorium [293]	117 Uus Ununseptium [294]	118 Uuo Ununoctium [294]
57 La Lanthanum 138.905	58 Ce Cerium 140.115	59 Pr Praseodymium 140.908	60 Nd Neodymium 144.24	61 Pm Promethium [144.913]	62 Sm Samarium 150.35	63 Eu Europium 151.966	64 Gd Gadolinium 157.25	65 Tb Terbium 158.925	66 Dy Dysprosium 162.50	67 Ho Holmium 164.930	68 Er Erbium 167.26	69 Tm Thulium 168.934	70 Yb Ytterbium 173.054	71 Lu Lutetium 174.967			
89 Ac Actinium 227.028	90 Th Thorium 232.038	91 Pa Protactinium 231.036	92 U Uranium 238.029	93 Np Neptunium 237.048	94 Pu Plutonium 244.064	95 Am Americium 243.061	96 Cm Curium 247.070	97 Bk Berkelium 247.070	98 Cf Californium 251.080	99 Es Einsteinium [252]	100 Fm Fermium 257.095	101 Md Mendelevium 258	102 No Nobelium 259	103 Lr Lawrencium [262]			
Alkali Metal	Alkaline Earth	Transition Metal	Semimetal	Nonmetal	Basic Metal	Halogen	Noble Gas	Lanthanide	Actinide								

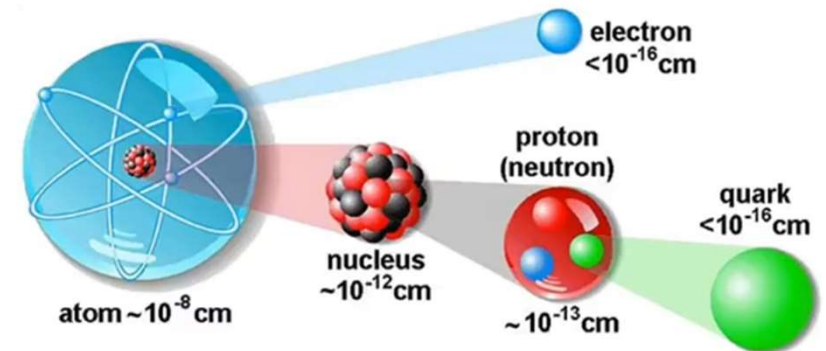
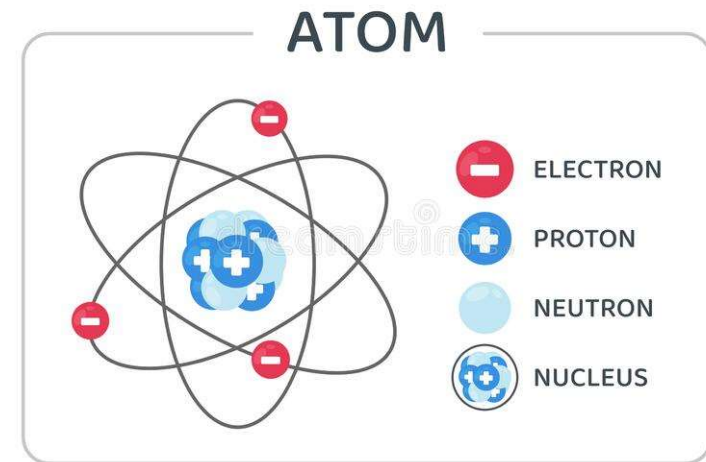
Are these fundamental truth underlying our experiential Universe?

Prof David Tang emphatically says that we taught our children white lies in the beginning of 20th century

What are the fundamental building blocks of nature?

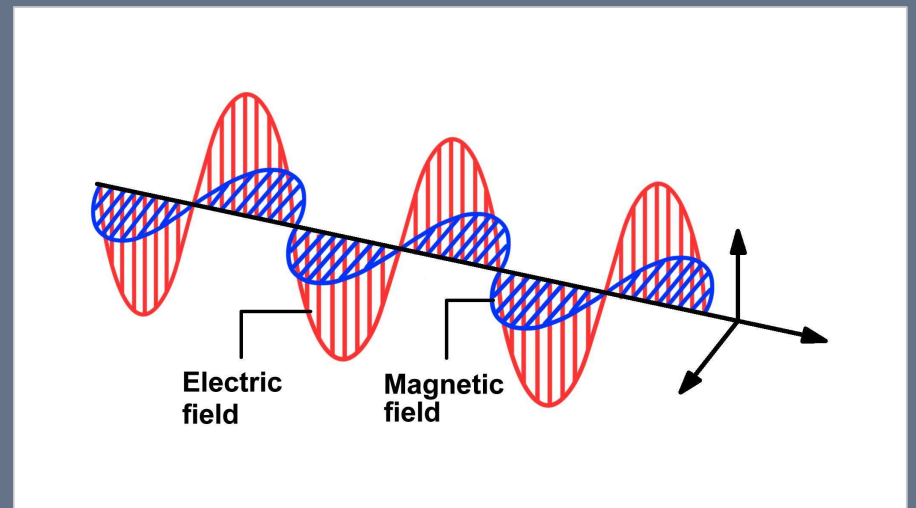
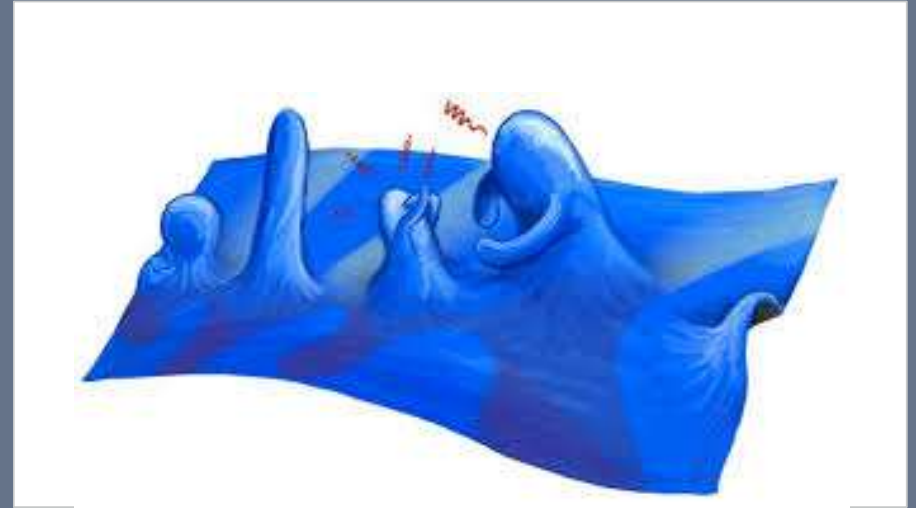
- At the end of 1800s , J.J. Thomson discovered a particle that was smaller than an atom that we now call electron. Then Rutherford and others had figured that the atoms also had a nucleus consisting of protons and neutrons.
- And in the 1970s , it was found that protons and neutrons are not fundamental . Inside the proton and neutron, there are smaller particles called quarks.

The fundamental truths shifted from the periodic table to one electron and two quarks



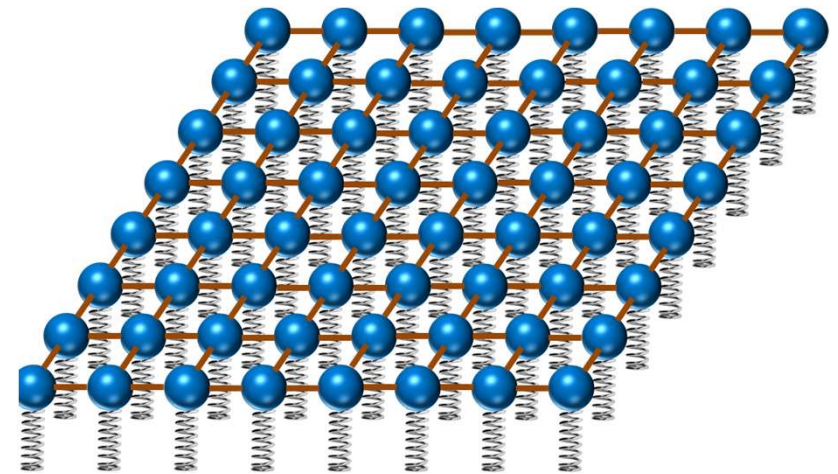
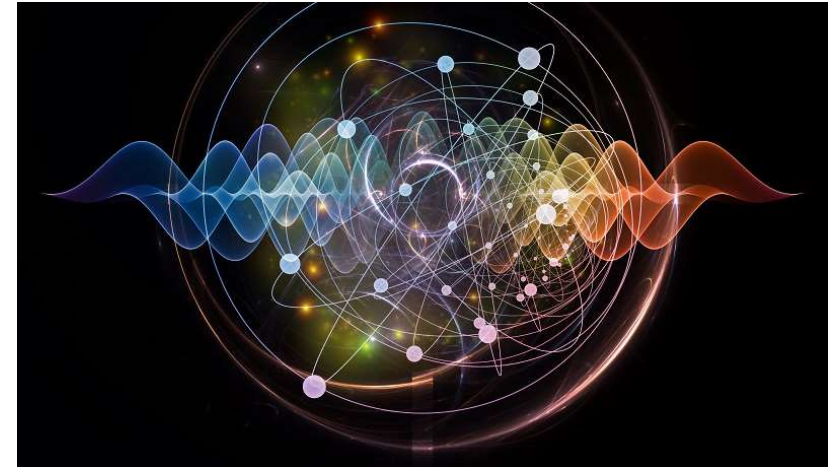
What are the fundamental building blocks of nature?

- But it was learnt that that's not true --- but the fundamental reality is much more subtle and abstract – they are fluid like substances which are spread throughout the entire universe and ripple in strange and interesting ways ---- named fields
- Field is something that takes a particular value at every point in space and that value which can change in time
- Michael Faraday initiated this intuition of fields- magnetic and electric field --- Field is real and we can affect things far away using the field without ever touching it.
- They had not realized that the idea of fields is much more important



What are the fundamental building blocks of nature?

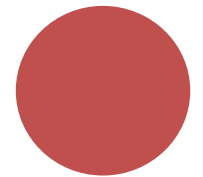
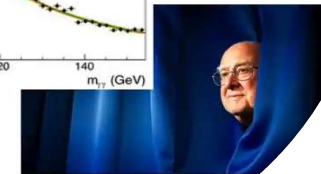
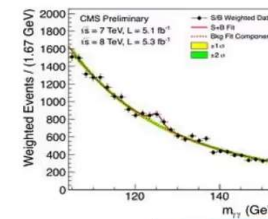
- In 1920s , Schrodinger and Heisenberg realized that at smaller scales the world is much more mysterious and counter intuitive – the theory of **quantum mechanics**
- QM - Energy is not continuous but always parceled in little discrete lumps(quantum).
- **Quantum field theory** is to combine the continuous fields of Faraday with the discrete ideas of quantum mechanics.
- There is a fluid spread throughout the entire universe something that we call the particle field and the ripples of this fluid get tied into little bundles of energy by the rules of QM and these bundles are what we call the particles. Eg: electron field and electron particle., up quark field and up quark particle, down quark field and down quark particle
- Thus, the electron particles are not fundamental, but the electron field is.



What are the fundamental building blocks of nature?

- The Standard model of physics claims total 17 fields and their corresponding particles.
- The Higgs field became famous in the recent years that was discovered in 2012 at the Large Hadron Collider where the Higgs particle lasts for 10^{-22} seconds
- This little bump in the data is how we know that Higgs particle existed .

The Higgs field



“Higgs boson”. It is about 2.4×10^{16} heavy

The new periodic table

$2/3$ $2/3$ u up	$1/3$ $2/3$ c charm	$2/3$ $2/3$ t top	0 1 γ photon	1 0 H Higgs boson
$1/3$ $1/3$ d down	$1/3$ $1/3$ s strange	$1/3$ $1/3$ b bottom	0 1 g gluon	
0 $1/2$ ν_e electron neutrino	0 $1/2$ ν_μ muon neutrino	0 $1/2$ ν_τ tau neutrino	0 1 Z⁰ Z boson	
0 $1/2$ e electron	0 $1/2$ μ muon	0 $1/2$ τ tau	1 1 W[±] W boson	

What are the fundamental building blocks of nature?

- The standard model is now thought to explain every single experiment that we've done on earth .
- But there is extra stuff which is still mystery called dark matter , dark energy , inflation in the first few fractions of seconds after the big bang
- So, they go for new physics beyond the standard model
- Search for grand unification of all these fields and forces into a single fundamental thing.
- LHC hasn't seen anything in support of this for 2 years but they are patient
- A bigger machine is required which costs 10 billion dollar and takes 20 years.

The theory of everything (so far)

$$Z = \int \mathcal{D}(\text{Fields}) \exp \left(i \int d^4x \sqrt{-g} (R - F_{\mu\nu} F^{\mu\nu} - G_{\mu\nu} G^{\mu\nu} - W_{\mu\nu} W^{\mu\nu} + \sum_i \bar{\psi}_i \not{D} \psi_i + \mathcal{D}_\mu H^\dagger \mathcal{D}^\mu H - V(H) - \lambda_{ij} \bar{\psi}_i H \psi_j) \right)$$

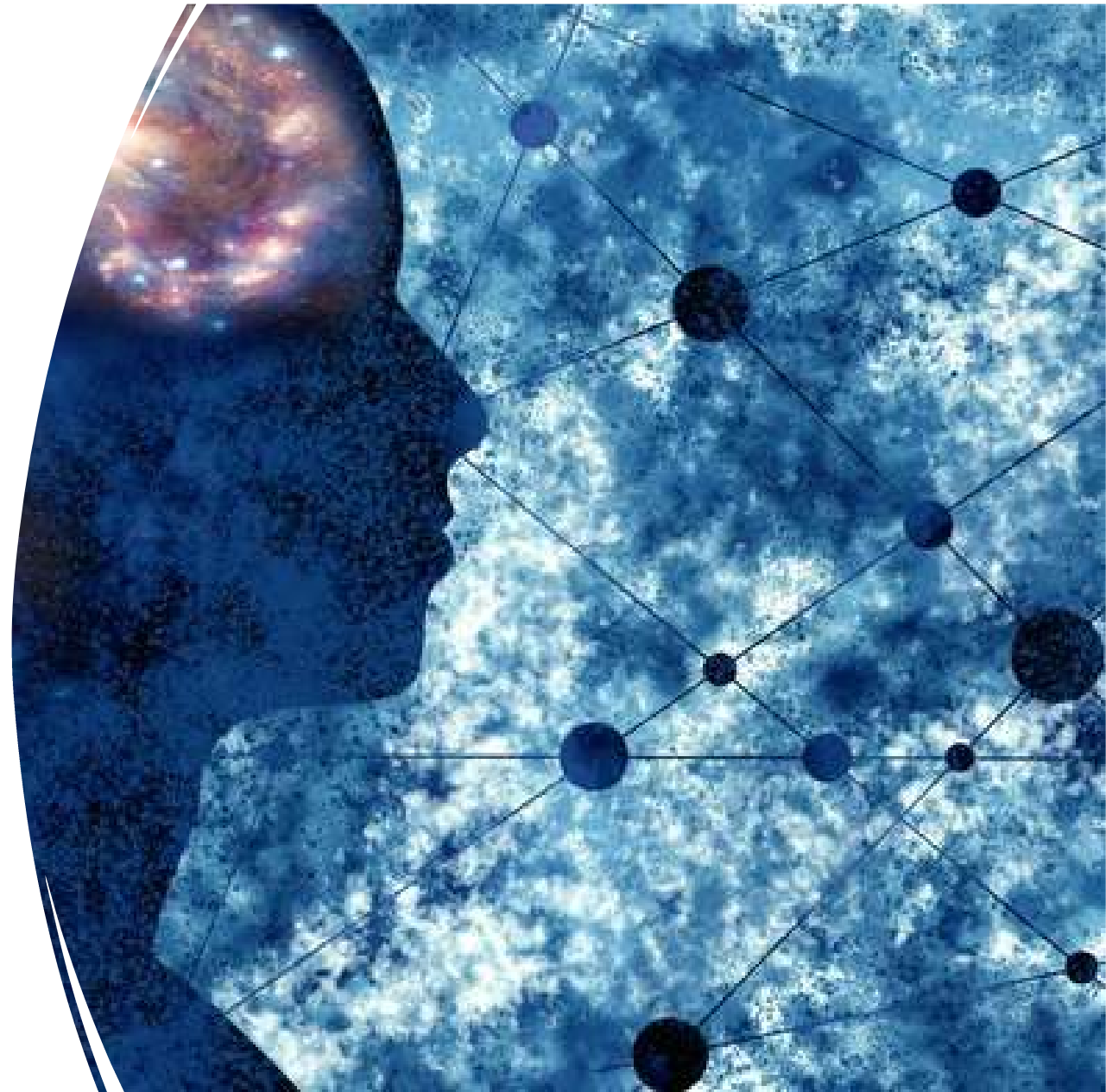
Diagram illustrating the components of the Lagrangian in the path integral Z :

- Gravity (points to R)
- Electromagnetism (points to $F_{\mu\nu} F^{\mu\nu}$)
- Strong force (points to $G_{\mu\nu} G^{\mu\nu}$)
- Weak force (points to $W_{\mu\nu} W^{\mu\nu}$)
- Matter (points to $\sum_i \bar{\psi}_i \not{D} \psi_i$)
- Higgs boson (points to $\mathcal{D}_\mu H^\dagger \mathcal{D}^\mu H - V(H)$)



Consciousness is an emerging phenomena

- Within modern science, the origin is the inert energy which gives rise to particles
- Such particles make up complex molecules that in turn makes of living organism
- So consciousness is an emerging phenomena of this syntactic process



What must be
the basic
building block
of this
Universe?

- That which must be eternal
- That which has no origin
- That which can exist independently
- This must have all the properties that are seen in the Universe and it must have properties that are not visible within this manifest Universe.



This feels tasty



I like to cook



She is my friend



I enjoy singing

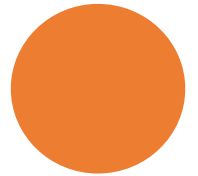
Experiences are the only kind of things that we know exist.

- My identity thus has two parts – I the experiencer and my experiences
- Unfortunately we have not given any importance to the experiencer part of my identity.
- In conditioned state, the experiencer and the experience are not the same
- In Pure state, these two are one and same.

What do we experience?

- When I eat , I experience the taste of the food.
- When I see, I experience the shape, color, location, emotion.

That is we experience psychological aspects of sense objects – sound, touch, form, taste and smell - but not what sense objects are made of.





What you see is a form
of consciousness

Your conscious creation

- As a cook, each recipe is a subtle idea at a level of conscious creation. That very subtle manifestation is the driver to the detailed process of ingredient collection and process of cooking. Cook's consciousness matters.
- As a scientist, you build a lab to carry out certain type of research in the field of consciousness (say). Your consciousness would drive this effort and its shape will be ultimately the shape of your consciousness only.



What is this consciousness?



The beautiful surroundings, flower garden, trees do not trigger a thief – his consciousness is that of vices.



What is consciousness?

- Someone looks at the Delhi iron pillar and would like to have a photo up.
- Yet another looks at its amazing resistance to rusting and finds out the possible reason
- Someone looks at the wall and would like to see the finishing and the aesthetic value.
- Yet another sees the wall and sees only dancing molecules.



What is consciousness?

An experience at the level of senses and body i.e. hunger, thirst, sexual attraction, fatigue

An experience at the level of mind – desires, happiness, distress, success and failures

An experience at the level of intellect: Marxism, Capitalism, Buddhism, Vedanta

An experience at the level of false ego: Indian, American, Hindu, Muslim, Christian, Male, Female, White and black

Conscious Experiences

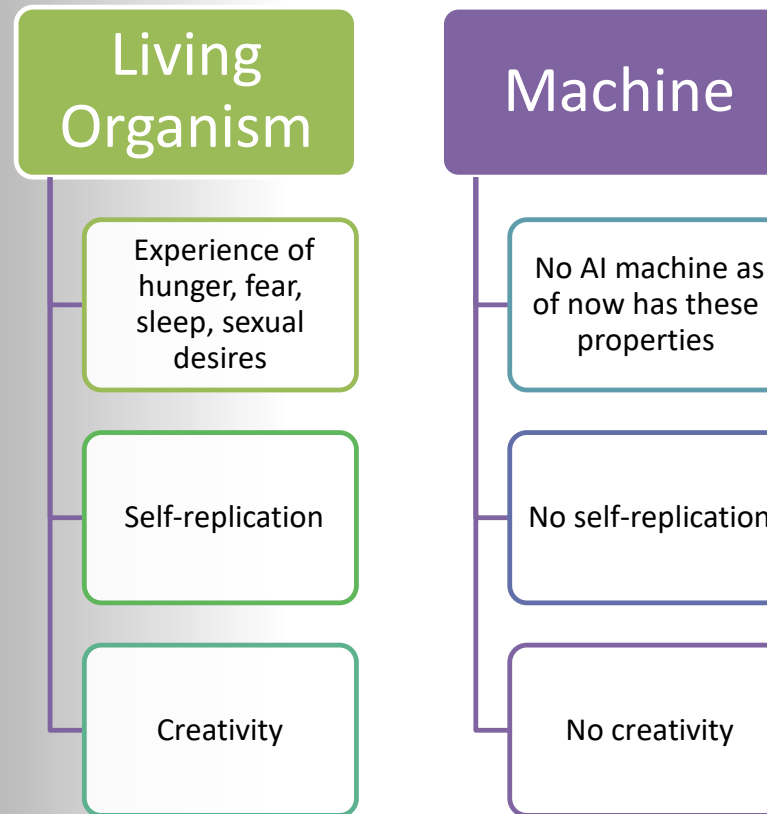
Gross Experience

- Sound
- Touch
- Form
- Taste
- Smell

Subtle Experience

- Pain
- Pleasure
- Happiness
- Distress
- Thoughts
- Desires
- Loving

Living Organism vs Machine



Did you ever contemplate if living matter is different from inert matter?

Are these like humans?



9/11 Attack on America, 26/11 Mumbai Attack
shook the psyche of the entire world. Will gunning
down thousands of AI machines will yield same
level of commotion?





The Columbia Space Shuttle Disaster

- The Space Shuttle *Columbia* disaster was a fatal incident in the United States [space program](#) that occurred on February 1, 2003, when the [Space Shuttle Columbia](#) (OV-102) disintegrated as it [reentered the atmosphere](#), killing all seven crew members. ([Brown](#), [Husband](#), [Clark](#), [Chawla](#), [Anderson](#), [McCool](#), [Ramon](#))

Nobody mourned for the space shuttle but for seven astronauts.

Are we mere sophisticated machines?

BG compels us to Contemplate.



What is consciousness?

Consciousness has been studied by numerous spiritual traditions

Bottom-up:

*“A person who is not disturbed by the **incessant flow of desires** – that enter like rivers into the ocean, which is ever being filled but is always still – can alone achieve peace, and not the man who strives to satisfy such desires.” - **Bhagavad Gita 2.70***

Top-down:

*“That which pervades the entire body you should know to be **indestructible**. No one is able to destroy that imperishable soul.” - **Bhagavad Gita 2.17***

Levels of Consciousness

Inert matter

We express our consciousness through matter

- Car, Bungalow, Bank Balance
- Objects of Material Consciousness
- The world is made of sense objects only

Living matter

The form of consciousness

- Mode of goodness
- Mode of Passion
- Mode of Ignorance
- 8.4 million species (Plants, aquatics, insects and reptiles, birds, animals and humans)

Pure Consciousness

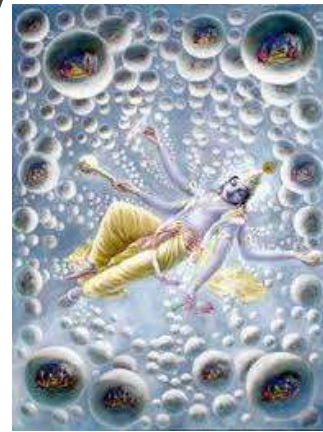
- Individual Conscious entities (kshara and akshara)
- Supreme conscious entity - the whole – the infinity – the Absolute Truth

In mode of
goodness , we can
ask the following
questions



Who am I?

What is matter?



What is Absolute Truth?

Does God Exist?



What is Brahman?

BG says two kinds of experiences



1. Bodily(or material) experience:

- A living body experiences an object in different perceptual spaces - Sound, Touch, Form, Taste and Smell.
- The body is arranged in a specific manner from gross to subtle which makes a living body look different from inert matter.

BG talks of two kinds of experiences



2. Divine(or spiritual) experience:

- Pure consciousness(divine experience) is that which is sat chit and ananda. Our original consciousness lies beyond our both gross and subtle bodies.

Pleasure and pain are part of bodily consciousness

- Pleasure and pain are part of body consciousness and hence are physical.
- Anaesthesia affects the life symptoms not Consciousness. As said in the beginning, consciousness cannot be suppressed by any means.
- Bodily desire, hatred, happiness, distress, life symptoms and convictions are all psycho-physical (combination of both gross and subtle) and are not part of soul or consciousness.
- I as the conscious being exist eternally but because of my conditioning with bodily experience, I have a habit of taking my bodily experience to be myself – the divine consciousness.



**Divine
experiences
makes us
detached**

You become detached from matter.

You do not experience lust, greed, anger, envy and pride even in the presence of agitating objects.

You are equally disposed to all living beings

You are full of joy.



Two categories of Pure Consciousness

- Bhagavad gita talks about two categories
 - one is miniscule which are infinite in number (ksara – fallible)
 - the other is Supreme Consciousness that is ONE without a second (akshara – infallible)
- When one is situated in self (atman), Supreme Soul reveals Himself to the purified soul.
- He is Master always and we – the miniscule ones – are His eternal servants.

Absolute Consciousness is variegated

- Absolute although One without second becomes many for His sweet pastimes. This is His inconceivable feature.
- It is completely wrong to assume that there is no activity at the level of pure consciousness.
- A very distant vision is green top mountain – but a closer and deep introspection leads to variegatedness.



Language and Thought

- Let's do a thought experiment
 - What happens if there is no language?
 - Can you still be communicative?
- Which is first? Thought or Language?
 - Where does meaning lie?
 - Is the meaning driver or inert energy?



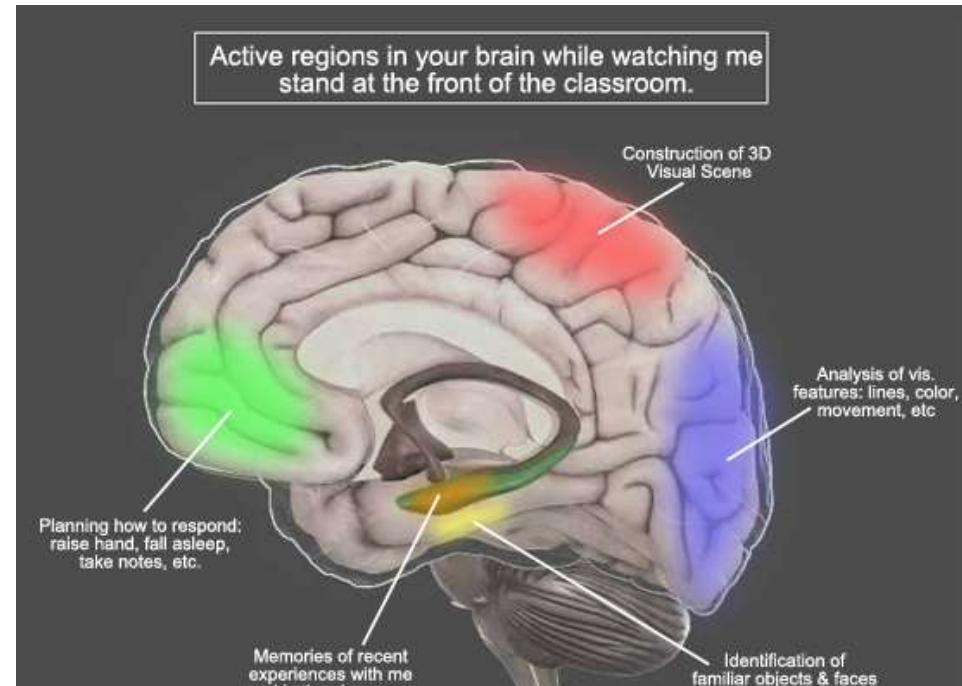
They can still communicate

Research by Prof. Jan, Princeton University

Prof. Laxmidhar Behera, Department of Electrical
Engineering, IIT Kanpur.

Unity of Percept

- Brain study shows that the brain processes different functions in its different parts for example in the experience of seeing:
 - shape is processed in one part
 - Colour in another part
 - Location yet in another part and so forth
 - Yet we have unity of perception – where does it take place



Neglect of Consciousness

- Depression
- Psychic patients
- Behaviour disorder
- Environmental degradation
- Human society as a whole is in danger





Mode of goodness is the way

- Meditation as outlined in BG is the way forward to take people towards consciousness
- Indian music, Yoga, meditation can be integrated in the CBT framework to cure our young generation
- Healthy way of life – Early rise, three times bath in trisandhya, vegetarian sanctified food in a regulated way, contemplation on the self through Bhagavad Gita are some of the ways to bring in consciousness.

Conclusion

- Consciousness is the source of everything
- Consciousness driven education
- Consciousness driven cow protection, organic farming and villages
- Consciousness driven cities and Universities
- Consciousness driven family life and varnashrama system

Consciousness is the missing link

Thank You!!
