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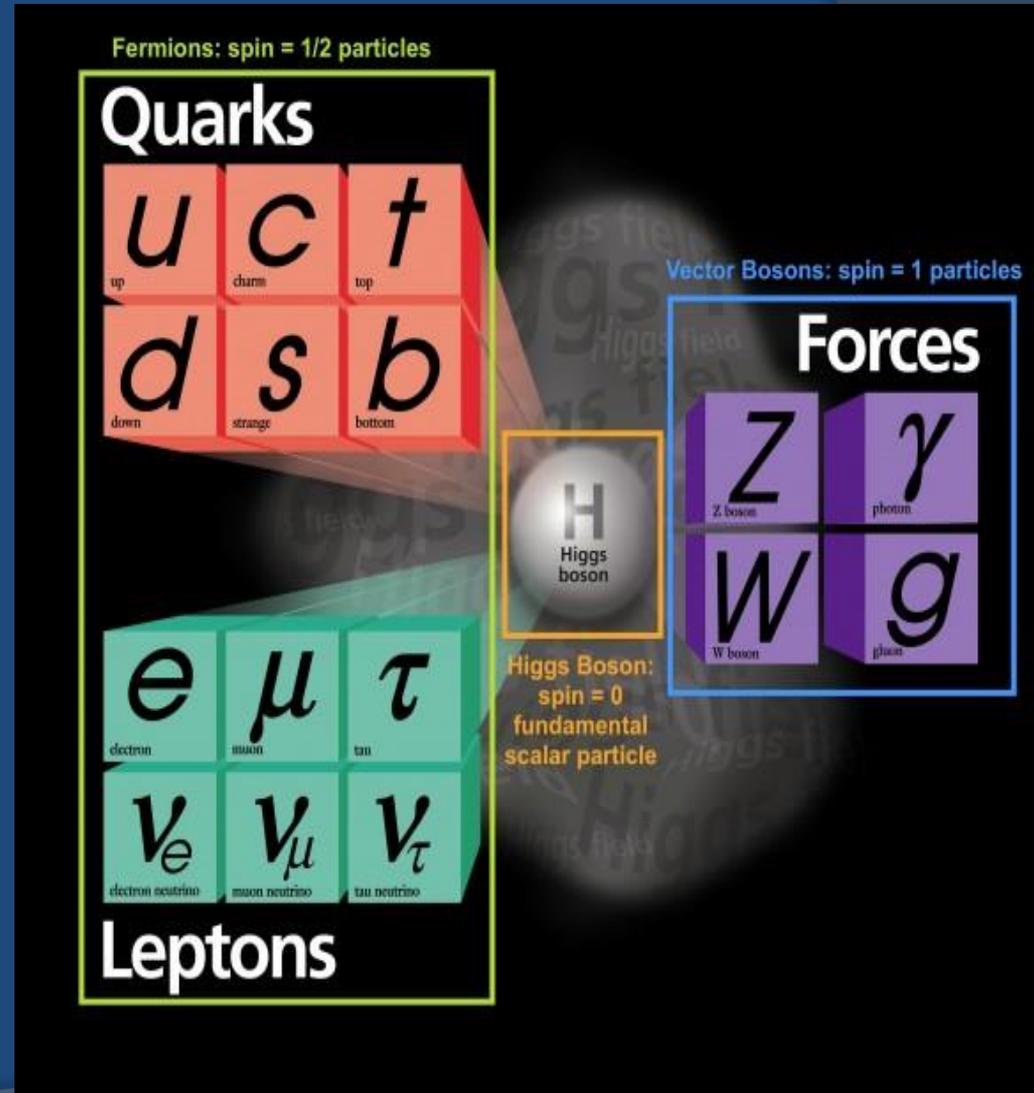
*BEYOND THE STANDARD MODEL*

# *CONTENT*

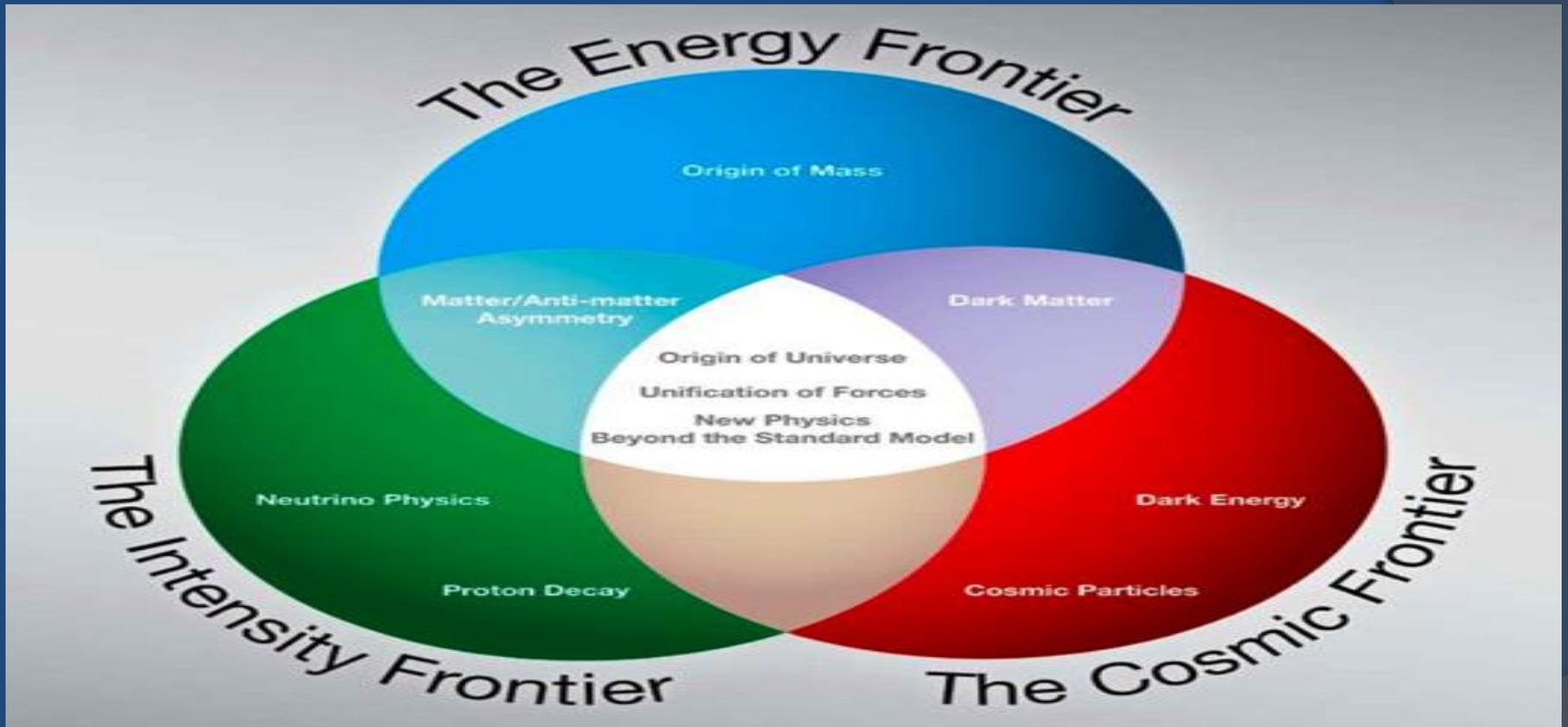
- ⦿ Introduction
- ⦿ Beyond the standard model
- ⦿ Drawbacks of the Standard model
- ⦿ Dark matter
- ⦿ Black Hole

# INTRODUCTION

- The standard Model Represent the Model worked out to solve particle physics, illustrating our understanding of the world,
- Describes
  1. Building blocks of matter
  2. Interactions that bind them
  3. Experimentation at particle accelerators



# Beyond The Standard Model



- What is it?
- Why ? ;  
(Does ST Model explain the complete picture?)

# Drawbacks of the Standard Model

- **Gravity**  
Most important of all. Where the hell's gravity? A theory of quantum gravitation, or more formally quantum geometrodynamics (QGD), does not yet exist. Incorporating gravity into particle physics looks to be a horrendous challenge.
- **Arbitrary parameters** (like the mass of the electron)  
There are just too many (20?),
- **Planck limits**  
The Standard Model describes quite accurately physics near the electroweak symmetry breaking scale (246 GeV). Which yet "low energy" approximation to a more fundamental theory. It can not be valid at energies above ( $\sim 10^{19}$  GeV), where gravity can no longer be ignored.
- **Causality became certain ....**  
The light-cone structure of special relativity ensures a rigid. The standard Model independent Q. estimate theories rely upon this structure for making predicting
- **Cosmology**
  1. Dark matter and dark energy
  2. Black Hole

# Dark Matter

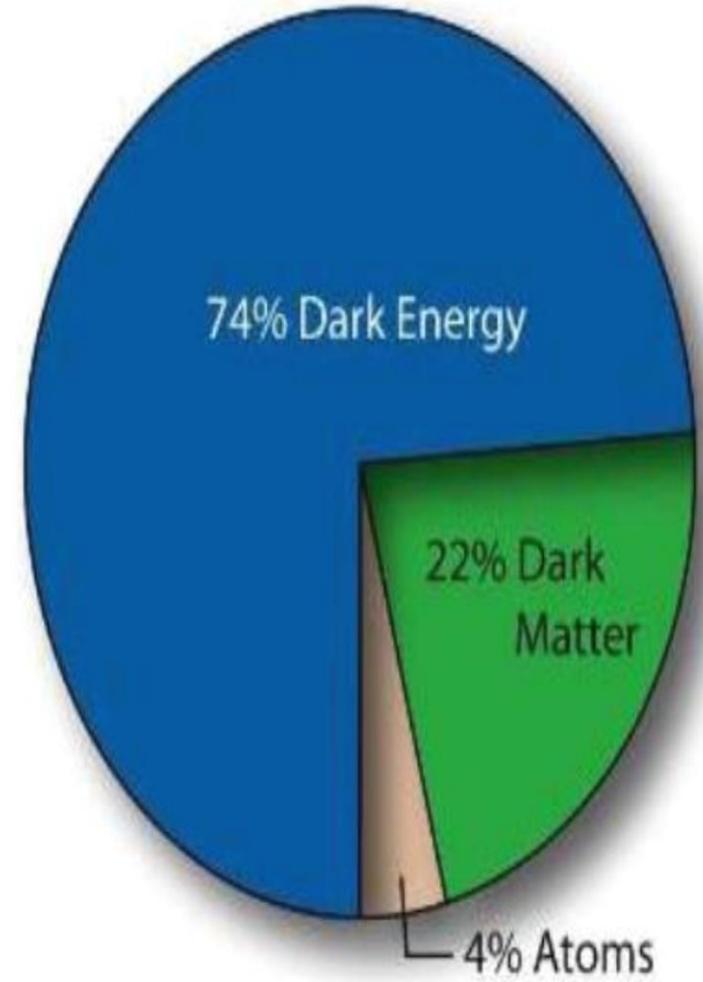
- ⦿ The non seen mass.
- ⦿ Is not reactant to light.
- ⦿ Detected from observation of light of other Galaxies

MACHOs  
(B.H, n star  
,dwarf )

WIMP  
(neutrino,  
magnetic  
monoplo, ....

# Dark Energy

- ⦿ The expansion of the world
- ⦿ Repulsive force accelerate the expansion of the universe.
- ⦿ The rate of expansion and its acceleration can be measured by observations based on the Hubble law
- ⦿ There might be a building connections between the planets, stars and even clusters might all bind together as just that marionette bonded to the player by a hidden strip...



# Black Holes

- ⊙ A black hole is a place in space where gravity pulls so much that even light can not get out.
- ⊙ The gravity is so strong because matter has been squeezed into a tiny space.
- ⊙ **Schwarzschild eq. ;**

$$c^2 d\tau^2 = \left(1 - \frac{r_s}{r}\right) c^2 dt^2 - \left(1 - \frac{r_s}{r}\right)^{-1} dr^2 - r^2 (d\theta^2 + \sin^2 \theta d\varphi^2)$$

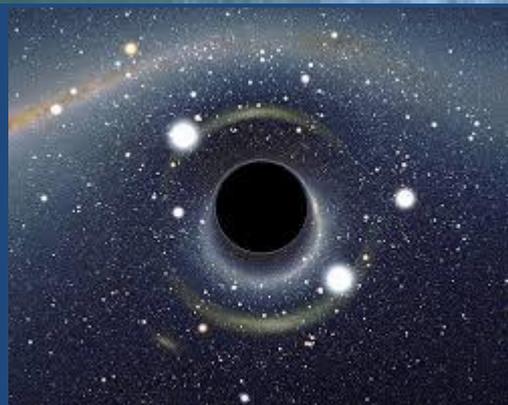
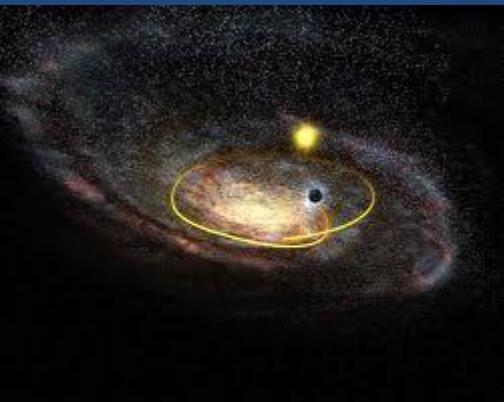
**The solution taken to be valid for all  $r > 0$ , is called a Schwarzschild black hole.**  
**The Mass of the B.H take any + value, In Planck units the total  $Q$  and the total  $J$  are expected to satisfy**

$$Q^2 + \left(\frac{J}{M}\right)^2 \leq M^2$$

- ⊙ *The Schwarzschild radius, where if the object comes to surface with that radius it would need speed  $\geq c$  to escape*

$$r_s = \frac{2Gm}{c^2}$$

# BLACK HOLES & THE EDDY FLUID



- First I got a sparked Idea about a relation between the B.H and the Ocean eddy since;
  1. Nothing caught up in them escapes.
  2. They looks a like and loop in circular motions

**My idea is, could we generate an eddy photonic, How ? And what is the information we could have out of that?**

# *The approach of Black hole and Eddy Ocean*

- ⦿ George Haller, professor of Nonlinear Dynamics at ETH Zurich, and Francisco Beron-Vera, research Professor of Oceanography at the University of Miami, proposed a similar mathematical approach.
- ⦿ Using mathematical models, they isolated water-transporting eddies from a sequence of satellite observations.
- ⦿ They found that these eddies are mathematically equivalent to black holes. At a critical distance, a light beam no longer spirals into the black hole.

# *Ocean Black Hole*

- ⦿ Contribute to climate change, could moderate the negative impact of melting sea ice in a warming climate.
- ⦿ Whirl loops were seen moving in a spiral motion trapping anything in its path including debris, oil and possibly living creatures.
- ⦿ And the whirlpools have a lifespan
- ⦿ Lake but remain coherent up to 1 yr

# Thanks

“When one's expectations are reduced to zero, one really appreciates everything one does have”

Stephen Hawking

“GOD Doesn't play Dice with Universe”

Einstein

“It's fine to discover new particles. But I don't think it's very good to believe ahead of time what you're going to discover.”

Freeman Dyson, 2003