



Symmetries in Nature

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randomnies.blogspot.mx

from SUSSP69 uebpwge

finite or Continuous | Global or Local

precegreatpicture.com

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u d e ν_e

→ matter particles

u c t d s b e μ τ ν_e ν_μ ν_τ

www.quantriumdynamics.org

In which sense are they equal and different?

When taking the concept of symmetry to a more fundamental level, that is, when looking out for the symmetries in the laws of nature, it is found out that forces are determined by symmetry principles. Therefore, a new understanding of the physical phenomena emerges from this picture.

SYMMETRY IS NOT ONLY AN UNDERLYING PRINCIPLE OF NATURE BUT ALSO OF THE PHYSICAL PHENOMENA.

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THE FLAVOUR PUZZLE

FERMIONS*
First Generation: Up quark, Down quark, Electron, Muon-neutrino, Electron-neutrino
Second Generation: Charm quark, Strange quark, Muon, Tau-neutrino
Third Generation: Top quark, Bottom quark, Tau, Muon-neutrino, Tau-neutrino

BOSONS
Z, W, Higgs, Photon, Gluon

Mass [giga-electronvolts]

- Mass hierarchy
- Large Neutrino Mixing Ang.
- vs
- Small Quark Mixing Ang.
- Why 3 and only 3 families?
- Could the Mixing angles be related to the masses?
- Could there be an underlying symmetry?
- Dirac or Majorana?

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Gravitational Force

http://physics.randolphcollege.edu

Electromagnetic Force

http://trinitymcc.com

Weak Force

http://physicsbuzz.physicscentral.com

Strong Force

http://hadron.physics.fsu.edu/~crede/

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u d e ν_e

http://www.hep.phy.cam.ac.uk/outreach/CROCS/images/

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The Higgs Mechanism

carajobuc.com

THE HIGGS BOSON WALKS INTO A CHURCH. THE PRIEST SAYS WE DON'T ALLOW HIGGS BOSONS IN HERE.

THE HIGGS BOSON SAYS BUT WITHOUT ME HOW CAN YOU HAVE MASS?

- Brian Malow

bohojo.files.wordpress.com

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