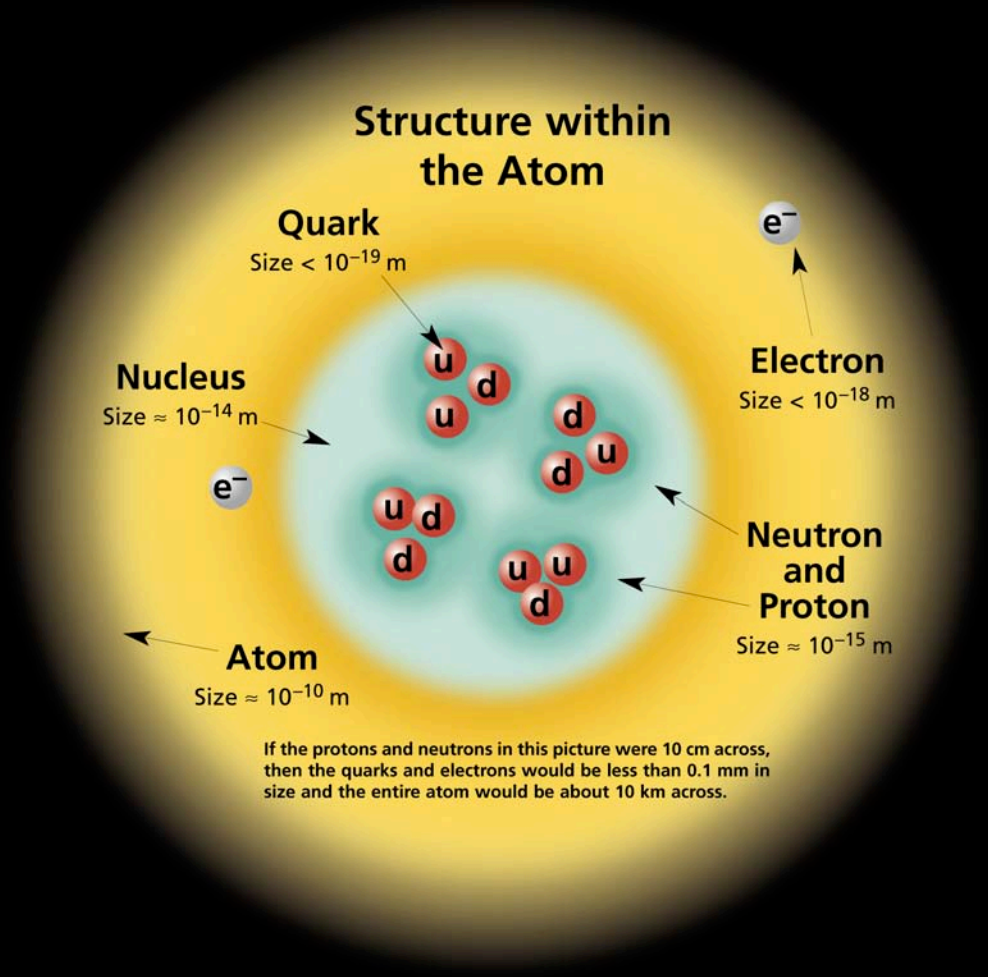
Sub-atomic Mystery Particles

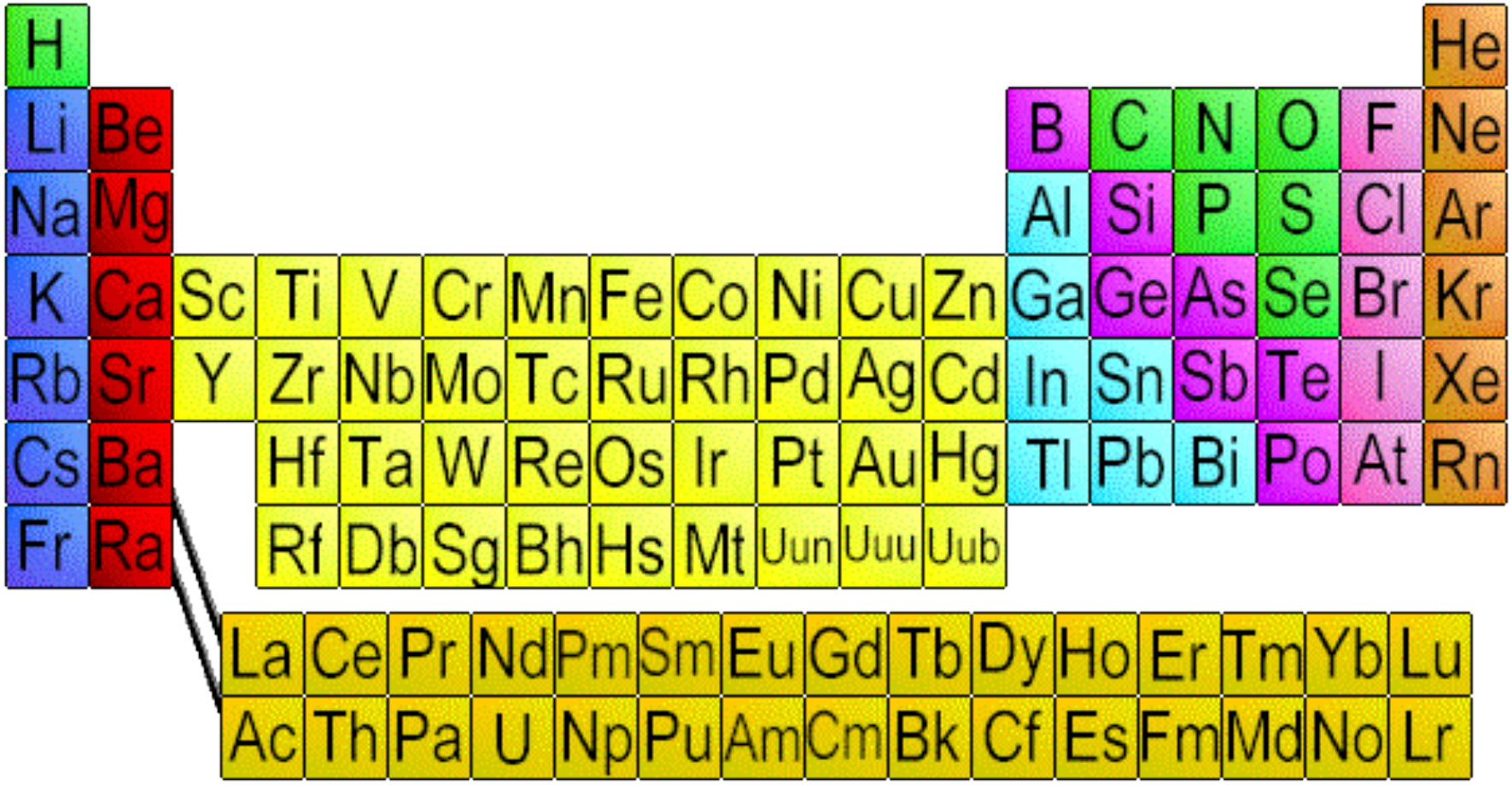


Professor Elizabeth H. Simmons

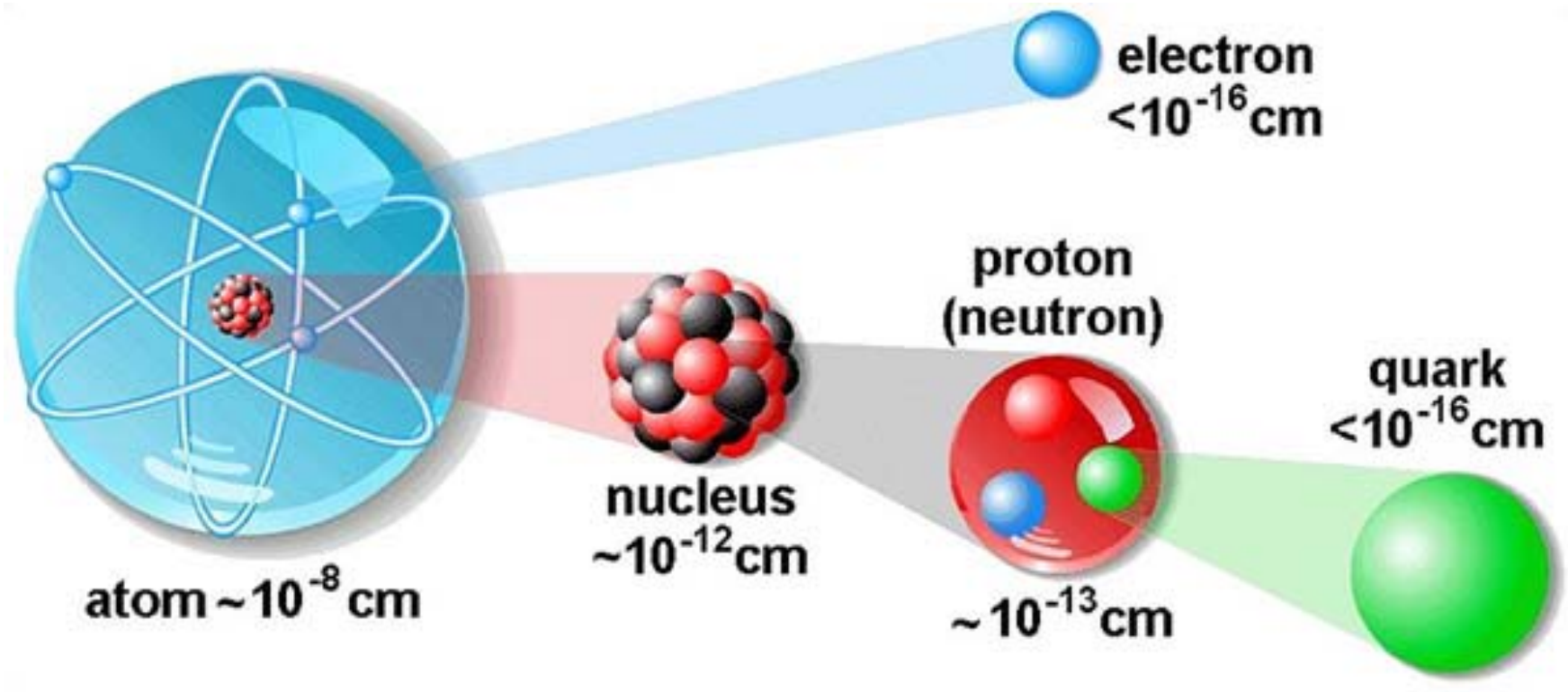
Department of Physics & Astronomy and Lyman Briggs College, Michigan State University

What is this ring made of ?

What does the Periodic Table tell us about atoms?



Sub-atomic particles:



Matter Particles

Force Carriers

e4.physik.uni-dortmund.de/bin/view/ATLAS/Bildergalerie

Why are there so many different kinds of particles?

What do the differences teach us?

Mystery particle #1: Top quark (t)

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Mystery particle #2: Neutrino (ν)

Mystery particle #2: Neutrino (ν)

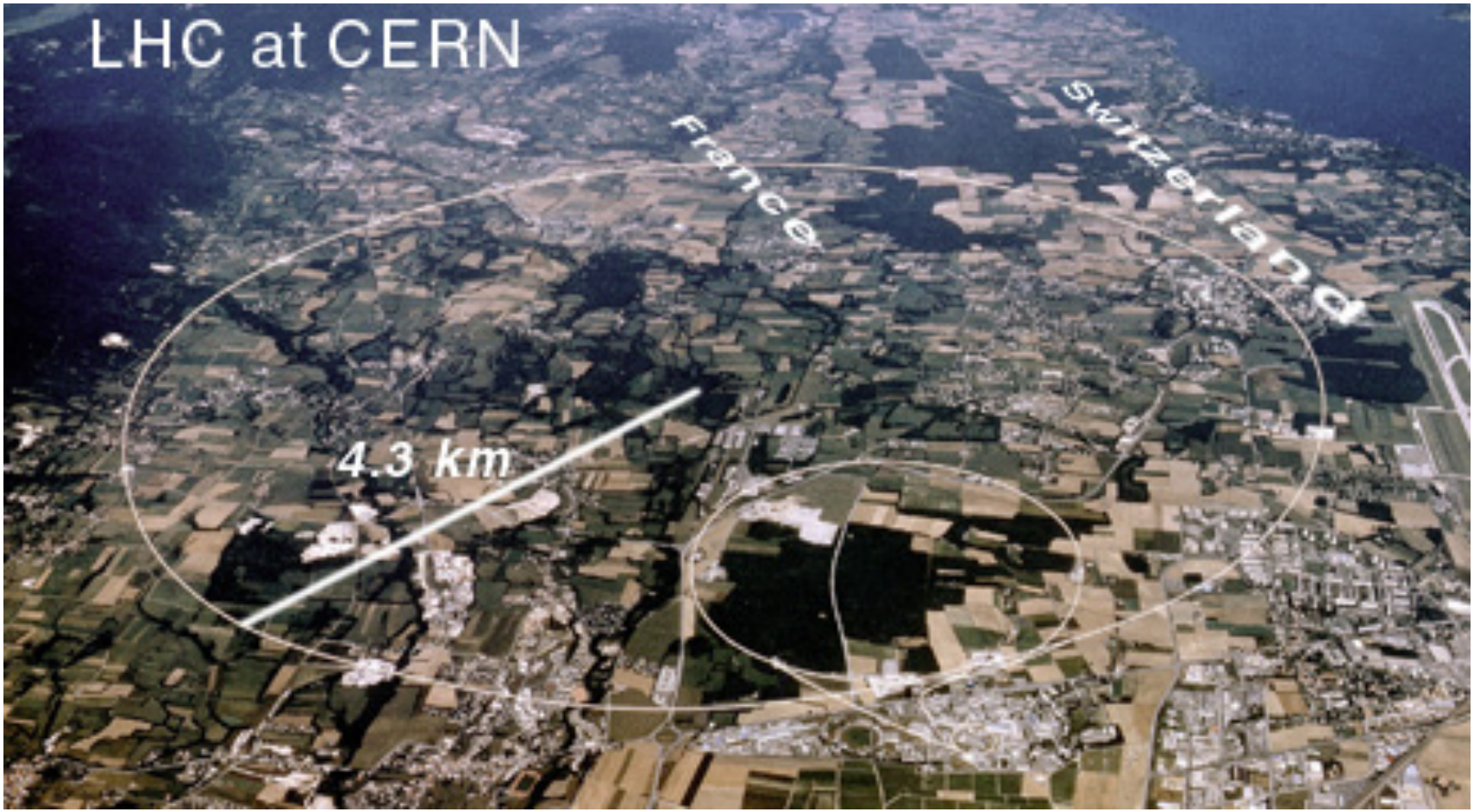
Cosmic Gall

Neutrinos, they are very small
They have no charge and little mass
And scarcely interact at all
…

John Updike (updated)

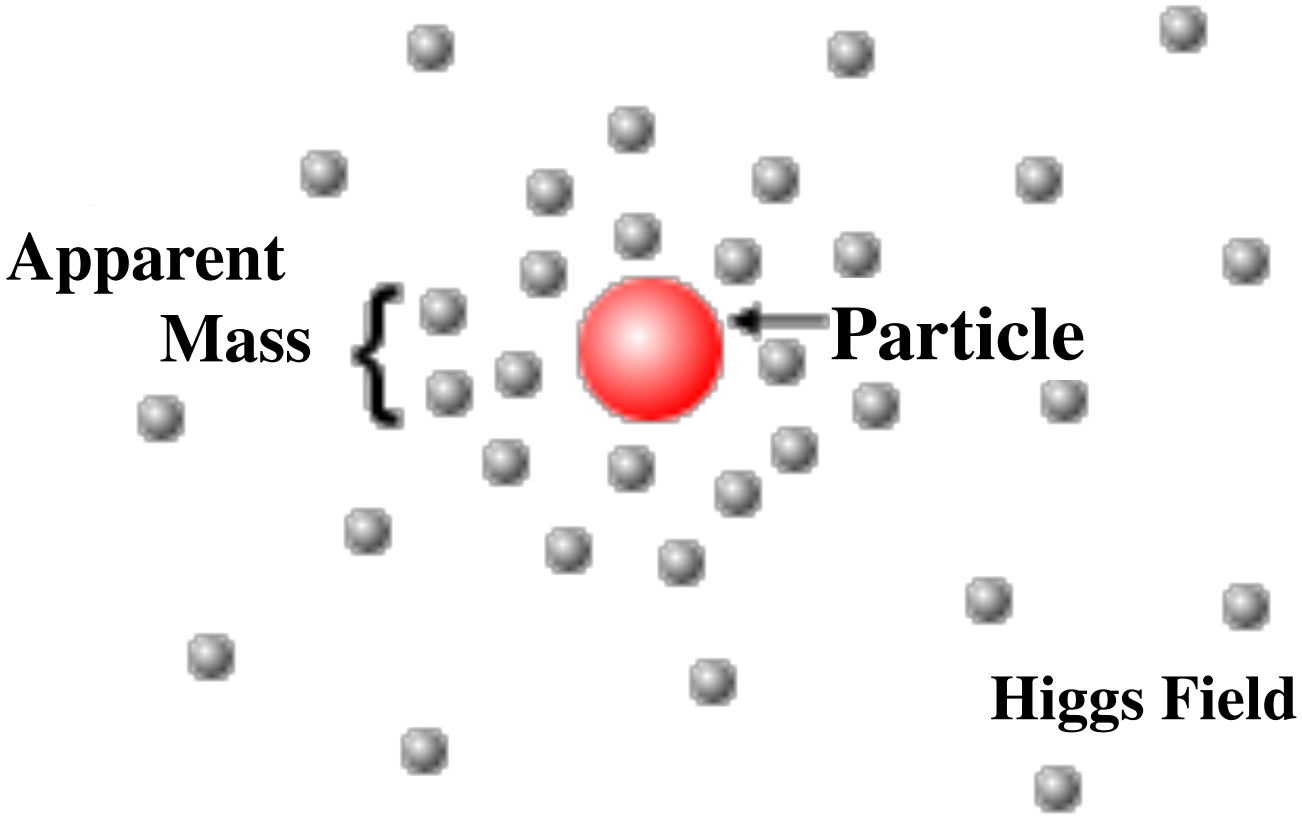
Studying Mystery Particles

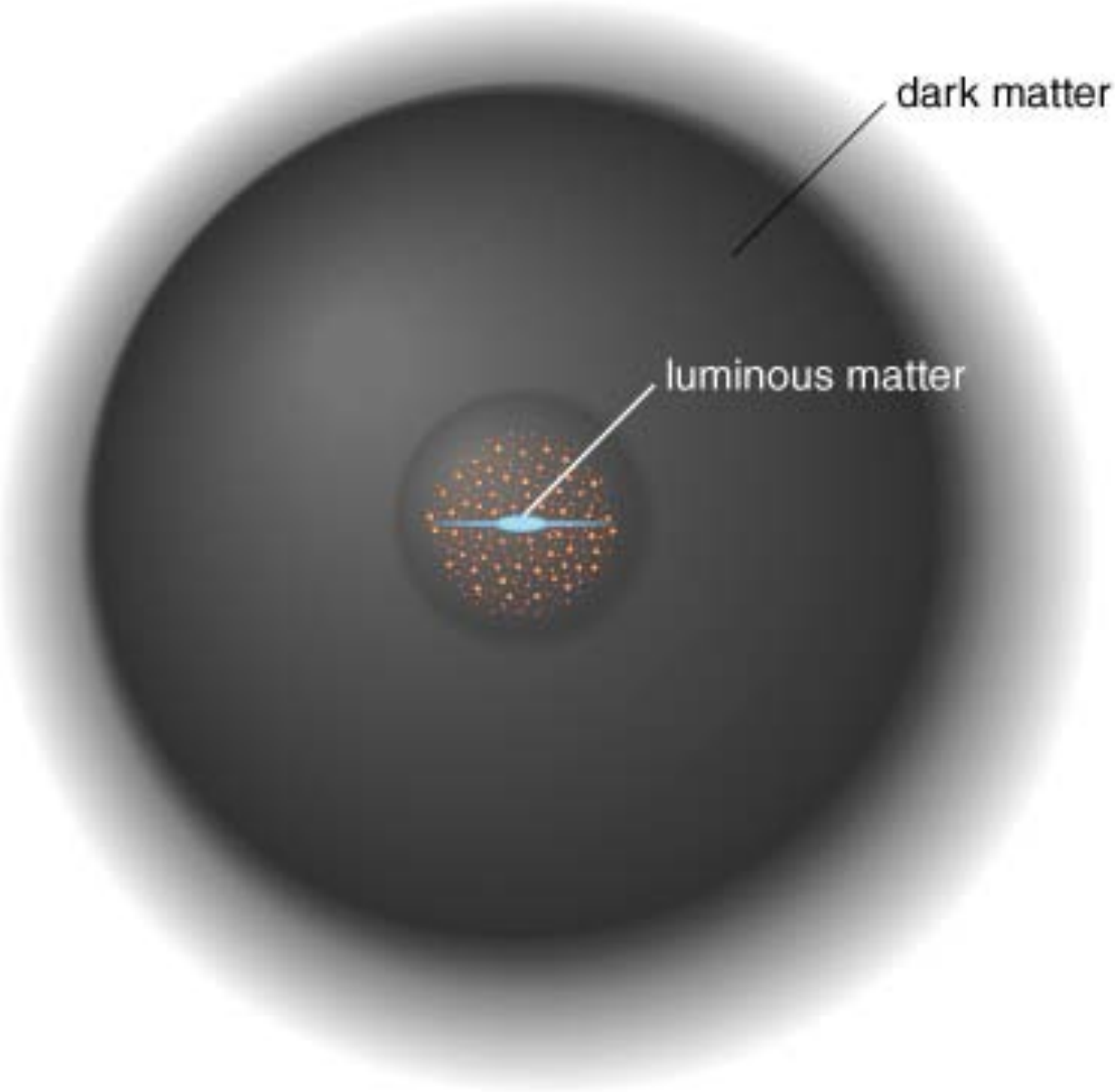
Causing particle collisions powerful enough to answer our questions requires a powerful particle accelerator: the **Large Hadron Collider** (LHC).




80/5 Tm.

The End


Apparent
Mass
Particle
Higgs Field



Sub-atomic particles matter!

- History: alchemy, atomic weapons
- Astronomy: sunshine, "metals", cosmology
- Medicine: PET, MRI, chemotherapy
- Household: smoke detectors, radon
- Computers: the World-Wide Web
- Archaeology & Earth Sciences: dating