

Where does mass come from?

Some subatomic particles have a great deal of mass and some have no mass at all. Nobody knew why this was happening until 1964, when a physicist by the name of Peter Higgs proposed that there is an energy field that permeates the universe. Particles that interact with this field convert some part of their energy into mass.



Photons, particles of light, do not interact with this field and therefore have no rest mass. This field is now called the Higgs field. The particle that represents this field was discovered at CERN in 2012.

Materials: Iron sand, 2 steel balls (one magnetic and one non-magnetic), small sifter, white board or any other flat surface

Activity: Spread the iron sand on the white board evenly using a sifter. Roll non-magnetic steel ball over the iron sand first, and then roll the magnetic ball. Observe what happens with each ball.



Questions to ask: Which ball goes faster on the iron sand? Why does the sand slow down the magnetic ball more than the non-magnetic one? Which ball gains mass after rolling on the sand and why? What does the sand represent in this experiment? What particles are represented by the magnetic ball? What particles are represented by the non-magnetic ball?

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