

## Physics 102 – Spring 2011 – Recitation module 8

Why do you think a neutron is a more efficient “bullet” for causing a nucleus to fission than is a proton?

What is the source of the sun’s energy?

Baryons are particles made up of three quarks (not necessarily the same type of quark). Mesons are particles made up of a quark and an anti-quark (not necessarily the same type of quark)

Suppose there are only three types of quarks (and their corresponding antiquarks):

Up quark, with electric charge of  $+2/3$

Down quark, with electric charge of  $-1/3$

Strange quark, with electric charge of  $-1/3$

How many baryons, with what electric charges, could you make from these three quarks?

How many mesons, with what electric charges, could you make from these three quarks?

Are electrons fundamental particles? (The are not fundamental if they have constituent particles.)

Are protons fundamental particles?

What is the Higgs particle? What is it that the Higgs particle is thought to do in modern physics?

What are the four fundamental forces of nature? What particles are thought to convey these forces?

Which force of nature is the strongest?

Which force of nature is the weakest?

If the electromagnetic force is so much stronger than the gravitational force, why is it we don't typically have to deal with the electromagnetic force the way we have to struggle against gravity?

What is a "critical mass" in nuclear physics?

What does it mean to "enrich" uranium? Why is this important?

Suppose when a uranium nucleus is split by a neutron, it emits two photons and nothing else, would you be able to build a nuclear bomb from uranium? Why or why not?

Why do physicists and astronomers think there is "dark matter" in our universe? Why do they call it "dark" matter?

Suppose you were immortal and had no need to take breaks, sleep or eat. How long would it take you to run a distance of one light year?