

Title: Particle Physics 2b - due to an audio problem

Date: Oct 23, 2010 03:45 PM

URL: <http://pirsa.org/10100110>

Abstract:

Baryons are made from **three quarks**
Antibaryons are made from **three antiquarks**

Mesons are made from one quark and one antiquark

and... quark number is conserved

There's six types of quark...
up, down, charm, strange, bottom, top



if you like, you can buy a full set
of plush toys representing them from
The Particle Zoo



<http://www.particlezoo.net>

Let's just use these two for now:

up (charge of **+2/3**)

down (charge of **-1/3**)

...and try questions #7, 8, 9

#7.

Mesons weren't conserved... why?

Because they essentially cancel themselves!
Each one has a quark and an antiquark which
cancel each other.

Baryons were conserved, in order to conserve quark number.

This is true even in event 6...



#8:

Baryons are either 3 quarks (matter)
or 3 antiquarks (antimatter).

Mesons are made of both at the same time!
(quark and antiquark)

#9:

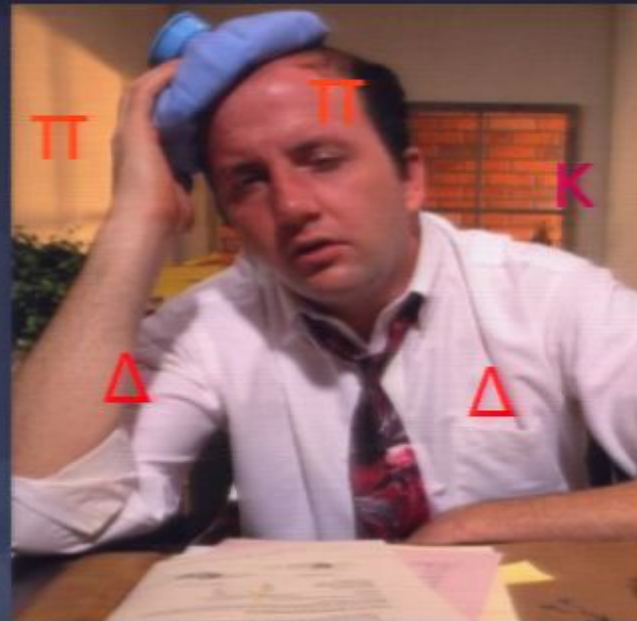
Proton (+1) up, up, down

Neutron (0) up, down, down

Helium (2 protons, 2 neutrons) 6 up,
6 down

in case you're thinking..

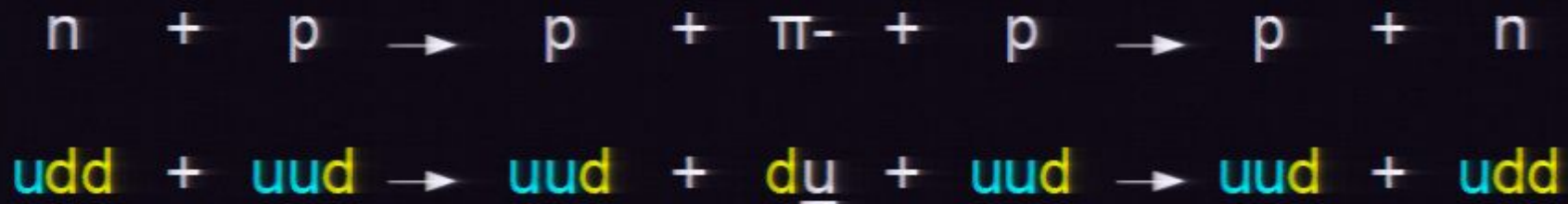
“Pions, kaons, deltas, the whole stupid Greek alphabet is changing into one another... WHO CARES my brain hurts and it's got nothin' to do with me!”



Let's try #14,
which is kind of important,
if you think intact nuclei are
important.

hint #1: we're trying to turn a neutron and a
proton into a proton and a neutron, respectively

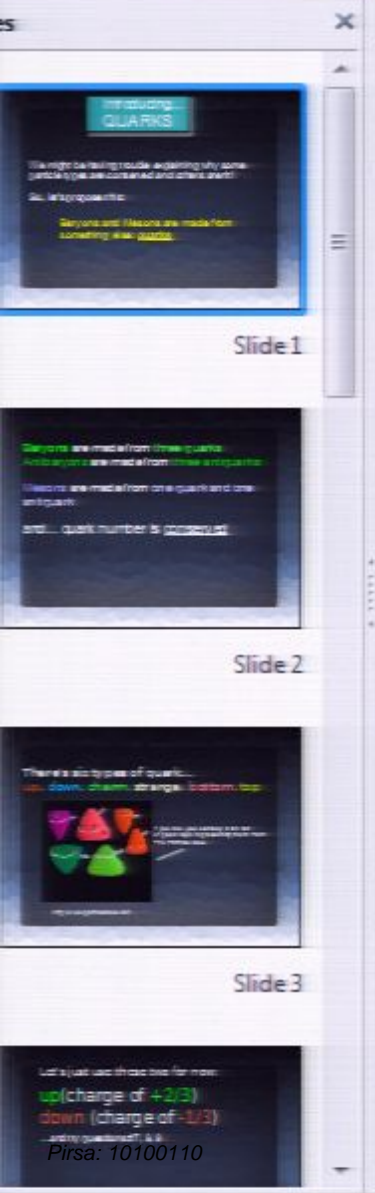
hint #2: consider the quarks needed on both
sides of the event... and what pions are made
of



Changing the neutron to a proton leaves us with one too many up quarks, and one too few down!

Luckily we can create a pion with a down quark, and antiup quark --- problem solved!

lick to exit presentation...



Normal Outline Notes Handout Slide Sorter

Introducing... QUARKS

We might be having trouble explaining why some particle types are conserved and others aren't!

So, let's propose this:

Baryons and Mesons are made from something else: quarks

Tasks View

Master Pages

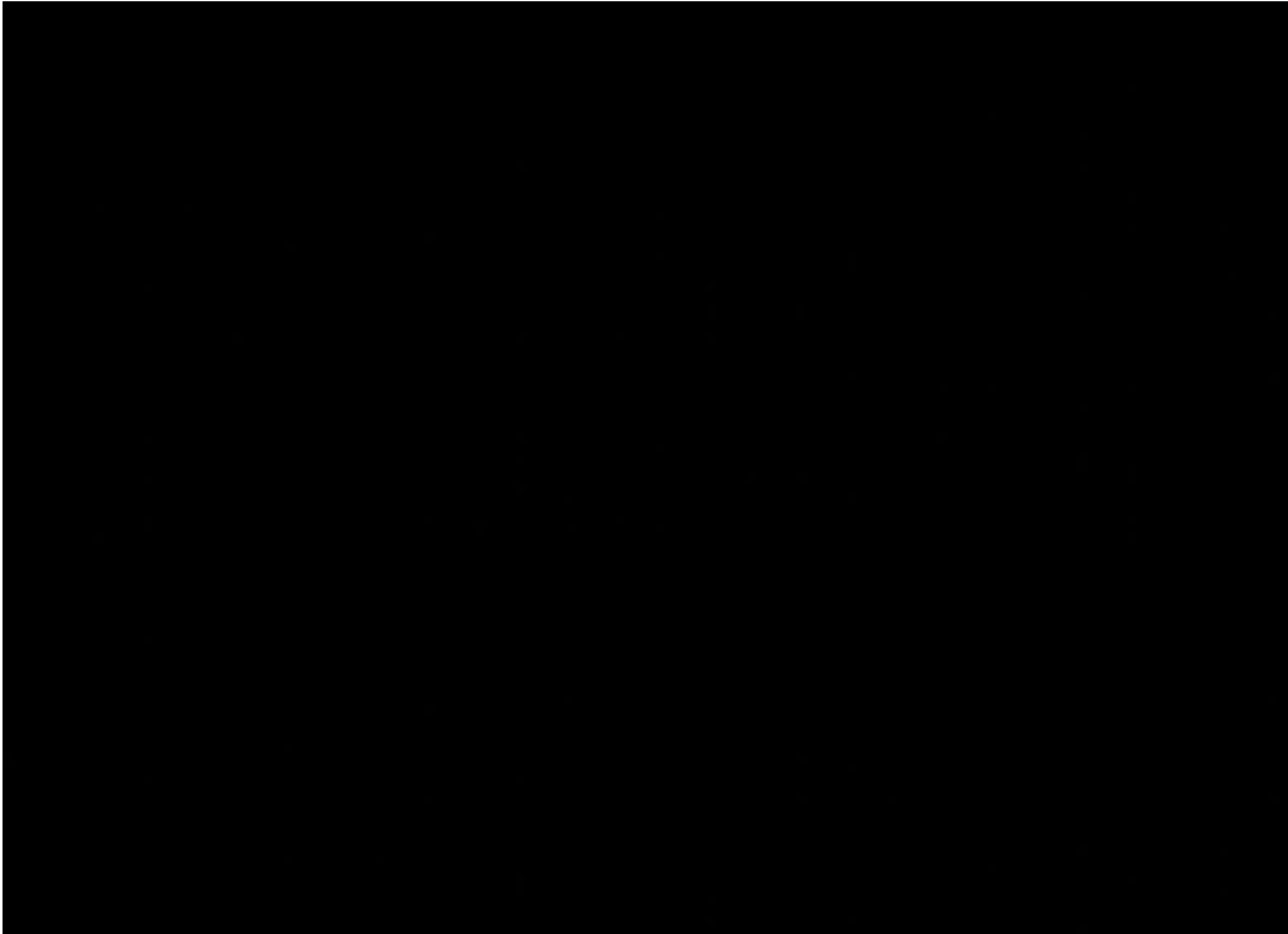
Layouts

Table Design

Custom Animation

Slide Transition





1500

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$$\frac{1500}{50} = 30$$

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$$\frac{1500}{50} = 30$$

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