

The Urantia Book, Part 4: Science and Cosmology.

“The world is an amazing place.”

D.N.A.

mind ~ brain

mass ~ matter

our prize-winning theories,

our best philosophies,

fall short.

“... more things in heaven and earth
than are dreamt of in
our philosophies.”

“The world is an amazing place.”

And the more we learn about the world, the more amazing it becomes.

Whether it's sorting out how DNA really works, or how mind relates to brain, or what mass and matter really are – our prize winning theories, our best philosophies, still fall short, and fail to explain what's really going on.

Even today, Shakespeare's famous words still hit the spot: there are...

“more things in heaven and on earth”

than we can imagine.

The universe is not only
stranger than we imagine,
it's stranger than we can imagine.



Or as scientists like to say,

*"The universe is not only stranger than we imagine,
it's stranger than we can imagine."*

So how do we go about exploring something we can't even imagine?

Reason

“scientific method”

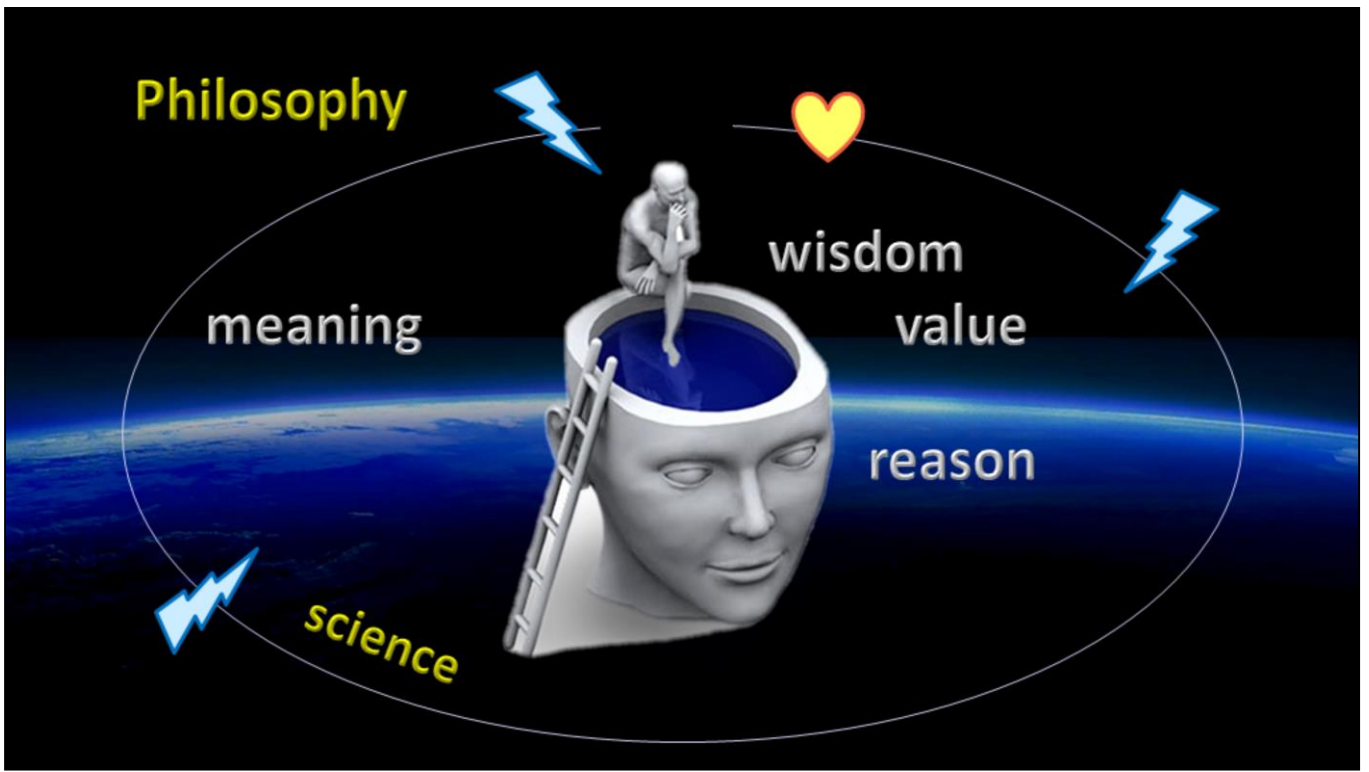
meaning

value



Well, we can go a long way with **Reason**. Think of all the once unimaginable things – about the subatomic world, about the mechanisms of material life – that our scientific method has revealed.

But what about things we can't measure, those things which reason can't grasp, like “meaning”, and “value”?



This is where **Philosophy** steps in, to take us all the way to the "full philosophic limit".

And **this** was Shakespeare's point: that our science and philosophy define the **frame** within which our reason and wisdom can act.

So here we are, stuck within our frame...

and yet, tickled by numinous intuitions, that take our breath away.



“Man must think in a mortal universe frame
but that does not mean that he cannot envision
other and higher frames within which
thought can take place.”

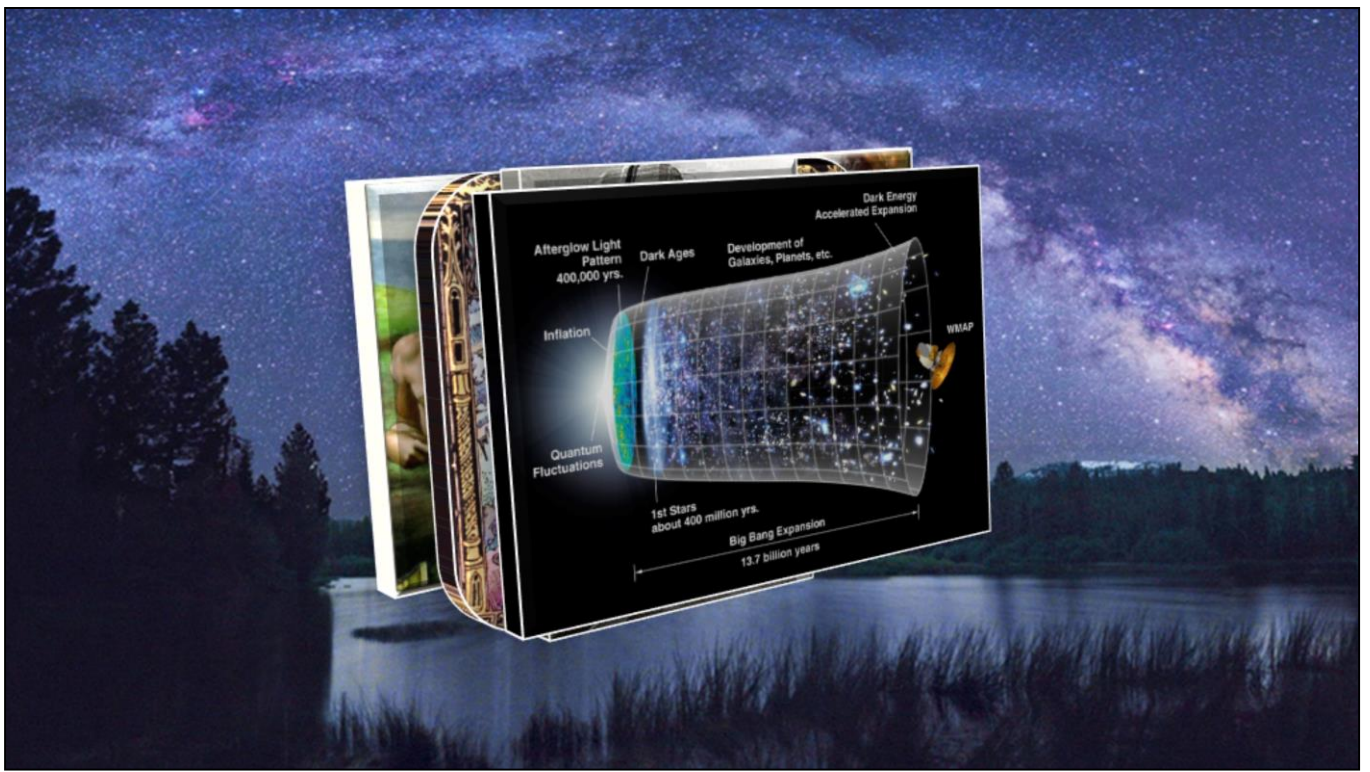
The Urantia Book (p.1260.3, paper 115:1.2)

In paper 115, the Urantia Book puts it like this:

“Man must think in a mortal universe frame,
but that does **not** mean that he cannot **envision**
other and higher frames within which
thought can take place.”

Frames, within which...

(1260.3, 115:1.2) “Conceptual frames”

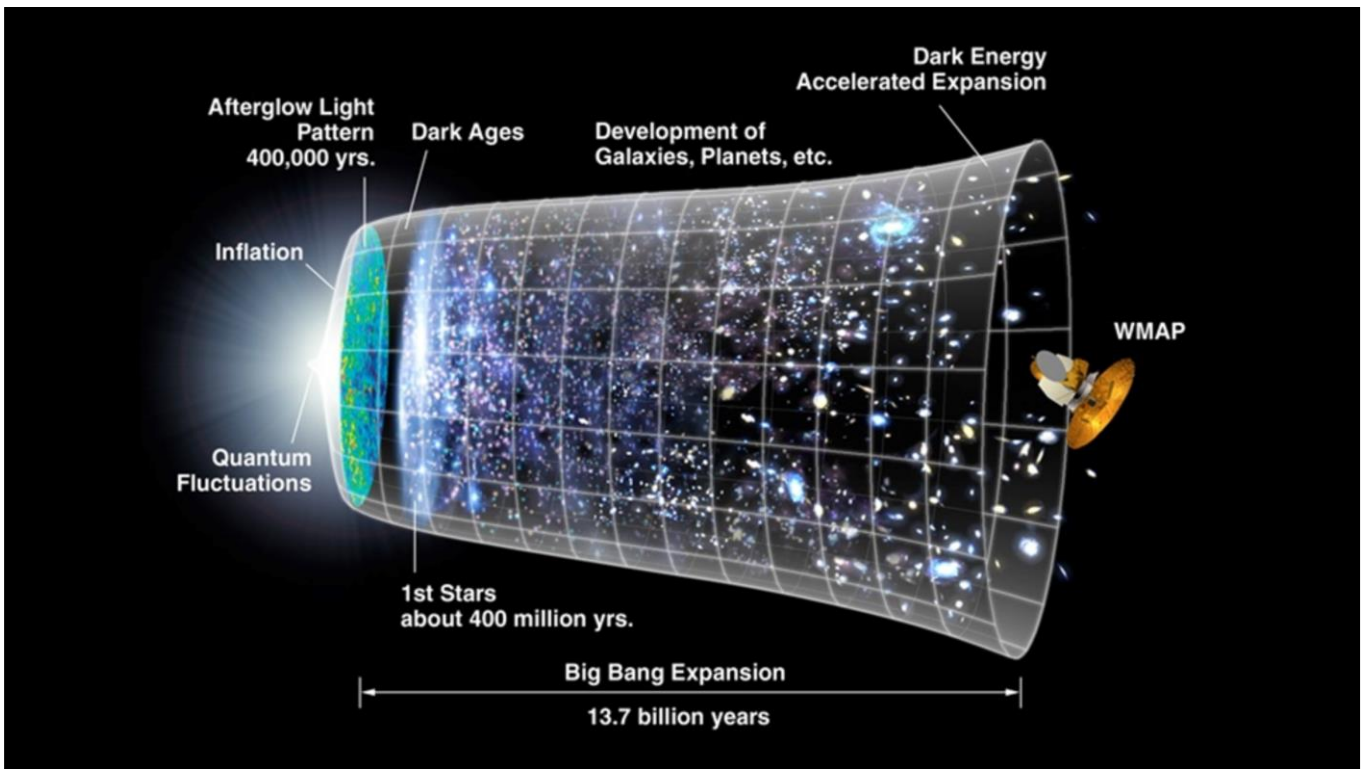


... thought can take place.

In **part 1** (of this series) we looked at this idea... of **"a frame in which to think"**;

how our frames have expanded and evolved,

and how a scientific materialism has driven us to where we are today.



So, are we there yet?

Does this extraordinary map, of energy evolving in space, forced on by some “**arrow of time**”, capture the highlights of universe history?

Or in a few short years, will our children’s children look back, and wonder,

“How could they have missed so much?”

The story so far...

Where are we ?



What are we ?



Personality

Why are we ?



Eternity

In **parts 2 and 3** we looked at the questions of what and why we are.

But I promised I'd get back to this question of where.

Where are we ?



Cosmology

So in this final part,
let's now explore this more scientific, or "cosmological" question:

Where are we ?

“... a finite manifold,
in a more than finite space.”



N-dimensional spaces

(Witten, 1995)

sequestering of particles and forces

(Randall & Sundrum, 1999)

Previously, I said:

*“the Urantia Book describes our place
in a finite manifold,
in a more than finite space.”*

To a physicist, this implies... a few extra dimensions of space,

and some **weird properties** for those particles and forces, locked onto
the **spacetime** we can measure, ...



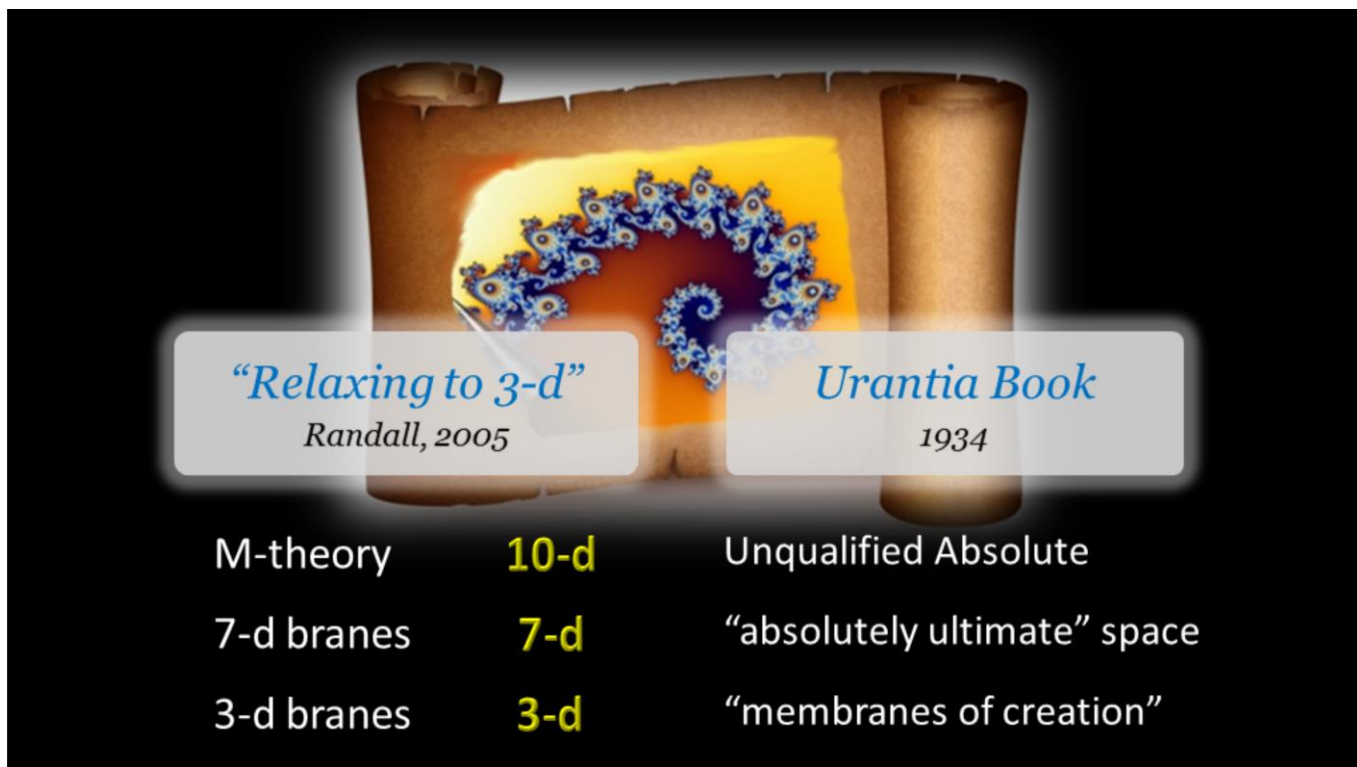
spacetime as a **finite** (time-dependent) slice
upon which **foundations** can evolve.

And spacetime itself becomes merely a finite, or **time-dependent** slice,

upon which certain "**foundations**" (1170.1, 106:7.8) can evolve.

Since about 1995, this sort of "**brane-world**" idea has become... not quite mainstream, but **actively explored**.

"At the inconceivably distant future eternity moment of the final completion of the entire master universe, no doubt we will all look back upon its entire history as only the beginning, simply the creation of certain finite and transcendental foundations for even greater and more enthralling metamorphoses in uncharted infinity. At such a future eternity moment the master universe will still seem youthful; indeed, it will be always young in the face of the limitless possibilities of never-ending eternity." (1170.1, 106:7.8)



For example, in her 2005 Paper “*Relaxing to Three Dimensions*”, physicist Lisa Randall sketched out how such a scheme might work:

Given some unqualified 10-dimensional potential, nature **favours** the eventuation of 7 dimensional and 3 dimensional sub-manifolds.

To put this in “*Urantia Book*” terms:

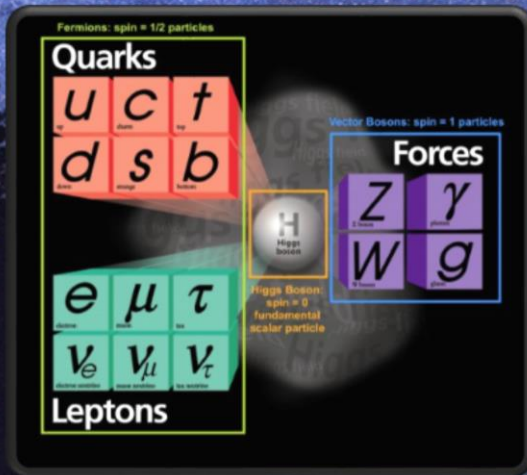
- from the potentials of **The Unqualified Absolute**,
- within an “absolutely ultimate” (**7-dimensional**) space,
- “membranes of creation” can evolve.

But such things are hard enough to imagine, let alone to measure.

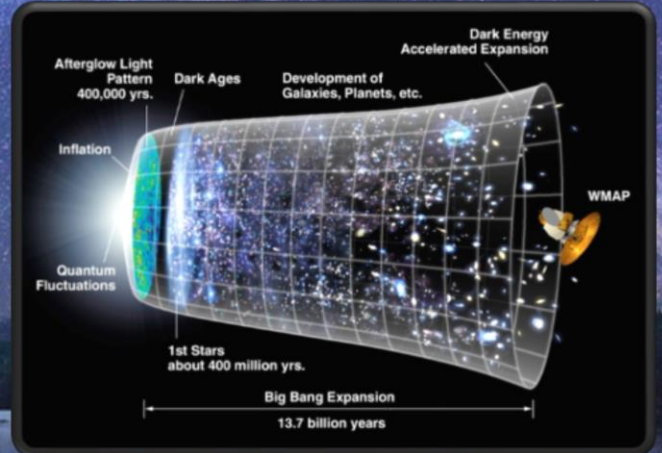
So let’s step back...

[*] Lisa Randall, “Relaxing to Three Dimensions”, <http://arxiv.org/abs/hep-th/0506053>

Standard models...



particle physics



cosmology

... to where science currently is, and ask the question: “Does the Urantia Book offer anything, anything at all, that might help to explain, or even to extend, these standard models – of **particle physics**, and of **cosmology** – that native science has evolved?”

Maybe.

First thing to note is that we have **two** “standard models”...

One of these (for **cosmology**) was built by scientists trying to explain how stars and galaxies move and interact.

This other one (for **particle physics**), has been forced on us by the weird behaviour of particles in the lab.

Sadly, these two **excellent** and **effective** standard models... are not compatible with each other.

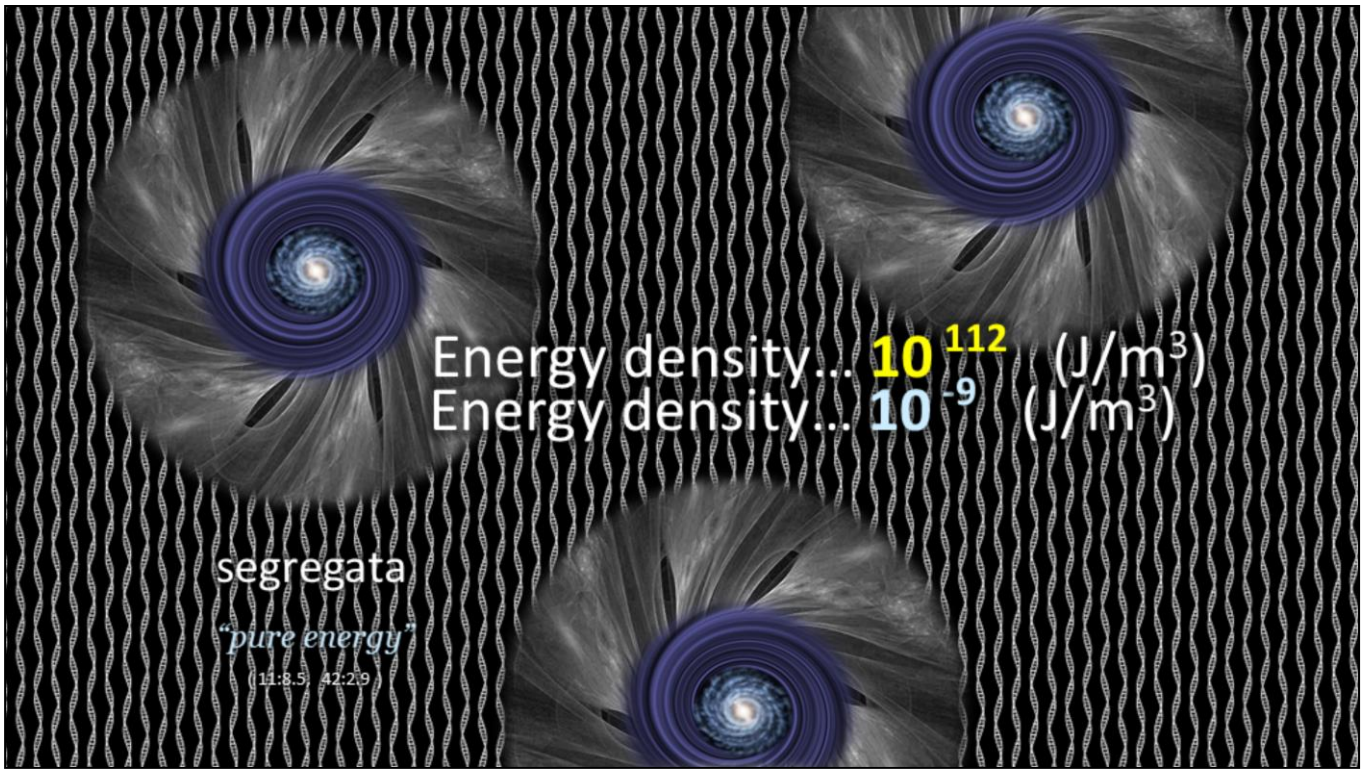
So what’s the problem?

Three spiral galaxies are arranged in a triangular pattern against a black background. The galaxies are rendered in shades of blue and white, with bright yellow-orange cores.

Energy density... 10^{-9} (J/m³)

One of the problems is that for standard, “**Big-Bang**” cosmology to work, space... needs to be mostly *empty*.

But for our quantum field theories to work, ...



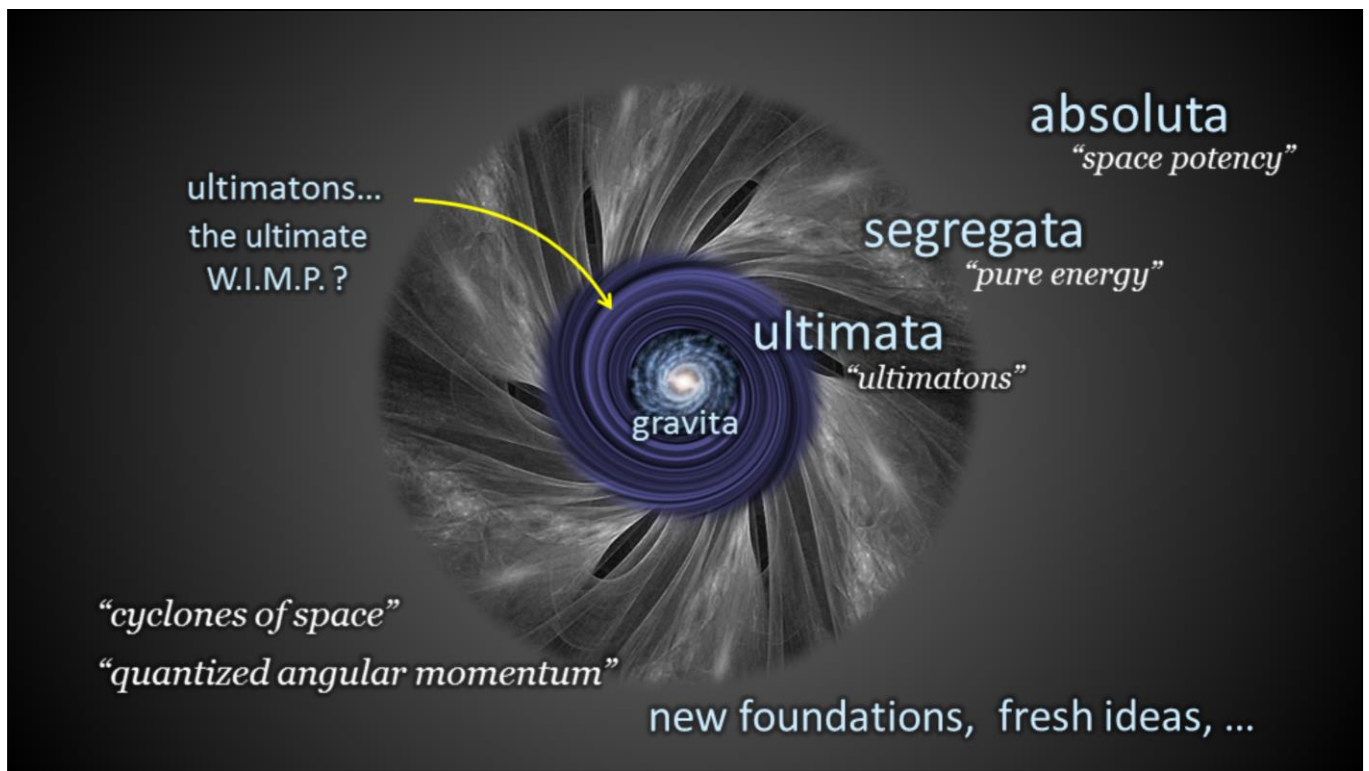
... the so-called "vacuum of space" needs to be surprisingly full;
implying some outrageous energy density distributed throughout space.

The Urantia Book reveals something, about this distribution of energy in space,
that might help these two "standard models" to get along.

In the Urantia Book scheme, something called segregata (or "pure energy")
is literally segregated into energy-dense islands.

It's within these "islands of energy" that a primitive and transparent form of mass
evolves, from which standard model matter can be built.

Here's another look:



From the **passive potentials** of space potency, or **absoluta**, ...

a pool of “pure energy”, or **segregata**, is condensed,
and then swirled into one of those vast “**cyclones of space**”.

This... angular momentum **quantizes**, and interacts, and **ultimatons** appear.

And it’s from these **ultimatons** that visible, standard model stuff – like electrons (and their photons!) – can be built. The Urantia book calls this visible stuff **gravita**.

* * *

Worth noting that, in this scheme, **ultimatons**, this transparent and primitive form of mass, serve not only as the precursor for standard model particles, they’re also the ultimate **WIMP** – that **W**eakly **I**nteracting **M**assive **P**article – that cosmology (so desperately) needs.

Of course, a scheme like this implies **new foundations** for physics, and some fresh ideas about space and time.

As we’ll see, the Urantia Book appears to provide both.

A fresh perspective on...

- foundations
- mass & matter
- dark islands
- Milky Way

Here's the plan: we'll begin with a quick review of the Urantia Book's unique foundations for physics,

then we'll see what these new foundations mean for mass and matter.

With this background in place, we can take a fresh look at what happens when mass (say a **neutron star**) collapses... not to a black hole, but to something called a "dark island". That can **explode**.

Finally, we'll explore some surprising implications for our ancient "**Milky Way**".

As we work through all this, ...

A fresh perspective on...

“The Limitations of Revelation”

The Urantia Book, paper 104 section 4

*“things which we can discover
for ourselves, we are allowed
to discover for ourselves.”*

*If something is not discoverable,
do those “limitations” apply?*

... keep in mind those “**limitations of revelation**” discussed in paper 101 section 4. As the revelators explain, they were **constrained** by what we might call a “prime directive” :

*things which we can **discover** for ourselves,
we are **allowed** to discover for ourselves.*

But what about things that human science can **never** prove, like Planck-scale interactions, or the global shape of space?

If something is not discoverable, ...

A fresh perspective on...

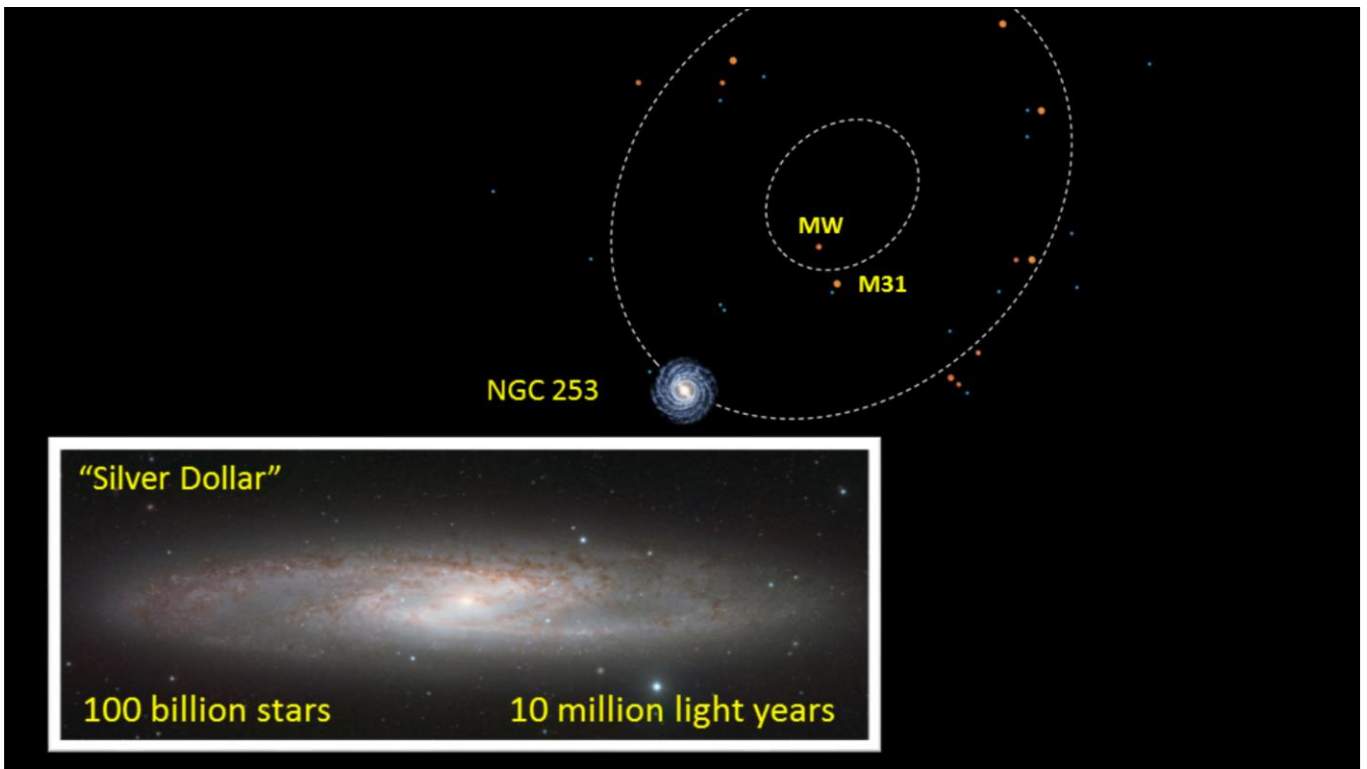
- foundations
- mass & matter
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*“things which we can discover
for ourselves, we are allowed
to discover for ourselves.”*

*If something is not discoverable,
do those “limitations” apply?*

... do those limitations apply?

Let's begin with those foundations.

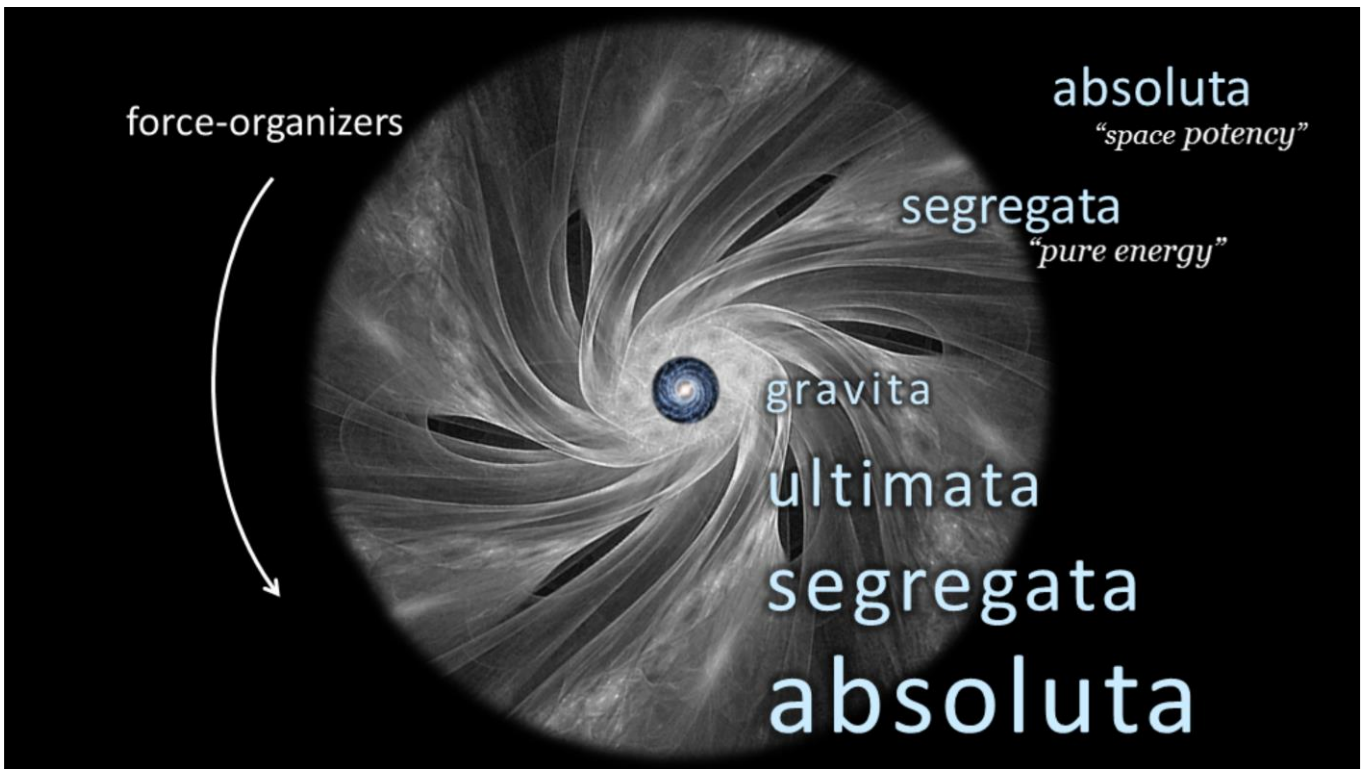


A good way to get a feel for Urantia Book physics is with a standard spiral galaxy.

For example, here's NGC 253, the famous "**Silver Dollar**", a galaxy of 100 billion stars, about 10 million light years away.

When we look at such a thing – with electromagnetic telescopes – we see something like [this] : a flat disk of stars, here seen almost edge on.

This visible galaxy, this tiny spiral of electromagnetically bright stuff, ...



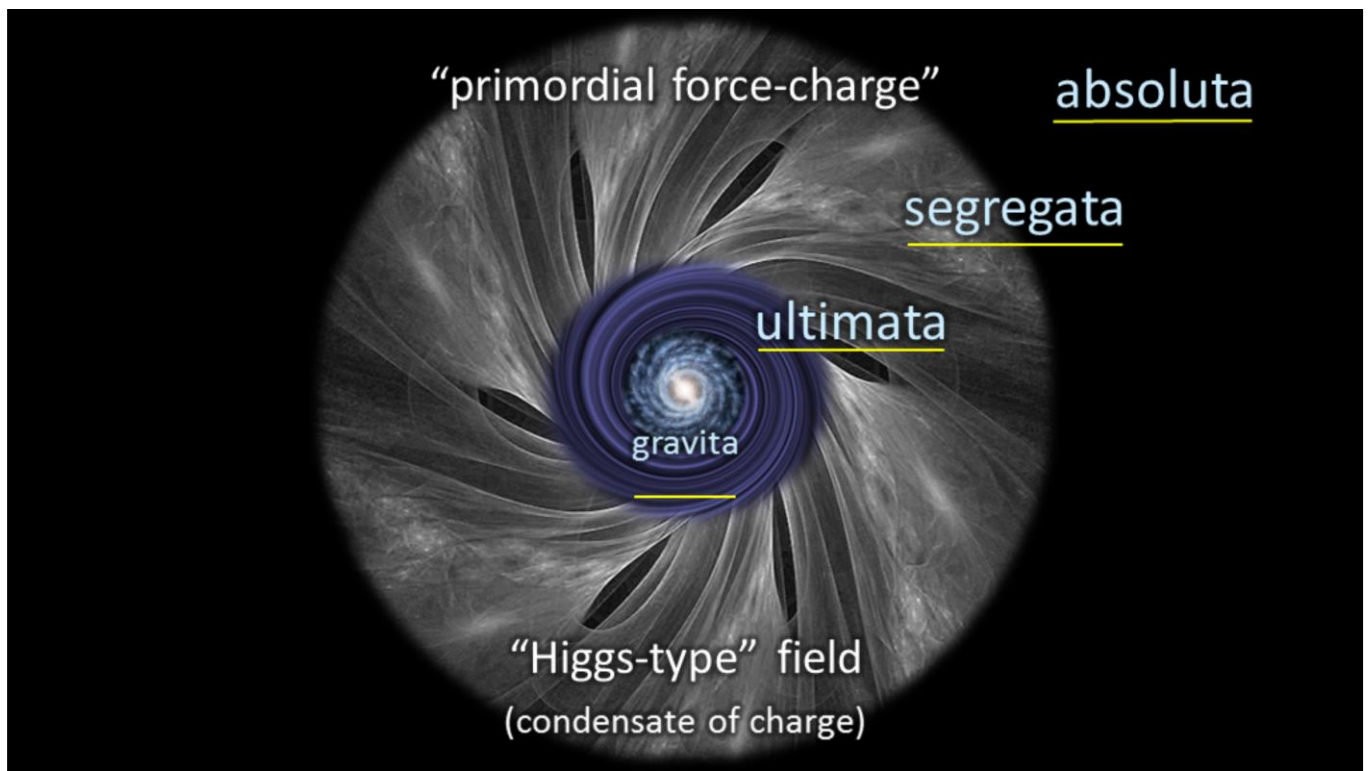
... is what the Urantia Book calls [gravita](#),
standard model stuff like atoms and photons.

But the Urantia Book adds a few things to this picture...

{ [gravita](#), [ultimata](#), [segregata](#), [absoluta](#) }

introducing “**force organizers**” who spin up vast cyclones of that **pure energy**, or [segregata](#), condensed from “space potency”, or [absoluta](#).

As the story goes, it’s within these isolated islands of segregata...



... that halos of “emergent energies” evolve, called ultimata.

from which “**power directors**” arrange gravita, that standard-model stuff from which stars and galaxies are made.

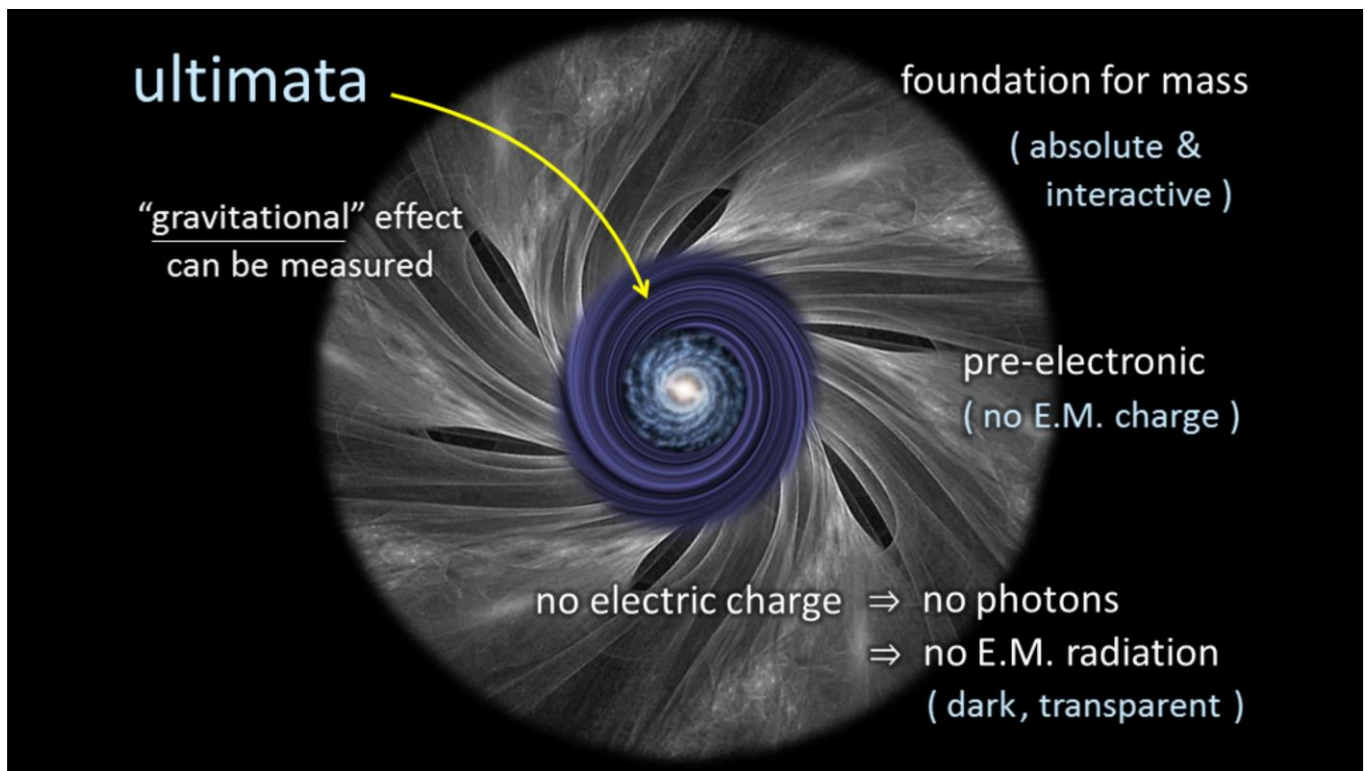
Here we see how these Urantia Book terms fit in:

- gravita is built from ultimatons (or ultimata)
- ultimatons evolve in segregata, and
- segregata is condensed from absoluta.

A couple of things to note:

First, segregata is described as a “**primordial force-charge**”, condensed from a global potential.

In modern terms, we’d call this a “**Higgs-type**” field (or condensate of charge).



And second, in the Urantia Book scheme, ultimata, and thus [ultimatons](#), are the **foundation** for [mass](#).

All mass, both the so-called **absolute** and **interactive** kinds.

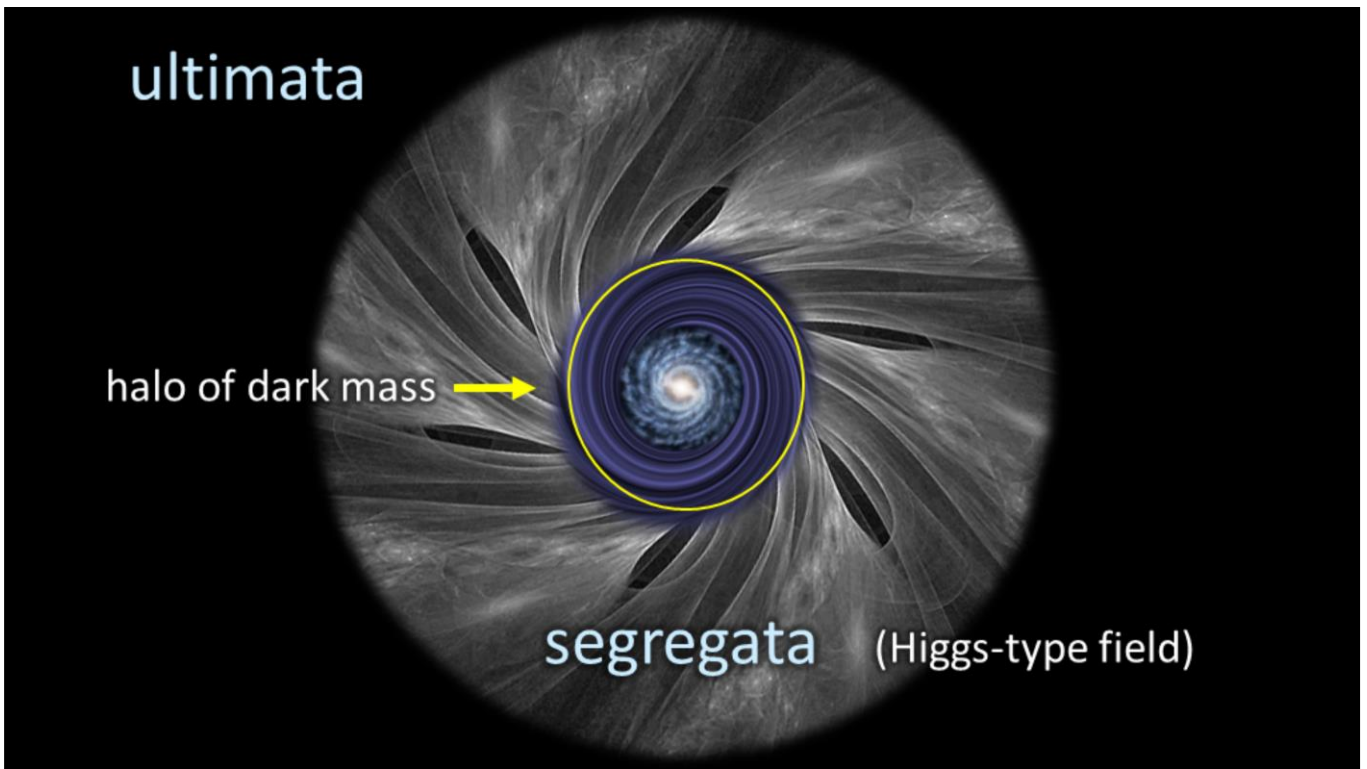
So a halo of [ultimatons](#) ... must be [massive](#).

But ultimatons are also **pre-electronic**, so this halo of ultimaton mass has no electric charge; and as we know, no electric charge means...

- **no photons**
- **no electromagnetic radiation**

So this halo of mass is [dark](#). Or rather... completely [transparent](#), and thus invisible.

But not [undetectable](#). The [gravitational](#) effect of all that mass is precisely what astronomers currently can measure, but can't explain.



What we have here is a tiny spiral of fluffy stars, embedded in a vast halo of **dark mass**. **Exactly** what our models of cosmology currently predict.

So in this simple picture we find the **two foundations** of standard model physics:

- **ultimata** serving as the **dark mass** required by cosmology, and
- **segregata**, serving as that condensate of charge (or **Higgs-type** field) that allows particle physics work.

[note: label “**ultimata**” floats down towards center during animation]

A fresh perspective on...

- foundations
- mass & matter
- dark islands
- Milky Way

Ok, that's a quick look at the unique foundations on which the Urantia Book's scientific story sits.

Let's now see what this means for **mass** and **matter**.