

Sunday July 8, 2012

First you have to imagine it

By Jim Taylor

This week, scientists announced that they believed they had confirmed the existence of the sub-atomic particle that made the universe possible.

It's called the Higgs boson, after physicist Peter Higgs, who first imagined it in 1964.

Nobel Prize-winning physicist and author Leon Lederman nicknamed it "The God Particle," because it was so crucial to theories about the creation of the universe. Given that name, I couldn't resist writing about it.

But Lederman admits that the elusive boson got that name by accident. His editor refused to let him call it "The Goddamn Particle" because it was so difficult to identify.

By now, almost everyone knows about atoms and molecules. And that atoms consist of particles called protons, electrons, and neutrons. We may have heard that those are made up of other particles with strange names like leptons and quarks, and maybe even that these aren't really particles at all but energy fields stuck together by gluons...

But to make all these bits fit together, physicists need the Higgs boson. Until this last week, they theorized that it must be there, but they couldn't prove it.

(Almost) conclusive proof

Now two research teams have independently concluded that they're 99.99 per cent sure they have proved the Higgs boson. Combining their studies, they believe they've hit the magic number for indisputable proof – 99.99995 per cent certainty, less than one chance in 1.7 million of their findings being a statistical fluke.

Which is better odds than winning the LottoMax jackpot.

The search for the Higgs boson has been the most expensive science project in history. It involved thousands of scientists, for over 40 years. Each of the two teams has spent about \$1 billion on its experiments.

Their primary tool, the Large Hadron Collider at CERN, 100 metres underground beneath the border between France and Switzerland, cost about \$10 billion to build. Its sole purpose is to accelerate protons – whatever protons are – to almost the speed of light, so that they can crash into other protons going the opposite direction and re-create a miniature replica of the Big Bang that's supposed to have created the universe.

Both teams claim blips on their monitoring systems could only be "strong indications of the production and decay of Higgs bosons," according to Gregorio Bernardi, a physicist at the University of Paris.

Esoterically impenetrable...

I do my best to understand how the Higgs mechanism works. Right after the Big Bang, all those new things that weren't really particles but energy fields were whizzing around empty space at the speed of light. Because they had no mass (not so much weight as resistance to being moved around), gravity didn't affect them. But when they passed through a Higgs field – imagine energy molasses, if you can – some bosons stuck to them. They slowed down and came out the other side with mass.

So what had effectively been nothing turned into something, which could then be affected by gravity, which started those somethings clumping together to form matter, which eventually coalesced into stars and galaxies and us.

Is that perfectly clear?

I didn't think so. The *Globe and Mail* called this whole process "theoretical physics at its most esoterically impenetrable."

But the scientific argument is basically very simple. "If the Higgs field didn't exist, particles would all be mass-less and would travel around all the time at the speed of light," says Dr. Robert Orr, a Canadian scientist involved in the Large Hadron Collider.

In other words, because things are what they are, there must be a Higgs boson.

Their argument parallels, by some irony, the argument for "intelligent design." The infinite complexity of the world could not have happened by chance, advocates claim. Because things are what they are, there must have been a designer.

Conflicting viewpoints

I'm not making light of the scientific research. These scientists believe totally in their cause. I have no doubt their research will eventually have profound applications, just as decoding DNA did.

But what astonishes me about the whole process is that scientists spend multi billions of dollars, and countless years of brainpower, pursuing an invisible entity with an infinitely short life span, whose presence can only be determined by observing its effect on other particles.

At the same time, other scientists – taking Stephen Hawking as an example – publish books debunking traditional notions of an invisible being with an infinite life span, whose presence can only be determined by observing its effect on people.

Am I the only one who sees an inconsistency here?

Indeed, a few radical thinkers suggest that the further one explores the sub-atomic world of particles and energy fields and bosons, the whole thing begins to look less like a thing and more like a thought.

Gravity was there all along. But it only became real for us after Isaac Newton imagined it. The Higgs boson needed Peter Higgs to imagine it before we could look for it. Maybe we're all only something that someone imagined.

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YOUR TURN

The point of last week's column was that even good things – like water – become harmful if taken to an extreme. Too little water kills. Too much water – whether falling into an ocean or getting swept away by a flood – can also kill. But somewhere between the extremes, there's a "just right" level. And I contended that that's a universal principle; the "good" lies somewhere between two extremes that we think of as "evil" or as "sins."

Charles Hill asked the inevitable question: Does the 'too much or too little' principle apply also to religion?" Charles also made a distinction between "religion" and "relationship with God."

Yes, I think it does. Too little (whether of formal religion or of that relationship with God) leads to moral and ethical rootlessness. Too much brings on rigid and mindless fundamentalism.

But can you have too close a relationship with God? I'll throw that question open....

Isabel Gibson brought the Goldilocks Principle down to human terms. "My husband is prone to say -- usually when I am whinging about something -- 'Nothing is all good or all bad.' And that's OK, I guess, as long as he doesn't do it too often..."

PSALM PARAPHRASES

I have started including a psalm paraphrase for the coming Sunday with my Soft Edges column, on Wednesdays. Why not on Sunday, you ask? Well, partly because psalms seem to me to fit better with the general mood of Soft Edges, which is more likely to deal directly with faith-related matters than these Sharp Edges columns. And partly because Soft Edges is about 250 words shorter than Sharp Edges, and so including the paraphrase on Wednesday won't make the e-mailing quite as long.

That does mean that if you want to receive the paraphrase, and are not on the Soft Edges mailing list, you'll need to subscribe. No charge, just send me a message, jimt@quixotic.ca. Or you can subscribe automatically by sending a blank e-mail to softedges-subscribe@quixotic.ca.

TECHNICAL STUFF

This column comes to you using the electronic facilities of Woodlakebooks.com.

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You can access several years of archived columns at <http://edges.Canadahomepage.net>.

I write a second column each Wednesday, called Soft Edges, which deals somewhat more gently with issues of life and faith. To sign up for Soft Edges, write to me directly, at the address above, or send a note to softedges-subscribe@quixotic.ca

PROMOTION STUFF...

If you know someone else who might like to receive this column regularly via e-mail, send a request to jimt@quixotic.ca. Or, if you wish, forward them a copy of this column. But please put your name on it, so they don't think I'm sending out spam.

For other sources worth pursuing, try

- David Keating's "SeemslkeGod" page, www.seemslkegod.org;
- Alan Reynold's weekly musings, punningly titled "Reynolds Rap" -- reynoldsrap@shaw.ca
- Isobel Gibson's thoughtful and well-written blog, isabel@traditionaliconoclast.com
- Wayne Irwin's "Churchweb Canada," an inexpensive service for any congregation wanting to develop a web presence, with free consultation. <http://www.churchwebcanada.ca>
- Alva Wood's satiric stories about incompetent bureaucrats and prejudiced attitudes in a small town are not particularly religious, but they are fun; write alvawood@gmail.com to get onto her mailing list.
