A Nobel Laureate Talking Nonsense: Brian Schmidt, a Case Study

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FOREWORD

Australian National University astronomer Professor Brian Schmidt is a Nobel Laureate for physics. On Monday the 15th of September 2014 he appeared on the ABC national Australian television programme Q&A. His response to a question put to him by an eleven year old boy in the audience is a typical example of why it is very unwise to passively accept the word of an Authority. Presented here are a number of the nonsensical claims made by a Nobel Laureate on matters of cosmology and mathematics; symptomatic of just how intellectually decrepit astronomy and astrophysics have become.

1. Expanding Infinity

The question put to Professor Schmidt by eleven year old Lachlan Irvin, via his father Peter, was,

"*how can something as infinitely large as the universe actually get bigger?*" [1]

Such a reasonable question requires a reasonable answer. Alas, it did not come. Schmidt began his reply with the following:

"*Ah, yes, this is always a problem: infinity getting bigger. So, if you think of the universe and when we measure the universe it, as near as we can tell, is very close to being infinite in size, that is we can only see 13.8 billion light years of it because that's how old the universe is, but we're pretty sure there's a lot more universe beyond the part we can see, which light just simply can't get to us. And our measurements are such that we actually think that very nearly that may go out, well, well, thousands of times beyond what we can see and perhaps an infinite distance*." [1]

However, an infinite universe cannot get bigger[1], bearing in mind that infinite simply means endless, and so is not even a real number. Professor Schmidt committed the very common cosmologist error that "*very close to being infinite in size*" is a scientific quantity [2]. Now I ask you, dear reader, just how close to infinite must one get to be "*very close to being infinite*"? With this in mind, how likely is it that cosmologists actually measured this nearness to infinity that Professor Schmidt has claimed? Professor Schmidt could not decide if his universe is finite, infinite, or 'near infinite' in size, so he included all three.

In any event, "*infinity getting bigger*" and "*very close to being infinite in size*" are meaningless and so have no relevance to physical science.

2. Sanity of the Questioner

Schmidt continued with,

"*So imagine you have an infinite universe, which I say is expanding. Well, that universe is actually embedded in four dimensions. It's this*

[1] I shall not consider the esoteric purely mathematical issues of Cantor's 'transfinite numbers', as they have no relevance here.

way, it's that way, it's that way and then there's time. And, so, as the universe gets bigger, essentially we are moving in this four dimensional space and we're sort of where something else was in the past but we're in the future and so we're progressing in this four dimensional space in the future. And I always say there's a problem with four dimensional space. It's very hard to visualise. And, indeed, I've never met a sane person who can visualise four dimensions and you don't want to be one of the people who can." [1]

First, contrary to Professor Schmidt's assertion, no Big Bang (expanding) universe is embedded in four dimensions because they[2] are all four-dimensional by a mathematical construction. This four-dimensional structure the cosmologists call 'spacetime', and according to them the Universe, although expanding, is not expanding into anything, and so it is not embedded in anything. Second, no cosmologist has ever measured a four-dimensional interval in their spacetime. After all, since they can't even visualise it surely they would be hard pressed to measure it. Third, the sanity of the eleven year old boy[3] who asked Professor Schmidt the question is not the issue, the notion of Schmidt's expanding infinite universe is; also bearing in mind that measurement of the alleged expansion is what Professor Schmidt got his Nobel Prize for.

3. Doubling Infinity

According to Professor Schmidt, infinity can be multiplied by 2:

"*So, ultimately, we're expanding into the future but think of it this way: in school you would have done this little experiment in math where you will put a ray starting at zero and it will go out one, two, three and off to infinity. You put a little arrow, it goes off forever. So I can multiply that by two. So zero stays at zero, one goes to two, two goes to four, four goes to eight and you can do that for any number you want all the way up to infinity. And that's sort of what the universe is doing. Infinity is just getting bigger and we're allowed to do that in mathematics. That's what's so cool about math.*" [1]

Consider the two infinite sequences of integers that Professor Schmidt referred to (where the three dots mean, 'goes on in like manner without end'),

0, 1, 2, 3, 4, …
0, 2, 4, 6, 8, …

First, all he has done here is put the non-negative even integers (the lower sequence) into what is called a 'one-to-one correspondence' with the non-negative integers (the upper sequence). This does not make infinity get bigger. Both sequences are infinite (i.e. they are endless). For every number in the upper sequence there is one and only one corresponding number in the lower sequence. Second, since infinity is not a real number, contrary to Professor Schmidt's claim, it can't even be multiplied by 2 because, ultimately, numbers on the real number line can only be multiplied by numbers. Infinity is often denoted by the symbol ∞. This is not a real number and so it cannot be used for the usual arithmetic or algebra. Substituting the symbol ∞ for the word 'endless' or the word 'infinity' or the word 'limitless' does not make ∞ a real number. Consequently, 2 x ∞ does not mean that infinity is doubled; it is a meaningless concatenation of symbols,

[2] There are three different Big Bang universes alleged by cosmologists; one finite in size, the other two infinite. They differ by their spacetime curvatures.
[3] His question is a rational one.

and therefore not mathematics. In like fashion, multiply Professor Schmidt's first sequence by ½. The resulting sequence is,

0, ½, 1, 3/2, 2, …

Does this mean that infinity has been halved? Is not this sequence also infinite? Halving infinity is just as nonsensical as doubling it.

4. Unemployment

Professor Schmidt closed his response with the following:

"*Well, it means that the galaxies that we see are getting - are moving away from us faster and faster such that eventually they will be moving so fast away from us that the light they emit will no longer be able to reach us. So we will be in the future looking out into a universe which is literally void of galaxies. Our own galaxy, it turns out, is not expanding because we have a lot of gravity here and it quit expanding 13.5 billion years ago but the rest of the universe will be accelerated out-of-sight and so I will be unemployed in the future because there will be nothing for me to look at.*"

The expansion is apparently spacetime selective; it is the spacetime between the galaxies that is expanding, not that within the galaxies, owing to gravity. However, gravity is not a force in Einstein's General Theory of Relativity, because it is spacetime curvature. Can you, dear reader, visualise four-dimensional spacetime curvature somehow holding galaxies together in the absence of any gravitational forces whilst the rest of the (infinite) Universe expands, without losing your sanity? No cosmologist has ever measured their four-dimensional spacetime curvature anywhere. And so did Professor Schmidt and his team of cosmologists really measure expansion of the Universe? But, of course, we have their word for it, don't we?

5. The Lesson Learned

Science is not done by celebrity. An Authority having a Nobel Prize is no guarantee that his or her utterances even make sense, let alone count as science or mathematics. Passively accepting the word of celebrity Authorities, Nobel Laureates or grape growers, will not protect you from unemployment, even if those Authorities and Laureates are gainfully employed by the very same word.

REFERENCES

[1] Q&A, ABC television, 15 September 2014, (the section 'Expanding Universe') http://www.abc.net.au/tv/qanda/txt/s4069393.htm

[2] Crothers, S. J., A Few Things You Need to Know to Tell if a Nobel Laureate is Talking Nonsense, 10 July 2015, http://vixra.org/pdf/1507.0067v2.pdf