

Ask A Genius 46 - Informational Cosmology 22

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Scott: In standard Big Bang cosmology, the issue is early universe galactic formation including the black holes, which become massive – 10% of their galaxy in mass relative to the stellar masses in all of the stars in their respective galaxy. In IC, the issue is new ideas like ultra-deep cosmic time, proton-rich and neutron-rich galaxies, and the persistence of galaxies over ultra-deep cosmic time, and the persistence representative of information processing over similar time scales. There's a cycling of galaxies and in information processing. How do these galaxies stay lit?

Rick: One solution is that galaxy could stay lit if a black hole is constantly vomiting energy or information into the galaxy. If a galaxy is a big 'ol information processor and stars are little sub-processors, then maybe the central black hole is spitting out an information feed in the form of matter, which is agglomerated by or absorbed by the rest of the galaxy and processed via how stars shine, via fusion.

That turns out to be a hard argument to defend because if you end up with a central black hole spitting up information for a hundred million years. You'd have to also figure out. You've got a lit galaxy, but there aren't some galaxies a million times bigger than some galaxies. You might have a few, but not commo.

The ratio of the smallest galaxy to the biggest galaxy is probably not more than 2 orders of magnitude, say 100 times bigger than the smallest galaxy. If the central black holes are spitting out energy, there has to be a way for a whole unused chunk to not be part of the galaxy.

Maybe, it would fall into the black hole. It doesn't seem that unreasonable to me. You've got an information feed across tens of millions of years. Under IC, a thought, a complete wave of information processing, takes roughly as long as the apparent age of the universe.

The universe changes its mind on the scale of ten billion years or so, as a clock time. So, it doesn't seem unreasonable – unless you think the whole thing is ridiculous – that a vomity black hole will spit up stuff for tens of millions of years and old black junk will fall into the black hole at some roughly equivalent rate.

You could view, don't know if this is geometrically right, a galaxy as a kind of a rotating donut, say. This isn't right geometrically, but it is okay in terms of picturing something.

Imagine if you're grabbing and rolling the sides of a donut – the you unroll a sock or unroll a condom, so that as you rotate it out of the center (you're rotating the ring) and you've got ring stuff coming out of the donut and falling back into the center on the bottom.

You've got a shower of matter falling out of the black hole and burnt out matter falling into the other side.

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