Anthropic Quantum Theorems

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In this paper I introduce the concept of Anthropic Quantum Theorems, which are coherent mathematical objects due to the canceling of complex amplitudes of wavefunctions, which means that such theorems' truth value depends on the self-consistent ability of eliminating "opponent" theorems.

In anthropic logic, one reasons about properties in terms of their probability of being produced by some background theory of the world. For example, if you give 100 people a red hat and 1 person a blue hat, then it is likely that most of these people will see themselves wearing a red hat when looking in the mirror. By reversing this logic, one can infer that most people are more likely to wear a red hat from a single observation that "I am wearing a red hat".

In the Everett interpretation of quantum mechanics, complex amplitudes that produce inconsistent scientific observations cancel each other out over time, leading to consistent scientific observations.

What does it mean to extend the principle of eliminating inconsistent observations, by canceling complex amplitudes of wavefunctions, to anthropic theorems that observe their own consistency?

I argue that such theorems' truth value depend on the self-consistent ability of eliminating "opponent" theorems, in a way that increases the probability of the theorem's truth value observed to be likely.

Assume that for some anthropic theorem, which meaning is a statement of anthropic logic, that the probability that the statement is true is `P`.

If there are many competing theorems, then the overall probability of `P` being high, gets lower, since all the competing theorems must share the probabilities adding up to one.

However, by exploiting Everett interpretation of quantum mechanics, such theorems can increase their own likelihood of being true by making competing theorems cancel out their complex amplitudes. With other words, the statement in anthropic logic is of a kind that it includes a reference to quantum mechanics, formulated in a way that, if there exists some theorem contradicting it, then that particular theorem will be eliminated by opposite contributions in the wavefunction from other contradicting theorems.

One can imagine this as a person living in a universe where you are more likely to exist if your history can prove who you are in a consistent way. This sounds a bit like the anthropic principle, but it is actually the opposite: Instead of requiring the history to be consistent with your existence, one requires existence to be more likely from a consistent history. It is the other way around.

"I exist" → "My history must explain who I am"	the anthropic principe
"My history explains who I am" → "I must exist"	anthropic quantum theorem

Every other mathematical object that contradicts the existence of an anthropic quantum theorem cancels out with other contradicting mathematical objects, by exploiting the fact that the possibility that they could exist makes them less likely to exist overall. The theorem eliminates other theorems.