

MY WEIRD PROMPTS

Podcast Transcript

EPISODE #175

Beyond the Hype: The Real State of Quantum Computing

Published January 05, 2026 • Runtime: 18:42

<https://myweirdprompts.com/episode/quantum-computing-reality-check/>

EPISODE SYNOPSIS

Is the quantum revolution finally here, or are we still decades away? In this episode of My Weird Prompts, Herman and Corn break down the shift from noisy experimental hardware to the era of stable logical qubits and error correction. They explore why you won't have a quantum computer in your pocket, the rise of "Quantum as a Service," and how this technology is quietly revolutionizing everything from battery chemistry to global security. Whether it is simulating complex molecules or securing the world's data, the "invisible backbone" of the next industrial revolution is being built right now in the freezing depths of dilution refrigerators.

DANIEL'S PROMPT

Daniel

What's the current state of quantum computing, and beyond the hype, what is its realistic trajectory? Specifically, will it ever become widely available to the public, or is it destined to remain a specialized tool for high-computation tasks, much like today's supercomputers?

TRANSCRIPT

Corn

Hey everyone, welcome back to My Weird Prompts. It is January fifth, two thousand twenty-six, and we are kicking off the new year with a deep dive into something that feels like it has been ten years away for the last thirty years. I am Corn, and joining me as always is my brother, the man who probably has a chalkboard full of complex equations in his room that he does not let me see.

Herman

Herman Poppleberry, at your service. And for the record, Corn, those equations are perfectly safe, though I cannot promise they would make sense to anyone else. It is great to be back. We had a fascinating prompt sent in by our housemate Daniel this week. He was asking about the actual state of quantum computing. Not the headlines, not the science fiction version, but the reality as we sit here in early two thousand twenty-six.

Corn

Yeah, Daniel really hit on something that I think a lot of people are feeling. There is this sense of quantum fatigue, right? We have been hearing about quantum supremacy and these massive breakthroughs for years, but most of us are still using classical silicon chips for everything. Daniel specifically wanted to know if this is going to be a tool for the masses eventually, or if it is destined to stay in the realm of high-end research, much like the supercomputers we discussed in episode two hundred seventy-five.

Herman

It is a brilliant question because it forces us to look past the marketing. If you look at the landscape right now, in January of twenty-six, we are in a very different place than we were even two years ago. We have moved out of what researchers called the NISQ era, which stands for Noisy Intermediate-Scale Quantum. Back then, we had qubits, the basic units of quantum information, but they were incredibly fragile. They would lose their quantum state, a process called decoherence, if you so much as looked at them funny.

Corn

Right, I remember you explaining that before. It was like trying to balance a spinning plate on a needle while someone is shaking the table. But lately, the conversation has shifted toward logical qubits and error correction. Is that where the real progress is happening?

Herman

Exactly. That is the big shift of twenty-five and twenty-six. We stopped racing just for the highest number of physical qubits and started focusing on how many of those we could group together to create one stable, logical qubit. Last year, we saw some incredible papers showing that we could finally suppress errors by adding more qubits, which was a huge theoretical hurdle. It means we are finally building the foundations of a reliable machine, not just a proof of concept.

Corn

So, to Daniel's point about the trajectory, where does that actually put us on the timeline? If we have stable logical qubits now, does that mean I am going to be buying a Quantum MacBook in two thousand thirty?

Herman

That is the million-dollar question. To understand why that might not happen, we have to talk about the environment these machines need. Most of the leading quantum architectures, like the ones using superconducting loops, require temperatures colder than outer space. We are talking about millikelvins, just a fraction of a degree above absolute zero. You need massive dilution refrigerators to keep them stable.

Corn

I mean, I have seen photos of those. They look like giant gold chandeliers or steampunk engines. I am assuming those are not going to fit in a backpack anytime soon.

Herman

Precisely. Unless there is a massive breakthrough in room-temperature superconductors, and we have seen plenty of false starts there recently, the physical requirements for quantum computing are just too demanding for a consumer device. You need a vacuum, you need extreme cooling, and you need shielding from electromagnetic interference. Even the Earth's magnetic field can mess with these things. So, the idea of a personal quantum computer is likely a non-starter for the foreseeable future.

Corn

That makes sense. But just because I do not have the hardware in my house doesn't mean I won't use it, right? We already live in a world where most of our heavy lifting is done in the cloud. My phone is basically just a very fancy window into a data center somewhere in Virginia or Oregon. Is that the realistic path for quantum? Quantum as a Service?

Herman

That is exactly where it is headed. In fact, it is already happening. If you look at what the major cloud providers are doing this year, they are integrating quantum processing units, or QPUs, directly into their existing high-performance computing clusters. It is not about replacing your CPU or your GPU. It is about having a specialized tool for specific problems.

Corn

I like that analogy. It is like how we use GPUs for graphics and AI training because they are better at parallel tasks, while the CPU handles the general logic. So a QPU would just be another co-processor in the rack?

Herman

Exactly. You would write a program, and the compiler would look at the code and say, okay, this part is a standard database query, so we will run that on a traditional server. But this other part, this complex optimization problem or this molecular simulation, that is going to be sent to the quantum processor down the hall.

Corn

That feels much more grounded than the hype we usually hear. But it also raises the question of what those problems actually are. If it is just for high-end research, does it really affect the average person? Before we get into the practical applications and what this means for things like security and medicine, let's take a quick break for our sponsors. Larry: Are you tired of your neighbors having better lawn ornaments than you? Do you feel like your front yard lacks that certain something that says, I am definitely a person of mystery? Introducing the Larry-Grade Invisibility Sphere. It is a three-foot diameter orb of pure, unadulterated chrome-plated mystery. Does it actually make things invisible? Well, if you stand directly behind it, people can't see you! It is physics, folks. It is heavy, it is shiny, and it will probably confuse the local birds. Perfect for gardens, patios, or as a very aggressive paperweight. Get yours today before the government realizes we are selling them. Larry: BUY NOW!

Corn

Alright, thanks Larry. I am not even going to ask how that thing is supposed to work. Anyway, back to the world of actual physics. Herman, we were talking about the trajectory of quantum computing and the idea that it will mostly live in the cloud. Let's talk about the use cases. Why should Daniel or any of our listeners care if they can't personally own one?

Herman

Well, think about the things that are currently impossible for even our best supercomputers. We talked about supercomputing in episode two hundred seventy-five, and while those machines are incredible at simulating weather or fluid dynamics, they struggle with things like molecular chemistry. If you want to simulate a relatively simple caffeine molecule down to the quantum level, a classical computer needs an astronomical amount of memory. A quantum computer, because it operates on the same principles as the molecules themselves, can do it naturally.

Corn

So we are talking about a total revolution in material science and drug discovery. Instead of the current method, which is often a bit like trial and error on a massive scale, we could actually design molecules with specific properties from the ground up?

Herman

Exactly. We are looking at things like more efficient catalysts for fertilizer production, which currently consumes about two percent of all global energy. We are looking at new battery chemistries that could triple the range of electric vehicles. These are second-order effects. You won't have a quantum computer in your car, but your car's battery will exist because a quantum computer designed it.

Corn

That is a great way to frame it. It is the invisible backbone of the next industrial revolution. But there is also a darker side to this that people always bring up, and that is encryption. I have seen headlines saying that quantum computers will break the internet. Is that a two thousand twenty-six problem, or is that still further out?

Herman

It is a transition problem that we are dealing with right now. There is an algorithm called Shor's algorithm that proves a sufficiently large quantum computer could crack the RSA encryption we use for almost everything online. However, and this is a big however, we don't have a machine nearly large enough or stable enough to do that yet. To crack a two thousand forty-eight bit RSA key, you would need millions of physical qubits, and as we discussed, we are currently working with much smaller numbers of high-quality logical qubits.

Corn

So the boogeyman isn't at the door yet?

Herman

Not yet, but the world isn't waiting. That is why we have seen the massive push for Post-Quantum Cryptography, or PQC. The National Institute of Standards and Technology has already finalized the new standards, and most major tech companies and governments are in the process of migrating their data to these quantum-resistant algorithms as we speak.

Corn

It is like Y2K all over again, but with higher stakes and a longer lead time.

Herman

Precisely. And that actually brings up another interesting trajectory point. One of the biggest areas of growth we are seeing in early twenty-six is quantum sensing and quantum communication. These are technologies that use quantum properties but don't necessarily require a full-scale universal quantum computer.

Corn

Quantum sensing? Like, measuring things with extreme precision?

Herman

Yes. We are talking about gravity sensors that can see through walls or deep underground, which is huge for mining and archaeology. Or incredibly precise clocks that don't rely on GPS satellites. If someone jams the GPS signal, a ship with a quantum clock could still navigate perfectly because it doesn't drift.

Corn

That is fascinating. It is like we are developing all these side-technologies while we wait for the main event of the universal quantum computer. It reminds me of the space race. We didn't just get to the moon; we got tang and velcro and better satellite communications along the way.

Herman

That is a perfect analogy. The pursuit of the quantum computer is forcing us to master the most minute details of the physical world. Even if we never build a machine that can simulate the entire universe, the tools we are building to try and do it are already changing how we measure and interact with reality.

Corn

So, to circle back to Daniel's question, the realistic trajectory isn't a world where everyone has a quantum laptop. It is a world where quantum is an integrated, specialized layer of our global infrastructure. It is something that happens in the background to make our medicines better, our batteries last longer, and our logistics more efficient.

Herman

Right. And I think we need to address the "hype" part of Daniel's prompt too. There was a period, maybe four or five years ago, where every startup was claiming they would have a functional quantum computer by next Tuesday. That has cooled off significantly. The companies that are still standing in twenty-six are the ones with real hardware and serious research teams. The "quantum winter" that some people predicted didn't really happen, but we did have a much-needed reality check.

Corn

I think that is healthy for any technology. We saw it with AI a few years ago too. Everyone realizes it is hard, the easy wins are gone, and now the real work begins. Speaking of AI, how does this connect back to what we discussed in episode two hundred thirty-four about Quantum AI? Is that still a major focus?

Herman

Oh, absolutely. In fact, some of the most promising near-term applications are in accelerating specific parts of machine learning. There are certain types of neural network architectures that might be much more efficient on a quantum system. We are seeing early experiments where quantum-classical hybrids are outperforming pure classical systems on very specific optimization tasks. It is not a broad-spectrum speedup yet, but the signal is there.

Corn

It is amazing how all these threads are starting to weave together. Supercomputing, AI, quantum. It feels like we are building this massive technological stack where each piece supports the others.

Herman

It really does. And I think for the average listener, the takeaway should be that quantum computing isn't a "replacement" for what we have. It is an "expansion." We aren't going to stop using silicon chips for the same reason we didn't stop using hammers when we invented the nail gun. They are different tools for different jobs.

Corn

That is a very Herman Poppleberry way of putting it. Simple, effective, and slightly nerdy. I love it. So, what should people be looking for in the next couple of years? If we are sitting here in January of twenty-six, what are the milestones to watch for in twenty-seven and beyond?

Herman

Watch for the first commercially useful "quantum advantage" in a specific industry. Not a laboratory experiment, but a company saying, "We saved ten million dollars in logistics costs because we used a quantum optimizer," or "We found this new drug candidate six months faster." Once we see the first clear, bottom-line ROI from a quantum process, the floodgates will open for investment in those specific cloud-based tools.

Corn

And I suppose we should also keep an eye on the networking side? I have heard people talking about a "quantum internet" where we can send entangled particles between cities.

Herman

That is definitely on the horizon. We have already seen successful tests of quantum key distribution over fiber optic cables between cities like New York and Washington D.C. The goal there isn't to send cat videos, but to send perfectly secure encryption keys that can't be intercepted without being noticed. It is about building a layer of unhackable communication for the most sensitive data.

Corn

Well, I for one am glad that my cat videos will remain on the classical internet where they belong. They don't need to be entangled.

Herman

Unless they are in a state of being both hungry and full at the same time, which I think my cat manages every morning.

Corn

Spoken like a true scientist. This has been a really enlightening look at where we actually stand. I feel like I have a much better handle on why I am not getting a quantum phone, but also why the work happening in those giant gold refrigerators actually matters to my life.

Herman

I am glad we could dig into it. It is easy to get lost in the jargon, but at its heart, it is just about learning to speak the language of the universe at its smallest level. And once we can do that, we can ask the universe to do some pretty amazing things for us.

Corn

Before we wrap up, I want to remind everyone that if you are enjoying these deep dives, please leave us a review on your podcast app or on Spotify. It genuinely helps other curious people find the show, and we love reading your feedback.

Herman

It really does make a difference. And thanks again to Daniel for sending in such a thoughtful prompt. It is always fun to step back and look at the big picture of where all this tech is going.

Corn

Definitely. You can find all our past episodes, including the ones we referenced today, at our website, myweirdprompts.com. We have an RSS feed there for subscribers and a contact form if you want to send us your own weird prompts. We are also on Spotify, so make sure to follow us there for the latest updates.

Herman

This has been My Weird Prompts. We will be back next week to tumble down another rabbit hole.

Corn

Until then, stay curious.

Herman

And keep asking those weird questions.

Corn

Bye everyone!

Herman

See ya!