Why Quantum Computing May Depend on the Moon

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SUMMARY

Interloon, a startup co-founded by Rob Meyerson, is addressing a critical shortage of helium-3, essential for cooling quantum computers, by developing a method to separate it from commercial-grade helium on Earth. Their long-term vision includes harvesting helium-3 from the moon, where it is abundant, and they aim to produce both on Earth and lunar sources to meet growing demand.

- *Interloon has created a technique called "cold capture" to separate helium-3 from commercial-grade helium.*
- *Helium-3 is crucial for cooling superconducting quantum computing chips, but its availability on Earth is declining due to reduced tritium production.*
- *The moon is identified as a future source of helium-3, with over a million metric tons available in lunar regolith.*
- *Interloon plans to produce 10 kilograms of helium-3 on the moon by the early 2030s while aiming for 2.5 kilograms annually from Earth.*
- *The company has secured nearly $500 million in purchase orders for helium-3, with contracts extending up to ten years.*
- *They are exploring partnerships with launch providers like SpaceX and Blue Origin to facilitate lunar operations.*
- *Interloon's technology could also support NASA's goals for lunar infrastructure development, contributing to a sustainable lunar economy.*

This startup is tackling a bottleneck facing quantum computing after president Trump made the technology a strategic national priority. Interloon says it's discovered a new way to harvest helium three, essential to cool the computers and to scale the industry. Joining us now is Interloon CEO and cofounder Rob Meyerson. I have to say when this idea hit my inbox, I was intrigued. Interloon's goal is to harvest helium three in industrial quantities from the moon. But in the here and now, there just isn't enough helium three for the quantum computing industry on Earth to scale. So you seem to have found a stop gap. What have you done?

Well, that well, that's right, Ed, and thanks for having me. We've we've devised a a technique. Our team has gone back to first principles, cracked the cracked the textbooks, and invented a way to separate helium three using cryogenic distillation from grade a helium here on Earth. This is an idea that's been around for a while but never pursued commercially. And as far as we know, we're the first to demonstrate the ability to separate helium three from commercial grade a helium.

The Bloomberg audience is familiar with the use of helium and cooling and stabilization in the chip industry, for

example. And so with the war in Iran and the Strait Of Hormuz, bottleneck, we came to understand that that there was a shortage there. How real is this for you now, Rob? What's your solution looking like on a timeline basis? Well, so the the the shortage we're talking about is helium three, which is an isotope of helium that's extremely rare on earth. It comes from the decay of tritium, and it's used to chill down superconducting quantum computing chips down to millikelvin temperatures. We've, for decades, secured our helium three from tritium decay in The US and overseas, including Canada, But there's not much tritium made anymore, and tritium has a twelve point three year half life. So it decays to helium three, and we're just not producing helium three anymore. And so Interloon has identified the moon as a a target market in the future. The the sun produces helium three in large quantities. There's over a million metric tons of of helium three on the moon and its lunar regolith. And in in developing that that plan to go to the moon and and extract helium three, we devised this this technology we call cold capture to devise helium to to separate helium three here on Earth.

So it's the same technique. We are yes. You heard right, Bloomberg's tech audience. We're talking about harvesting helium three from the moon. That's the ultimate goal. Right, Rob? But I guess from an economics perspective, you know, that technique, it has a higher yield on the moon. Like, can I get us to the point where this is real? Yeah. It absolutely will have a higher yield on the moon. We plan with our go to market in the early twenty thirties to produce 10 kilograms of helium three on the moon here on Earth by deploying cold capture to grade a helium plants on Earth, we expect to produce about two and a half kilograms of helium three annually. And we have customers that have already signed up to buy helium three from us over well, just under $500,000,000 in purchase orders, binding contracts that extend from 2028 out to seven to ten years in the future. So we had to find a way to service those customers earlier. And by applying this technology that we've developed for the moon to this Earth application, we're able to do that.

Rob, just very quickly, have you a pathway or a plan in place to get your technology to the moon's surface? Who is the launch provider? Who's gonna help you do that operationally? Well well, we have a little bit of time to decide on that end, Ed, but we we are looking to the Artemis program and launch companies like SpaceX and Blue Origin, but other companies that are building landers like Firefly, Intuitive Machines, and others. We we we plan to invest alongside the Artemis program, the NASA program to go back to the moon and then on to Mars, and we will use that infrastructure that they developed. Now, of course, Ed, the infrastructure we need to harvest large volumes of of helium three from regolith is infrastructure that also can help NASA build a moon base, build roads, and build do construction on the moon that will support Right. Large scale and long long term lunar economy.