

Mathematician

Jason Liu is a senior at the Davidson Academy at the University of Nevada, Reno. The 17-year-old's work in mathematics earned him a finalist position at this year's Regeneron Science Talent Search, a national high school competition rewarding original scientific research. He and the other finalists will fly to Washington D.C. on March 5 for the next round of judging.

So, what was your project?

So, my project was in math. It basically takes these things called integer-valued polynomials, which are just polynomials that send integer inputs to integer outputs. It takes these integer-valued polynomials and works on characterizing a generalization of those. So, it's based off of a paper by two other guys that generalizes these integer-valued polynomials to a q -deformed version, which means that, instead of plugging in integers, you plug in these q -integers that are polynomials in q . And in a sense, what I'm doing is I'm characterizing all q -integer valued polynomials that send positive q -integers to polynomials in q , and negative q -integers to polynomials in q -inverse.

OK. I think I'm following. I was never much of a math guy myself. But what's the practical application for this?

So, as far as direct applications, I'm not quite sure. The only other paper I've



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found on q -integer valued polynomials is that paper by the other two guys. But, in their paper, they do mention that the set of all q -integer valued polynomials—that is, in some sense, equivalent to a quantum group, a specific quantum group. And these quantum groups are very important for quantum mechanics. So, it's possible that, with the help of my characterization for specific types of q -integer valued polynomials, researchers in quantum mechanics might be able to benefit from that and better understand quantum mechanics.

So, your work is essentially broadening the material that quantum mechanics is built on?

Yes.

Gotcha. What's happening next at the contest?

So, at the moment, because I made the top 40, I get around \$25,000 from Regeneron, and I believe 11th place through 40th place, that's all they get—other than meeting all the wonderful people at the camp. But for the top 10 places, there's larger money prizes. I think for first place it's a quarter million. And I think this the last round of judging.

Wow. So, you've already won \$25,000 for this?

Yes, conditional on me actually going to the camp.

That's awesome. Are you the only one representing Northern Nevada in this competition?

I think I'm the only one representing Nevada in general, yeah.

Well, congratulations, Jason. Do you have a main goal that you're working towards right now for your future?

As far as college goes, I was accepted early into MIT, so I think I'll be going there if nothing goes wrong. As far as line of work, I'm not 100 percent sure what I want to do after I graduate. I think I'll probably still work on this project a bit more, but I don't know if I'll be doing that long term after I graduate. So, basically, no set plans. □

NOTES FROM THE NEON BABYLON

BY BRUCE VAN DYKE

Burning Bernie questions

The journalist S. E. Cupp saw Trump's tweet after Joe Biden's big win in South Carolina, a tweet that read "Congratulations to Sleepy Joe Biden!" This snarky little blast was enough to inspire this response from Cupp: "Who would enjoy a grown-up, not a 5-year-old, in the White House?"

This isn't just a fair question, but also a pretty decent summation of the 2020 campaign, as well as a nifty bumper sticker. Not bad at all.

Hey President Capone, way to eliminate the Virus Response Team established by Obama during the Ebola year of 2014. Way to dismantle it because it was an intelligent and effective creation, but, since it was created by Obama, it—of course—had all those nasty Obama cooties and, of course, had to therefore be destroyed. Very clairvoyant of you, president with skull of cement. Nice work.

So Bernie is 78. As is Bloomberg. Biden will be 78 later this year. For gawd's sake, we've got the 78-year old honky B team! 3B78 in 2020.

Here is a very easy pledge to take this year, or at least it seems easy to me. That no matter who the Democratic nominee is, I will support him/her totally. No problem. Right?

I'm just a little concerned, though, that an ornery chunk of Bernie voters won't take that pledge. Bernheads, I appreciate the passion. I appreciate the commitment. It's a good thing. It's a *great* thing. But dagnab it, there are gonna be times when you gotta take one for the team. That might happen to you this year. It just might. You gotta do better in this arena than you did in 2016. Cool?

I'm a stone cold hippie socialist boomer geezer from California.

Just slightly to the left of Jane Fonda. I dig Bernie. Big time. *And that's exactly what scares the poop out of me.* Because I know that if a guy like me really likes a candidate, he/she probably has *no chance* in Oshkosh or Kalama-zoo or Scranton or Tallahassee, places that (1) will be incredibly important in this election, and (2) don't care much for tie-dyed hoodies. There's only one thing that must be done this year. Just one. It's do or die time, mofos. For real.

So Berners, good luck and give 'em hell. I pledge right now that if you come out of the Convention with the nomination, I will bust my ass to make sure Bernie becomes the next president. You're god-damned right.

The question—will you folks suck it up and do the same if Bernie falls short? □



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