ABQJournal Online » Seventh-Grader Wins News Mexico Supercomputing Challenge

Cole Kendrick would have had a long wait to track the rotation of an entire galaxy, so he used Python code to write a computer program that condensed 1 billion years into about 15 days.

But that was also too long to wait, so he learned the faster C code language, and turned 1 billion years into 20 hours.

Kendrick is 13, a seventh-grader at Los Alamos Middle School, and on Tuesday he took first place at the 21st New Mexico Supercomputing Challenge, hosted by Los Alamos National Laboratory. The annual contest pits hundreds of elementary- through high-school students against each other in a kind of science fair intended to teach them how to use computers to analyze, model and solve real-world problems.

Kendrick won $1,000 for his project, titled “Computer Simulation of Dark Matter Effects on Galaxy Rotation.” He also won the $100 Crowd Favorite award. He said he might spend the money on a new graphics card “for faster results.” Twenty hours is a long time to wait for one billion years to go by, after all.

A soccer, basketball and viola player as well as a computer whiz, Kendrick said he took an interest in his subject because he and his father, Brian, a theoretical physicist at the lab, enjoy astronomy. He also wanted to study dark matter, he said, because he didn’t know what it was.

He called dark matter “an invisible mass” and the “core of a black hole.” (Wikipedia calls it “matter that is inferred to exist from gravitational effects on visible matter and background radiation, but is undetectable by emitted or scattered electromagnetic radiation.”) Kendrick wrote a program that models a galaxy with its rotation, and then added the mysterious dark matter mass, which made stars rotate faster. The result, he said, matched experimental data scientists have measured previously.

“When you’re trying to simulate a galaxy, there’s a vast number of stars,” said Drew Einhorn, one of the competition’s judges. “It takes a lot of computation to do the work he did. … In the traditional explanation of how a galaxy works, what’s predicted and observed don’t match. Adding dark matter that’s invisible make them match.”

Kendrick said his project was meant to help people understand “what’s really going on in the universe,” which Einhorn echoed.

“This is an area without a lot of real practical applications,” Einhorn said, “but it’s fundamental in understanding how the universe works.”

The project took about a year, Kendrick said.

While the supercomputing challenge is a team competition, he decided to ride solo because “it would have been hard to split the project and get organized as a team.”

David Kratzer, the challenge’s coordinator and a staff member at LANL who works on supercomputing, said single-person teams have won before.

“Most of the time, multiple member teams do better,” he said. “The challenge is a lot of work. We compare it to a marathon.”

Second prize went to Los Alamos High School students Peter Ahrens, Dustin Tauxe and Stephanie Djidjev, whose project “BrilliAnts” developed algorithms based on ant foraging behavior to

determine which ant optimizations work best.

Third place was a tie between a team from Eldorado and La Cueva high schools in Albuquerque and another from Desert Academy in Santa Fe.