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‘Itasca’ to boost U computer power

The University’s new supercomputer will open the door for groundbreaking research.

By [Jerimiah Oetting](#) [3] December 08, 2009 (3 years ago)

Deep in the underbelly of the University of Minnesota’s Walter Library, Dr. Birali Runesha is at home among the long rows of humming computers and blinking lights. The Minnesota Supercomputing Institute, where Runesha serves as director of scientific computing and applications, is also home to one of the University’s newest assets — more than 8,000 cores of additional computing power, codenamed “Itasca,” set to open to researchers soon.



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“Having a system like [Itasca] available to the researchers gives us an edge to the competition,” Runesha said.

Itasca’s computing power was ranked 67th of 500 on a recently published list of the world’s top supercomputers. The machine is owned by the University; most U.S. supercomputers are federally funded.

“Our resources are in the top three,” Runesha said. “We might be No. 1.”

With more than 400 principal investigators and 4,000 users, Runesha said having Itasca in addition to Calhoun, the older system, will be crucial to many researchers at the University.

With many University researchers anxiously waiting for Itasca’s computing power, the pressing question seems to be when it will open.

“Well, we’re pushing for it to be soon,” Runesha said with a hesitant laugh. “I guess that’s the best answer.”

One of these researchers is Dr. Graham Candler, whose area of expertise includes the study of “hypersonic aerodynamic problems related to re-entry.”

“I predict how a space shuttle flies when it gets back in the atmosphere,” he explained. “It basically involves solving huge, nonlinear systems of equations.”

Currently, he is working on a project for NASA involving a new Mars rover. According to Candler, the rover is the largest ever sent to Mars and is “about the size of a Mini Cooper.” The large size poses many problems for re-entry.

By mapping a grid of data points around an object similar to a parachute and putting it under conditions like those experienced at re-entry, he is able to understand the physics of

what is happening at each data point.

With more computing power, Candler said he can increase the number of data points and understand more of the physics.

“When we have Itasca, it’s going to completely open what we can do,” he said.

Candler explained that this will allow researchers to do more work and will bring in more projects from outside agencies like NASA.

Theoretical astrophysicist Tom Jones uses MSI to simulate complex processes occurring in the universe, like the formation of large structures and the physics around black holes.

Jones said he is currently waiting for Itasca to become available so he can study the dynamics of the generation of magnetism in the universe.

“It will be the largest calculation of its kind that’s ever been done,” he said.

According to Jones, magnetism plays a subtle but crucial role in many processes throughout the universe.

Using Itasca, Jones is going to set up a simulation that helps him and his colleagues explore that question.

“We’re very fortunate at the University to have resources to do that sort of thing,” he said.

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