

# Guy Ron Nabs 2008 JSA Thesis Prize



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Ron's, The Proton Elastic Form Factor Ratio at Low Q<sup>2</sup>, furthers our understanding of the structure of the proton.

"The proton is not a point particle. It has some structure inside it, particles known as quarks. These quarks are charged and they're moving around," said Ron, who earned his doctorate from Tel Aviv University in Israel.

The proton contains three quarks, and each quark carries an electric charge and magnetic moment. As they move, the charged quarks produce a magnetic field.

The result of quarks moving around inside the proton is a distribution of electric and magnetic fields. "We measured how these electric and magnetic distributions are different from each other," Ron explained.

The data Ron and his colleagues collected for his thesis experiment prompted the scientists to follow up with a dedicated, more precise measurement of the proton last fall. The result will be published soon.

In addition, Ron is involved in another, high-precision run that will continue the research. "This part, which is currently on the schedule for 2012, will measure the same quantity at even lower energies in a different technique," he said.

In the meantime, Ron has changed his research focus to physics beyond the Standard Model. He's using lasers to trap radioactive atoms to study the radiation the atoms give off.

"This is weak interaction physics. It's beyond Standard Model physics but in a different energy range, in a very-low-energy range, complementary to all these high-energy experiments," he said. "It's a very different technique, but it's the kind of experiment that's very complementary to experiments like Q-weak and others," Ron said.

When notified that he had won the prize, Ron was initially surprised. "In Hebrew, you translate this as the imposter syndrome. You feel like an imposter; people are handing you things you couldn't possibly deserve. And I definitely could not have done any of the work without the people in my collaboration. Everybody else worked really hard on it, and it is as much their award as mine," he said.

Ron Gilman, the chairperson of the Jefferson Lab Users Group Board, which oversees selection of the winner, said the board was impressed with the quality of nominations for this year's prize. "The students did excellent research. What particularly set Guy Ron above the other students was that he proposed, defended and led the running of a follow-up experiment to his own Ph.D. research, all while still in graduate school."

Ron presented his thesis work at the Users Group Workshop and Annual Meeting at Jefferson Lab on June 8-10.

The Thesis Prize was established in 1999 by the Southeastern Universities Research Association, the predecessor management and operating contractor for Jefferson Lab. It is awarded to a graduate student who has carried out research related to Jefferson Lab science. It is awarded for the best graduate student thesis and includes an award of \$2,000 and a commemorative plaque. Four areas are considered in rating a submitted thesis: the quality of the written dissertation, the student's contribution to the research, the work's impact on the field of physics and service (how the work benefits Jefferson Lab or other experiments).

The Thesis Prize is one of many projects supported by the JSA Initiatives Fund, a program funded by the JSA owners (SURA and CSC/ATD) to support efforts that further the scientific outreach and promote the science, education and technology missions of Jefferson Lab and the lab's user community. The annual commitment of \$500,000 is administered by the JSA Programs Committee. For more information about the program, see <http://www.jsallc.org/IF/IFIndex.html>.

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