

Quantum Computer Scientist Profiled In Nature In Connection With Einstein Centenary

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Dr. Dorit Aharonov, of the Benin School of Engineering and Computer Science at the Hebrew University of Jerusalem, has been chosen by the science journal [Nature](#) as one of four young theorists being profiled in the current issue of the magazine to mark the 100th anniversary of Albert Einstein's publication of three of his landmark theories in 1905, when he was 26 years old.

Dr. Aharonov's work focuses on a new computational model based on the law of [quantum physics](#) that has caused a revolution in the theory of computer science.

Quantum computers, if ever built, will be able to solve certain computational problems dramatically faster than any standard computer. Many laboratories all over the world are currently trying to create large-scale quantum computers.

Dr. Aharonov's work concentrates on overcoming the main problem with quantum computers: large-scale quantum systems are very sensitive to errors whose effect might ruin the computation process. In her Ph.D. project, Dr. Aharonov, together with advisor Prof. Michael Ben-Or, showed how to protect the quantum computer from errors by theoretical means. Dr. Aharonov hopes to develop new techniques for solving difficult computational problems with the aid of the laws of quantum physics.

“I was very happy about being chosen by Nature,” said Dr. Aharonov, 34, who was born in Washington, D.C., earned her academic degrees at the Hebrew University and has done post-graduate work at the Institute of Advanced Study at Princeton and at the University of California, Berkeley. “This shows the great importance that the world scientific community attributes to quantum computation. The field brings together ideas from physics and mathematics to investigate fundamental questions, such as: What is the computational power of nature and how does the transition between classical and quantum physics occur?”

Dr. Aharonov’s studies have revealed some connections between the fault tolerance of quantum computation and a long-standing, open question in physics: Why is it that most phenomena that we see around us are classical, whereas the underlying physics is quantum?

The profile on Dr. Aharonov appears in the current issue of Nature, together with profiles of three other young theorists from Harvard University, the Massachusetts Institute of Technology and the Max Planck Institute in Germany.

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