



Eugene Polzik and Ignacio Cirac, SciAm 50 in 2007

A step forward towards the quantum computer by two ICFO Distinguished Invited Professors is one of the outstanding results of 2007, according to Scientific American.

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An article on quantum teleportation between light and matter by a group of researchers led by Eugene Polzik and Ignacio Cirac has been listed in SciAm 50, the selection of the best scientific achievements of the past year made by the magazine Scientific American. Polzik and Cirac are ICFO Distinguished Invited Professors and their work was designed and begun during their visits to the Institute.

The distinguished experiment is the first observed case of quantum teleportation between matter and light. Besides its fundamental interest to physicists, this result is relevant to the speculative goal of building quantum computers and networks. These systems would exploit

quantum mechanics to achieve unprecedented processing capabilities. One approach to their development involves storing data in atoms in the form of quantum states and transmitting the information with light waves. But this requires the transfer of quantum states between matter and light. Such transfer had been previously demonstrated between objects of the same type (light pulses or particles). In Polzik and Cirac's experiment a light pulse was teleported onto an atomic ensemble containing 1012 caesium atoms.



Profs. Cirac and Polzik