liquid crystal projectors, put computers everywhere (after all, who invented the transistor?)—and let's rock Atlanta in 1999!

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Table-Top Classical Teleportation Channel Found in East Lansing

With respect to Graham Collins's story entitled "Quantum Teleportation Channels Opened in Rome and Innsbruck" (PHYSICS TODAY, February, page 18), let it be known that a classical teleportation channel has just been discovered here in East Lansing that teleports far more information than the four-state quantum channel revealed by Collins.

Classical teleportation works as follows.

Alice and Bob are on opposite sides of a pool table, on which there are one red ball and a white cue ball. The red ball, at rest, is much closer to Alice than it is to Bob. A "preparer" launches the cue ball toward the red ball in such a way that the cue ball has momentum only in the y direction. This momentum is known to Bob, but not to Alice, who suffers from terminal nearsightedness. In the subsequent collision, the impact is not dead center, and the cue ball speeds toward Alice's side of the table, where it hits the cushion with momenta P_x and P_y. Alice (despite her nearsightedness) can anyhow measure P_x and P_y at the cushion next to her.

Meanwhile, the red ball is heading toward the cushion where Bob is waiting. (Bob is color blind and cannot distinguish the red ball from the green table top.)

Alice and Bob are equipped with a telephone consisting of two tin cans and a piece of string. Unlike the quantum mechanical analog, this communication system is not entangled. Instead, the string is straight and taut. Using the telephone, Alice communicates her measured values of P_x and P_y to Bob. Because the sound moves along the string faster than the red ball moves across the table, Bob is able to use the information from Alice (and what he knows about the initial state of the cue ball) to predict both the x and y components of the momentum of the red ball that is headed in his direction. In an apparent crisis of causality, he is able to make this prediction in advance of the arrival of the red ball at his side of the table. Further, his prediction is classical without the loss of information inherent in quantization. Note, however, that the process does not travel faster than the speed of light, tin can telephones being notoriously slow channels.

Recent experiments at Pinball Pete's in East Lansing, Michigan, have suggested that classical teleportation may be capable of transmitting more information than previously imagined. For example, it appears that the accuracy with which Bob predicts the momenta on his side of the table may be directly related to the accuracy with which Alice makes her own measurements. Thus, not only is momentum information transferred, but accuracy information is also somehow teleported in the process. Pool-table theorist Sluggo Pulaski points out that if accuracy is truly teleported, then that will occur without any knowledge of accuracy on the part of either Alice or Bob.

"I guess that sorta leaves quantum teleportation in the dust," concludes Pulaski.

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Error Caused Drop in Ranking of Physics at SUNY at Stony Brook

In his letter on US doctoral programs in physics (PHYSICS TODAY, March, page 15), Jeffrey Bair mentions that whereas the physics department at the State University of New York at Stony Brook was ranked number 12 in the 1982 National Academy of Sciences study, it was ranked number 22 in 1995 by the National Research Council. He seems to suggest that this change may somehow be related to Stony Brook's relatively low proportion of faculty who obtained their doctoral degrees in the Stony Brook department or in one of the other eleven top-ranked departments (as ranked in 1995).

We would like to remind your readers of the correct explanation: Stony Brook's low ranking in 1995 was caused by a factual error, in that our entire Institute for Theoretical Physics was omitted from the list of faculty circulated to the NRC study's panelists. (In fact, the error was reported in a "Washington Reports" story by Irwin Goodwin in PHYSICS TODAY, November 1995, page 67.)

In other independent, objective

measures Stony Brook continues to fare well. According to a letter from John Perdew and Frank Tipler (PHYSICS TODAY, October 1996, page 15), data from the Institute for Scientific Information places Stony Brook in thirteenth place among American physics departments for citation impact (citations per paper) in the period 1981–94, and third among public universities. Another study, similarly based on empirical criteria, concluded that the College of Arts and Sciences at Stony Brook was tied for second place among American public universities in the per capita quality of its research programs.[1]

Reference

1. H. D. Graham, N. Diamond, *The Rise of American Research Universities: Elites and Challengers in the Postwar Era*, Johns Hopkins U. P., Baltimore (1997).

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Japanese Researchers Reveal Tomonaga's Path to QED Renormalization

The year 1997 marked not only the centenary of J. J. Thomson's "discovery" of the electron (as commemorated in the October 1997 issue of PHYSICS TODAY) but also the golden jubilee of the birth of the renormalization program in quantum electrodynamics. Sin-itiro Tomonaga played a crucial role in this QED development, along with Julian Schwinger, Richard Feynman, and Freeman Dyson, as recorded in Tian Yu Cao's *Conceptual Developments of 20th Century Field Theories*.

In his review of the book by Cao (PHYSICS TODAY, June 1997, page 79), James Cushing states that "Cao displays a truly impressive understanding of both the history and content of these profound developments [quantum and gauge field theories]. Certainly this extended case study . . . is likely to become the standard reference on the history and conceptual underpinnings of modern field theory." We have found, however, that part of Cao's description of Tomonaga's contributions to renormalization is not accurate. We have also determined that the same basic misunderstanding appears in the 1980 book by Schwinger[1] and the 1994 book by Silvan Schweber,[2] although

continued on page 92