

Wu, Shaknov, and the EPR dilemma

At the risk of gilding the lily that is the article “Chien-Shiung Wu’s trailblazing experiments in particle physics” by Chon-Fai Kam, Cheng-Ning Zhang, and Da Hsuan Feng (*Physics Today*, December 2024, page 28), I would like to add a note relating to the theoretical work of John Wheeler,¹ Wu and Irving Shaknov’s experiments on the polarization correlations of entangled gamma-ray photons produced in positronium annihilation,² and their implications for the Einstein-Podolsky-Rosen (EPR) “dilemma.” In September 1993, I wrote to Wheeler asking whether he or anyone else “considered these correlations in the EPR context” or if the time around which these papers were published was “just not ripe for such considerations.” He answered, “no one I knew of” and “right,” respectively.

I also asked “whether Einstein knew of [Wheeler’s] work,” to which he answered “no.”

As noted by Kam, Zhang, and Feng in their reply in the April 2025 issue (page 7), “Wu and Shaknov’s experiment was done only about 15 years after Albert Einstein, Boris Podolsky, and Nathan Rosen first brought the concept of quantum entanglement to light in what’s known as the EPR paper.” The first connection of the work to EPR that I can find is in a paper by David Bohm and Yakir Aharonov, published seven years after the Wu-Shaknov paper. They remarked that the Wu-Shaknov experiment “is explained adequately by the current quantum theory which implies distant correlations, of the type leading to the paradox of [Einstein-Rosen-Podolsky],

but not by any reasonable hypotheses implying a breakdown of the quantum theory that could avoid the paradox of ERP.”³

References

1. J. A. Wheeler, *Ann. NY Acad. Sci.* **48**, 219 (1946).
2. C. S. Wu, I. Shaknov, *Phys. Rev.* **77**, 136 (1950).
3. D. Bohm, Y. Aharonov, *Phys. Rev.* **108**, 1070 (1957), p. 1075.

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Another Fowler

The recent letter to the editor from Victor van Lint (*Physics Today*, December 2024, page 11) warrants a follow-up: There was yet another Fowler at Los Alamos, Joseph L. Fowler, who during the 1940s used measurements of magnetic-flux compression to discern the dynamics of explosively driven metal shells. That work was a precursor to magnetic-flux-compression generator development led by Clarence “Max” Fowler around 1960. Max remarked to me around 1971 that Fowler was a very common name, but not as generally common as variations on “Martin,” such as “Martino” and “Martinez.”

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CHIEN-SHIUNG WU around 1975. (Photo from the AIP Emilio Segrè Visual Archives.)

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