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Haunted Quantum Entanglement DOUGLAS SNYDER — There are two steps in establishing a quantum entanglement. These two steps often are not considered as independent from one another. Step 1 involves the interaction through which the particles are to be entangled. Step 2 involves making the result of the interaction through which the development of the entanglement begins available to the environment. Step 1 can occur in isolation from the environment. Step 2 then occurs with making the result of the interaction available to the environment through no longer isolating the particles. The entanglement that begins to develop in step 1 can originate in a form where there is which-way information. With step 2, the entanglement is complete and which-way information is established (option 1). Instead of completing the entanglement with step 2, the developing entanglement can be eliminated with the result that which-way information is lost. The result is a distribution for each of the paired particles that exhibits interference (option 2). The elimination of the developing entanglement results in haunted quantum entanglement. Through the use of options 1 and 2, one need not associate measurements on each of two entangled particles after measurements on each of the particles in order to decipher information. Associating measurements can be done automatically as measurements are made through the ability to control whether a developing entanglement is allowed to be fully established or instead eliminated. Options 1 and 2 can be used in a communications device.

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