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Teaching Quantum Physics Without Paradoxes in Introductory Physics Courses[1] ART HOBSON, University of Arkansas — Although the resolution to the wave-particle paradox has been known for 80 years, it is seldom presented. Briefly, the resolution is that both material particles and photons are the quanta of spatially continuous but energetically quantized fields. But because the resolution resides in quantum field theory and is not usually spelled out in ordinary language, it is neither generally understood nor generally taught, especially not in the context of non-relativistic quantum physics in general introductory physics courses for scientists and non-scientists. Why not teach from the beginning that electrons are quantized excitations of a real physical field, the "electron field"? Four experimental results form a good framework for teaching: interference fringes in the double-slit experiments for light and for electrons, and the isolated photon and electron interactions that appear on the screen in the same two experiments done with low-intensity beams.

[1] *American Journal of Physics,* July 2005, pp. 630-634.

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