1086-81-895 **Tepper L Gill*** (tgill@howard.edu), 2300 6th St. NW, Washington, DC 20059. *The Correct Hilbert Space for Feynman's Formulation of Quantum Theory.*

In this talk, I introduce a new separable Hilbert space, which contains the standard one as a compact dense subspace. This space makes it possible to construct path integrals using Feynman's originally definition and is the correct space for Feynman's formulation of quantum mechanics. The space of finitely additive measures (including the delta function) is contained in the new space and it provides a finite norm for non-absolutely integrable functions. I show that both the convolution and Fourier transform extend to this space as bounded linear operators. This is result means that both the Schrödinger and Heisenberg formulations of quantum mechanics may also be formulated on this space. It is well known that the Feynman formulation does not make sense as a theory on the standard one. (Received September 15, 2012)