1109-46-33 **Ekaterina Nathanson*** (enathanson@ggc.edu), D 1470, 1000 University Center Lane, Lawrenceville, GA 30043, and **Palle Jorgensen**. *A global solution to the Schrodinger equation: from Henstock to Feynman.*

One of the key elements of Feynman's formulation of non-relativistic quantum mechanics is a so-called Feynman path integral. It plays an important role in the theory, but it appears as a postulate based on intuition rather than a well-defined object. No previous attempts to supply Feynman's theory with rigorous mathematics have been satisfactory. In the talk, we consider a new approach to defining the Feynman's path integral, based on the theory developed by P. Muldowney. Muldowney uses the Henstock integration technique, and non-absolute integrability of the Fresnel integrals in order to obtain a representation of the Feynman's path integral as a functional. This approach offers a mathematically rigorous definition supporting Feynman's intuitive derivations. But in his work, Muldowney gives only local in space-time solutions. A physical solution to the non-relativistic Schrödinger equation must be global, and it must be given in the form of a unitary one-parameter group in L2. The purpose of this talk is to show that one-dimensional Muldowney's local solutions may be extended to yield a global solution. Moreover, the global extension can be represented by a unitary one-parameter group acting in L2. (Received January 10, 2015)