1145-11-1601   **Edray Herber Goins*** (`ehgoins@mac.com`), 610 North College Avenue, Claremont, CA 91711.
Fuchsian Differential Equations with Prescribed Monodromy: An Introduction to Solving a Quintic Without Using Radicals. Preliminary report.

We all learn at an early age how to find the roots of a quadratic polynomial using square roots via the Quadratic Formula. In the 1540's, Gerolamo Cardano published a method of finding the roots of both cubic and quartic polynomials using both square roots and cube roots. In 1823, Niels Henrik Abel gave a proof which showed that the roots of quintic polynomials cannot be expressed in terms of radicals. But in 1858, Charles Hermite showed that such roots can be expressed in terms of hypergeometric functions!

In this talk, we explain how to express such roots in terms of these functions by reducing the problem to inverting rational functions by using solutions to certain differential equations. This is a report on work done as part of the Research Experiences for Undergraduate Faculty (REUF) with Torina Lewis (Clark Atlanta University), Katie Quertermous (James Madison University), Chris Seaton (Rhodes College), and Alfredo Villanueva (Savannah State University). (Received September 23, 2018)