1016-11-297   **Robert S. Maier*** (`rsm@math.arizona.edu`), Dept. of Mathematics, University of Arizona, Tucson, AZ 85721. *Modular Equations and Algebraic Hypergeometric Transformations.*

We indicate how Ramanujan's theories of elliptic functions to alternative bases can be understood in modular terms, in a deep way that facilitates the derivation of new hypergeometric and Heun identities. For instance, his modular equation of degree 3 in the theory of signature 3, which has been proved in several ways, follows readily from the relation between the function field generators ('Hauptmoduln') of the genus-zero curve $X_0(3)$ and the genus-zero curve $X_0(9)$, which triply covers it. By exploiting similar relations between Hauptmoduln, mostly due to Fricke, we work out many additional hypergeometric identities, such as the modular equation of degree 6 in the theory of signature 3, and the equation of degree 9 in the theory of signature 4. (Received February 14, 2006)