1163-14-532 **Michael T Schultz*** (`michael.schultz@usu.edu`). *Connecting the differential geometry of the Siegel Modular threefold & Hilbert Modular surfaces with algebro-arithmetic data of certain K3 surfaces.*

Principally polarized abelian surfaces A over $\mathbb{C}$ are realized either as the Jacobian of a genus two curve or as the product of two elliptic curves. One constructs a K3 surface from A as the minimal resolution of dividing A by the minus identity involution, resulting in a Jacobian elliptic surface of Picard rank 17 or 18, respectively, called the Kummer surface $\mathrm{Kum}(A)$. Accordingly, the moduli space of such surfaces is isomorphic to the Siegel modular threefold or a Hilbert modular surface, respectively. In this talk, I will explain how the process of degenerating families of these elliptic K3 surfaces can be understood in two different ways: on one hand, it can be viewed as restricting to special subvarieties within the moduli space of abelian surfaces where the endomorphism ring of the abelian surface has special properties, for example, it is a CM field, an indefinite quaternion algebra, or a real quadratic field. Alternatively, it can be understood in terms of certain differential geometric conditions imposed on the conformal curvature tensor on the moduli space using the associated Picard-Fuchs equations. In this way, we connect a robust differential geometric structure on the moduli space with important algebro-arithmetic data. (Received September 08, 2020)