ANDREAS MALMENDIER, Utah State University

Geometry of (1,2)-polarized Kummer surfaces

A smooth K3 surface obtained as the blow-up of the quotient of a four-torus by the involution automorphism at all 16 fixed points is called a Kummer surface. Kummer surface need not be algebraic, just as the original torus need not be. However, algebraic Kummer surfaces obtained from abelian varieties provide a fascinating arena for string compactification as they are not trivial spaces but are sufficiently simple for one to be able to analyze most of their properties in detail.

In this talk, we give an explicit description for the relation between algebraic Kummer surfaces of Jacobians of genus-two curves with principal polarization and those associated to (1, 2)-polarized abelian surfaces from three different angles: the point of view of 1) the binational geometry of quartic surfaces in $\mathbb{P}^3$ using even-eights, 2) elliptic fibrations on K3 surfaces of Picard-rank 17 over $\mathbb{P}^1$ using Nikulin involutions, 3) theta-functions of genus-two using two-isogeny. Finally, we will explain how these (1,2)-polarized Kummer surfaces naturally allow for an identification of the complex gauge coupling in Seiberg-Witten gauge theory with the axion-dilaton modulus in string theory using an old idea of Sen. (This is joint work with Adrian Clingher.)