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Speaker: Dr. Rafael Andrist, University of Ljubljana

Holomorphic Symplectomorphisms of Markov Surfaces

The Diophantine solutions of the equation $x^2 + y^2 + z^2 = 3xyz$ were originally considered by Markov, and are now called *Markov triples*. Later, this equation was studied over the complex numbers and considered as an algebraic surface. The group of algebraic automorphisms of the *Markov surface* is discrete and acts transitively on the Markov triples. The Markov surface admits a natural meromorphic symplectic form with a singularity only in the origin. We describe the identity component of the group of holomorphic symplectomorphisms of the Markov surface. In contrast to the algebraic case, this group is infinite-dimensional and interpolates any permutation of (ordered) Markov triples. The results can be extended to so-called Markov-type surfaces of the form $x^2 + y^2 + z^2 - 3xyz - Ax - By - Cz - D = 0$.