Talk Math 2 Me

Riemann Surfaces, with a View Towards Hodge Theory

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Abstract

In this talk, we will discuss the construction of complex projective curves (or, equivalently, Riemann surfaces) as compactifications of the zero-locus of systems of polynomial equations, with an emphasis on plane curves which ramify over the Riemann Sphere. It will be revealed that these objects do in fact possess interesting topology, and that this topology is intimately connected to algebraic considerations, first by a ramification counting argument, but continuing into more intrinsic expressions of this relationship. Finally, we sketch the basic idea of Hodge theory: the relationship between singular cohomology groups (in the usual topological sense) and spaces of holomorphic (and anti-holomorphic) forms.