

Boğaziçi MATH COLLOQUIUM

Understanding algebraic varieties through group actions

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Abstract: Algebraic varieties are very natural mathematical objects, abundant in nature. They appear as curves, surfaces or higher dimensional objects. Classically, an algebraic variety is defined as the set of solutions of a system of polynomial equations, over an appropriate field of definition (say, real or complex numbers). The task of developing a good understanding of the geometry and topology of algebraic varieties has occupied mathematicians for centuries. To this end, it is important to consider group actions, or, equivalently, the symmetries of the space that preserve the underlying algebraic structure. Such technique has proven its efficiency in many branches of mathematics, leading, for example, to the classification of Riemann surfaces. The purpose of this talk is to provide an introduction to the main techniques in algebraic transformation groups (e.g. cellular decompositions, torus actions, equivariant cohomology) and to illustrate how they enlighten our understanding of the geometry of algebraic varieties in three cases of interest: Brieskorn-Pham varieties, homogeneous spaces and spherical varieties.

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Place: TB 250, Boğaziçi University