Title: Algorithmic Invariant Theory

Let $G$ be an algebraic group acting on a vector space $V$ over a field $K$ or, more generally, an affine variety $X$. Invariant theory studies the ring $K[X]^G$ of all regular functions on $X$ that are constant on the $G$-orbits. Hilbert asked whether $K[X]^G$ is always finitely generated as an algebra. Another classical question is how we can compute $K[X]^G$. This talk focuses on the latter question. Emphasis will be given to the computation of invariants of finite groups, invariant fields, and separating invariants. The talk will present some recent developments.