Asymptotic Study of Symmetric Ideals

About the talk: The study of ideals invariant under the action of a monoid, particularly S_∞ or $\mathrm{Inc}^i(\mathbb{N})$, in a polynomial ring with infinitely many variables has garnered significant attention. Such ideals, termed S_∞-invariant ideals, are often represented as an increasing sequence of truncated ideals $(I_n)_{n>0}$ in the polynomial ring $R = \mathbb{K}[x_{i,j} \mid 1 \leq i \leq c, j \geq 1]$. In foundational work, Cohen, Aschenbrenner, and Hillar established that R is symmetric noetherian.

In this talk, we discuss recent advancements in the study of the asymptotic behavior of chains of symmetric ideals. We discuss the asymptotic behavior of algebraic and homological invariants including codimension, projective dimension, Castelnuovo-Mumford regularity, and Betti tables along chains of symmetric ideals. We conclude this talk by demonstrating that the preservation of equivariant linear quotients and equivariant stable ideals under the action of the $\mathrm{Inc}^i(\mathbb{N})$-operator.