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Commutative Algebra up to Symmetry and FI-modules

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Ideal theory over a polynomial ring in countably many variables is rather complicated. In particular, motivated by results from algebraic statistics and representation theory, one is interested in ideals in such a ring which are invariant under the action of a symmetric group. These kind of ideals can be described by associated ascending chains of symmetric ideals in finitely many variables. In this talk we discuss some new results and open questions of ideals in such chains and their limits. Our approach is based on FI-modules with varying coefficients and various related techniques.

This talk is based on joint work with Uwe Nagel.