Algebraic equations with fewnomials and the Erdős-Rényi conjecture

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Abstract:

In 1949, Erdős and Rényi independently conjectured that if the square of a polynomial has a fixed number of terms, then the polynomial itself has a bounded number of terms, i.e., it is a "fewnomial" (also called lacunary or sparse). This was later proved by Schinzel in 1987 and further extended by Zannier in 2008 to composition of polynomials.

In a joint work with C. Fuchs and U. Zannier, we are able to formulate and prove the full generalisation: if a polynomial is "algebraic integral" over fewnomials, then it is itself a fewnomial. I will present a short history of this problem and discuss some connections with other geometric issues about irreducibility and integral points, together with a natural non-standard characterisation.