Author: Tamás Szőnyi (Budapest)

Title: Lacunary polynomials and finite geometry

Summary:

Fully reducible lacunary polynomials over finite fields were introduced by László Rédei in [2, 3]. He applied them to several problems: directions determined by a set of q points in a Desarguesian affine plane, factorizations of abelian groups, automorphisms of the Paley-graph, sums of roots of unity. An elementary proof of some results of Rédei for $q = p$ prime was given by Lovász and Schrijver [1]. In this talk we briefly survey the main theorems of Rédei's book and the Lovász-Schrijver paper. More recent applications of fully reducible lacunary polynomials in finite geometry will also be mentioned. Some of the results from the nineties can be found in [4].

References:

[1] L. Lovász, A. Schrijver, Remarks on a theorem of Rédei, *Studia Scient. Math. Hungar.* **16** (1981), 449-454.

[2] L. Rédei, *Lückenhafte Polynome über endlichen Körpern*, Birkhäuser, Basel, 1970.

[3] L. Rédei, *Lacunary polynomials over finite fields*, Akadémiai Kiadó, Budapest, and North-Holland, Amsterdam, 1973

[4] T. Szőnyi, Around Rédei's theorem, *Discrete Math.* **208/209** (1999), 557-575.