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Lorenzo Luperi Baglini*, Oskar Morgenstern Platz 1, 1090 Vienna, Vienna, Austria. *Partition regularity of nonlinear Diophantine equations.*

In the recent past, several problems regarding the partition regularity of nonlinear configurations have been solved. In this talk, we want to present some general sufficient and necessary conditions for the partition regularity of Diophantine equations, which extend Rado's Theorem and some other classic result by covering large classes of nonlinear equations. The techniques we use to obtain these conditions are twofold: sufficient conditions are obtained by exploiting algebraic properties in the space of ultrafilters $\beta\mathbb{N}$, grounding on combinatorial properties of positive density sets and IP sets; necessary conditions are obtained by means of some algebraic considerations based on a nonstandard approach to ultrafilters. (Received January 08, 2019)