Multidimensional Diophantine approximations: from Khintchine to nowadays

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ABSTRACT

A perfect theory of linear Diophantine approximations was built by A. Khintchine, V. Jarník and K. Mahler in the 1920s-1950s. This was initiated in the famous paper *Über eine klasse linear Diophantine Approximationen* (Rendiconti Circ. Math. Palermo, 1926) by Khintchine. In particular, this wonderful paper deals with

- Diophantine approximations with lacunary sequences,
- existence of (two-dimensional) singular vectors,
- inhomogeneous approximations (one-dimensional case),
- transeference theorems.

In my lecture I would like to discuss classic and modern results on the topic. We will speak about the Peres-Schlag method for constructing badly approximable numbers in various Diophantine problems such as approximation with lacunary sequences, polynomials and Littlewood-like problems. We discuss various types of Diophantine exponents and inequalities between them. We intend to give a brief survey on linear inhomogeneous Diophantine approximations and follow the story that has its origin in Khintchines theorem. We discuss some open problems as well as the solutions of some problems formulated by W. Schmidt in the 1970-80s.

Monday November 12, 2012
4:00 p.m.
MATH 350