

GEOMETRY & PHYSICS SEMINAR

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On open problems and selected applications of uniform distribution theory

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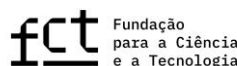
Abstract:

Uniform distribution theory studies how to distribute a finite or infinite number of points in a given space of interest. The field rests upon (more than) two seminal papers. Weyl started the field in 1916, while Roth contributed an important lower bound result in 1958 as well as a still unsolved question. Since then, uniform distribution theory has become the basis of modern Quasi-Monte Carlo integration which has important applications in numerical analysis and financial mathematics. The main characteristic of uniform distribution theory is its unique way of combining algorithmic questions with such diverse fields as analysis, number theory or geometry.

In the first part of this talk I will introduce the cornerstones of the theory as well as its most important open questions in the classical setting of the d -dimensional unit cube. The second part addresses the generalization of the theory to compact spaces and topological groups. This allows for the construction of uniformly distributed sequences on the sphere or in compact groups such as the orthogonal group, and, as such, finds applications in integral geometry.



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