Colloquium

Les mardi 26 et mercredi 27 mai prochains
trois exposés de Colloquium auront lieu en salle 4, FST 4

Mardi 26 mai 2015, 14h-15h

Block partitions of sequences

Imre Barany (Budapest and London)

Abstract: Given a sequence $A = (a_1, ..., a_n)$ of real numbers, a block B of A is either a set $B = \{a_i, a_{i+1}, ..., a_j\}$ where $i \leq j$ or the empty set. The size b of a block B is the sum of its elements. We show that when each a_i lies in $[0, 1]$ and k is a positive integer, then there is a partition of A into k blocks $B_1, ..., B_k$ such that $|b_i - b_j| \leq 1$ for every i, j. We extend this result in several directions. This is joint work with Victor Grinberg.

Mardi 26 mai 2015, 15h30-16h30

The finite field Kakeya problem, recent developments and generalizations

Aart Blokhuis (University of Technology, Eindhoven)

Abstract: The finite field Kakeya problem asks for the minimal number of points in n-dimensional affine space over a the finite field of order q covered by a set of lines, one in each direction. One of the most spectacular results in the area of algebraic combinatorics was Dvir's lower bound cq^n (more precisely $\binom{q+n-1}{n}$) for the size of a Kakeya-set. In the talk we will survey related results, recent improvements and a variation of the problem, with comparable results, valid over any field.

Mercredi 27 mai 2015, 14h-15h

Universality Theorems in Geometry

Ulrich Brehm (Technische Universität Dresden)

Abstract: Universality of geometric realization spaces for classes of combinatorial objects is a quite common phenomenon. Universality means essentially that for each semi-algebraic set there exists a combinatorial object of the given class such that its realization space is in some sense equivalent to the given semi-algebraic set. The proofs always give some kind of encoding of semi-algebraic sets by combinatorial objects of the type under consideration. After a brief overview of several known universality theorems I state a universality theorem for realization spaces of polyhedral maps (i.e. dissections of a closed 2-manifold into polygons) and give a fairly extensive sketch of the proof.