

This special volume is contributed by the speakers of the Discrete Geometry and Convexity conference, held in Budapest, June 19-23, 2017. The aim of the conference is to celebrate the 70th birthday and the scientific achievements of professor Imre Bárány, a pioneering researcher of discrete and convex geometry, topological methods, and combinatorics. The extended abstracts presented here are written by prominent mathematicians whose work has special connections to that of professor Bárány. Topics that are covered include: discrete and combinatorial geometry, convex geometry and general convexity, topological and combinatorial methods.

ISBN 978-963-279-963-6



9 789632 799636

MATEMATIKA
FELSŐFOKON



TYPOTEX

PREFACE	9
A FEW GREAT RESULTS OF IMRE BÁRÁNY	11
A FEW SNAPSHOTS OF IMRE BÁRÁNY	14
INVITED ARTICLES	
The beauty and the mystery of the symmetric moment curve <i>Alexander Barvinok</i>	19
Monotonicity of functionals of random polytopes <i>Mareen Beermann and Matthias Reitzner</i>	23
Thieves dividing birthday presents and birthday cakes <i>Pavle Blagojević and Pablo Soberón</i>	29
Polynomials in finite geometry and combinatorics <i>Aart Blokhuis</i>	35
Families of vectors without antipodal pairs <i>Péter Frankl and Andrey Kupavskii</i>	38
On a Helly-type question for central symmetry <i>Alexey Garber and Edgardo Roldán-Pensado</i>	44
An old method with two new geometrical applications <i>Péter Hajnal and Endre Szemerédi</i>	50
Helly theorems for connected sets in the plane <i>Andreas F. Holmsen</i>	53
Problems for Imre Bárány's Birthday <i>Gil Kalai</i>	59
Geometric representations and quantum physics <i>László Lovász</i>	66
How small orbits of periodic homeomorphisms of spheres can be? <i>Luis Montejano and Evgeny V. Shchepin</i>	69

Random normal vectors are normal	74
<i>Hoi H. Nguyen and Van H. Vu</i>	
Families of curves with many touchings	82
<i>János Pach and Géza Tóth</i>	
k-monotone interpolation	89
<i>Attila Pór</i>	
Polytopes and cones in random hyperplane tessellations	91
<i>Rolf Schneider</i>	
Tensors, colors, and convex hulls	97
<i>Pablo Soberón</i>	
On the number of non-intersecting hexagons in 3-space	102
<i>József Solymosi and Ching Wong</i>	
A vector-sum theorem and the Fermat–Torricelli problem in normed planes	106
<i>Konrad J. Swanepoel</i>	
Holes in planar point sets	111
<i>Pavel Valtr</i>	
\mathcal{F}-convexity: A short survey	114
<i>Liping Yuan and Tudor Zamfirescu</i>	

CONTRIBUTED ARTICLES

Algebraic vertices of non-convex polyhedra	123
<i>Arseniy Akopyan</i>	
Longest convex chains and subadditive ergodicity	125
<i>Gergely Ambrus</i>	
Random polytopes and the affine surface area	127
<i>Károly J. Böröczky</i>	
Random approximations of convex bodies by ball-polytopes	133
<i>Ferenc Fodor</i>	
Globalizing groups	135
<i>Augustin Fruchard</i>	

A note on a picture-hanging puzzle <i>Radoslav Fulek</i>	137
Coin-weighting and different directions of lines <i>Zoltán Füredi</i>	138
Proof of László Fejes Tóth's zone conjecture <i>Zilin Jiang and Alexandr Polyanskii</i>	142
Dense regular horoball packings in higher dimensional hyperbolic spaces <i>Robert Thijs Kozma</i>	143
Approximation of convex bodies by polytopes in the geometric distance <i>Márton Naszódi</i>	145
On the gap between translative and lattice kissing numbers of a convex body <i>István Talata</i>	148
A result in asymmetric Euclidean Ramsey theory <i>Sergei Tsaturian</i>	149
On the geometry of Alexandrov surfaces <i>Costin Vîlcu</i>	150