

# Combinatorial and Discrete Geometry

Géza Csima, 2023

1. Affine and convex sets, Radon, Carathéodory, Helly theorems and their applications.
2. Evaluations, Euler characteristic, h-vector of polytopes and Dehn-Sommerville equations, upper limit theorem of polytopes, Steinitz theorem.
3. Szemerédi-Trotter theorem and its applications, Complexity of arrangements of sections, lower envelope, Davenport-Schinzel series.
4. Erdős-Szekeres theorems, results and variants.
5. Danzer-Grünbaum theorem for antipodal point sets, Erdős-Füredi theorem for acute triangles, Bezdek-Pach conjecture for pairwise tangent homothetics, Bezdek-Connelly theorem, Naszódi theorem.
6. Hadwiger number, Bezdek-Kuperberg-Kuperberg conjecture, Cheong-Lee's example for the Hadwiger number of topological discs, Estimate for the Hadwiger number of centrally symmetric star-like discs.