Target audience: doctoral students, researchers and Professors in Mathematics.

Abstract:

Simplices of groups are perhaps the simplest to explain high dimensional complexes of groups. They are amazingly powerful tool for constructing interesting spaces.

I will describe in some detail few such constructions:

-- now classical reflection groups trick of M. Davis.

-- two, related spiritually but not logically, methods of constructing complexes with simplicial nonpositive curvature. This involves interesting quotients of Coxeter groups.

-- finally I will show how to go from simplices of groups to more general complexes. This is motivated by applications to billiards.