

# Seminarium geometrów

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## Classifying space for proper actions for groups admitting a strict fundamental domain

Abstract: For an infinite discrete group  $G$ , the classifying space for proper actions  $\underline{E}G$  is a proper  $G$ -CW-complex  $X$ , such that for every finite subgroup  $F \subset G$  the fixed point set  $X^F$  is contractible. In a joint work with Nansen Petrosyan we describe a procedure of constructing new models for  $\underline{E}G$  out of the standard ones, provided the action of  $G$  on  $\underline{E}G$  admits a strict fundamental domain. Our construction is of combinatorial nature, and it depends only on the structure of the fundamental domain. The resulting model is often much ‘smaller’ than the old one, and thus it is well-suited for (co-)homological computations. Before outlining the construction, I shall give some background on the space  $\underline{E}G$ . I will also discuss some examples and applications in the context of Coxeter groups, graph products of finite groups and automorphism groups of buildings.