

## Z-Classes in Geometry and Groups

R. S. Kulkarni  
(IIT Mumbai)

In each classical geometry, implicitly based on real numbers, complex numbers, quaternions, or octonians, the "dynamical types" of transformations are described as translations, transvections, rotations, reflections, glide reflections ..... . One question is: can these "dynamical types" be described in terms of the automorphism group of the geometry alone? Other question is: when the groups are infinite, why the "dynamical types" are only finite in number? We shall see that this finiteness comes from the fact that implicitly the real numbers are at the basis of these geometries. Also the notion of a "dynamical type" is connected with a purely group-theoretically defined, precise, notion of a "z-class". Namely two elements in a group  $G$  are called z-equivalent if their centralisers are conjugate subgroups. In this lecture I shall give a survey of the work on enumeration of z-classes in the last decade.