In applications of geometry there appear often very complicated subsets of Euclidean spaces. For such subsets we try to obtain a description using sets with simple construction such as for example polyhedra, which leads to the notion of triangulation. In the case of any subset E of the plane any triangulation consists in partitioning of the set E into a finite (or locally finite) family of subsets each of which is either a triangle, perhaps slightly deformed, either an arc, or a single point. This definition generalizes to spaces of higher dimensions, where the notion of triangle is replaced by the notion of d-dimensional simplex and our subset of the n-dimensional Euclidean space is the union of simplexes deformed by a deformation h called homeomorphism (homeomorphism a continuous one-to-one mapping the inverse of which is continuous too). If our set E is a smooth surface, or as we say, a smooth manifold, then - as Cairns proved - triangulating homeomorphism h can be found smooth as well. However, there are very simple examples of subsets of the n-dimensional space, defined by a finite number of polynomial equalities and inequalities, which are not smooth, or as we say, have singularities. Recently, the theorem of Cairns has been generalized to sets with singularities. The aim of our present project is to use this generalization to study geometry of such sets and get some applications in analysis.