The plan of study

   I continue the study of the general cohomology theory, toric geometry or transformation group theory, and I want to broadened my horizons and study the algebraic topology. In the field of the general cohomology, I want to advance my study until now and determine the K-local types of lens spaces. Until now the quasi KO-types of lens spaces were determined in case of mod odd, 2, 4, 8 and weighted mod 4, but the K-local types were only determined in case of mod prime. The K-local types of mod 4, 8, square of odd prime and weighted mod 4 lens spaces are valuable. These results may apply the problem of the stable homotopy types of stunted lens spaces. We conjecture that the stable homotopy types of two stunted lens spaces coincide if and only if their K-local types coincide. For a certain class of spaces (such as toric varieties), we shall study of the algorism to determine their quasi KO-types. Particularly it is unknown that the algorism to determine the KO-groups of a toric variety with a fan, therefore it is one of theme which I want to study. In this theme the studies of toric geometry and K-theory should fuse.

   In the field of the toric geometry, I will continue to study for the "torus manifold" or "torus orbifold" introduced by Hattori-Masuda or Davis-Januszkiewicz. In the algebraic geometry, it is well known that a combinatorial object called "fans" classifies toric varieties completely, and therefore its geometrical properties are described by the words of fans. For a "torus manifold" which is topological extension of toric variety, we can construct associated "multi-fan" which is extension of the fan. But this association is not one-to-one, the classification of torus manifolds which associate same multi-fan is not known well. After this I aim at determination of multi-fans and torus manifolds, in particular the classification of torus manifolds. This field is studied actively in the topology and combinatorics, and many new concepts are introduced such as X-ray, GKM-graph, convex chain and linearly independent coloring and so on. I want to examine their relationships. There are themes that I start to study, the relationships between convex chains and multi-polytopes and the relationship between small covers and the coloring polytopes.