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Section:

13. Combinatorics

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Combinatorial manifolds with vertex-transitive automorphism group.

A d-dimensional *combinatorial manifold* is a simplicial complex such that the link of every vertex is a $(d-1)$-dimensional combinatorial sphere. For a number of topological manifolds triangulations have been found that are combinatorial manifolds with a minimal number of vertices.

We make use of a list of all transitive permutation groups of small degree and determine, up to combinatorial equivalence, all combinatorial manifolds with vertex-transitive automorphism group on $n \leq 12$ vertices. With the exception of groups of small order, we extend this result to $n \leq 15$ vertices. We furthermore obtain combinatorial manifolds with the homology of $S^2 \times S^3$, $S^3 \times S^3$, $S^2 \times S^5$, and $S^3 \times S^4$ on 14, 16, and 18 vertices. Part of these results is joint work with E. Köhler.

Reference: E. Köhler, and F. H. Lutz, Combinatorial manifolds with transitive automorphism group on few vertices, in preparation.