Orlik, Peter
Introduction to arrangements. (English) Zbl 0722.51003
Regional Conference Series in Mathematics 72. Providence, RI: American Mathematical Society (AMS) (ISBN 0-8218-0723-4). x, 110 p. (1989).

In the author's words: "An arrangement of hyperplanes is a finite collection of codimension one subspaces in a finite dimensional vector space over some field. Arrangements occur in several branches of mathematics: in the study of braids and phase transition, in wave fronts, in hypergeometric functions, in reflection groups and Lie algebras, in coding theory, in the study of certain singularities, in combinatorics and group theory,and in spline functions." This survey of arrangements begins with a set of modern definitions and proceeds with a brief treatment of the combinatorial background required (lattices, the Möbius function, the Poincaré polynomial of a lattice, etc.). Successive chapters deal with combinatorial algebras, lattice homology, the topology of the complement of an arrangement over complex numbers, the cohomology of the complement, the algebra of differential forms, recent developments in the study of the topology of the complement, free arrangements, and reflection arrangements. The treatment is highly topological rather than purely geometric, in contrast to the classical work of B. Grünbaum on arrangements. The present survey draws heavily on the work of V. I. Arnold, E. Brieskorn, P. Deligne, M. Falk, T. Kohno, K. Saito, H. Terao, T. Zaslavsky and the author's own research.

Reviewer: G.L.Alexanderson (Santa Clara)

MSC:

51D99	Geometric closure systems
52C35	Arrangements of points, flats, hyperplanes (aspects of discrete geometry)
51-02	Research exposition (monographs, survey articles) pertaining to geometry
05B35	Combinatorial aspects of matroids and geometric lattices
51D25	Lattices of subspaces and geometric closure systems
06B25	Free lattices, projective lattices, word problems
57N65	Algebraic topology of manifolds

Cited in **2** Reviews
Cited in **38** Documents

Keywords:

matroid; arrangement of hyperplanes; survey; arrangements; lattices; Möbius function; Poincaré polynomial of a lattice; differential forms; free arrangements; reflection arrangements