<<Sheaves in topology   >>

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Constructible and perverse sheaves are the algebraic counterpart of the decomposition of a singular space into smooth manifolds, a great geometrical idea due to R. Thom and H. Whitney. These sheaves, generalizing the local systems that are so ubiquitous in mathematics, have powerful applications to the topology of such singular spaces (mainly algebraic and analytic complex varieties).   This introduction to the subject can be regarded as a textbook on modern algebraic topology, treating the cohomology of spaces with sheaf (as opposed to constant) coefficients.   The first 5 chapters introduce derived categories, direct and inverse images of sheaf complexes, Verdier duality, constructible and perverse sheaves, vanishing and characteristic cycles. They also discuss relations to D-modules and intersection cohomology. Later chapters apply this powerful tool to the study of the topology of singularities, polynomial functions and hyperplane arrangements.   Some fundamental results, for which excellent sources exist, are not proved but just stated and illustrated by examples and corollaries. In this way, the reader is guided rather quickly from the basic theory to current research questions, supported in this by examples and exercises.

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