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Resolution of a Higher Matrix Factorization Module -- 5.2 Betti Numbers -- 5.3 Strong Matrix Factorizations -- 5.4 Resolutions over Intermediate Rings -- 6 Far-Out Syzygies -- 6.1 Pre-stable Syzygies and Generic CI Operators -- 6.2 The Graded Case -- 6.3 The Box Complex -- 6.4 From Syzygies to Higher Matrix Factorizations -- 6.5 Betti Numbers of Pre-stable Matrix Factorizations -- 7 The Gorenstein Case -- 7.1 Syzygies and Maximal Cohen-Macaulay Modules -- 7.2 Stable Syzygies in the Gorenstein Case -- 7.3 Maximal Cohen-Macaulay Approximations -- 7.4 Stable Matrix Factorizations over a Gorenstein Ring -- 8 Functoriality -- 8.1 HMF Morphisms -- References -- Index.

Sommario/riassunto

This book introduces a theory of higher matrix factorizations for regular sequences and uses it to describe the minimal free resolutions of high syzygy modules over complete intersections. Such resolutions have attracted attention ever since the elegant construction of the minimal free resolution of the residue field by Tate in 1957. The theory extends the theory of matrix factorizations of a non-zero divisor, initiated by Eisenbud in 1980, which yields a description of the eventual structure of minimal free resolutions over a hypersurface ring. Matrix factorizations have had many other uses in a wide range of mathematical fields, from singularity theory to mathematical physics.
