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Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	Introduction -- Introduction to Superstrings -- Heterotic Strings and the Free Fermionic Construction -- Surveys of Gauge Models -- Landscape Surveys Through Metaheuristic Algorithms -- Appendix A: The Gauge Framework -- Appendix B: Layer One Statistics. .
Sommario/riassunto	In this thesis, the author describes the development of a software framework to systematically construct a particular class of weakly coupled free fermionic heterotic string models, dubbed gauge models. In their purest form, these models are maximally supersymmetric ($N = 4$), and thus only contain superpartners in their matter sector. This feature makes their systematic construction particularly efficient, and they are thus useful in their simplicity. The thesis first provides a brisk

introduction to heterotic strings and the spin-structure construction of free fermionic models. Three systematic surveys are then presented, and it is conjectured that these surveys are exhaustive modulo redundancies. Finally, the author presents a collection of metaheuristic algorithms for searching the landscape for models with a user-specified spectrum of phenomenological properties, e.g. gauge group and number of spacetime supersymmetries. Such algorithms provide the groundwork for extended generic free fermionic surveys.
