'This book provides a compendious exposition of many aspects of the mathematics of modular forms and their applications to various aspects of string theory. It succeeds in explaining sophisticated mathematical ideas in a manner that is amenable to theoretical physicists. Although the main emphasis is in applications to modular properties of string theory, the subject matter has many other physical applications far removed from string theory. The book contains many topics that are not usually described in mathematics textbooks and should therefore also appeal to mathematicians learning the basics of algebraic geometry and number theory. In summary, this is an outstanding book.'

**Michael Green**, Emeritus Lucasian Professor, University of Cambridge

'In recent times, modular functions have entered theoretical physics in a dizzying variety of ways. D'Hoker and Kaidi have written a masterful introduction to this material. Students and experienced researchers alike will find this book to be a valuable resource.'

**Edward Witten**, Institute for Advanced Studies, Princeton

An indispensable resource for readers in physics and mathematics seeking a solid grasp of the mathematical tools shaping modern theoretical physics, this book comprises a practical introduction to the mathematical theory of modular forms and their application to the physics of string theory and supersymmetric Yang–Mills theory.

Suitable for adventurous undergraduates, motivated graduate students, and researchers wishing to navigate the intersection of cutting-edge research in physics and mathematics, it guides readers from the theory of elliptic functions to the fascinating mathematical world of modular forms, congruence subgroups, Hecke theory, and more. Having established a solid basis, the book proceeds to numerous applications in physics, with only minimal prior knowledge assumed. Appendixes review foundational topics, making the text accessible to a broad audience, along with exercises and detailed solutions that provide opportunities for practice. After working through the book, readers will be equipped to carry out research in the field.

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