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Descrizione fisica	1 online resource (xvii, 282 pages) : illustrations
Disciplina	530.15
Soggetti	Mathematical physics Computer simulation Special functions Mathematics - Data processing Computational Physics and Simulations Special Functions Theoretical, Mathematical and Computational Physics Computational Mathematics and Numerical Analysis
Lingua di pubblicazione	Inglese
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1. Gamma Functions, Beta Functions, and related -- 2. Error Functions and Fresnel Integrals -- 3. Legendre Polynomials and Legendre Functions -- 4. Bessel and Airy Functions -- 5. Struve Functions and Related Functions -- 6. Confluent Hypergeometric Function -- 7. Coulomb Wave Functions -- 8. Hypergeometric Functions -- 9. J Functions -- 10. Jacobi Elliptic Functions -- 11. Elliptic Integrals -- 12. Weierstraß Functions -- 13. Parabolic Cylinder Functions -- 14. Mathieu Functions -- 15. Orthogonal Polynomials - General Aspects -- 16. Hermite Polynomials -- 17. Laguerre Polynomials -- 18. Chebychev Polynomials -- 19. Bernoulli and Euler Polynomials -- 20. Riemann Zeta Function -- 21. Piecewise Interpolation Polynomials -- 22. Wigner- and Clebsch-Gordan Coefficients -- 23. Coordinate Systems.
Sommario/riassunto	This handbook focuses on special functions in physics in the real and complex domain. It covers more than 170 different functions with additional numerical hints for efficient computation, which are useful to anyone who needs to program with other programming languages as

well. The book comes with MATLAB-based programs for each of these functions and a detailed html-based documentation. Some of the explained functions are: Gamma and Beta functions; Legendre functions, which are linked to quantum mechanics and electrodynamics; Bessel functions; hypergeometric functions, which play an important role in mathematical physics; orthogonal polynomials, which are largely used in computational physics; and Riemann zeta functions, which play an important role, e.g., in quantum chaos or string theory. The book's primary audience are scientists, professionals working in research areas of industries, and advanced students in physics, applied mathematics, and engineering.