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Descrizione fisica	1 online resource (XIII, 243 p. 39 illus., 3 illus. in color.)
Disciplina	530.15
Soggetti	Physics Statistics Nuclear physics Probabilities Medical physics Radiation Computer science - Mathematics Mathematical Methods in Physics Statistics for Engineering, Physics, Computer Science, Chemistry and Earth Sciences Particle and Nuclear Physics Probability Theory and Stochastic Processes Medical and Radiation Physics Computational Mathematics and Numerical Analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Knowledge an Logic -- Bayes' Theorem -- Probable and Improbable Data -- Descriptions of Distributions I: Real x -- Description of Distributions II: Natural x -- Form Invariance I -- Examples of Invariant Measures -- A Linear Representation of Form Invariance -- Going Beyond Form Invariance: The Geometric Prior -- Inferring the Mean or Standard Deviation -- Form Invariance II: Natural x -- Item Response Theory -- On the Art of Fitting -- Problems and Solutions -- Description of Distributions I -- Real x -- Form Invariance I -- Beyond

Sommario/riassunto

This new edition offers a comprehensive introduction to the analysis of data using Bayes rule. It generalizes Gaussian error intervals to situations in which the data follow distributions other than Gaussian. This is particularly useful when the observed parameter is barely above the background or the histogram of multiparametric data contains many empty bins, so that the determination of the validity of a theory cannot be based on the chi-squared-criterion. In addition to the solutions of practical problems, this approach provides an epistemic insight: the logic of quantum mechanics is obtained as the logic of unbiased inference from counting data. New sections feature factorizing parameters, commuting parameters, observables in quantum mechanics, the art of fitting with coherent and with incoherent alternatives and fitting with multinomial distribution. Additional problems and examples help deepen the knowledge. Requiring no knowledge of quantum mechanics, the book is written on introductory level, with many examples and exercises, for advanced undergraduate and graduate students in the physical sciences, planning to, or working in, fields such as medical physics, nuclear physics, quantum mechanics, and chaos.