

1. Record Nr.	UNINA9910337880603321
Autore	Nawrocki Waldemar
Titolo	Introduction to Quantum Metrology : The Revised SI System and Quantum Standards / / by Waldemar Nawrocki
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2019
ISBN	3-030-19677-1
Edizione	[2nd ed. 2019.]
Descrizione fisica	1 online resource (334 pages)
Disciplina	389.1015195 530.8
Soggetti	Physical measurements Measurement Electronics Microelectronics Nanoscience Nanostructures Nanotechnology Measurement Science and Instrumentation Electronics and Microelectronics, Instrumentation Nanoscale Science and Technology Nanotechnology and Microengineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Preface -- Theoretical Background of Quantum Metrology -- Measurements, Standards and Systems of Units -- The Revised SI System of Units -- Quantum Voltage Standards -- SQUID Detectors of Magnetic Flux -- Quantum Hall Effect and the Resistance Standard -- Quantization of Electrical Conductance and Thermal Conductance in Nanostructures -- Single Electron Tunneling -- Atomic Clocks and Time Scales -- Standards and Measurements of Length -- Satellite Navigation Systems -- Scanning Probe Microscopes -- New Standards of Mass.
Sommario/riassunto	This book discusses the theory of quantum effects used in metrology,

and presents the author's research findings in the field of quantum electronics. It also describes the quantum measurement standards used in various branches of metrology, such as those relating to electrical quantities, mass, length, time and frequency. The first comprehensive survey of quantum metrology problems, it introduces a new approach to metrology, placing a greater emphasis on its connection with physics, which is of importance for developing new technologies, nanotechnology in particular. Presenting practical applications of the effects used in quantum metrology for the construction of quantum standards and sensitive electronic components, the book is useful for a broad range of physicists and metrologists. It also promotes a better understanding and approval of the new system in both industry and academia. This second edition includes two new chapters focusing on the revised SI system and satellite positioning systems. Practical realization (mise en pratique) the base units (metre, kilogram, second, ampere, kelvin, candela, and mole), new defined in the revised SI, is presented in details. Another new chapter describes satellite positioning systems and their possible applications. In satellite positioning systems, like GPS, GLONASS, BeiDou and Galileo, quantum devices – atomic clocks – serve wide population of users.
