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Nota di contenuto	Cover; USING SI UNITS IN ASTRONOMY; Title; Copyright; Contents; Preface; Acknowledgments; 1 Introduction; 1.1 Using SI units in astronomy; 1.2 Layout and structure of the book; 1.3 Definitions of terms (lexicological, mathematical and statistical); 1.3.1 Lexicological and mathematical; 1.3.2 Statistical; 1.4 A brief history of the standardization of units in general; 1.5 A brief history of the standardization of scientific units; 1.6 The future of SI units; 1.7 Summary and recommendations; 1.7.1 Summary; 1.7.2 Recommendations; 2 An introduction to SI units; 2.1 The set of SI base units 2.2 The set of SI derived units 2.3 Non-SI units currently accepted for use with SI units; 2.4 Other non-SI units; 2.5 Prefixes to SI units; 2.5.1 CGPM-approved prefixes for SI units; 2.5.2 Unofficial prefixes for SI units; 2.5.3 Powers of 1000; 2.5.4 Some astronomical examples; 2.5.5

Other methods of denoting very large or very small numbers; 2.6 IAU recommendations regarding SI units; 2.6.1 Angle; 2.6.2 Time; 2.6.3 Distance and mass; 2.6.4 Wavenumber; 2.6.5 Magnitude; 2.7 Summary and recommendations; 2.7.1 Summary; 2.7.2 Recommendations; 3 Dimensional analysis

3.1 Definition of dimensional analysis 3.1.1 The dimensions of the SI base units; 3.1.2 Dimensions of some of the SI derived units; 3.2 Dimensional equations; 3.3 Summary and recommendations; 3.3.1 Summary; 3.3.2 Recommendations; 4 Unit of angular measure (radian); 4.1 SI definition of the radian; 4.2 Commonly used non-SI units of angular measure; 4.2.1 Converting from ( $^{\circ}$  ' ") and (h m s) to radians; 4.3 Spherical astronomy; 4.3.1 Spherical triangles; 4.3.2 Coordinate systems in astronomy; 4.3.3 Relationships between astronomical coordinate systems; 4.4 Angular distances and diameters 4.4.1 Distances between pairs of astronomical objects 4.4.2 Field or plate scale determination; 4.5 Steradian; 4.5.1 Conversions between sexagesimal and steradian measures; 4.5.2 Area of the constellation Crux; 4.5.3 Further examples of angular area measurement in astronomy; 4.6 Summary and recommendations; 4.6.1 Summary; 4.6.2 Recommendations; 5 Unit of time (second); 5.1 SI definition of the second; 5.2 Definition of time; 5.3 Systems of time or time scales; 5.3.1 Dynamical time; 5.3.2 Atomic time; 5.3.3 Time systems currently in use; 5.3.4 Multiples of the second; 5.3.5 Leap second 5.3.6 Relationships between mean solar time and mean sidereal time 5.3.7 The month; 5.3.8 The year; 5.3.9 ISO8601 standard on dates and time; 5.4 The hertz: unit of frequency; 5.5 Angular motion; 5.5.1 Angular velocity and acceleration; 5.5.2 Rotation period and period of revolution; 5.5.3 Proper motions; 5.5.4 Proper-motion catalogues; 5.6 The determination of the ages of celestial bodies; 5.6.1 Nucleocosmochronology; 5.6.2 Pulsars; 5.7 Summary and recommendations; 5.7.1 Summary; 5.7.2 Recommendations; 6 Unit of length (metre); 6.1 SI definition of the metre 6.2 Linear astronomical distances and diameters

## Sommario/riassunto

A multitude of measurement units exist within astronomy, some of which are unique to the subject, causing discrepancies that are particularly apparent when astronomers collaborate with researchers from other disciplines in science and engineering. The International System of Units (SI) is based on seven fundamental units from which other units may be derived, but many astronomers are reluctant to drop their old and familiar systems. This handbook demonstrates the ease with which transformations from old units to SI units may be made. Using worked examples, the author argues that astronomers would benefit greatly if the reporting of astronomical research and the sharing of data were standardized to SI units. Each chapter reviews a different SI base unit, clarifying the connection between these units and those currently favoured by astronomers. This is an essential reference for all researchers in astronomy and astrophysics, and will also appeal to advanced students.