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Nota di contenuto	Intro -- Preface -- What You Can Find in This essential -- Contents -- List of Figures -- 1: Introduction: What Is Radio Astronomy? -- 1.1 The Development of Astronomy Up to the Nineteenth Century -- 1.2 Electromagnetic Waves and Radio Technology -- 1.3 Karl Jansky and Grote Reber: The Beginning of Radio Astronomy -- 1.4 The Further Development of Radio Astronomy -- 1.5 The Nuremberg "Arno Penzias Radio Telescope" -- 2: What Are Electromagnetic Waves? -- 2.1 Basic Properties of Electromagnetic Waves -- 2.2 The Spectrum of Electromagnetic Waves -- 2.3 Which Electromagnetic Waves Can Be Used for Radio Astronomy? -- 2.4 Physical Quantities of Electromagnetic Waves -- 2.5 Cosmic Radio Sources -- 2.5.1 Thermal Radiation -- 2.5.2 Non-thermal Continuous Radiation -- 2.5.3 The 21-cm Radiation of Neutral Hydrogen -- 3: How Does a Radio Telescope Work? -- 3.1 The Components of a Radio Telescope -- 3.2 Properties of a Parabolic Antenna -- 3.3 Characterisation of the Receiver by the Noise Temperature -- 3.4 Signal Processing and Display -- 3.5 Determination of the Radiation Temperature and Intensity of a Cosmic Source -- 3.6 Antenna Control -- 4: What Can You Observe with a Radio Telescope? -- 4.1 Radio Radiation from the Sun -- 4.2 The Cassiopeia A Radio Source -- 4.3 The 21-cm Radio Radiation from the Milky Way -- 4.4 Creation of Radio Maps --

5: Outlook -- 5.1 Interferometry -- 5.2 Radio Astronomical Research -- 5.3 Own Entry into Radio Astronomy -- Sources and Literature -- General Introductions to Astronomy (Selection) -- Books on Radio Astronomy (Selection) -- Chapter 1 -- Chapter 2 -- Chapter 3 -- Chapter 4 -- Chapter 5.

Sommario/riassunto

Radio technology enables the extension of astronomical observations beyond light to other frequency ranges. This led to the discovery of numerous cosmic radio sources, the physical causes of which are explained, as is the operation of a radio telescope. Even small radio telescopes can observe radiation from the Sun and other radio sources, as well as 21-cm radiation from the Milky Way. Through interferometry, a much higher resolution can be achieved than with individual radio telescopes. As a result, radio astronomical research can contribute to many current questions in astronomy, cosmology, and physics. This Springer essential is a translation of the original German 1st edition essentials, Radioastronomie by Thomas Lauterbach, published by Springer Fachmedien Wiesbaden GmbH, part of Springer Nature in 2020.
