

1. Record Nr.	UNINA9910957853103321
Autore	Woolfson Michael Mark
Titolo	The FUNDAMENTALS OF IMAGING : FROM PARTICLES TO GALAXIES
Pubbl/distr/stampa	Singapore, : World Scientific Publishing Company, 2011
ISBN	9786613555212 9781280349058 1280349050 9781848166868 1848166869
Edizione	[1st ed.]
Descrizione fisica	1 online resource (375 p.)
Disciplina	621.367
Soggetti	Imaging systems Electrical & Computer Engineering Engineering & Applied Sciences Electrical Engineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di contenuto	Contents; Preface; 1. The Human Visual System; 1.1 The Optical System; 1.2 The Photoreceptors; 1.3 The Way that Nerve Cells Operate and Communicate; 1.4 The Neural Network of the Eye; 1.5 The Visual Cortex; 2. The Evolution of the Eye; 2.1 Plants and Light; 2.2 Different Forms of Eye; 2.3 The Evolution of the Vertebrate Eye; 3. Waves and Image Formation; 3.1 What is Light?; 3.2 Huygens' Wavelets; 3.3 Reflection and Refraction; 3.4 Stereoscopy; 3.5 Holography; 4. Seeing Small Objects; 4.1 Resolution of the Visual System; 4.2 A Simple Microscope - the Magnifying Glass 4.3 The Compound Microscope 4.4 Phase-Contrast Microscopy; 4.5 Electron Microscopy; 4.5.1 The transmission electron microscope; 4.5.2 The scanning electron microscope; 4.5.3 The scanning transmission electron microscope; 4.5.4 The scanning tunnelling microscope; 5. Photography and the Recording of Images; 5.1 The Origins of the Camera; 5.2 Recording and Storing Monochrome Images; 5.2.1 Joseph Nicephore Niepce; 5.2.2 Daguerreotypes; 5.2.3 William Henry Fox Talbot; 5.2.4 From the wet collodion process to modern film; 5.3 The

Beginning of Colour Photography; 5.3.1 Louis Ducos du Hauron
5.3.2 The Lippmann process
5.4 Modern Colour Photography; 5.4.1 The autochrome process; 5.4.2 The modern era of colour photography; 5.5 The Basic Construction of a Camera; 5.6 Digital Cameras; 6. Detecting and Imaging with Infrared Radiation; 6.1 The Radiation from Hot Bodies; 6.2 The Detection of Infrared Radiation; 6.2.1 The effectiveness of infrared and heat detectors; 6.2.2 Thermocouples and thermopiles; 6.2.3 Bolometers; 6.2.4 Golay cells; 6.2.5 Pyroelectric detectors; intruder alarms; 6.3 Infrared Imaging; 6.3.1 A night-vision device; 6.3.2 Thermography: thermal imaging; 7. Radar
7.1 The Origin of Radar
7.2 Determining the Distance; 7.3 The Basic Requirements of a Radar System; 7.4 Generators of Radio Frequency Radiation; 7.4.1 The klystron amplifier; 7.4.2 The cavity magnetron; 7.5 Transmitting the Pulses; 7.5.1 A simple dipole; 7.5.2 The parabolic reflector; 7.5.3 Multiple-dipole-array antennae; 7.5.4 Phased-array radar; 7.6 Reception and Presentation; 7.7 Doppler Radar; 7.7.1 The Doppler effect; 7.7.2 Pulsed-Doppler radar; 7.8 Synthetic Aperture Radar; 7.8.1 A simple illustration of SAR; 7.8.2 More complex SAR applications; 7.9 Other Radar Applications
7.9.1 Secondary radar
7.9.2 Ground penetrating radar; 8. Imaging the Universe with Visible and Near-Visible Radiation; 8.1 Optical Telescopes; 8.2 Refracting Telescopes; 8.3 Reflecting Telescopes; 8.4 Infrared Astronomy; 8.5 Adaptive Optics; 8.5.1 The Keck telescopes; 8.5.2 Flexible mirror systems; 9. Imaging the Universe with Longer Wavelengths; 9.1 Observations in the Far Infrared; 9.1.1 COBE results; 9.2 Radio Telescopes; 9.2.1 The beginning of radio astronomy; 9.2.2 Big-dish radio telescopes; 9.2.3 Radio interferometers; 9.2.4 Radio telescope images
10. Imaging the Universe with Shorter Wavelengths

Sommario/riassunto

It is through images that we understand the form and function of material objects, from the fundamental particles that are the constituents of matter to galaxies that are the constituents of the Universe. Imaging must be thought of in a flexible way as varying from just the detection of objects - a blip on a screen representing an aircraft or a vapour trail representing the passage of an exotic particle - to displaying the fine detail in the eye of an insect or the arrangement of atoms within or on the surface of a solid. The range of imaging tools, both in the type of wave phenomena used and
