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Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Acronyms and abbreviations -- Preface -- 1. Introduction. 1.1. Photon transfer history and application; 1.2. Photon transfer family; 1.3. Chapter review -- 2. Photon interaction. 2.1. Photoelectric effect; 2.2. Quantum efficiency; 2.3. Quantum yield -- 3. Photon transfer noise sources. 3.1. Photon shot noise; 3.2. Signal shot noise; 3.3. Fano noise; 3.4. Fixed pattern noise; 3.5. Read noise -- 4. Photon transfer theory. 4.1. Photon transfer relation; 4.2. Sense node sensitivities; 4.3. Interacting photon sensitivities; 4.4. Incident photon sensitivities; 4.5. Photon transfer general derivation; 4.6. Effective quantum yield -- 5. Photon transfer curve. 5.1. PTC setup and generation; 5.2. PTC family; 5.3. PTC errors; 5.4. Shutterless (time-delayed integration) PTC; 5.5. Variance PTC; 5.6. Example experimental PTC data -- 6. e-/DN Variance 79 -- 7. Nonlinearity.7.1. Introduction; 7.2. V/V nonlinearity; 7.3. V/e- nonlinearity. 8. Flat fielding. 8.1. Theory; 8.2. Photon transfer verification; 8.3. Nonlinearity -- 9. Modulation photon transfer. 9.1. Introduction; 9.2. Sinusoidal signal; 9.3. Sinusoidal noise; 9.4. Modulation PTC -- 10. Signal-to-noise performance. 10.1. Uniform stimulus; 10.2. Image S/N performance; 10.3. Flat fielding; 10.4. Image averaging; 10.5. On-chip averaging -- 11. Read noise. 11.1. Introduction; 11.2. Pixel source follower noise; 11.3. Sense node reset noise; 11.4. Dark current noise; 11.5. ADC quantizing noise; 11.6. Offset fixed pattern noise; 11.7. System noise -- 12. Lux transfer. 12.1. Introduction; 12.2. Minimum detection limit; 12.3. Responsivity; 12.4. Modulation LTC; 12.5.

	Acceptable image; 12.6. LTC ratio; 12.7. LTC data sequence -- Appendix A. PTC data reduction example -- Appendix B. PTC simulation program with thermal dark current -- Appendix C. PTC simulation program with FPN removal through flat fielding -- Appendix D. LTC simulation program with thermal dark current -- Table of symbols -- References -- Index.
Sommario/riassunto	The invention of the charge-coupled device 30 years ago was the beginning of a remarkable image capture technology that has changed the course of imaging in fields ranging from astronomy to biotechnology. This book presents a comprehensive history, tutorial, and state-of-the-art description of CCDs and is intended for scientists, engineers, imaging hardware managers, and graduate students.