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Nota di contenuto	Part I. Foundations: 1. The nature of cosmology; 2. Geometry; 3. Classical physics and gravity -- Part II. Relativistic Cosmological Models: 4. Kinematics of cosmological models; 5. Matter in the Universe; 6. Dynamics of cosmological models; 7. Observations in cosmological models; 8. Light-cone approach to relativistic cosmology -- Part III. The Standard Model and Extensions: 9. Homogeneous FLRW universes; 10. Perturbations of FLRW universes; 11. The cosmic background radiation; 12. Structure formation and gravitational lensing; 13. Confronting the Standard Model with observations; 14. Acceleration from dark energy or modified gravity; 15. 'Acceleration' from large scale inhomogeneity?; 16. 'Acceleration' from small scale

inhomogeneity? -- Part IV. Anisotropic and Inhomogeneous Models: 17. The space of cosmological models; 18. Spatially homogeneous anisotropic models; 19. Inhomogeneous models -- Part V. Broader Perspective: 20. Quantum gravity and the start of the universe; 21. Cosmology in a larger setting; 22. Conclusion: our picture of the universe.

#### Sommario/riassunto

Cosmology has been transformed by dramatic progress in high-precision observations and theoretical modelling. This book surveys key developments and open issues for graduate students and researchers. Using a relativistic geometric approach, it focuses on the general concepts and relations that underpin the standard model of the Universe. Part I covers foundations of relativistic cosmology whilst Part II develops the dynamical and observational relations for all models of the Universe based on general relativity. Part III focuses on the standard model of cosmology, including inflation, dark matter, dark energy, perturbation theory, the cosmic microwave background, structure formation and gravitational lensing. It also examines modified gravity and inhomogeneity as possible alternatives to dark energy. Anisotropic and inhomogeneous models are described in Part IV, and Part V reviews deeper issues, such as quantum cosmology, the start of the universe and the multiverse proposal. Colour versions of some figures are available at [www.cambridge.org/9780521381154](http://www.cambridge.org/9780521381154).