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Nota di contenuto	Introduction -- Observations of the Large-Scale Structure of the Universe -- Modeling Emission Line Galaxies -- Signal Extraction from Noisy LIM Data -- Signal Separation from Confused LIM Data -- Signal Extraction from 3D LIM Data -- Application of LIM Data for Studying Cosmic Reionization -- Summary and Outlook -- Appendix.
Sommario/riassunto	Line intensity mapping (LIM) is an observational technique that probes the large-scale structure of the Universe by collecting light from a wide field of the sky. This book demonstrates a novel analysis method for LIM using machine learning (ML) technologies. The author develops a conditional generative adversarial network that separates designated emission signals from sources at different epochs. It thus provides, for the first time, an efficient way to extract signals from LIM data with foreground noise. The method is complementary to conventional statistical methods such as cross-correlation analysis. When applied to three-dimensional LIM data with wavelength information, high reproducibility is achieved under realistic conditions. The book further

investigates how the trained machine extracts the signals, and discusses the limitation of the ML methods. Lastly an application of the LIM data to a study of cosmic reionization is presented. This book benefits students and researcherswho are interested in using machine learning to multi-dimensional data not only in astronomy but also in general applications.