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| Sommario/riassunto | It is well-known by now that the angular momentum carried by elementary particles can be categorized as spin angular momentum (SAM) and orbital angular momentum (OAM). In the early 1900s, Poynting recognized that a particle, such as a photon, can carry SAM, which has only two possible states, i.e., clockwise and anticlockwise circular polarization states. However, only fairly recently, in 1992, Allen et al. discovered that photons with helical phase fronts can carry OAM, which has infinite orthogonal states. In the past two decades, the OAM-carrying beam, due to its unique features, has gained increasing interest from many different research communities, including physics, chemistry, and engineering. Its twisted phase front and intensity distribution have enabled a variety of applications, such as micromanipulation, laser beam machining, nonlinear matter interactions, imaging, sensing, quantum cryptography and classical communications. This book aims to explore novel insights of OAM beams. It focuses on state-of-the-art advances in fundamental theories, devices and applications, as well as future perspectives of OAM beams. |