1. Record Nr. UNINA9910687973203321

Titolo	Optical Interferometry : a multidisciplinary technique in science and engineering / / edited by Mithun Bhowmick
Pubbl/distr/stampa	London : , : IntechOpen, , 2022
Descrizione fisica	1 online resource (110 pages)
Disciplina	535.470287
Soggetti	Interferometry
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	1. Introductory Chapter: Optical Interferometry in Interdisciplinary Applications 12 -- 2. Integrated Optics and Photonics for Optical Interferometric Sensing 66 -- 3. 2D Relative Phase Reconstruction in Plasma Diagnostics 52 -- 4. Bragg Grating Tuning Techniques for Interferometry Applications 24 -- 5. A Review of Optical Interferometry Techniques for Quantitative Determination of Optically Active Materials in a Solution 64 -- 6. Interferometric Gravitational Wave Detectors 18.
Sommario/riassunto	For decades the subject has expanded from fundamental physics and astronomy projects to engineering and telecommunications studies. With the most recent technologies available, along with an extremely well-connected community ready to employ them, the application domain has advanced into other, less explored areas of research. The aim of this book is to review recent developments in OI techniques and aid readers in their exploration of different aspects of the subject. The focus of the novel reports presented in this volume ranges from traditional topics to newer applications, such as those related to biology and clinical procedures. Although this collection of articles is by no means exhaustive, efforts have been made to provide examples and discussions from as many different areas of this wide-ranging subject as possible.

2.

Record Nr.	UNINA9910349516103321
Autore	Álvarez Miguel Dovale
Titolo	Optical Cavities for Optical Atomic Clocks, Atom Interferometry and Gravitational-Wave Detection / / by Miguel Dovale Álvarez
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2019
ISBN	3-030-20863-X
Edizione	[1st ed. 2019.]
Descrizione fisica	1 online resource (258 pages)
Collana	Springer Theses, Recognizing Outstanding Ph.D. Research, , 2190-5053
Disciplina	535.4 535.470287
Soggetti	Lasers Photonics Gravitation Quantum physics Physical measurements Measurement Optics, Lasers, Photonics, Optical Devices Classical and Quantum Gravitation, Relativity Theory Quantum Physics Measurement Science and Instrumentation
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Atomic clocks, cold atoms and gravitational waves -- Part 1: Cavities for Optical Atomic Clocks -- Thermal-noise-limited room-temperature ULE cavity -- Isolation from external perturbations -- Measuring resonator stability -- Part 2: Cavities for Atom Interferometry -- Cavity atom optics -- Fundamental limitations of cavity-assisted atom interferometry -- Gravitational wave detection with cavity-assisted atom interferometry -- 4-mirror large-waist cavity with tuneable stability for enhanced atom interferometry -- Part 3: Cavities for Gravitational-wave Detection -- Near-unstable cavities for future gravitational wave detectors -- Modelling parametric instabilities at Advanced LIGO and ET -- Summary and conclusions -- Appendix.

Sommario/riassunto

Devised at the beginning of the 20th century by french physicists Charles Fabry and Alfred Perot, the Fabry-Perot optical cavity is perhaps the most deceptively simple setup in optics, and today a key resource in many areas of science and technology. This thesis delves deeply into the applications of optical cavities in a variety of contexts: from LIGO’s 4-km-long interferometer arms that are allowing us to observe the universe in a new way by measuring gravitational waves, to the atomic clocks used to realise time with unprecedented accuracy which will soon lead to a redefinition of the second, and the matterwave interferometers that are enabling us to test and measure gravity in a new scale. The work presented accounts for the elegance and versatility of this setup, which today underpins much of the progress in the frontier of atomic and gravitational experimental physics.