1. Record Nr. UNINA9910817027903321

Titolo	Atomic, molecular, and optical science : an investment in the future / / Panel on the Future of Atomic, Molecular, and Optical Sciences, Committee on Atomic, Molecular, and Optical Sciences, Board on Physics and Astronomy, Commission on Physical Sciences, Mathematics, and Applications, National Research Council
Pubbl/distr/stampa	Washington, D.C., : National Academy Press, 1994
ISBN	1-280-19586-X 9786610195862 0-309-56683-5 0-585-02434-0
Edizione	[1st ed.]
Descrizione fisica	1 online resource (223 p.)
Altri autori (Persone)	DunnG. H <1932-> (Gordon H.)
Disciplina	539/.07/073
Soggetti	Atoms - Research Physics - Research Molecules - Research Optics - Research
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Panel chairman: Gordon H. Dunn.
Nota di contenuto	Atomic, Molecular, and Optical Science -- Copyright -- Preface -- Acknowledgments -- Contents -- Executive Summary -- Part I Overview -- Part II Atomic, Molecular, and Optical Science: Today and Tomorrow -- 1 Case Studies in AMO Science -- LASERS: FROM BASIC RESEARCH TO NEW TECHNOLOGIES AND NEW INDUSTRIES -- MANIPULATING ATOMS: NEW TECHNOLOGY FOR TODAY AND TOMORROW -- Laser Trapping and Cooling of Atoms and Ions: Particle Optics -- Optical Tweezers and the Biosciences -- BUCKYBALLS AND CARBON NANOTECHNOLOGY: SURPRISING NEW MATERIALS FROM SMALL SCIENCE -- 2 Recent Major Advances and Opportunities in AMO Science and Applications to the Needs of Society -- THE NATION'S SCIENTIFIC KNOWLEDGE BASE -- Recent Discoveries and Future Opportunities in AMO Science -- Fundamental Laws and Symmetries -- Cavity Electrodynamics and Micromasers -- Highly Perturbed Atoms in

Intense Laser and Microwave Fields -- Transient States of Atomic Systems and Collision Dynamics -- New Insights into Molecular Dynamics -- Clusters -- Physics of Nonlinear Optics -- Laser Cooling and Trapping -- Interactions with Surfaces -- Enabling Other Fields of Science -- Astrophysics -- Space Science -- Atmospheric and Environmental Science -- Plasma Physics -- Exotic Atoms and Nuclear Physics -- Surface and Condensed Matter Physics -- Biosciences-Mapping the Human Genome -- THE NATION'S MEASUREMENT TECHNOLOGY -- Measurement Standards -- Measurement and Instrumentation -- AMO in Measurement and Sensing for Industry -- THE NATION'S TECHNOLOGICAL INFRASTRUCTURE AND U.S. ECONOMIC PRODUCTIVITY, COMPETITIVE POSITION, AND... -- Industrial Technology, Manufacturing, and Processing -- Lasers in Manufacturing -- Plasma Processing of Materials -- Chemical Manufacturing -- Information Technology, High-Performance Computing, and Communications -- The Erbium-Doped Fiber-Optic Amplifier.
Optical Data Storage -- Energy -- Energy Production -- Efficient Use of Energy -- Global Change -- Defense -- Weapons Systems and Delivery -- Remote Sensing -- Countermeasures -- C3-Communication, Command, and Control -- Health and Medical Technology -- Medicine -- Radiation and Health Physics -- Design of Bioactive Molecules (Pharmaceuticals) -- Space Technology -- Measurement and Sensing -- Spacecraft Navigation and Communication -- Transportation -- Aviation -- Ground Transportation -- 3 Education and Human Resources -- SCIENCE EDUCATION -- K-12 Education -- Undergraduate and Graduate Education -- HUMAN RESOURCES IN AMO SCIENCE -- Present Situation -- PhD Production and Initial Employment -- Future Needs -- 4 Funding and Infrastructure for Research and Development in AMO Science -- RESOURCES -- Federal Funding for Research in AMO Science -- National Science Foundation -- Department of Energy -- Department of Defense Research Offices -- National Aeronautics and Space Administration -- Total Funding from Federal Grants and Contracts -- Federal Laboratories -- National Institute of Standards and Technology -- Department of Energy Laboratories -- Department of Defense Laboratories -- INFRASTRUCTURE AND FACILITIES -- The Single Investigator -- Centers and Institutes -- User Facilities -- National Laboratories -- Other Infrastructure Issues -- Evolution of Subfields -- Theory -- Instrumentation -- Academic Culture -- Postdoctoral Associates/Researchers and PhD Employment -- Communication and Organization -- 5 Economic Impact of AMO Science -- 6 International Perspectives in AMO Science -- APPENDIXES -- A Nobel Prizes Awarded in AMO Science Since 1964 -- 1964 -- Nicolai Gennediyevich Basov -- Aleksandr Mikhailovich Prokhorov -- Charles H. Townes -- 1966 -- Alfred Kastler -- Robert S. Mulliken -- 1967 -- Ronald G.W. Norrish -- George Porter -- 1971.
Dennis Gabor -- Gerhard Herzberg -- 1976 -- William N. Lipscomb, Jr. -- 1981 -- Nicolaas Bloembergen -- Kenichi Fukui -- Roald Hoffmann -- Arthur L. Schawlow -- Kai M.B. Siegbahn -- 1986 -- Dudley R. Herschbach -- Yuan T. Lee -- John C. Polanyi -- Gerd Binnig and Heinrich Rohrer -- 1989 -- Hans G. Dehmelt -- Wolfgang Paul -- Norman F. Ramsey -- 1991 -- Richard R. Ernst -- 1992 -- Rudolph A. Marcus -- B Impact of AMO Science -- C Citation Analysis -- D Survey of AMO Scientists -- EDUCATION AND EMPLOYMENT PROFILE -- RESEARCH AND DEVELOPMENT ACTIVITIES AND TRENDS -- HUMAN RESOURCES AND DEMOGRAPHICS.