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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	<p>Part I Sensing Techniques and Systems -- Toward Standoff Sensing of CBRN with THz Waves -- THz Wave Sensing at ETRO-VUB: Beyond Conventional Limits -- Near-Field Characterization of Conductive Micro-Resonators for Terahertz Sensing -- Bio-chemical Process Monitoring with Terahertz Sensors -- SubMM-wave Reflection and Transmission Technique for Testing and Monitoring of Biochemical Solutions -- Radiation Induced Molecular Damage Addressed by Terahertz Spectroscopy – a Theoretical Study -- Compressive Sensing Imaging at sub-THz Frequency in Transmission Mode -- Testing of sub-THz Properties of Bioliquids using WGM Resonator with Microfluidic Channel -- Optical and THz Evaluation of Components for Gas Sensing Spectroscopy in Hazardous Environments -- Analysis of Active Pharmaceutical Ingredients by Terahertz Spectroscopy -- Fabrication of Bi2212 Single Crystal Bolometer for Detection of Terahertz Waves -- Integrating THz Sensors/Structures through Electrowetting in Dielectrics (EWOD) for Security Applications -- Part II Materials Properties -- The Critical Effect of Hydration on the THz Signatures of Biomolecules and Bioparticles -- Anisotropic Medium Approach for the Optical Nonlinearities of Dilute Nitride Superlattices -- Part III THz Sources -- Development of Terahertz Frequency Quantum Cascade Lasers for the Applications as Local Oscillators -- Broadband Heterogeneous Quantum Cascade Lasers -- AlGaAs/GaAs Terahertz Quantum Cascade Laser with Gold-Based Metal – Metal Waveguide -- Infrared Laser Frequency Combs for Multispecies Gas Detection -- CBRN Defense Using THz Pulse Trains from Semiconductor Disk Lasers -- Progress in Development of the Resonant Tunneling Diodes as Promising Compact Sources at the THz Gap Bottom -- Investigating Glow Discharge Detectors as a Millimeter-Wave/Terahertz Radiation Detection Tool -- The Linewidth Enhancement Factor of Dilute Nitride Intersubband Lasers without Inversion.</p>
Sommaro/riassunto	<p>This work is intended to jointly address the development, realization and applications of emitters and detectors of terahertz (THz-0.3 THz up to 10 THz) and their application to diagnostics of CBRN effects and detection of explosives and CBRN. Hazardous substances typically exhibit rotational and vibrational transitions in this region, hence giving access to spectroscopic analysis of a large variety of molecules which play a key role in security as well as various other areas, e.g. air pollution, climate research, industrial process control, agriculture, food industry, workplace safety and medical diagnostics can be monitored by sensing and identifying them via THz (0.3 to 10 THz) and mid infrared (MIR-10 THz to 100 THz) absorption “finger prints”. Most plastics, textiles and paper are nearly transparent for THz radiation.</p>