Record Nr. UNINA9910136318503321

Titolo Gamma-ray bursts: 15 years of GRB afterglows: progenitors,

environments and host galaxies from the nearby to the early universe /

/ editors, A.J. Castro-Tirado, J. Gorosabel, I.H. Park

Pubbl/distr/stampa EDP SCIENCES, 2012

Les Ulis:,: EDP Sciences,, [2021]

©2013

Descrizione fisica 1 online resource (675 p.)

Collana EAS Publication Series

Disciplina 522.686 2

Soggetti Astronomy

Gamma ray bursts SCIENCE / Astronomy

Lingua di pubblicazione Inglese

Formato Materiale a stampa

Livello bibliografico Monografia

Nota di contenuto Frontmatter -- List of Participants -- Contents -- Editorial -- Chapter

I. Historical Remarks -- THE HISTORY OF BATSE -- EARLY DANISH GRB EXPERIMENTS - AND SOME FOR THE FUTURE? -- IOFFE INSTITUTE GRB EXPERIMENTS: PAST, PRESENT AND FUTURE -- Chapter II. Prompt Emission-I Observations -- FERMI AND SWIFT OBSERVATIONS OF SHORT GRBS -- TEMPORAL DECOMPOSITION STUDIES OF GRB LIGHTCURVES -- PHOTOSPHERIC EMISSION FROM GAMMA-RAY BURSTS -- GRBS OBSERVED BY MAXI -- SEARCHING FOR GALACTIC SOURCES IN

THE SWIFT GRB CATALOG -- KONUS-WIND OBSERVATION OF THE ULTRA-LUMINOUS GRB 110918A -- GAMMA-RAY BURSTS: THE DEPENDENCE OF THE SPECTRAL LAG ON THE ENERGY -- ON THE PROPERTIES OF SPECTRAL LAGS AND PEAK-COUNT RATES OF RHESSI GAMMA-RAY BURSTS -- FERMI/LAT OBSERVATIONS OF GRB 110625A

-- INTRINSIC PROPERTIES OF SWIFT LONG GAMMA-RAY BURSTS -- THE MULTI-BAND EMISSION PROFILE IN GRB -- ON THE PROMPT SIGNALS OF

GAMMA RAY BURSTS -- Chapter III. Prompt Emission-II Theory -- RADIATIVE MECHANISMS IN GRB PROMPT EMISSION -- WIDE-BAND SPECTRA OF PROMPT EMISSION -- GLOBAL PROPERTIES OF HIGH-

ENERGY EMISSION FROM GAMMA-RAY BURSTS -- ON AMATI RELATION FOR GRB PROMPT EMISSION -- RELATIVISTIC FILAMENTATION INSTABILITY IN AN ARBITRARILY ORIENTED MAGNETIC FIELD -- Chapter IV. Jet Dynamics -- GAMMA-RAY BURST JET DYNAMICS -- COOLING-INDUCED STRUCTURES IN COLLAPSAR ACCRETION DISKS -- 3D GRB JETS DRILLING THROUGH THE PROGENITOR -- RADIO AFTERGLOW OF THE JETTED TIDAL DISRUPTION EVENT SWIFT J1644+57 -- MAGNETIC FIELD AMPLIFICATION AND SATURATION BY TURBULENCE IN A RELATIVISTIC SHOCK PR -- RADIATION FROM ACCELERATED PARTICLES IN RELATIVISTIC JETS WITH SHOCKS, SHEAR-FLOW, AND RECONNECTION -- ACCELERATION OF MAGNETIZED COLLAPSAR JETS AFTER BREAKOUT -- GRB PROMPT EMISSION AND THE PHYSICS OF ULTRA-RELATIVISTIC OUTFLOWS -- Chapter V. Afterglow Emission-I Long GRBs (Observations) -- LINEAR AND CIRCULAR POLARIMETRY **OBSERVATIONS OF GAMMA-RAY BURST AFTERGLOWS -- IMPLICATIONS** OF EARLY TIME OBSERVATIONS OF OPTICAL AFTERGLOWS OF GRBS --AN INTRINSIC CORRELATION BETWEEN GRB OPTICAL/UV AFTERGLOW BRIGHTNESS AND DECAY RATE -- PHYSICAL PROPERTIES OF RAPIDLY DECAYING AFTERGLOWS -- TACKLING THE AFTERGLOW FORWARD-SHOCK MODEL WITH GROND -- A COMPLETE SAMPLE OF LONG BRIGHT SWIFT GRBS -- OBSERVING GRB AFTERGLOWS. SNE AND THEIR HOST GALAXIES WITH THE 10.4 M GRAN TELESCOPIO CANARIAS (GTC) --STATISTICAL PROPERTIES OF GRB AFTERGLOW PARAMETERS AS EVIDENCE OF COSMOLOGICAL EVOLUTION OF HOST GALAXIES --VLT/X-SHOOTER ABSORPTION SPECTROSCOPY OF THE GRB 120327A AFTERGLOW -- GRBS FOLLOWED-UP BY THE BOOTES NETWORK --CATACLYSMIC VARIABLES AND GAMMA-RAY SOURCES -- GAMMA-RAY BURST OBSERVATIONS WITH ISON NETWORK -- MANAGING GRB AFTERGLOWS OPTICAL/IR OBSERVATIONS IN THE WEB 2.0 ERA -- GRB 110715A: MULTIWAVELENGTH STUDY OF THE FIRST GAMMA-RAY BURST OBSERVED WITH ALMA -- COLOR INDICES OF OPTICAL AFTERGLOWS OF LONG GRBS IN THE SWIFT ERA -- A CASE STUDY OF DARK GRB 051008 -- MILLIMETRE OBSERVATIONS OF GAMMA-RAY BURSTS AT IRAM -- Chapter VI. Afterglow Emission-II (Theory) -- GRB AFTERGLOW -- THEORETICAL ASPECTS OF THE FIREBALL SCENARIO --SIMILARITIES: GRB 940217, GBR 090926A AND GRB 980923 -- Chapter VII. Short GRBs -- MULTI-WAVELENGTH OBSERVATIONS OF SHORT-**DURATION GAMMA-RAY BURSTS: RECENT RESULTS -- SHORT** DURATION GAMMA-RAY BURST WITH EXTENDED EMISSION -- SHORT GRB AFTERGLOWS OBSERVED WITH GROND -- GRB EMISSION IN NEUTRON STAR TRANSITIONS -- SPECTRAL EVOLUTION OF SHORT GRBS ON SUB-MILLISECOND TIME SCALE -- NUCLEOSYNTHESIS FROM LGRB-TYPE ACCRETION DISKS -- A GTC STUDY OF THE AFTERGLOW AND HOST GALAXY OF THE SHORT-DURATION GRB 100816A -- HIGH-ENERGY EMISSION IN SHORT GRBS AND THE ROLE OF MAGNETAR CENTRAL ENGINES -- Chapter VIII. Progenitors and Environments --DISSECTING THE GRB ENVIRONMENT WITH OPTICAL AND X-RAY OBSERVATIONS -- EARLY UV/OPTICAL EMISSION OF THE TYPE IB SN 2008D -- THE CIRCUMSTELLAR MEDIUM SURROUNDING ROTATING MASSIVE STARS AS GRB PRECURSORS -- GRB AFTERGLOWS: A STORY YET TO BE WRITTEN -- Chapter IX. Host Galaxies -- THE COSMIC **EVOLUTION OF GAMMA-RAY BURST HOST GALAXIES -- KECK** OBSERVATIONS OF 160 GAMMA-RAY BURST HOST GALAXIES -- THE REDSHIFT DISTRIBUTION OF THE TOUGH SURVEY -- GRB-SN CONNECTION IN SAO RAS OBSERVATIONS -- X-SHOOTER SLIT OBSERVATIONS OF GRB HOST GALAXIES -- ON THE METAL AVERSION OF LGRBS -- PROBING GALAXY EVOLUTION WITH GAMMA-RAY BURSTS -- THE MASS-SFR-METALLICITY RELATION OF STAR FORMING GALAXIES

AND ITS EVOLUTION: IMPLICATIONS FOR GRB/SN HOST GALAXIES -- A DEEP SEARCH FOR THE HOST GALAXIES OF GRBS WITH NO DETECTED OPTICAL AFTERGLOW -- STUDY OF BTA, HUBBLE, AND SPITZER GRB 021004 DEEP FIELDS -- THE MULTI-BAND STUDY OF THE ENVIRONMENT OF THE RC J0311+0507 RADIO GALAXY: A STEP FORWARD TO UNDERSTAND MASSIVE STELLAR SYSTEM FORMATION AT Z > 4 -- GRB HOST GALAXIES: A FASCINATING RESEARCH FIELD --Chapter X. Instrumentation and Techniques-I (Ongoing Projects) --RECENT PROGRESS ON GRBS WITH SWIFT -- THE INTERPLANETARY NETWORK -- STATUS AND PERSPECTIVES OF MINI-MEGATORTORA WIDE-FIELD MONITORING SYSTEM WITH HIGH TEMPORAL RESOLUTION -- STATUS OF THE BOOTES-IR PROJECT AT OSN FOR GRB NEAR-IR FOLLOW-UP -- PHOTOMETRIC OBSERVATIONS OF GRB080605 BY BOOTES-1B AND BOOTES-2 -- STATUS OF PI OF THE SKY TELESCOPES IN SPAIN AND CHILE -- GLORIA - THE GLOBAL ROBOTIC TELESCOPES INTELLIGENT ARRAY FOR E-SCIENCE -- STATUS UPDATE OF THE WA --SWIFT PUBLICATION STATISTICS AND THE COMPARISON WITH OTHER MAJOR OBSERVATORIES -- ASTRONOMICAL HOSTING IN CENTRAL ASIA -- Chapter XI. Instrumentation & Techniques-II (Lomonosov/UFFO) --ULTRA-FAST FLASH OBSERVATORY: FAST RESPONSE SPACE MISSIONS FOR EARLY TIME PHASE OF GAMMA RAY BURSTS -- THE ULTRA FAST FLASH OBSERVATORY PATHFINDER - UFFO-P GRB IMAGING AND LOCATION WITH ITS CODED MASK X-RAY IMAGER UBAT V. Reglero1 --DESIGN, CONSTRUCTION AND PERFORMANCE OF THE DETECTOR FOR UFFO BURST ALERT & TRIGGER TELESCOPE -- THE CALIBRATION AND SIMULATION OF THE GRB TRIGGER DETECTOR OF THE ULTRA FAST FLASH OBSERVATORY -- THE SLEWING MIRROR TELESCOPE AND THE DATA-ACQUISITION SYSTEM -- SPACE EXPERIMENTS ON-BOARD OF LOMONOSOV MISSION TO STUDY GAMMA-RAY BURSTS AND UHECRS --BDRG AND SHOK INSTRUMENTS FOR STUDY OF GRB PROMPT EMISSION IN MICHAYLO LOMONOSOV SPACE MISSION -- DEVELOPMENT OF SLEWING MIRROR TELESCOPE OPTICAL SYSTEM FOR THE UFFO-PATHFINDER -- DESIGN AND IMPLEMENTATION OF ELECTRONICS AND DATA ACQUISITION SYSTEM FOR ULTRA-FAST FLASH OBSERVATORY --DEVELOPMENT OF MOTORIZED SLEWING MIRROR STAGE FOR THE UFFO PROJECT -- IN-FLIGHT CALIBRATIONS OF UFFO-PATHFINDER --Chapter XII. Cosmology and Early Universe -- GAMMA-RAY BURSTS AND THE FIRST STARS -- A COMMON BEHAVIOR IN THE LATE X-RAY AFTERGLOW OF ENERGETIC GRB-SN SYSTEMS -- Chapter XIII. Instrumentation & Techniques-III Future Projects x -- X-RAY AND GAMMA-RAY POLARIMETRY OF GRBS -- GRBS AND LOBSTER EYE X-RAY TELESCOPES -- OBSERVING GRBS WITH THE LOFT WIDE FIELD MONITOR -- A-STAR: THE ALL-SKY TRANSIENT ASTROPHYSICS REPORTER --FEASIBILITY OF A SMALL, RAPID OPTICAL/IR RESPONSE, NEXT GENERATION GAMMA-RAY BURST MISSION -- GRB POTENTIAL OF ESA GAIA -- Chapter XIV. Non Electromagnetics, VHE and UHE Emission --CONSTRAINING GRB AS SOURCE FOR UHE COSMIC RAYS THROUGH NEUTRINO OBSERVATIONS -- FERMI GBM CAPABILITIES FOR MULTI-MESSENGER TIME-DOMAIN ASTRONOMY -- COSMIC-RAYS AND GAMMA RAY BURSTS -- CONCLUDING REMARKS -- Index

Sommario/riassunto

Gamma-ray bursts (GRB) are amongst the most energetic phenomena in the Universe. In 1997 (more than 15 years ago), BeppoSAX allowed the detection of the first GRB X-ray afterglow, leading to the detection of afterglows at other wavelengths (optical, radio) in the following years, probing the cosmological distance scale. There are still many other open issues which still need to be addressed, regarding both theoretical and observational aspects: prompt emission and afterglow physics, progenitors (including Pop III stars), host galaxies, multi-

messenger information, etc.