

Table of Contents

Preface	xv
The organizing committee.....	xvii
Conference photograph	xviii
Conference participants.....	xix
Post symposium address by the Local Organizing Committee.....	xxi
<i>K. Maeda</i>	
Welcome Address	xxii
<i>N. Kawai</i>	

Part 1. INVITED & CONTRIBUTED TALKS

Section A. Massive Stars and Supernovae

Chair: Pete Roming

Final fates of massive stars	1
<i>K. Nomoto</i>	
Environments of massive stars and the upper mass limit.....	9
<i>P. A. Crowther</i>	
A supergiant progenitor for SN 2011dh	18
<i>M. C. Bersten, O. Benvenuto, & K. Nomoto</i>	
Superluminous supernovae	22
<i>R. M. Quimby</i>	
Mass loss and fate of the most massive stars.....	29
<i>J. S. Vink</i>	
The flavors of SN II light curves.....	34
<i>I. Arcavi</i>	

Section B. Multiwavelength Emission of GRBs and Supernovae

Chair: Sylvio Klose

GRB prompt X-ray emission.....	40
<i>T. Sakamoto</i>	
Optical and near-infrared flares in GRB afterglows	46
<i>T. Krühler</i>	
Ultraviolet-bright Type IIP supernovae from massive red supergiants	54
<i>T. J. Moriya, N. Tominaga, S. I. Blinnikov, P. V. Baklanov, & E. I. Sorokina</i>	

Multiwavelength observations of GRB afterglows	58
<i>A. J. Castro-Tirado</i>	
Ultra high energy cosmic rays from engine-driven relativistic supernovae	67
<i>S. Chakraborti</i>	
SN1987A: the X-ray remnant at age 25 years	71
<i>D. N. Burrows, S. Park, E. A. Helder, D. Dewey, R. McCray, S. A. Zhekov, J. L. Racusin, & E. Dwek</i>	
Section C. Progenitors of Supernovae and GRBs	
<i>Chair: Jesper Sollerman</i>	
Supernovae and gamma-ray bursts	75
<i>P. A. Mazzali</i>	
Recent observations of GRB-supernovae	83
<i>B. E. Cobb</i>	
GRB 101225A - a new class of GRBs?	91
<i>C. C. Thöne, A. de Ugarte Postigo, C. Fryer, K. Page, J. Gorosabel, D. Perley, M. Aloy, C. Kouveliotou, & the Christmas Burst collaboration</i>	
Constraining gamma-ray burst progenitors	95
<i>A. Leván</i>	
GRB progenitors and observational criteria	102
<i>B. Zhang</i>	
Identifying supernova progenitors and constraining the explosion channels	110
<i>S. D. Van Dyk</i>	
Searching for Wolf-Rayet stars in M101	118
<i>J. L. Bibby, P. A. Crowther, A. F. J. Moffat, M. M. Shara, D. Zurek, & L. Drissen</i>	
H and He in stripped-envelope SNe - how much can be hidden?	122
<i>S. Hachinger, P. A. Mazzali, S. Taubenberger, W. Hillebrandt, K. Nomoto, D. N. Sauer</i>	
Section D. Mass Loss, Stellar Core Collapse & Gravitational Signatures	
<i>Chair: Massimo Della Valle</i>	
Cutting-edge issues in core-collapse supernova theory	126
<i>K. Kotake</i>	
A shallow water analogue of asymmetric core-collapse, and neutron star kick/spin	134
<i>T. Foglizzo, F. Masset, J. Guilet & G. Durand</i>	
Spectropolarimetry of Type Ibc supernovae	138
<i>M. Tanaka, K. S. Kawabata, T. Hattori, P. A. Mazzali, K. Aoki, M. Iye, K. Maeda, K. Nomoto, E. Pian, T. Sasaki, & M. Yamanaka</i>	
Gravitational waves and gamma-ray bursts	142
<i>A. Corsi</i>	

3D core-collapse supernova simulations: neutron star kicks and nickel distribution	150
<i>A. Wongwathanarat, H.-T. Janka, & E. Müller</i>	
Core collapse in rotating massive stars and LGRBs	154
<i>A. Batta</i>	
SN 2010jp (PTF10aaxi): A jet-driven Type II supernova.	159
<i>N. Smith, S. B. Cenko, N. Butler, J. S. Bloom, M. M. Kasliwal³, A. Horesh, S. R. Kulkarni, N. M. Law, P. E. Nugent, E. O. Ofek, D. Poznanski, R. M. Quimby, B. Sesar, S. Ben-Ami, I. Arcavi, A. Gal-Yam, D. Polishook, D. Xu, O. Yaron, D. A. Frail, & M. Sullivan</i>	

Section E. Environments and Host Galaxies of GRBs & Supernovae

Chair: Annalisa De Cia

Host galaxies of gamma-ray bursts	167
<i>E. M. Levesque</i>	
The soft X-ray landscape of gamma-ray bursts: thermal components	175
<i>R. Starling, K. Page, & M. Sparre</i>	
The local environments of core-collapse SNe within host galaxies	183
<i>J. P. Anderson, S. M. Habergham, P. A. James & M. Hamuy</i>	
The optically unbiased GRB host (TOUGH) survey	187
<i>P. Jakobsson, J. Hjorth, D. Malesani, J. P. U. Fynbo, T. Krühler, B. Milvang-Jensen, & and N. R. Tanvir</i>	
The locations of SNe Ib/c and their comparison to those of WR stars and GRBs	191
<i>G. Leloudas</i>	
Dust and metal column densities in GRB host galaxies	199
<i>P. Schady, T. Dwelly, M. J. Page, J. Greiner, T. Krühler, S. Savaglio, S. Oates, A. Rau, & the GROND and UVOT teams</i>	
Type Ib/c supernovae with and without gamma-ray bursts	207
<i>M. Modjaz</i>	
Unveiling the fundamental properties of gamma-ray burst host galaxies	212
<i>S. Savaglio</i>	

Section F. Massive Star Formation and Cosmological Implications

Chair: Nobu Kawai

Star formation in the early universe	216
<i>K. Omukai</i>	
Luminosities, masses and star formation rates of galaxies at high redshift	224
<i>A. J. Bunker</i>	
Star formation and the metallicity aversion of long-duration gamma-ray bursts .	232
<i>J. F. Graham & A. S. Fruchter</i>	

Nucleosynthesis in neutrino-driven, aspherical population III supernovae	237
<i>S.-I. Fujimoto, M.-A. Hashimoto, M. Ono, & K. Kotake</i>	
Gamma-ray bursts as cosmological probes.	241
<i>T. Totani</i>	
On the intrinsic nature of the updated luminosity time correlation in the X-ray afterglows of GRBs.	248
<i>M. G. Dainotti, V. Petrosian, & J. Singal</i>	
Section G. Supernova Early Emission, Anisotropies & Pair-Instability	
<i>Chair: Roni Waldman</i>	
Pair-instability explosions: observational evidence	253
<i>A. Gal-Yam</i>	
Asymmetry in supernovae	261
<i>K. Maeda</i>	
Detecting the first supernovae in the universe with JWST	269
<i>D. J. Whalen</i>	
X-rays, γ -rays and neutrinos from collisionless shocks in supernova wind breakouts	274
<i>B. Katz, N. Sapir, & E. Waxman</i>	
Relativistic and newtonian shock breakouts	282
<i>E. Nakar</i>	
Probing explosion geometry of core-collapse supernovae with light curves of the shock breakout	285
<i>A. Suzuki & T. Shigeyama</i>	
Section H. GRB Demographics & Jet Physics	
<i>Chair: Johan Fynbo</i>	
Magnetars and gamma ray bursts.	289
<i>N. Bucciantini</i>	
Are short GRBs powered by magnetars?	297
<i>P. T. OBrien & A. Rowlinson</i>	
Population III gamma-ray burst.	301
<i>K. Ioka, Y. Suwa, H. Nagakura, R. S. de Souza, & N. Yoshida</i>	
Formation and evolution of black hole and accretion disk in collapse of massive stellar cores.	305
<i>Y. Sekiguchi</i>	
Concluding Remarks	309
<i>E. Pian, N. Kawai, & Roming, P. W. A.</i>	
Conference photographs.	312

Part 2. POSTERS

Searching for X-ray counterparts of <i>Fermi</i> gamma-ray pulsars in <i>Suzaku</i> observations	317
<i>Y. Aoki, T. Enomoto, Y. Yatsu, N. Kawai, T. Nakamori, J. Kataoka, & P. S. Parkinson</i>	
Temporal evolution of GRB spectra: leptonic and hadronic.	319
<i>K. Asano & Peter Mészáros</i>	
Detecting TeV γ -rays from GRBs with km ³ neutrino telescopes.	321
<i>T. L. Astraatmadja</i>	
Neutrinos from GRBs and their detection with ANTARES.	323
<i>T. L. Astraatmadja on behalf of the ANTARES Collaboration</i>	
Spectropolarimetry of Type IIn SN 2010jl: peering into the heart of a monster	325
<i>F. E. Bauer, P. Zelaya, A. Clocchiatti, & J. Maund</i>	
Super iron-rich gas towards GRB 080310: SN yields or dust destruction?	327
<i>A. De Cia, C. Ledoux, P. Vreeswijk, A. Fox, A. Smette, P. Petitjean, G. Bjornsson, J. Fynbo, J. Hjorth, & P. Jakobsson</i>	
On the origin of the 6.4 keV line from the GRXE	329
<i>R. Eze, K. Saitou, & K. Ebisawa</i>	
The luminous Type Ibc supernova 2010as	331
<i>G. Folatelli</i>	
A new equation of state based on nuclear statistical equilibrium for core-collapse simulations	333
<i>S. Furusawa, S. Yamada, K. Sumiyoshi, & H. Suzuki</i>	
Turbulent magnetic field amplification behind strong shock waves in GRB and SNR	335
<i>T. Inoue</i>	
Neutron star kicks affected by standing accretion shock instability for core-collapse supernovae.	337
<i>W. Iwakami Nakano, K. Kotake, N. Ohnishi, S. Yamada, & K. Sawada</i>	
Supernova nucleosynthesis with neutrino processes: dependence of fluorine abundance on stellar mass, explosion energy and metallicity	339
<i>N. Izutani, H. Umeda, & T. Yoshida</i>	
Progenitors of electron-capture supernovae	341
<i>S. Jones, R. Hirschi, F. Herwig, B. Paxton, F. X. Timmes, & K. Nomoto</i>	
Mass and metallicity constraints on supernova progenitors derived from integral field spectroscopy of the environment.	343
<i>H. Kuncarayakti, Ma. Doi, G. Aldering, N. Arimoto, K. Maeda, T. Morokuma, R. Pereira, T. Usuda, & Y. Hashiba</i>	
Observing GRBs and supernovae at Gemini Observatory as target of opportunity (ToO).	345
<i>M. Lemoine-Busserolle, K. C. Roth, E. R. Carrasco, B. W. Miller, A. W. Stephens, I. Jorgensen, & B. Rodgers</i>	

Trigger simulations for GRB detection with the <i>Swift</i> Burst Alert Telescope.	347
<i>A. Lien, T. Sakamoto, N. Gehrels, D. Palmer, & C. Graziani</i>	
The Ultra-Fast Flash Observatory's space GRB mission and science	349
<i>H. Lim, S. Ahmad, P. Barrillon, S. Blin-Bondil, S. Brandt,</i> <i>C. Budtz-Jrgensen, A. J. Castro-Tirado, P. Chen, H. S. Choi, Y. J. Choi,</i> <i>P. Connell, S. Dagoret-Campagne, C. De La Taille, C. Eyles, B. Grossan,</i> <i>I. Hermann, M.-H. A. Huang, S. Jeong, A. Jung, J. E. Kim, S.-W. Kim,</i> <i>Y. W. Kim, J. Lee, E. V. Linder, T.-C. Liu, N. Lund, K. W. Min,</i> <i>G. W. Na, J. W. Nam, K. H. Nam, M. I. Panasyuk, I. H. Park, V. Reglero,</i> <i>J. Řípa, J. M. Rodrigo, G. F. Smoot, S. Svetilov, N. Vedenkin, & I. Yashin</i>	
An X-ray study of mass-loss rate and wind acceleration of massive stars.	351
<i>Y. Maeda, Y. Sugawara, & the WR140 collaborations</i>	
GRB host galaxies: theoretical investigation	353
<i>Jirong Mao</i>	
Photospheric thermal radiation from GRB collapsar jets.	355
<i>A. Mizuta & S. Nagataki</i>	
Magnetorotational supernovae with different equations of state	357
<i>S. G. Moiseenko & G. S. Bisnovaty-Kogan</i>	
Influence of stellar oscillations on pulsar and magnetar magnetospheres	359
<i>V. Morozova, B. Ahmedov, & O. Zanotti</i>	
Carnegie Supernova Project: spectroscopic observations of core collapse supernovae	361
<i>N. I. Morrell</i>	
The accretion-powered jet propagations and breakout criteria for GRB progenitors	363
<i>H. Nagakura, Y. Suwa, & K. Ioka</i>	
Neutrino-driven supernova explosions powered by nuclear reactions.	365
<i>K. Nakamura, T. Takiwaki, K. Kotake, & N. Nishimura</i>	
Stellar core collapse and exotic matter.	367
<i>K. Nakazato & K. Sumiyoshi</i>	
Revisiting metallicity of long gamma-ray burst host galaxies: the role of chemical inhomogeneities in galaxies	369
<i>Y. Niino</i>	
Radiation from accelerated particles in shocks	371
<i>K.-I. Nishikawa, B. Zhang, E. J. Choi, K. W. Min, J. Niemić,</i> <i>M. Medvedev, P. Hardee, Y. Mizuno, A. Nordlund, J. Frederiksen, H. Sol,</i> <i>M. Pohl, D. H. Hartmann, & G. J. Fishman</i>	
Black-hole formation in potential γ -ray burst progenitors	373
<i>E. O'Connor, L. Dessart, & C. D. Ott</i>	
The fast evolution of SN 2010bh associated with GRB 100316D.	375
<i>F. Olivares E., J. Greiner, P. Schady, A. Rau, S. Klose, & T. Krühler for the GROND team</i>	
Exploding SNe with jets: time-scales	377
<i>O. Papish & N. Soker</i>	

Observations of GRBs in the mm/submm range at the dawn of the ALMA era	380
<i>A. de UgartePostigo, A. Lundgren, S. Martín, D. García-Appadoo, I. de Gregorio Monsalvo, C. C. Thöne, J. Gorosabel, A. J. Castro-Tirado, R. Sánchez-Ramírez, & J. C. Tello on behalf of a larger collaboration</i>	
Early time bolometric light curves of Type II supernovae observed by <i>Swift</i>	383
<i>T. A. Pritchard & P. W. A. Roming</i>	
Cosmological effects on the observed flux and fluence distributions of gamma-ray bursts.	385
<i>J. Řípa, A. Mészáros, & F. Ryde</i>	
Study of very early phase GRB afterglows with MITSuME.	387
<i>Y. Saito, Y. Yatsu, H. Nakajima, N. Kawai, K. Asano, Y. Aoki, M. Hayashi, S. Song, K. Kawakami, K. Tokoyoda, T. Enomoto, R. Usui, D. Kuroda, K. Yanagisawa, H. Shimizu, H. Toda, S. Nagayama, H. Hanayama, M. Yoshida, & K. Ohta</i>	
Origin of ultra-high energy cosmic rays: nuclear composition of gamma-ray burst jets.	389
<i>S. Shibata & N. Tominaga</i>	
Wave-driven mass loss: a mechanism for late-stage stellar eruptions.	391
<i>J. Shiode & E. Quataert</i>	
Radio insight into the nature of Type IIb progenitors	393
<i>C. J. Stockdale, S. D. Ryder, A. Horesh, K. W. Weiler, N. Panagia, S. D. Van Dyk, F. E. Bauer, S. Immler, R. A. Sramek, D. Pooley, J. M. Marcaide, & N. Kassim</i>	
Numerical code of the neutrino-transfer in three dimensions for core-collapse supernovae.	395
<i>K. Sumiyoshi & S. Yamada</i>	
On the importance of the equation of state for the neutrino-driven supernova explosion mechanism	397
<i>Y. Suwa</i>	
Optical to X-rays SNe light curves following shock breakout through a thick wind	399
<i>G. Svirski, E. Nakar, & R. Sari</i>	
Type II-P supernovae in the mid-infrared	401
<i>T. Szalai & J. Vinkó</i>	
The Type II supernovae 2006V and 2006au: two SN 1987A-like events	403
<i>F. Taddia</i>	
Magnetic energy release in relativistic plasma.	405
<i>H. R. Takahashi & K. Ohsuga</i>	
Evolution of stars just below the critical mass for iron core formation	407
<i>K. Takahashi, H. Umeda, & T. Yoshida</i>	
3D hydrodynamic core-collapse SN simulations for an $11.2 M_{\odot}$ star with spectral neutrino transport	409
<i>T. Takiwaki, K. Kotake, & Y. Suwa</i>	

Spectral evolutions study of gamma-ray burst exponential decays with <i>Suzaku</i> -WAM	411
<i>M. S. Tashiro, K. Onda, K. Yamaoka, M. Ohno, S. Sugita, T. Uehara, & H. Seta</i>	
Shock breakout of Type II plateau supernova	413
<i>N. Tominaga, T. Morokuma, & S. I. Blinnikov</i>	
GRB100816A and the nature of intermediate duration gamma-ray bursts.....	415
<i>R. L. Tunnicliffe & A. Levan</i>	
Classification of long gamma ray bursts using cosmologically corrected temporal estimators	417
<i>N. A. Vasquez & C. Vasconez</i>	
The red supergiant problem: circumstellar dust as a solution	419
<i>J. Walmswell & J. Eldridge</i>	
SVOM visible telescope: performance and data process scheme	421
<i>C. Wu, Y. L. Qiu, & and H. B. Cai on behalf of SVOM team</i>	
Development of a micro-satellite TSUBAME for X-ray polarimetry of GRBs ...	423
<i>Y. Yatsu, M. Hayashi, K. Kawakami, K. Tokoyoda, T. Enomoto, T. Toizumi, N. Kawai, K. Ishizaka, A. Muta, H. Morishita, S. Matsunaga, T. Nakamori, J. Kataoka, & S. Kubo</i>	
Study of emission mechanism of GRBs probed by the gamma-ray polarization with IKAROS-GAP	425
<i>D. Yonetoku, T. Murakami, T. Sakashita, Y. Morihara, S. Gunji, T. Mihara, K. Toma, & GAP team</i>	
Progenitor for Type Ic supernova 2007bi	427
<i>T. Yoshida & H. Umeda</i>	
Structure formation and characterization in supernova explosions	429
<i>P. A. Young, C. Ellinger, C. Fryer, & G. Rockefeller</i>	
Fate of most massive stars.	431
<i>N. Yusof, R. Hirschi, & H. A. Kassim</i>	

Part 3. ABSTRACTS

Measuring cosmological parameters with GRBs: status and perspectives.....	433
<i>L. Amati</i>	
New interpretation of the Amati relation.	433
<i>A. Baranov</i>	
The SED Machine - a dedicated transient spectrograph.	434
<i>S. Ben-Ami</i>	
PTF10iue - evidence for an internal engine in a unique Type Ic SN.....	434
<i>S. Ben-Ami</i>	
Direct evidence for the collapsar model of long gamma-ray bursts	435
<i>O. Bromberg</i>	

On pair instability supernovae and gamma-ray bursts	435
<i>P. Chardonnet</i>	
Pan-STARRS1 observations of ultraluminous SNe	435
<i>R. Chornock</i>	
The influence of rotation on the critical neutrino luminosity in core-collapse supernovae.	436
<i>S. Couch</i>	
General relativistic magnetospheres of slowly rotating and oscillating neutron stars	436
<i>V. Giryanskaya</i>	
Host galaxies of short GRBs	437
<i>A. M. N. Guelbenzu</i>	
GRB 100418A: a bridge between GRB-associated hypernovae and SNe	437
<i>T. Hashimoto</i>	
Two super-luminous SNe at $z \sim 1.5$ from the SNLS	438
<i>A. Howell</i>	
Prospects for very-high-energy gamma-ray bursts with the Cherenkov Telescope Array	438
<i>J. Kakuwa</i>	
The dynamics and radiation of relativistic flows from massive stars	439
<i>A. MacFadyen</i>	
The search for light echoes from the supernova explosion of 1181 AD	439
<i>B. McDonald</i>	
The proto-magnetar model for gamma-ray bursts	439
<i>B. Metzger</i>	
Stellar black holes at the dawn of the universe	440
<i>I. F. Mirabel</i>	
MAXI J0158-744: the discovery of a supersoft X-ray transient	440
<i>M. Morii</i>	
Wide-band spectra of magnetar burst emission	441
<i>Y. Nakagawa</i>	
Dust formation and evolution in envelope-stripped core-collapse supernovae	441
<i>T. Nozawa</i>	
The host galaxies of dark gamma-ray bursts	442
<i>D. Perley</i>	
Keck observations of 150 GRB host galaxies	442
<i>D. Perley</i>	
Search for properties of GRBs at large redshift	443
<i>G. Pizzichini</i>	
The early emission from SNe	443
<i>I. Rabinak</i>	

Spectral properties of SN shock breakout	443
<i>N. Sapia</i>	
MAXI observation of GRBs and short X-ray transients	444
<i>M. Serino</i>	
A three-dimensional view of SN 1987A using light echo spectroscopy	444
<i>B. Sinnott</i>	
X-ray study of the southern extension of the SNR Puppis A	445
<i>M. Smith</i>	
All-sky survey of short X-ray transients by MAXI GSC	445
<i>T. Toizumi</i>	
Development of the CALET gamma-ray burst monitor (CGBM)	445
<i>K. Yamaoka</i>	
Author index	447
Object index	451
Subject index	454

