

Table of Contents

Preface	xi
Participant List	xiii

Part I. Talks

Section A. Space Missions and Observations

The Next Generation of High-energy Astrophysics Observatories (Invited)	5
<i>S. S. Holt</i>	
Particle Acceleration in Solar Flares and Coronal Mass Ejections (Invited)	15
<i>R. P. Lin</i>	
Recent Observations of X-ray Emission from Galactic Binary Neutron Stars (Invited)	27
<i>J. Swank</i>	
Observation of Black Holes in X-ray Binaries (Invited)	37
<i>Y. Tanaka</i>	
X-ray Emission Characteristics of Pulsars (Invited)	49
<i>W. Becker</i>	
The Constellation X-ray Mission (Invited)	61
<i>N. E. White and H. Tananbaum</i>	
X-ray Emission as an Indicator of Cosmic-ray Acceleration in Supernova Remnants (Invited)	69
<i>R. Petre, G. E. Allen, U. Hwang, J. W. Keohane, and E. V. Gotthelf</i>	
Recent Satellite Observations of X-ray Emission from AGN (Invited)	77
<i>H. Kunieda</i>	

Section B. High-Energy Phenomena in and Emission from Astrophysical Plasmas

Neutron Stars in Supernova Remnants (Invited)	91
<i>F. Pacini</i>	
Multiwavelength Diagnostics of Pulsar Plasmas (Invited)	95
<i>R. W. Romani</i>	
Thermal Radiation from Isolated Neutron Stars (Invited)	103
<i>G. G. Pavlov and V. E. Zavlin</i>	

Jets from Compact Objects (Invited)	113
<i>H. C. Spruit</i>	
Gamma-rays from Solar Flares(Invited)	123
<i>R. Ramaty and N. Mandzhavidze</i>	
The Scaling of Solar Flare Hard X-ray Emission to Other Flaring Objects in the Universe	133
<i>P. C. H. Martens</i>	
High-energy Emission from Supernovae and Remnants (Invited)	135
<i>R. A. Chevalier</i>	
X/ γ -rays from Active Galactic Nuclei (Invited)	143
<i>R. Svensson</i>	
Radiative Processes and Geometry of Spectral States of Black-hole Bina- ries (Invited)	153
<i>A. A. Zdziarski</i>	
Gamma-ray Emission from Pulsar Outer Magnetospheres (Invited) . .	171
<i>K. Hirotani</i>	
Population Synthesis of Old Neutron Stars in the Galaxy (Invited) . .	181
<i>S. B. Popov, M. Colpi, A. Treves, R. Turolla, V. M. Lipunov, and M. E. Prokhorov</i>	
Properties of Nonthermal Emission in Plerions (Invited)	189
<i>R. Bandiera</i>	
The Impact of Cooling Flows in Clusters of Galaxies (Invited)	199
<i>S. W. Allen</i>	
Ultrasoft Narrow-line Seyfert 1 Galaxies: An Extreme of Accretion onto Supermassive Black Holes	207
<i>W. N. Brandt</i>	
 Section C. Effects of Magnetic Fields on Highly Energetic Processes and Emission from Astrophysical Plasmas	
Interaction of Gravitationally Contracting Gas Having Angular Momen- tum with Magnetic Field, and the Acceleration and Collimation of Astrophysical Jets (Invited)	213
<i>Y. Uchida, M. Nakamura, T. Miyagoshi, T. Kobayashi, T. Mukawa, and S. Hirose</i>	
A Three-dimensional Outer-magnetospheric Gap Model for Gamma-ray Pulsars: I. The Crab Pulsar (Invited)	223
<i>K. Cheng, M. Ruderman, and L. Zhang</i>	
Accreting Plasmas in Black Hole Magnetospheres (Invited)	233
<i>M. Takahashi</i>	
Magnetohydrodynamic Turbulence in Accretion Discs	241
<i>U. Torkelsson, A. Brandenburg, Å. Nordlund, and R. F. Stein</i>	

Plasma Masers in Radio Pulsars	243
<i>M. Lyutikov, R. Blandford, and G. Machabeli</i>	
The Physics of Soft Gamma Repeaters (Invited)	245
<i>C. Thompson</i>	
The Magnetic Fields of the Universe and Their Origin (Invited)	255
<i>S. A. Colgate and H. Li</i>	
Jets from Black Hole Magnetospheres (Invited)	265
<i>K. Shibata, S. Koide, T. Kudoh, and S. Aoki</i>	
 Section D. Particle Acceleration in Astrophysical Plasmas	
Particle Acceleration in Solar Flares (Invited)	277
<i>J. A. Miller</i>	
Particle Acceleration at Astrophysical Shocks (Invited)	291
<i>A. Achterberg</i>	
Ultrahigh Energy Cosmic-ray Accelerators (Invited)	303
<i>A. V. Olinto</i>	
Electron Acceleration by Strong DC Electric Fields in Extragalactic Jets	311
<i>Y. E. Litvinenko</i>	
Radio Evidence for Nonthermal Particle Acceleration in Normal Stars .	313
<i>K. R. Lang</i>	
Wave-powered Relativistic Electron Generation in Nonuniform Magnetic Fields	315
<i>M. P. Leubner</i>	
 Section E. Physical Processes in Relativistic Astrophysical Plasmas	
Collisionless Halos Around Black Holes (Invited)	321
<i>A. Gruzinov</i>	
Gamma-ray Bursts and Afterglow (Invited)	329
<i>R. Sari</i>	
Population Synthesis of GRB Progenitors: Problems With Kicks (Invited)	339
<i>C. L. Fryer</i>	
Hypernovae: SNe 1997ef, 1998bw, and 1997cy (Invited)	347
<i>T. Nakamura, K. Maeda, K. Iwamoto, T. Suzuki, K. Nomoto, P. A. Mazzali, M. Turatto, I. J. Danziger, and F. Patat</i>	
Compton Scattering, Pair Annihilation, and Pair Production in a Plasma (Invited)	359
<i>V. Krishan</i>	

Part II. Posters

A Model for the Spatial Distribution of Relativistic Electrons in the Crab Nebula	371
<i>E. Amato</i>	
General-Relativistic MHD Simulation of Jets from a Geometrically Thin Accretion Disk Around a Schwarzschild Black Hole	373
<i>S. I. Aoki, S. Koide, K. Shibata, and T. Kudoh</i>	
Electron Trapping and Precipitation in Asymmetric Solar Flare Loops	375
<i>M. J. Aschwanden, L. Fletcher, T. Sakao, T. Kosugi, and H. Hudson</i>	
Active Late-Type Stellar Coronae: Hints for Flare Heating?	377
<i>M. Audard, M. Güdel, J. J. Drake, V. Kashyap, and E. F. Guinan</i>	
Stochastic Acceleration and Nonthermal Radiation in Clusters of Galaxies	379
<i>P. Blasi and A. Olinto</i>	
Relativistic Adiabatic Shocks in Accretion Flows	381
<i>D. M. Caditz and S. Tsuruta</i>	
Pulsar Geometrodynamics: Relativistic Radiative Plasma Theory and its Associated Quantum Phenomena	385
<i>A. A. da Costa</i>	
X-ray Emission from Supermassive Black Holes in Elliptical Galaxies and Low Radiative-efficiency Accretion	387
<i>T. Di Matteo and S. W. Allen</i>	
Magnetic Helicity, Dynamo Action, Reconnection, and Particle Acceleration	389
<i>G. B. Field and E. G. Blackman</i>	
Starquakes in Neutron Stars	391
<i>L. M. Franco, B. Link, and R. I. Epstein</i>	
Gyrosynchrotron Emission from Stellar Coronae	393
<i>M. Güdel and A. Zucker</i>	
X-ray Radiation from Flare-heated Coronal Plasma	395
<i>M. Güdel</i>	
Primordial Flares, Flux Tubes, and Gamma-ray Bursts	397
<i>K. M. Hiremath</i>	
Internal Rotation of AB Doradus	399
<i>K. M. Hiremath</i>	
Which Forces Accelerate Jets?	401
<i>S. X. Kato, T. Kudoh, and K. Shibata</i>	
Particle Acceleration and Radiation in Magnetospheres of Collapsing Stars	403
<i>V. Kryvdyk</i>	
Collimation of Magnetically Driven Outflows from Accretion Disks	407
<i>T. Kudoh, R. Matsumoto, and K. Shibata</i>	

A Scaling Law for Magnetic Flux Tubes on an AGN Accretion Disk . . .	409
<i>A. M. K. LeRoux, D. W. Longcope, and S. Tsuruta</i>	
Hidden Blazars In Radio Loud Quasars?	411
<i>F. Ma</i>	
Hard X-ray Spectrum of the Above-the-Looptop Source in Impulsive Solar Flares	413
<i>S. Masuda</i>	
Numerical Simulations of the Precessing Jets of SS433	415
<i>E. Müller and W. Brinkmann</i>	
Statistical Properties of Kerr BH Flywheel Model of QSOs/AGNs . . .	417
<i>S. Nitta</i>	
Interaction of the SS433 Jet with the Interstellar Medium	419
<i>P. O'Neill, R. Sood, P. Durouchoux, and S. Safi-Harb</i>	
High-energy Radiation from a Model of Quasars, AGNs, and the Galactic Center with Magnetic Monopoles	421
<i>Q.-H. Peng</i>	
NLTE Model Atmospheres for Extremely Hot Compact Stars	423
<i>T. Rauch, J. L. Deetjen, S. Dreizler, and K. Werner</i>	
Far-ultraviolet Emission from Supernova Remnant Shocks	425
<i>R. Sankrit, W. P. Blair, and the FUSE SNR Team</i>	
Self-organized Criticality with Data from MCG-6-30-15?	427
<i>R. Sivron, E. Goralski, A. LeRoux, S. Tsuruta, and H. Kunieda</i>	
Candidates for Optical Counterpart in the Field of PSR 1821-24 in M28	431
<i>F. K. Sutaria</i>	
Magnetic Field Effects upon Neutron Star Cooling	433
<i>M. A. Teter, D. Rilett, and S. Tsuruta</i>	
The Isolated Neutron Star RX J185635-3754	437
<i>F. M. Walter, P. An, J. Lattimer, and M. Prakash</i>	
Reacceleration of Relativistic Electrons by Turbulent Alfvén Waves in Ra- dio Jets	439
<i>D.-Y. Wang and Y. Ma</i>	
Statistical Properties of Magnetic Separators in Model Active Regions .	443
<i>B. T. Welsch and D. W. Longcope</i>	
Numerical Simulations of Solar Flares	445
<i>T. Yokoyama and K. Shibata</i>	
Summary of Posters on Solar Physics (Summary)	447
<i>M. J. Aschwanden</i>	

Part III. Panel Discussion and Symposium Summary**Section A. Panel Discussion on Common Physical Processes and Mechanisms for High-Energy Emission from Astrophysical Plasmas**

Solar Flares, the Solar Corona, and Solar Physics	455
<i>E. N. Parker</i>	
Astrophysics in the New Millennium	461
<i>C. R. Canizares</i>	
Neutron Star Powered Accelerators	463
<i>M. Ruderman</i>	
Does the Magnetodynamic Model for the Formation of AGN Jets Survive New Findings of High-energy Phenomena near the Central Objects?	473
<i>Y. Uchida</i>	

Section B. Symposium Summary

Symposium Summary and Concluding Remarks	485
<i>G. B. Field</i>	
Author Index	491

