

XIV International Conference on Topics in Astroparticle and Underground Physics (TAUP 2015)

Journal of Physics: Conference Series Volume 718

Torino, Italy
7 – 11 September 2015

Part 1 of 2

Editors:

**Nicolao Fornengo
Marco Regis
Hannes-S. Zechlin**

ISBN: 978-1-5108-2536-9
ISSN: 1742-6588

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2015) by the Institute of Physics
All rights reserved. The material featured in this book is subject to
IOP copyright protection, unless otherwise indicated.

Printed by Curran Associates, Inc. (2016)

For permission requests, please contact the Institute of Physics
at the address below.

Institute of Physics
Dirac House, Temple Back
Bristol BS1 6BE UK

Phone: 44 1 17 929 7481
Fax: 44 1 17 920 0979

techtracking@iop.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

PART 1

REVIEW CONTRIBUTIONS

DIRECT DETECTION: LIQUID NOBLES	1
<i>Daniel S. Akerib</i>	
DARK MATTER INDIRECT SEARCHES: MULTI-WAVELENGTH AND ANISOTROPIES	8
<i>Shin'Ichiro Ando</i>	
DARK MATTER DIRECT DETECTION: CRYSTALS	15
<i>P Belli</i>	
MULTI-MESSENGER ASTRONOMY: GRAVITATIONAL WAVES, NEUTRINOS, PHOTONS, AND COSMIC RAYS	23
<i>Marica Branchesi</i>	
DARK MATTER INDIRECT SEARCHES: CHARGED COSMIC RAYS	29
<i>Marco Cirelli</i>	
NEUTRINOLESS DOUBLE BETA DECAY	37
<i>Oliviero Cremonesi</i>	
NEUTRINOS FROM SUPERNOVAE	47
<i>Basudeb Dasgupta</i>	
THEORY OF HIGH-ENERGY MESSENGERS	50
<i>Charles D. Dermer</i>	
OVERVIEW AND STATUS OF ADVANCED INTERFEROMETERS FOR GRAVITATIONAL WAVE DETECTION	62
<i>H Grote</i>	
GAMMA-RAY ASTRONOMY FROM THE GROUND	70
<i>Dieter Horns</i>	
ACCELERATOR SEARCHES FOR NEW PHYSICS IN THE CONTEXT OF DARK MATTER	78
<i>Steven Lowette</i>	
LOW-ENERGY NEUTRINOS	86
<i>Livia Ludhova</i>	
DIRECT NEUTRINO MASS EXPERIMENTS	94
<i>Susanne Mertens</i>	
LONG BASELINE NEUTRINO EXPERIMENTS	103
<i>Mauro Mezzetto</i>	
STERILE NEUTRINOS	109
<i>Antonio Palazzo</i>	
OPEN DATA POLICY AND DATA SHARING IN ASTROPARTICLE PHYSICS: THE CASE FOR HIGH-ENERGY MULTI-MESSENGER ASTRONOMY	117
<i>M Spiro</i>	
IMPLICATIONS OF COSMOLOGICAL OBSERVABLES FOR PARTICLE PHYSICS: AN OVERVIEW	120
<i>Yvonne Y Y Wong</i>	

COSMOLOGY

THE DYNAMICS OF FACE-ON GALAXIES IN MOND	128
<i>Garry W. Angus</i>	
SECRET NEUTRINO INTERACTIONS: A PSEUDOSCALAR MODEL	133
<i>Maria Archidiacono, Steen Hannestad, Rasmus Sloth Hansen, Thomas Tram</i>	
DETECTING PARTICLE DARK MATTER SIGNATURES BY CROSS-CORRELATING γ-RAY ANISOTROPIES WITH WEAK LENSING	138
<i>S Camera, M Fornasa, N Fornengo, M Regis</i>	
MODIFIED GRAVITY AND DARK MATTER	143
<i>Jose A. R. Cembranos</i>	
THE GAIA MISSION: THE DAWN OF ASTROMETRIC COSMOLOGY? STATUS AND PROSPECTS AFTER 14 MONTHS OF SCIENCE OPERATIONS	149
<i>Alessandro Spagna, Mariateresa Crosta, Mario G Lattanzi, Paola Re Fiorentin</i>	

DARK RADIATION AND INFLATIONARY FREEDOM	154
<i>Stefano Gariazzo</i>	
VACUUM EFFECTS IN MAGNETIC FIELD WITH ACCOUNT FOR FERMION ANOMALOUS MAGNETIC MOMENT AND AXIAL-VECTOR INTERACTION	162
<i>Andrey Bubnov, Nadezda Gubina, Vladimir Zhukovsky</i>	
PLANCK 2015 CONSTRAINTS ON NEUTRINO PHYSICS	166
<i>Massimiliano Lattanzi</i>	
SOLUTION OF CONHARMONIC CURVATURE TENSOR IN GENERAL RELATIVITY	172
<i>Rishi Kumar Tiwari</i>	

DARK MATTER

BACKGROUND STUDY OF NAI(TL) CRYSTALS FOR THE KIMS-NAI EXPERIMENT	177
<i>P Adhikari, G Adhikari, S Choi, C Ha, I S Hahn, Ej Jeon, H W Joo, W G Kang, H J Kim, H O Kim, K W Kim, N Y Kim, S K Kim, Y D Kim, Y H Kim, H S Lee, J H Lee, M H Lee, D S Leonard, J Li, S Y Oh, S L Olsen, H K Park, H S Park, K S Park, J H So, Y S Yoon</i>	
PHOTONIC DARK MATTER PORTAL REVISITED	183
<i>S A Alavi, F S Kazemian</i>	
DARK MATTER PHENOMENOLOGY OF GUT INSPIRED SIMPLIFIED MODELS	188
<i>Giorgio Arcadi</i>	
EARLY COMMISSIONING CALIBRATION DATA SETS FOR DEAP-3600	193
<i>Berta Beltrán</i>	
DARK MATTER ANNIHILATION FACTORS IN THE MILKY WAY'S DWARF SPHEROIDAL GALAXIES	198
<i>V Bonnavard, C Combet, D Maurin, M G Walker, A Geringer-Sameth</i>	
AMS-02 ANTIPROTONS: IMPLICATIONS FOR DARK MATTER	203
<i>Mathieu Boudaud</i>	
PREDICTIONS OF HYDRODYNAMIC SIMULATIONS FOR DIRECT DARK MATTER DETECTION	208
<i>Nassim Bozorgnia, Francesca Calore, Matthieu Schaller, Mark Lovell, Gianfranco Bertone, Carlos S. Frenk, Robert A. Crain, Julio F. Navarro, Joop Schaye, Tom Theuns</i>	
ANTI-NUCLEI PRODUCTION AT THE LHC MEASURED WITH ALICE	213
<i>Stefania Bufalino</i>	
THE SUPERCDMS SOUDAN HIGH THRESHOLD WIMP SEARCH AND THE PLANNED SUPERCDMS SNOLAB EXPERIMENT	218
<i>R Calkins</i>	
THE FERMI GEV EXCESS: CHALLENGES FOR THE DARK MATTER INTERPRETATION	223
<i>Francesca Calore, Nassim Bozorgnia, Mark Lovell, Gianfranco Bertone, Matthieu Schaller, Carlos S. Frenk, Robert A. Crain, Joop Schaye, Tom Theuns, James W. Trayford</i>	
THE ADAMO PROJECT AND DEVELOPMENTS	228
<i>V Caracciolo, R Bernabei, P Belli, F Cappella, R Cerulli, F A Danevich, A D'Angelo, A Di Marco, A Incicchitti, D V Poda, V I Tretyak</i>	
PHENOMENOLOGY OF DARK MATTER-NUCLEON EFFECTIVE INTERACTIONS	233
<i>Riccardo Catena</i>	
RECENT ANALYSES ON THE DAMA/LIBRA-PHASE1 DATA	238
<i>R Bernabei, P Belli, A Di Marco, F Montecchia, A D'Angelo, A. Incicchitti, F Cappella, V Caracciolo, R Cerulli, C J Dai, H L He, H H Kuang, X H Ma, X D Sheng, R G Wang, Z P Ye</i>	
ICECUBE PEV NEUTRINOS AND LEPTOPHILIC DARK MATTER	243
<i>Marco Chianese</i>	
SENSITIVITY OF SODIUM IODIDE CRYOGENIC SCINTILLATION-PHONON DETECTORS TO WIMP SIGNALS	248
<i>M Clark, P Nadeau, P C F Di Stefano, J-C Lanfranchi, S Roth, M Von Sivers, I Yavin</i>	

THE DARKSIDE AWAKENS	253
<i>S Davini, P Agnes, L Agostino, I F M Albuquerque, T Alexander, A K Alton, K Arisaka, H O Back, B Baldin, K Biery, G Bonfini, M Bossa, B Bottino, A Brigatti, J Brodsky, F Budano, S Bussino, M Cadeddu, L Cadonati, M Cadoni, F Calaprice, N Canci, A Candela, H Cao, M. Carielli, M. Carlini, S. Catalanotti, P. Cavalcante, A. Chepurnov, A. Cocco, G. Covone, D. D'Angelo, M. D'Incecco, S. Cecco, M. Deo, M. Vincenzi, A. Derbin, A. Devoto, F. Eusanio, G. Pietro, E. Edkins, A. Empl, A. Fan, G. Fiorilli, K. Fomenko, G. Foster, D. Franco, F. Gabriele, C. Galbiati, C. Giganti, A. Goretti, F. Granato, L. Grandi, M. Gromov, M. Guan, Y. Guardincerri, B. Hackett, K. Herner, E. Hungerford, A. Ianni, A. Ianni, I. James, C. Jollet, K. Keeter, C. Kendziora, V. Kobychev, G. Koh, D. Korablev, G. Korga, A. Kubankin, X. Li, M. LIssia, P. Lombardi, S. Luitz, Y. Ma, I. Machulin, A. Mandarano, S. Mari, J. Maricic, L. Marini, C. Martoff, A. Meregaglia, P. Meyers, T. Miletic, R. Milincic, D. Montanari, A. Monte, M. Montuschi, M. Monzani, P. Mosteiro, B. Mount, V. Muratova, P. Musico, J. Napolitano, M. Orsini, F. Ortica, L. Pagani, M. Pallavicini, E. Pantic, S. Parmeggiano, K. Pelczar, N. Pelliccia, S. Perasso, A. Pocar, S. Pordes, D. Pugachev, H. Qian, K. Randle, G. Ranucci, A. Razeto, B. Reinhold, A. Renshaw, A. Romani, B. Rossi, N. Rossi, S. Rountree, D. Sablone, P. Saggese, R. Saldanha, W. Sands, S. Sangiorgio, C. Savarese, E. Segreto, D. Semenov, E. Shields, P. Singh, M. Skorokhvatov, O. Smirnov, A. Sotnikov, C. Stanford, Y. Suvorov, R. Taraglia, J. Tatarowicz, G. Testera, A. Tonazzo, P. Trinchese, E. Unzhakov, A. Vishneva, B. Vogelaar, M. Wada, S. Walker, H. Wang, Y. Wang, A. Watson, S. Westerdale, J. Wilhelmi, M. Wojcik, X. Xiang, J. Xu, C. Yang, J. Yoo, S. Zavatarelli, A. Zec, W. Zhong, C. Zhu, G. Zuzel</i>	
ANTIDEUTERONS FROM DECAYING GRAVITINO DARK MATTER	259
<i>Timur Delahaye, Michael Greife</i>	
NEWS: NUCLEAR EMULSIONS FOR WIMP SEARCH	264
<i>Natalia Di Marco</i>	
ISOTROPIC DIFFUSE AND EXTRAGALACTIC γ-RAY BACKGROUND: EMISSION FROM EXTRAGALACTIC SOURCES VS DARK MATTER ANNIHILATING PARTICLES	269
<i>Mattia Di Mauro</i>	
DISTILLATION COLUMN FOR THE XENON1T EXPERIMENT	275
<i>Alexander Fieguth</i>	
SABRE: WIMP MODULATION DETECTION IN THE NORTHERN AND SOUTHERN HEMISPHERE	280
<i>F Froborg</i>	
DARK MATTER SEARCH PROJECT PICO-LON	285
<i>K Fushimi, H Ejiri, R Hazama, H Ikeda, K Imagawa, K Inoue, G Kanzaki, A Kozlov, R Orito, T Shima, Y Takemoto, Y Teraoka, S Umehara, K Yasuda, S Yoshida</i>	
STATUS OF THE XENON PROJECT	289
<i>Marco Garbini</i>	
LATEST RESULTS ON SEARCHES FOR DARK MATTER SIGNATURES IN GALACTIC AND EXTRAGALACTIC SELECTED TARGETS BY THE MAGIC TELESCOPES	294
<i>P Giammaria, J Aleksic, S Lombardi, C Maggio, J Palacio, J Rico, G Vanzo, M Vazquez Acosta</i>	
IN-SITU SURFACE CONTAMINATION REMOVAL AND COOL-DOWN PROCESS OF THE DEAP-3600 EXPERIMENT	299
<i>Pietro Giampa</i>	
TREX-DM: A LOW BACKGROUND MICROMEASUREMENT TPC FOR LOW-MASS WIMP DETECTION	304
<i>F J Iguaz, J G Garza, F Aznar, J F Castel, S Cebrían, T Dafni, J A García, I G Irastorza, A Lagraba, G Luzón, A Peiró</i>	
PREDICTING THE CAPTURE RATE IN THE SUN FROM A DIRECT DETECTION SIGNAL INDEPENDENTLY OF THE ASTROPHYSICS	309
<i>Juan Herrero-García</i>	
SIMULATION AND VERIFICATION OF THE COSMOGENIC BACKGROUND AT THE SHALLOW DEPTH GIOVE DETECTOR	315
<i>J Hakenmüller, W Maneschg, G Heusser</i>	
GEV EXCESS AND PHENOMENOLOGICAL ASTROPHYSICS MODELING	320
<i>Xiaoyuan Huang, Torsten Enßlin, Marco Selig</i>	
CANFRANC UNDERGROUND LABORATORY	325
<i>A Ianni</i>	
ON THE DARK MATTER DISTRIBUTION IN THE MILKY WAY	329
<i>Fabio Iocco, Miguel Pato</i>	
DIRECT DARK MATTER SEARCH WITH XMASS: MODULATION ANALYSIS	335
<i>Kazuyoshi Kobayashi</i>	
CAN MUON-INDUCED BACKGROUNDS EXPLAIN THE DAMA DATA?	340
<i>Joel Klinger, Vitaly A. Kudryavtsev</i>	
ULTRA-LOW BACKGROUND MEASUREMENT CAPABILITIES AT SNOLAB	345
<i>Ian Lawson</i>	

DIRECTIONAL DARK MATTER DETECTION WITH THE DMTPC M³ EXPERIMENT	350
<i>Michael Leyton</i>	
RADIATIVE NEUTRINO MASS GENERATION FROM WIMP DARK MATTER	355
<i>Roberto A Lineros</i>	
NOVEL GAMMA-RAY FEATURES FROM DARK MATTER CASCADE PROCESSES INVOLVING SCALARS AND FERMIONS AS INTERMEDIATE STATES	360
<i>Sergio Lopez-Gehler</i>	
AN EXCITING PROSPECT: DETECTING INELASTIC TRANSITIONS OF XENON CAUSED BY DARK MATTER	365
<i>Christopher McCabe</i>	
THE LZ DARK MATTER EXPERIMENT	370
<i>D N McKinsey</i>	
INDIRECT SEARCHES FOR DARK MATTER PARTICLES AT SUPER-KAMIOKANDE	375
<i>Piotr Mijakowski</i>	
(IN)DIRECT DETECTION OF BOOSTED DARK MATTER	380
<i>Kaustubh Agashe, Yanou Cui, Lina Necib, Jesse Thaler</i>	
ISOSPIN VIOLATING DARK MATTER IN STÜCKELBERG PORTALS WITH INTERSECTING D-BRANES	385
<i>Miguel Peiró</i>	
SCALAR DARK MATTER IN AN EXTRA DIMENSION INSPIRED MODEL	390
<i>Roberto Lineros, Fabio Pereira Dos Santos</i>	
NEW RESULTS ON LOW-MASS DARK MATTER FROM THE CRESST-II EXPERIMENT	395
<i>F Petricca, G Angloher, A Bento, C Bucci, L Canonica, X Defay, A Erb, F V Feilitzsch, N Ferreira Iachellini, P Gorla, A Gütlein, D Hauß, J Jochum, M Kiefer, H Kluck, H Kraus, J C Lanfranchi, J Loebell, A Münster, C Pagliarone, W Potzel, F Pröbst, F Reindl, K. Schaffner, J. Schieck, S. Schonert, W. Seidel, L. Stodolsky, C. Strandhagen, R. Strauss, A. Tanzke, H. Thi, C. Turkoglu, M. Uffinger, A. Ulrich, I. Usherov, S. Wawoczny, M. Willers, M. Ustrich, A. Zoller</i>	
LOW ENERGY ANALYSIS IN CUORE-0	400
<i>Gabriele Piperno</i>	
PRECISION MEASUREMENTS OF E+, E-, E++E- FLUXES WITH AMS-02	405
<i>Cecilia Pizzolotto</i>	
INTERACTION OF AXIONS WITH RELATIVISTIC SPINNING PARTICLES	409
<i>V A Popov, A B Balakin</i>	
THE CRESST-III LOW-MASS WIMP DETECTOR	414
<i>R Strauss, G Angloher, A Bento, C Bucci, L Canonica, X Defay, A Erb, F Von Feilitzsch, N Ferreira Iachellini, P Gorla, A Gütlein, D Hauß, J Jochum, M Kiefer, H Kluck, H Kraus, J C Lanfranchi, J Loebell, A Münster, C Pagliarone, F Petricca, W Potzel, F Probst, F. Reindl, K. Schaffner, J. Schieck, S. Schonert, W. Seidel, L. Stodolsky, C. Strandhagen, A. Tanzke, H. Thi, C. Turkoglu, M. Uffinger, A. Ulrich, I. Usherov, S. Wawoczny, M. Willers, M. Ustrich, A. Zoller</i>	
COSMOGENIC AND PRIMORDIAL RADIOISOTOPES IN COPPER BRICKS SHORTLY EXPOSED TO COSMIC RAYS	419
<i>I Coarasa, J Amaré, S Cebrián, C Cuestá, E García, M Martínez, M A Oliván, Y Ortigoza, A Ortíz De Solórzano, J Puimedón, M L Sarsa, J A Villar, P Villar</i>	
MOSCAB (MATERIA OSCURA A BOLLE)	424
<i>Antonino Pullia</i>	
THE QUAX PROPOSAL: A SEARCH OF GALACTIC AXION WITH MAGNETIC MATERIALS	428
<i>G Ruoso, A Lombardi, A Ortolan, R Pengo, C Braggio, G Carugno, C S Gallo, C C Speake</i>	
STATUS OF THE ANAIS DARK MATTER PROJECT AT THE CANFRANC UNDERGROUND LABORATORY	433
<i>J Amaré, S Cebrián, C Cuesta, E García, M Martínez, M A Oliván, Y Ortigoza, A Ortíz De Solórzano, C Pobes, J Puimedón, M L Sarsa, J A Villar, P Villar</i>	
EDELWEISS-III EXPERIMENT: STATUS AND FIRST LOW WIMP MASS RESULTS	438
<i>Silvia Scorza</i>	
GALACTIC CENTER EXCESS BY HIGGS PORTAL DARK MATTER	444
<i>Arindam Das, Nobuchika Okada, Osamu Seto</i>	
SEARCHES FOR THE VIOLATION OF PAULI EXCLUSION PRINCIPLE AT LNGS IN VIP(-2) EXPERIMENT	449
<i>H Shi, S Bartalucci, S Bertolucci, C Berucci, A M Bragadireanu, M Cargnelli, A Clozza, C Curceanu, L De Paolis, S Di Matteo, A D'Uffizi, J-P Egger, C Guaraldo, M Iliescu, T Ishiwatari, J Marton, M Laubenstein, E Milotti, D Pietreanu, K Piscicchia, T Ponta, A Vidal, E. Sbardella, A. Scorda, D. Sirghi, F. Sirghi, L. Sperandio, O. Doce, E. Widmann, J. Zmeskal</i>	
SELF-INTERACTING DARK MATTER AND STERILE NEUTRINOS	454
<i>Yong Tang</i>	

MEASUREMENT OF RADIOACTIVE CONTAMINATION IN THE CCD'S OF THE DAMIC EXPERIMENT	458
<i>A Aguilar-Arevalo, D Amidei, X Bertou, D Bole, M Butner, G Canceled, A Castañeda Vásquez, A E Chavarria, J R De Mello Neto, S Dixon, J C D'Olive, J Estrada, G Fernandez Moroni, K P Hernández Torres, F Izraelevitch, A Kavner, B Kilminster, I Lawson, J Liao, M. Lopez, J. Molina, G. Moreno-Granados, J. Pena, P. Privitera, Y. Sarkis, V. Scarpine, T. Schwarz, M. Haro, J. Tiffenberg, D. Machado, F. Trillaud, X. You, J. Zhou</i>	
ICARUS STATUS AND NEAR FUTURE	463
<i>Filippo Varanini</i>	
ANALYTIC EXPRESSIONS FOR THE KINETIC DECOUPLING OF WIMPS	468
<i>Luca Visinelli</i>	
A QUANTITATIVE STUDY OF AMS-02 $E \pm$ DATA. WHAT CAN WE LEARN ABOUT DARK MATTER?	473
<i>Andrea Vittino, Mattia Di Mauro</i>	
DARK MATTER IDENTIFICATION WITH COSMIC-RAY ANTIDEUTERONS	478
<i>Philip Von Doetinchem</i>	
THE DARKSIDE-50 OUTER DETECTORS	483
<i>S Westerdale, P Agnes, L Agostino, I F M Albuquerque, T Alexander, A K Alton, K Arisaka, H O Back, B Baldin, K Biery, G Bonfini, M Bossa, B Bottino, A Brigatti, J Brodsky, F Budano, S Bussino, M Cadeddu, L Cadonati, M Cadoni, F Calaprice, N Canci, A Candela, H. Cao, M. Cariello, M. Carlini, S. Catalanotti, P. Cavalcante, A. Chepurinov, A. Cocco, G. Covone, D. D'Angelo, M. D'Incecco, S. Davini, S. De Cecco, M. De Deo, M. Vincenzi, A. Derbin, A. Devoto, F. Eusanio, G. Pietro, E. Edkins, A. Empl, A. Fan, G. Fiorillo, K. Fomenko, G. Foster, D. Franco, F. Gabriele, C. Galbiati, C. Giganti, A. Goretti, F. Granato, L. Grandi, M. Gromov, M. Guan, Y. Guardincerri, B. Hackett, K. Herner, E. Hungerford, A. Ianni, I. James, C. Jollet, K. Keeter, C. Kendziora, V. Kobychew, G. Koh, D Korablev, G. Korga, A. Kubankin, X. Li, M. Lissia, P. Lombardi, S. Luitz, Y. Ma, I. Machulin, A. Mandarano, S. Mari, J. Maricic, L. Marini, C. Martoff, A. Mereaglia, P. Meyers, T. Miletic, R. Milincic, D. Montanari, A. Monte, M. Montuschi, M. Monzani, P. Mosteiro, B. Mount, V. Muratova, P. Musico, J. Napolitano, M. Orsini, F. Ortica, L. Pagani, M. Pallavicini, E. Pantic, S. Parmeggiano, K. Pelczar, N. Pelliccia, S. Perasso, A. Pocar, S. Pordes, D. Pugachev, H. Qian, K. Randle, G. Ranucci, A. Razeto, B. Reinhold, A. Renshaw, A. Romani, B. Rossi, N. Rossi, S. Rountree, D. Sablone, P. Saggese, R. Saldanha, W. Sands, S. Sangiorgio, C. Savarese, E. Segreto, D. Semenov, E. Shields, P. Singh, M. D'Skorokhvatov, O. Smirnov, A. Sotnikov, C. Stanford, Y. Suvorov, R. Tartaglia, J. Tatarowicz, G. Testera, A. Tonazzo, P. Trinchese, E. Unzhakov, A. Vishneva, B. Vogelaar, M. Wada, S. Walker, H. Wang, Y. Wang, A. Watson, J. Wilhelmi, M. Wojcik, X. Xiang, J. Xu, C. Yang, J. Yoo, S. Zavatarelli, A. Zec, W. Zhong, C. Zhu, G. Zuzel</i>	
HALO-INDEPENDENT UPPER LIMITS ON THE DARK MATTER SCATTERING CROSS SECTION WITH NUCLEONS	490
<i>Sebastian Wild, Francesc Ferrer, Alejandro Ibarra</i>	
XMASS 1.5: THE NEXT STEP IN KAMIOKA, JAPAN	495
<i>Benda Xu</i>	
NEW APPROACHES IN THE ANALYSIS OF DARK MATTER DIRECT DETECTION DATA	501
<i>Kookhyun Yoon, Stefano Scopel</i>	
THE CDEX DARK MATTER PROGRAM AT THE CHINA JINPING UNDERGROUND LABORATORY	505
<i>Qian Yue, Kejun Kang, Jianming Li, Henry T. Wong</i>	
ANGULAR POWER SPECTRUM OF STERILE NEUTRINO DECAY LINES: THE ROLE OF EROSITA	510
<i>Fabio Zandanel, Christoph Weniger, Shin'Ichiro Ando</i>	
 <u>HIGH ENERGY ASTROPHYSICS AND COSMIC RAYS</u>	
NEUTRINOS AT EXTREME ENERGIES	515
<i>Roberto Aloisio</i>	
ON THE SENSITIVITY OF ATMOSPHERIC CHERENKOV TELESCOPE ARRAYS FOR REGIONS WITH PRESENCE OF MULTIPLE GAMMA-RAY SOURCES	520
<i>L Ambrogio, F Aharonian, E De Oña Wilhelmi</i>	
SIMULATION OF THE ASTRI TWO-MIRRORS SMALL-SIZE TELESCOPE PROTOTYPE FOR THE CHERENKOV TELESCOPE ARRAY	525
<i>C Bigongiari, G Cusumano, F Di Piero, V La Parola, A Stamerra, P Vallania</i>	
SCIENCE WITH THE ASTRI MINI-ARRAY FOR THE CHERENKOV TELESCOPE ARRAY: BLAZARS AND FUNDAMENTAL PHYSICS	530
<i>Giacomo Bonnoli, Fabrizio Tavecchio, Andrea Giuliani, Ciro Bigongiari, Federico Di Piero, Antonio Stamerra, Giovanni Pareschi, Stefano Vercellone</i>	
DEEPLY X-RAYING THE HIGH-ENERGY SKY	535
<i>Eugenio Bottacini, Marco Ajello</i>	

THE TAIGA EXPERIMENT: FROM COSMIC RAY TO GAMMA-RAY ASTRONOMY IN THE TUNKA VALLEY	540
<i>N Budnev, I Astapov, P Bezyazeev, A Bogdanov, V Boreyko, M B�ker, M Br�ckner, A Chiavassa, O Chvalaev, O Gress, T Gress, O Grishin, A Dyachok, S Epimakhov, O Fedorov, A Gafarov, N Gorbunov, V Grebenyuk, A Grinuk, A Haungs, R Hiller, D Horns, T Huege, A Ivanova, A. Kalinin, N. Karpov, N. Kalmykov, Y. Kazarina, K. Kirichkov, S. Kiryuhin, M. Kleifges, R. Kokoulin, V. Kozhin, O. Kromer, M. Kunnas, L. Kuznichenov, V. Lenok, B. Lubsandorzhiev, N. Lubsandorzhiev, R. Mirgazov, R. Mirzoyan, R. Monkhoev, R. Nachtigall, A. Pakhorukov, M. Panasyuk, L. Pankov, A. Perevalov, A. Petrukhin, V. Platonov, V. Poleschuk, E. Popova, A. Porelli, V. Prosin, V. Puskhin, G. Rubtsov, A. Pushnin, V. Samoliga, P. Satunin, F. Schroder, Y. Semenev, A. Silaev, A. Silaev Jr., A. Skurikhin, V. Slucka, C. Spiering, L. Sveshnikova, V. Tabolenko, B. Tarashansky, A. Tkachenko, L. Tkachev, M. Tluczykont, D. Voronin, R. Wischniewski, A. Zagorodnikov, V. Zurbanov, I. Yashin</i>	
CORRELATION BETWEEN UHECRS MEASURED BY THE PIERRE AUGER OBSERVATORY AND TELESCOPE ARRAY AND NEUTRINO CANDIDATE EVENTS FROM ICECUBE	545
<i>A Christov, G Golup, T Montaruli, M Rameez, J Aublin, L Caccianiga, P L Ghia, E Roulet, M Unger, H Sagawa, P Tinyakov</i>	
EXPECTED PERFORMANCE OF THE ASTRI MINI-ARRAY IN THE FRAMEWORK OF THE CHERENKOV TELESCOPE ARRAY	550
<i>F Di Piero, C Bigongiari, A Stamerra, P Vallania</i>	
RECENT HIGHLIGHTS FROM ARGO-YBJ	555
<i>Di Sciascio Giuseppe</i>	
HADRONIC MATTER PHASES AND THEIR APPLICATION TO RAPIDLY ROTATING NEUTRON STARS	560
<i>Tomoki Endo</i>	
PRELIMINARY ANALYSIS OF EUSO—TA DATA	565
<i>F Fenu, L W Piotrowski, H Shin, A Jung, S Bacholle, F Bisconti, F Capel, J Eser, Y Kawasaki, E Kuznetsov, O Larsson, S Mackovjak, H Miyamoto, Z Plebaniak, G Prevot, M Putis, K Shinozaki, J Adams, M Bertaina, P Bobik, M Casolino, J N Matthews, M Ricci, L Wiencke</i>	
PRECISION MEASUREMENTS OF NUCLEAR CR ENERGY SPECTRA AND COMPOSITION WITH THE AMS-02 EXPERIMENT	570
<i>E Fiandrini</i>	
HIGHLIGHTS OF RECENT RESULTS FROM THE VERITAS GAMMA-RAY OBSERVATORY	575
<i>Lucy Fortson</i>	
ATMOSPHERIC NEUTRINOS	580
<i>Thomas K. Gaisser</i>	
THEORETICAL UNCERTAINTIES IN EXTRACTING COSMIC-RAY DIFFUSION PARAMETERS: THE BORON-TO-CARBON RATIO	585
<i>Yoann Genolini</i>	

PART 2

STUDIES ON MUON TOMOGRAPHY FOR ARCHAEOLOGICAL INTERNAL STRUCTURES SCANNING	590
<i>H G�mez, C Carloganu, D Gibert, J Jacquemier, Y Karyotakis, J Marteau, V Niess, S Katsanevas, A Tonazzo</i>	
MEASUREMENT OF THE MUON CONTENT OF AIR SHOWERS WITH ICETOP	595
<i>J G Gonzalez</i>	
GAMMA-RAY AND NEUTRINO DIFFUSE EMISSIONS OF THE GALAXY ABOVE THE TEV	600
<i>D Gaggero, D Grasso, A Marinelli, A Urbano, M Valli</i>	
THE AUGER ENGINEERING RADIO ARRAY AND MULTI-HYBRID COSMIC RAY DETECTION	605
<i>E M Holt</i>	
CHARGE-SIGN DEPENDENT SOLAR MODULATION FOR EVERYONE	610
<i>Rolf Kappf</i>	
MUON MULTIPLICITIES MEASURED USING AN UNDERGROUND COSMIC-RAY ARRAY	615
<i>P Kuusiniemi, T Enqvist, L Bezrukov, H Fynbo, L Inzhechik, J Joutsenvaara, K Loo, B Lubsandorzhiev, V Petkov, M Slupecki, W H Trzaska, A Virkaj�rvi</i>	
LATEST MAGIC DISCOVERIES PUSHING REDSHIFT BOUNDARIES IN VHE ASTROPHYSICS	620
<i>M Manganaro, J Becerra, M Nievas, J Sitarek, F Tavecchio, S Buson, D Dominis, A Dom�nguez, E Lindfors, D Mazin, A Moralejo, A Stamerra, Ie Vovk</i>	
CALET ON THE ISS: A HIGH ENERGY ASTROPARTICLE PHYSICS EXPERIMENT	625
<i>Pier Simone Marrocchesi</i>	
HIGH ENERGY NEUTRINO DETECTION WITH KM3NET	630
<i>Pasquale Migliozi</i>	

RESULTS OF THE FIRST EUSO-BALLOON FLIGHT	635
<i>H Miyamoto, M Bertaina</i>	
AXION-LIKE PARTICLES FROM EXTRAGALACTIC HIGH ENERGY SOURCES.....	640
<i>J Conrad, M Meyer, D Montanino</i>	
COSMIC RAYS FROM MULTI-WAVELENGTH OBSERVATIONS OF THE GALACTIC DIFFUSE EMISSION	645
<i>Elena Orlando</i>	
THE MINI-ARRAY OF ASTRI SST-2M TELESCOPES, PRECURSORS FOR THE CHERENKOV TELESCOPE ARRAY	651
<i>Giovanni Pareschi, Giacomo Bonnoli, Stefano Vercellone</i>	
NEW APPROACH TO COSMIC RAY INVESTIGATIONS ABOVE THE KNEE.....	656
<i>A G Bogdanov, R P Kokoulin, A A Petrukhin</i>	
APPLICATION OF PHOTON DETECTORS IN THE VIP2 EXPERIMENT TO TEST THE PAULI EXCLUSION PRINCIPLE.....	661
<i>A Pichler, S Bartalucci, M Bazzi, S Bertolucci, C Berucci, M Bragadireanu, M Cargnelli, A Clozza, C Curceanu, L De Paolis, S Di Matteo, A D'Ufflzi, J-P Egger, C Guaraldo, M Iliescu, T Ishiwatari, M Laubenstein, J Marton, E Milotti, D Pietreanu, K Piscicchia, T. Ponta, E. Sbardella, A. Scordo, H. Shi, D. Sirghi, F. Sirghi, L. Sperandio, O. Vazquez-Doce, E. Widmann, J. Zmeskal</i>	
RESULTS AND PERSPECTIVES OF COSMIC RAY MASS COMPOSITION STUDIES WITH EAS ARRAYS IN THE TUNKA VALLEY	666
<i>V V Prosin, N M Budnev, A Chiavassa, A N Dyachok, S N Epimakhov, F Fenu, Yu A Fomin, O A Gress, T I Gress, N N Kalmykov, N I Karpov, E E Korosteleva, V A Kozhin, L A Kuzmichev, B K Lubsandorzhev, N B Lubsandorzhev, R R Mirgazov, R D Monhoev, E A Osipova, M. Panasyuk, L. Pankov, E. Popova, V. Ptuskin, Y. Semenev, A. Silaev, A. Silaev Jr., A. Skurikhin, C. Spiering, V. Sulakov, L. Sveshnikova, A. Zagorodnikov</i>	
LOCATION AND ORIGIN OF GAMMA-RAYS IN BLAZARS	671
<i>B Rani, T P Krichbaum, J A Hodgson, J A Zensus</i>	
COSMIC RAY SPECTRUM AND COMPOSITION FROM THREE YEARS OF ICETOP AND ICECUBE.....	676
<i>K Rawlins</i>	
THE JEM-EUSO PROGRAM	681
<i>Marco Ricci</i>	
MEASUREMENT OF COSMIC RAYS WITH LOFAR.....	686
<i>L Rossetto, S Buitink, A Corstanje, J E Enriquez, H Falcke, J R Hörandel, A Nelles, J P Rachen, P Schellart, O Scholten, S Ter Veen, S Thoudam, T N G Trinh</i>	
STUDY OF THE PENETRATING COMPONENT OF COSMIC RAYS UNDERGROUND USING LARGE SCINTILLATION DETECTORS.....	691
<i>O G Ryazhskaya</i>	
MEASUREMENT OF THE MASS COMPOSITION OF ULTRA-HIGH ENERGY COSMIC RAYS WITH THE PIERRE AUGER OBSERVATORY.....	696
<i>Mariangela Settimo</i>	
ELECTRON AND THERMAL NEUTRON LATERAL DISTRIBUTION FUNCTIONS IN EAS AT HIGH ALTITUDE	702
<i>O B Shchegolev, V V Alekseenko, Z Y Cai, Z Cao, S W Cui, D M Gromushkin, X W Guo, H H He, Y Liu, X Ma, Yu V Stenkin, V I Stepanov, J Zhao</i>	
STUDY OF MUON BUNDLES FROM EXTENSIVE AIR SHOWERS WITH THE ALICE DETECTOR AT CERN LHC	706
<i>K Shtejer</i>	
LONG-TERM STUDIES OF THE CYGNUS REGION AND ITS OBJECTS: CYG X-3 AND γCYgni SNR.....	711
<i>V G Sinitsyna, V Y Sinitsyna</i>	
HIGH ENERGY NEUTRINOS FROM GAMMA-RAY BURST FIREBALLS	716
<i>Irene Tamborra</i>	
SENSITIVITY OF A SEARCH FOR COSMIC RAY SOURCES INCLUDING MAGNETIC FIELD EFFECTS	721
<i>Martin Erdmann, Gero Müller, Martin Urban</i>	
GAMMA RAY ASTRONOMY WITH LHAASO	726
<i>S Vernetto</i>	
SHALON OBSERVATIONS OF ACTIVE GALACTIC NUCLEI AT RED SHIFT FROM $Z = 0.0179$ TO $Z = 2.979$	731
<i>V G Sinitsyna, A Y Alaverdyan, M S Andreeva, K A Balygin, S S Borisov, I A Ivanov, A M Kirichenko, A I Klimov, I P Kozhukhova, R M Mirzafatikhov, N I Moseiko, S I Nikolsky, I E Ostashev, A I Palamarchuk, V Y Sinitsyna, I G Volokh</i>	

NEUTRINOS

LATEST RESULTS ON ATMOSPHERIC NEUTRINO OSCILLATIONS FROM ICECUBE/DEEPCORE	737
<i>J P A M De André</i>	
AN AUTONOMOUS UNDERWATER TELESCOPE FOR MEASURING THE SCATTERING OF LIGHT IN THE DEEP SEA	742
<i>K G Balasi, T Domvoglou, I Kiskiras, D Lenis, M Maniatis, N Maragos, G Stavropoulos</i>	
GEONEUTRINOS AND REACTOR ANTINEUTRINOS AT SNO+	747
<i>M Baldoncini, V Strati, S A Wipperfurth, G Fiorentini, F Mantovani, W F McDonough, B Ricci</i>	
ON CONCENTRATION OF ⁴²AR IN LIQUID ARGON	752
<i>A S Barabash, R R Saakyan, V I Umatov</i>	
NEUTRINO OSCILLATIONS: FROM AN HISTORICAL PERSPECTIVE TO THE PRESENT STATUS	757
<i>S Bilenky</i>	
INVESTIGATING $\beta\beta$ DECAY WITH THE NEMO-3 AND SUPERNEMO EXPERIMENTS	768
<i>S Blot</i>	
RESULTS FROM THE CUORE-0 EXPERIMENT	773
<i>L Canonica, C Alduino, K Alfonso, D R Artusa, F T Avignone III, O Azzolini, T I Banks, G Bari, J W Beeman, F Bellini, A Bersani, M Biassoni, C Brofferio, C Bucci, A Caminata, X G Cao, S Capelli, L Cappelli, L Carbone, L Cardani, P Carniti, N Casali, L Cassina, D. Chiesa, N. Chott, M. Clemenza, S. Copello, C. Cosmelli, O. Cremonesi, R. Creswick, J. Cushman, I. Dafinei, A. Dally, C. Davis, S. Dell'Oro, M. Deninno, S. Domizio, M. Vacri, A. Drobizhev, D. Fang, M. Faverzani, G. Fernandes, E. Ferri, F. Ferroni, E. Fiorini, B. Fujikawa, A. Giachero, L. Gironi, A. Giuliani, L. Gladstone, P. Gorla, C. Gotti, T. Gutierrez, E. Haller, K. Han, E. Hansen, K. Heeger, R. Hennings-Yeomans, K. Hickerson, H. Huang, R. Kadel, G. Keppel, Y. Kolomensky, K. Lim, X. Liu, Y. Ma, M. Maino, L. Marini, M. Martinez, R. Maruyama, Y. Mei, N. Moggi, S. Morganti, P. Mosteiro, C. Nones, E. Norman, A. Nucciotti, T. O'Donnell, F. Orto, J. Ouellet, C. Pagliarone, M. Pallavicini, V. Palmieri, L. Pattavina, M. Pavan, G. Pessina, V. Pettinacci, G. Piperno, S. Pirro, S. Pozzi, E. Previtali, C. Rosenfeld, C. Rusconi, E. Sala, S. Sangiorgio, D. Santone, N. Scielzo, V. Singh, M. Sisti, A. Smith, L. Taffarello, M. Tenconi, F. Terranova, C. Tomei, S. Trentalange, G. Ventura, M. Vignati, S. Wagaarachchi, B. Wang, H. Wang, J. Wilson, L. Winslow, T. Wise, L. Zanotti, G. Zhang, B. Zhu, S. Zimmermann, S. Zucchelli</i>	
LUMINEU: A SEARCH FOR NEUTRINOLESS DOUBLE BETA DECAY BASED ON ZNMOO4 SCINTILLATING BOLOMETERS	778
<i>E Armengaud, Q Arnaud, C Augier, A Benoît, A Benoît, L Bergé S Boiko, T Bergmann, J Blümer, A Broniatowski, V Brudanin, P Camus, A Cazes, M Chapellier, F Charlieux, D M Chernyak, N Coron, P Coulter, F A Danevich, T De Boissière, R Decourt, M De Jesus, L Devoyon, A. Drillien, L. Dumoulin, K. Eitel, C. Enss, D. Filosofov, A. Fleischmann, N. Foerster, N. Fourches, J. Gascon, L. Gastaldo, G. Gerbier, A. Giuliani, D. Gray, M. Gros, L. Hehn, S. Henry, S. Herve, G. Heuermann, V. Humbert, I. Ivanov, A. Juillard, C. Kefelian, M. Kleifges, H. Kluck, V. Kobychiev, F. Koskas, V. Kozlov, H. Kraus, V. Kudryavtsev, H. Sueur, M. Loidl, P. Magnier, E. Makarov, M. Mancuso, P. Marcillac, S. Marnieros, C. Marrache-Kikuchi, A. Menshikov, S. Nasonov, X. Navick, C. Nones, E. Oliveiri, P. Pari, B. Paul, Y. Penichot, G. Pessina, M. Piro, O. Plantevin, D. Poda, T. Redon, M. Robinson, M. Rodrigues, S. Rozov, V. Sanglard, B. Schmidt, S. Scorza, V. Shlegel, B. Siebenborn, O. Strazzer, D. Tcherniakhovskii, M. Tenconi, L. Torres, V. Tretyak, L. Vagneron, Y. Vasiliev, M. Velazquez, O. Viraphong, R. Walker, M. Weber, E. Yakushev, X. Zhang, V. Zhdankov</i>	
SEARCH FOR DOUBLE BETA DECAY OF ¹¹⁶CD WITH ENRICHED ¹¹⁶CDWO4 CRYSTAL SCINTILLATORS (AURORA EXPERIMENT)	783
<i>F A Danevich, A S Barabash, P Belli, R Bernabei, F Cappella, V Caracciolo, R Cerulli, D M Chernyak, S D'Angelo, A Incicchitti, V V Kobychiev, S I Konovalov, M Laubenstein, V M Mokina, D V Poda, O G Polischuk, V N Shlegel, V I Tretyak, V I Umatov</i>	
A COMMON SOLUTION OF TWO COSMIC PUZZLES	788
<i>Shlomo Dado, Arnon Dar</i>	
NON-STANDARD NEUTRINO INTERACTIONS IN ICECUBE	793
<i>Melanie Day</i>	
RECENT RESULTS FROM COSMOLOGY AND NEUTRINOLESS DOUBLE BETA DECAY	798
<i>Stefano Dell'Oro, Simone Marcocci</i>	
IMPACT OF STERILE NEUTRINOS IN LEPTON FLAVOUR VIOLATING PROCESSES	803
<i>Valentina De Romeri</i>	
STATUS AND NEUTRINO OSCILLATION PHYSICS POTENTIAL OF THE HYPER-KAMIOKANDE PROJECT IN JAPAN	808
<i>Gianfranca De Rosa</i>	
SHIP: A NEW FACILITY TO SEARCH FOR HEAVY NEUTRINOS AND STUDY $\nu\tau$ PROPERTIES	813
<i>M De Serio</i>	

SEARCH FOR STERILE NEUTRINO MIXING IN THE MUON NEUTRINO TO TAU NEUTRINO APPEARANCE CHANNEL WITH THE OPERA DETECTOR	818
<i>A Di Crescenzo</i>	
RESULTS FROM THE OPERA EXPERIMENT IN THE CNCS BEAM	822
<i>N Di Marco</i>	
MEASURING THE 14C CONTENT IN LIQUID SCINTILLATORS	827
<i>T Enqvist, I R Barabanov, L B Bezrukov, A M Gangapshev, Y M Gavriluyuk, V Yu Grishina, V I Gurentsov, J Hissa, J Joutsenvaara, V V Kazalov, S Krokhalova, J Kutuniva, P Kuusiniemi, V V Kuzminov, A S Kurlovich, K Loo, B K Lubsandorzhev, S Lubsandorzhev, V Morgalyuk, G. Novikova, A. Pshukov, V. Sinev, M. Slupecki, W. Trzaska, S. Umerov, A. Veresnikova, A. Virkajarvi, Y. Yanovich, V. Zavarzina</i>	
ZICOS - NEW PROJECT FOR NEUTRINOLESS DOUBLE BETA DECAY EXPERIMENT USING ZIRCONIUM COMPLEX IN LIQUID SCINTILLATOR.....	831
<i>Yoshiyuki Fukuda</i>	
DEVELOPMENT OF MICROWAVE-MULTIPLEXED SUPERCONDUCTIVE DETECTORS FOR THE HOLMES EXPERIMENT	836
<i>A Giachero, D Becker, D A Bennett, M Faverzani, E Ferri, J W Fowler, J D Gard, J P Hays-Wehle, G C Hilton, M Maino, J A B Mates, A Puiu, A Nucciotti, C D Reintsema, D S Swetz, J N Ullom, L R Vale</i>	
A FLEXIBLE SCINTILLATION LIGHT APPARATUS FOR RARE EVENTS SEARCHES	841
<i>L Gironi, G Baldazzi, V Bonvicini, R Campana, S Capelli, Y Evangelista, M Fasoli, M Feroci, F Fuschino, C Labanti, M Marisaldi, E Previtali, L Riganese, A Rashevsky, M Sisti, A Vacchi, A Vedda, G Zampa, N Zampa, M Zuffa</i>	
A COMBINED LIMIT ON THE NEUTRINO MASS FROM NEUTRINOLESS DOUBLE-BETA DECAY SEARCHES IN MULTIPLE ISOTOPES	846
<i>P Guzowski</i>	
SEARCH FOR EV STERILE NEUTRINOS AT A NUCLEAR REACTOR — THE STEREO PROJECT	851
<i>J Haser</i>	
SEARCH FOR DOUBLE ELECTRON CAPTURE ON ¹²⁴XE WITH THE XMASS-I DETECTOR.....	855
<i>Katsuki Hiraide</i>	
HIGH SIGNIFICANCE MEASUREMENT OF THE TERRESTRIAL NEUTRINO FLUX WITH THE BOREXINO DETECTOR.....	860
<i>A Ianni, M Agostini, K Altenmüller, S Appel, G Bellini, J Benziger, D Bick, G Bonfini, D Bravo, B Caccianiga, F Calaprice, A Caminata, P Cavalcante, A Chepurinov, D D'Angelo, S Davini, A Derbin, L Di Noto, I Drachnev, A Etenko, G Fiorentini, K Fomenko, D Franco, F. Gabriele, C. Galbiati, C. Ghiano, M. Giammarchi, M. Goger-Neff, A. Goretti, M. Gromov, C. Hagner, E. Hungerford, A. Ianni, K. Jedrzejczak, M. Kaiser, V. Kobychov, D. Korablev, G. Korga, D. Kryn, M. Laubenstein, B. Lehnert, E. Litvinovich, F. Lombardi, P. Lombardi, L. Ludhova, G. Lukyanchenko, I. Machulin, S. Manecki, W. Maneschg, F. Mantovani, S. Marcocci, E. Meroni, M. Meyer, L. Miramonti, M. Misiaszek, M. Montuschi, P. Mosteiro, V. Muratova, B. Neumair, L. Oberauer, M. Obolensky, F. Ortica, M. Pallavicini, L. Papp, L. Perasso, A. Pocar, G. Ranucci, A. Razeto, A. Re, B. Ricci, A. Romani, R. Roncin, N. Rossi, S. Schonert, D. Semenov, H. Singen, M. Skorokhvatov, O. Smirnov, A. Sotnikov, S. Sukhotin, Y. Suvorov, R. Tartaglia, G. Testera, J. Thurn, M. Toropova, E. Unzhakov, A. Vishneva, R. Vogelaar, F. Feilitzsch, H. Wang, S. Weinz, J. Witner, M. Wojcik, M. Wurm, Z. Yokley, O. Zaimidoroga, S. Zavatarelli, K. Zuber, G. Zuzel</i>	
STATUS AND FUTURE PROSPECT OF 48CA DOUBLE BETA DECAY SEARCH IN CANDLES	866
<i>T Iida, K Nakajima, S Ajimura, T Batpurev, W M Chan, K Fushimi, R Hazama, H Kakubata, B T Khai, T Kishimoto, X Li, T Maeda, A Masuda, K Matsuoka, K Morishita, N Nakatani, M Nomachi, S Noshiro, I Ogawa, T Ohata, H Osumi, K Suzuki, Y Tamagawa, K Tesuno, V T T Trang, T. Uehara, S. Umehara, S. Yoshida</i>	
EXTREMELY HIGH ENERGY NEUTRINOS IN SIX YEARS OF ICECUBE DATA	871
<i>Aya Ishihara</i>	
THE SNOLAB SCIENCE PROGRAM.....	876
<i>Chris Jillings</i>	
RESULTS AND PROSPECTS OF ICECUBE'S REAL TIME ALERT CAPABILITIES	881
<i>Thomas Kintscher</i>	
KM3NET - ORCA: MEASURING THE NEUTRINO MASS ORDERING IN THE MEDITERRANEAN	886
<i>Antoine Kouchner</i>	
NEUTRINO-ATOM COLLISIONS	891
<i>Konstantin A Kouzakov, Alexander I Studenikin</i>	
UNDERGROUND PHYSICS WITH DUNE.....	896
<i>Vitaly A Kudryavtsev</i>	
THE NEXT DOUBLE BETA DECAY EXPERIMENT	901
<i>A Läing</i>	
LATEST DOUBLE CHOOZ RESULTS	906
<i>Thierry Lasserre</i>	

BACKGROUND REJECTION OF N+ SURFACE EVENTS IN GERDA PHASE II	910
<i>Björn Lehnert</i>	
NEUTRINO AND DARK MATTER PHYSICS WITH SUB-KEV GERMANIUM DETECTORS	916
<i>Hau Bin Li</i>	
ATOMIC IONIZATION BY NEUTRINOS AT LOW ENERGIES	921
<i>Cheng-Pang Liu</i>	
DIRECT DETECTION OF RELIC ACTIVE AND STERILE NEUTRINOS	926
<i>Yu-Feng Li</i>	
STATISTICAL CRITERIA FOR SEARCH OF HEAVY NEUTRINO IN TRITIUM SPECTRUM	931
<i>Alexey Lokhov, Fyodor Tkachov</i>	
STATUS AND PROSPECTS OF THE SNO+ EXPERIMENT	936
<i>J Maneira</i>	
RECENT RESULTS WITH ANTARES, THE FIRST UNDERSEA NEUTRINO TELESCOPE IN THE MEDITERRANEAN SEA	941
<i>Annarita Margiotta</i>	
THREE-NEUTRINO MIXING: STATUS AND PROSPECTS	946
<i>A Marrone, F Capozzi, E Lisi, D Montanino, A Palazzo</i>	
RECENT PROGRESS OF SPAN TOWARDS NEUTRINO MASS SPECTROSCOPY	951
<i>T Masuda, H Hara, Y Miyamoto, N Sasao, M Tanaka, S Uetake, A Yoshimi, K Yoshimura, M Yoshimura</i>	
RECENT NUCLEON DECAY RESULTS FROM SUPER KAMIOKANDE	956
<i>S Mine</i>	
CHARACTERIZATION OF THE ASTROPHYSICAL NEUTRINO FLUX AT THE ICECUBE NEUTRINO OBSERVATORY	961
<i>Lars Mohrmann</i>	
ON THE HIGH-ENERGY COSMIC NEUTRINOS SEEN BY ICECUBE	966
<i>G Pagliaroli, A Palladino, F L Villante, F Vissani</i>	
AXEL: HIGH PRESSURE XENON GAS TIME PROJECTION CHAMBER FOR NEUTRINOLESS DOUBLE BETA DECAY SEARCH	971
<i>Sheng Pan</i>	
SCINTILLATING BOLOMETERS FOR THE LUCIFER PROJECT	976
<i>L Pattavina</i>	
SEARCH FOR DOUBLE BETA DECAY OF ¹⁰⁶CD IN THE TGV-2 EXPERIMENT	982
<i>N I Rukhadze, V B Brudanin, V G Egorov, A A Klímenko, A Kovalik, P Kouba, F Piquemal, S V Rozov, E Rukhadze, A V Salamatin, F Šimković, Yu A Shitov, I Štekl, V V Timkin, E A Yakushev</i>	
DEVELOPMENT OF AN UNDERGROUND LOW BACKGROUND INSTRUMENT FOR HIGH SENSITIVITY MEASUREMENTS	987
<i>E Sala, I S Hahn, W G Kang, G W Kim, Y D Kim, M H Lee, D S Leonard, Su Yeon Park</i>	
BACKGROUND ANALYSIS AND REDUCTION FOR THE ECHO EXPERIMENT	992
<i>Stephan Scholl</i>	
LOW ENERGY NEUTRINOS IN SUPER-KAMIOKANDE	997
<i>Hiroyuki Sekiya</i>	
RECENT RESULT FROM RENO	1002
<i>Hyunkwan Seo</i>	
THE CUORE CRYOSTAT: COMMISSIONING AND PERFORMANCE	1007
<i>V Singh, C Alduino, F. Alessandria, A Bersani, M Biassoni, C Bucci, A Caminata, L Canonica, L Cappelli, R Cereseto, N Chott, S Copello, O Cremonesi, J S Cushman, A D'Addabbo, C J Davis, S Dell'Oro, A Drobizhev, M A Franceschi, L Gladstone, P Gorla, M Guetti, C. Ligi, T. Napolitano, A. Nucciotti, D. Orlandi, J. Ouellet, C. Pagliarone, L. Pattavina, C. Rusconi, D. Santone, L. Taffarello, F. Terranova, J. Wallig, T. Wise, S. Uttaro</i>	
STANDARD MODEL FERMION MASSES AND MIXING ANGLES GENERATED IN 3HDM	1012
<i>A Ibarra, A Solaguren-Beascoa</i>	
THEORETICAL CHALLENGES IN DOUBLE BETA DECAY	1017
<i>Sabin Stoica</i>	
RELATIVISTIC ELECTRONS SPIN STATES AND SPIN LIGHT IN DENSE NEUTRINO FLUXES	1022
<i>Ilya Balantsev, Alexander Studenikin</i>	
NEUTRINO SPIN-FLAVOR OSCILLATIONS DERIVED FROM THE MASS BASIS	1028
<i>R Fabbriatore, A Grigoriev, A Studenikin</i>	

RECENT RESULTS FROM BOREXINO	1034
<i>G Testera, M Agostin, K Altenmüller, S Appel, G Bellini, J Benziger, D Bick, G Bonfini, D Bravo, B Caccianiga, F Calaprince, A Caminata, P Cavalcante, A Chepurinov, D D'Angelo, S Davini, A Derbin, L Di Noto, I Drachnev, A Etenko, K Fomenko, D Franco, F Gabriele, C. Galbiati, C. Ghiano, M. Giammarchi, M. Goger-Neff, A. Goretti, M. Gromov, C. Hagner, E. Hungerford, A. Ianni, K. Jędrzejczak, M. Kaiser, V. Kobaychev, D. Korablev, G. Korga, D. Kryn, M. Laubenstein, B. Lehnert, E. Litvinovich, F. Lombardi, P. Lombardi, L. Ludhova, G. Lukyanchenko, I. Machulin, S. Manecki, W. Maneschg, S. Marcocci, E. Meroni, M. Meyer, L. Miramonti, M. Misiaszek, M. Montuschi, P. Mosteiro, L. Muratova, B. Neumair, L. Oberauer, M. Obolensky, F. Ortica, M. Pallavicini, L. Papp, L. Perasso, A. Pocar, G. Ranucci, A. Razeto, A. Re, A. Romani, R. Roncin, N. Rossi, S. Schonert, D. Semenov, H. Simgen, M. Skorokhvatov, O. Smirnov, A. Sotnikov, S. Sukhotin, Y. Suvorov, R. Tartaglia, J. Thurn, M. Toropova, E. Unzhakov, A. Vishneva, R. Vogelaar, F. Feilitzsch, H. Wang, S. Weinz, J. Winter, M. Wojcik, M. Wurm, Z. Yokley, O. j Zaimidoroga, S. Zavatarelli, K. Zuber, G. Zuzel</i>	
THE LEPTONIC DIRAC CP-VIOLATING PHASE FROM SUM RULES	1040
<i>I Girardi, S T Petcov, A V Titov</i>	
WA105: A LARGE-SCALE DEMONSTRATOR OF THE LIQUID ARGON DOUBLE PHASE TPC	1045
<i>A Tonazzo</i>	
NEW LIMITS ON 2B PROCESSES IN ¹⁰⁶CD	1049
<i>V I Tretyak, P Belli, R Bernabei, V B Brudanin, F Cappella, V Caracciolo, R Cerulli, D M Chernyak, F A Danevich, S D'Angelo, A Di Marco, A Incicchitti, M Laubenstein, V M Mokina, D V Poda, O G Polischuk, I A Tupitsyna</i>	
OMNIBUS EXPERIMENT: CPT AND CP VIOLATION WITH STERILE NEUTRINOS	1054
<i>K K Loo, N Yu Novikov, M V Smirnov, W H Trzaska, M Wurm</i>	
ICARUS STATUS AND NEAR FUTURE	1059
<i>Filippo Varanini</i>	
CALDER - NEUTRINOLESS DOUBLE-BETA DECAY IDENTIFICATION IN TeO₂ BOLOMETERS WITH KINETIC INDUCTANCE DETECTORS	1064
<i>M Vignati, F Bellini, L Cardani, N Casali, M G Castellano, I Colantoni, A Coppolecchia, C Cosmelli, A Cruciani, A D'Addabbo, S Di Domizio, M Martinez, C Tomei</i>	
SOX: SEARCH FOR SHORT BASELINE NEUTRINO OSCILLATIONS WITH BOREXINO	1069
<i>M Vivier, M Agostini, K Altenmüller, S Appel, G Bellini, J Benziger, N Berton, D Bick, G Bonfini, D Bravo, B Caccianiga, F Calaprince, A Caminata, P Cavalcante, A Chepurinov, K Choi, M Cribier, D D'Angelo, S Davini, A Derbin, L Di Noto, I Drachnev, M Durero, A. Etenko, S. Farinon, V. Fischer, K. Fomenko, D. Franco, F. Gabriele, J. Gaffiot, C. Galbiati, C. Ghiano, M. Giammarchi, M. Goeger-Neff, A. Goretti, M. Gromov, C. Hagner, T. Houdy, E. Hungerford, A. Ianni, N. Jonquieres, K. Jędrzejczak, M. Kaiser, V. Kobaychev, D. Korablev, G. Korga, V. Kornoukhov, D. Kryn, T. Lachenmaier, T. Lasserre, M. Laubenstein, B. Lehnert, J. Link, E. Litvinovich, F. Lombardi, P. Lombardi, L. Ludhova, G. Lukyanchenko, I. Machulin, S. Manecki, W. Maneschg, S. Marcocci, J. Maricic, G. Mention, E. Meroni, M. Meyer, L. Miramonti, M. Misiaszek, M. Montuschi, P. Mosteiro, V. Muratova, R. Musenich, B. Neumair, L. Oberauer, M. Obolensky, F. Ortica, M. Pallavicini, L. Papp, L. Perasso, A. Pocar, G. Ranucci, A. Razeto, A. Re, A. Romani, R. Roncin, N. Rossi, S. Schonert, L. Scola, D. Semenov, H. Simgen, M. Skorokhvatov, O. Smirnov, A. Sotnikov, S. Sukhotin, Y. Suvorov, R. Tartaglia, G. Testera, J. Thurn, M. Toropova, C. Veysiere, E. Unzhakov, R. Vogelaar, F. Feilitzsch, H. Wang, S. Weinz, J. Winter, M. Wojcik, M. Wurm, Z. Yokley, O. Zaimidoroga, S. Zavatarelli, K. Zuber, G. Zuzel</i>	
NEUTRINOS IN DENSE MEDIA: HELICITY- AND PAIR CORRELATIONS	1075
<i>Hendrik Vogel, Alexander Kartavtsev, Georg Raffelt</i>	
THEORETICAL DEVELOPMENTS IN SUPERNOVA NEUTRINO PHYSICS: MASS CORRECTIONS AND PAIRING CORRELATORS	1080
<i>Cristina Volpe</i>	
LATEST PROGRESS FROM THE DAYA BAY REACTOR NEUTRINO EXPERIMENT	1085
<i>Zhe Wang</i>	
CURRENT STATUS OF SK-GD PROJECT AND EGADS	1090
<i>Chenyuan Xu</i>	
NEUTRINO ASTROPHYSICS WITH HYPER-KAMIOKANDE	1095
<i>Takatomi Yano</i>	
CONSTRAINTS ON THE FLAVOR-DEPENDENT NON-STANDARD INTERACTION IN PROPAGATION FROM ATMOSPHERIC NEUTRINOS	1100
<i>Osamu Yasuda</i>	
NEUTRINO EMISSION FROM NEARBY SUPERNOVA PROGENITORS	1105
<i>Takashi Yoshida, Koh Takahashi, Hideyuki Umeda</i>	
PREDICTIONS FOR NEUTRINOLESS DOUBLE-BETA DECAY IN THE 3+1 STERILE NEUTRINO SCENARIO	1110
<i>C Giunti, E M Zavanin</i>	
JUNO CENTRAL DETECTOR AND ITS PROTOTYPING	1116
<i>Zhimin Wang</i>	
STATUS AND PERSPECTIVES OF NEUTRINO MAGNETIC MOMENTS	1121
<i>Studenikin Alexander</i>	

GRAVITATIONAL WAVES

METHODOLOGY OF THE JOINT SEARCH FOR GRAVITATIONAL WAVE AND LOW ENERGY NEUTRINO SIGNALS FROM CORE-COLLAPSE SUPERNOVAE	1129
<i>Claudio Casentini</i>	
THE FIRST TIME DOMAIN EXPERIMENT WITH SWIFT: MONITORING OF SEVEN NEARBY GALAXIES	1135
<i>I Andreoni, P D'Avanzo, S Campana, M Branchesi, Mg Bernardini, M Delia Valle, F Mannucci, A Melandri, G Tagliaferri</i>	
THE GINGER PROJECT AND STATUS OF THE GINGERINO PROTOTYPE AT LNGS	1140
<i>A Ortolan, J Belfi, F Bosi, A Di Virgilio, N Beverini, G Carelli, E Maccioni, R Santagata, A Simonelli, A Beghi, D Cuccato, A Donazzan, G Naletto</i>	
GRAVITATIONAL-WAVE DETECTION BY DISPERSION FORCE MODULATION IN NANOSCALE PARAMETRIC AMPLIFIERS	1145
<i>Pinto Fabrizio</i>	
STUDIES ON THE HIGH-ENERGY FOLLOW-UP OF GRAVITATIONAL WAVE TRANSIENT EVENTS	1150
<i>Massimiliano Razzano, Barbara Patricelli, Giancarlo Cella, Francesco Fidecaro, Elena Pian, Antonio Stamerra, Marica Branchesi</i>	
NEWTORITES IN BAR DETECTORS OF GRAVITATIONAL WAVE	1155
<i>F Ronga</i>	
LIGHT AS A PROBE OF THE STRUCTURE OF SPACE-TIME	1160
<i>Angelo Tartaglia</i>	
ADVANCED VIRGO PHASE CAMERAS	1165
<i>L Van Der Schaaf, K Agatsuma, M Van Beuzekom, M Gebyehu, J Van Den Brand</i>	

OUTREACH AND EDUCATION

EEE - EXTREME ENERGY EVENTS: AN ASTROPARTICLE PHYSICS EXPERIMENT IN ITALIAN HIGH SCHOOLS	1170
<i>M Abbrescia, C Avanzini, L Baldini, R Baldini Ferroli, G Batignani, G Bencivenni, E Bossini, E Bressan, A Chiavassa, C Cicalò, L Cifarelli, E Coccia, A Corvaglia, D De Gruttola, S De Pasquale, A Di Giovanni, M D'Incecco, M Dreucci, F L Fabbri, E Fattibene, A Ferrarrov, R Forster, V Frolov, P Galeotti, M Garbini, G Gemme, I Gnesi, S Grazi, C Gustavino, D Hatzifotiadou, P Rocca, A Maggiora, G Maron, M Mazziotta, S Miozzi, F Noferini, F Nozzoli, M Panareo, M Panetta, R Paoletti, L Perasso, F Pilo, G Piragino, F Riggi, G Righini, A Rodriguez, G Sartorelli, E Scapparone, M Schioppa, A Scribano, M Selvi, S Serci, E Siddi, S Squarcia, M Taiuti, G Terreni, M Vistoli, L Votano, M Williams, S Zani, A Zichichi, R Zuyewski</i>	

Author Index