

FRONTIERS IN NUCLEAR STRUCTURE, ASTROPHYSICS, AND REACTIONS

FINUSTAR 3

Rhodes, Greece 23 – 27 August 2010

EDITORS

Paraskevi Demetriou
NCSR "Demokritos", Athens, Greece

Rauno Julin
University of Jyväskylä, Jyväskylä, Finland

Sotirios V. Harissopoulos
NCSR "Demokritos", Athens, Greece

SPONSORING ORGANIZATIONS

EC (FP7/REGPOT/Grant 230123-LIBRA)
NCSR "Demokritos", Athens, Greece



AIP
American Institute
of Physics

Melville, New York, 2011
AIP | CONFERENCE PROCEEDINGS ■ 1377

Editors

Paraskevi Demetriou
Institute of Nuclear Physics
NCSR "Demokritos"
P. O. Box 60228
153.10 Aghia Paraskevi
Athens, Greece

E-mail: vivian@inp.demokritos.gr

Rauno Julin
Department of Physics
University of Jyväskylä
P. O. Box 35 (YFL)
FI-40014, Jyväskylä, Finland

E-mail: julin@phys.jyu.fi

Sotirios V. Harissopoulos
Tandem Accelerator Laboratory
Institute of Nuclear Physics
NCSR "Demokritos"
P. O. Box 60228
153.10 Aghia Paraskevi
Athens, Greece

E-mail: sharisop@inp.demokritos.gr

Authorization to photocopy items for internal or personal use, beyond the free copying permitted under the 1978 U.S. Copyright Law (see statement below), is granted by the American Institute of Physics for users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of \$30.00 per copy is paid directly to CCC, 222 Rosewood Drive, Danvers, MA 01923, USA. For those organizations that have been granted a photocopy license by CCC, a separate system of payment has been arranged. The fee code for users of the Transactional Reporting Services is: 978-0-7354-0937-8/11/\$30.00

© 2011 American Institute of Physics

No claim is made to original U.S. Government works.

Permission is granted to quote from the AIP Conference Proceedings with the customary acknowledgment of the source. Republication of an article or portions thereof (e.g., extensive excerpts, figures, tables, etc.) in original form or in translation, as well as other types of reuse (e.g., in course packs) require formal permission from AIP and may be subject to fees. As a courtesy, the author of the original proceedings article should be informed of any request for republication/reuse. Permission may be obtained online using Rightslink. Locate the article online at <http://proceedings.aip.org>, then simply click on the Rightslink icon "Permission for Reuse" link found in the article abstract. You may also address requests to: AIP Office of Rights and Permissions, Suite 1N01, 2 Huntington Quadrangle, Melville, NY 11747-4502, USA; Fax: 516-576-2450; Tel.: 516-576-2268; E-mail: rights@aip.org.

L.C. Catalog Card No. 2011909179
ISBN 978-0-7354-0937-8
ISSN 0094-243X
Printed in the United States of America

AIP Conference Proceedings, Volume 1377
Frontiers in Nuclear Structure, Astrophysics, and Reactions
FINUSTAR 3

Table of Contents

Preface: Frontiers in Nuclear Structure, Astrophysics, and Reactions Paraskevi Demetriou, Rauno Julin, and Sotirios V. Harissopoulos	1
Committees	3
Conference Photo	4
Scientific Program	5

ORAL CONTRIBUTIONS

Spectroscopy of neutron-rich Pu nuclei P. Chowdhury, S. Hota, S. Lakshmi, S. K. Tandel, T. Harrington, E. Jackson, K. Moran, U. Shirwadkar, I. Ahmad, M. P. Carpenter, C. J. Chiara, J. Greene, C. R. Hoffman, R. V. F. Janssens, T. L. Khoo, F. G. Kondev, T. Lauritsen, C. J. Lister, E. A. McCutchan, D. Seweryniak, I. Stefanescu, and S. Zhu	13
MUSETT and the spectroscopy of heavy elements at GANIL Barbara Sulignano and MUSETT Collaboration	18
Weak decay rates for neutron-deficient Kr isotopes relevant for the rp process P. Sarriguren	23
Electron capture reactions and beta decays in stellar environments T. Suzuki, H. Mao, M. Honma, T. Yoshida, T. Kajino, and T. Otsuka	28
The impact of LUNA results on astroparticle physics Carlo Gustavino	33
Laser spectroscopy—Present and future at ISOLDE K. T. Flanagan	38

Exotic modes of excitation and weak interaction rates at finite temperature	
N. Paar	46
Measurement of isospin mixing in $^{80}\text{Zr}^*$ at finite temperature	
A. Corsi, O. Wieland, S. Barlini, V. L. Kravchuk, A. Bracco, F. Camera, F. C. L. Crespi, A. Giaz, S. Leoni, R. Nicolini, V. Vandone, G. Benzoni, N. Blasi, S. Brambilla, B. Million, D. Montanari, L. Bardelli, M. Bini, G. Casini, A. Nannini, G. Pasquali, G. Poggi, M. Cinausero, M. Degerlier, F. Gramegna, T. Marchi, G. Baiocco, M. Bruno, M. D'Agostino, L. Morelli, G. Vannini, M. Ciemala, M. Kmiecik, A. Maj, K. Mazurek, W. Meczynski, S. Myalski, and A. Ordine	51
Experimental studies of an exotic decay mode at the proton drip-line: The two-proton radioactivity	
L. Audirac, N. Adimi, P. Ascher, B. Blank, B. A. Brown, C. Borcea, G. Canchel, I. Companis, F. Delalee, C. E. Demonchy, F. de Oliveira Santos, C. Dossat, J. Giovinazzo, S. Grévy, L. V. Grigorenko, L. Hay, J. Huikari, T. Kurtukian-Nieto, S. Leblanc, I. Matea, J.-L. Pedroza, L. Perrot, J. Pibernat, L. Serani, C. Stodel, P. Strivastava, and J.-C. Thomas	56
The EXL experiment at FAIR and plans with the ESR at GSI	
N. Kalantar-Nayestanaki	61
Incident-energy dependent quenching of the analyzing power in pre-equilibrium composite particle emission	
A. A. Cowley, S. S. Dimitrova, and J. J. van Zyl	69
Nuclear astrophysics with light nuclei at GANIL	
François de Oliveira Santos	74
The r-process nucleosynthesis during the decompression of neutronised matter	
S. Goriely, N. Chamel, and J. M. Pearson	82
Fission-Fusion: A new reaction mechanism for nuclear astrophysics based on laser-ion acceleration	
P. G. Thirolf, D. Habs, M. Gross, K. Allinger, J. Bin, A. Henig, D. Kiefer, W. Ma, and J. Schreiber	88

Lifetime measurement of the 2^+_1 state in ^{20}C	
M. Petri, P. Fallon, A. O. Macchiavelli, S. Paschalis, K. Starosta, T. Baugher, D. Bazin, L. Cartegni, R. M. Clark, H. L. Crawford, M. Cromaz, A. Dewald, A. Gade, G. F. Grinyer, S. Gros, M. Hackstein, H. B. Jeppesen, I. Y. Lee, S. McDaniel, D. Miller, M. M. Rajabali, A. Ratkiewicz, W. Rother, P. Voss, K. A. Walsh, D. Weisshaar, and M. Wiedeking	96
Neutron-rich $^{62,64,66}\text{Fe}$ show enhanced collectivity: The washout of $N=40$ in terms of experiment, valence proton symmetry and shell model	
W. Rother, A. Dewald, H. Iwasaki, S. M. Lenzi, K. Starosta, D. Bazin, T. Baugher, B. A. Brown, H. L. Crawford, C. Fransen, A. Gade, T. N. Ginter, T. Glasmacher, G. F. Grinyer, M. Hackstein, G. Ilie, J. Jolie, S. McDaniel, D. Miller, P. Petkov, Th. Pissulla, A. Ratkiewicz, C. A. Ur, P. Voss, K. A. Walsh, D. Weisshaar, and K.-O. Zell	104
New generation of physics with exotic nuclei at RIBF	
H. Sakurai	109
Exotic shapes and exotic clusterization	
J. Cseh, J. Darai, and A. Algora	116
Assigning γ deformation from fine structure in exotic nuclei	
L. S. Ferreira, E. Maglione, and P. Arumugam	121
Gamow-Teller transitions starting from $T_z = +3/2$ nucleus ^{47}Ti	
E. Ganioglu, H. Fujita, Y. Fujita, T. Adachi, A. Algora, M. Csatlos, J. Deaven, E. Estevez, C. Guess, J. Gulyás, K. Hatanaka, K. Hirota, D. Ishikawa, A. Krasznahorkay, H. Matsubara, R. Meharchand, F. Molina, H. Okamura, H. J. Ong, G. Perdikakis, B. Rubio, C. Scholl, G. Susoy, T. Suzuki, A. Tamii, J. Thies, R. G. T. Zegers, and J. Zenihiro	126
Exotic structures near the drip lines	
M. M. Sharma, J. K. Sharma, and A. A. Saldanha	131
Coupled-channels density-matrix approach to low-energy nuclear reaction dynamics	
Alexis Diaz-Torres	136

Elastic scattering of beryllium isotopes near the Coulomb barrier	
A. Di Pietro, F. Amorini, P. Figuera, M. Fisichella, M. Lattuada, A. Musumarra, M. Papa, M. G. Pellegriti, G. Randisi, F. Rizzo, D. Santonocito, G. Scalia, V. Scuderi, E. Strano, D. Torresi, L. Acosta, I. Martel, F. Perez-Bernal, M. J. G. Borge, O. Tengblad, A. M. Vidal, L. M. Fraile, H. Jeppesen, D. Voulot, F. Wenander, J. Gomez-Camacho, M. Milin, R. Raabe, and M. Zadro	144
Proton-induced fission of actinides at energies 26.5 and 62.9 MeV—Theoretical interpretation	
P. Demetriou, Th. Keutgen, R. Prieels, and Y. El Masri	152
TAS measurements for reactor physics and nuclear structure	
A. Algora, D. Jordan, J. L. Taín, B. Rubio, J. Agramunt, L. Caballero, E. Náchter, A. B. Perez-Cerdan, F. Molina, E. Estevez, A. Krasznahorkay, M. D. Hunyadi, J. Gulyás, A. Vitéz, M. Csatlós, L. Csige, J. Äystö, H. Penttilä, S. Rinta-Antila, I. Moore, T. Eronen, A. Jokinen, A. Nieminen, J. Hakala, P. Karvonen, A. Kankainen, U. Hager, T. Sonoda, A. Saastamoinen, J. Rissanen, T. Kessler, C. Weber, J. Ronkainen, S. Rahaman, V. Elomaa, K. Burkard, W. Hüller, L. Batist, W. Gelletly, A. L. Nichols, T. Yoshida, A. A. Sonzogni, and K. Peräjärvi	157
Measurements of ISGMR in Sn, Cd and Pb isotopes and the asymmetry of nuclear matter incompressibility	
M. Fujiwara, T. Li, D. Patel, U. Garg, G. P. A. Berg, Y. Liu, R. Marks, J. Matta, B. K. Nayak, P. V. Madhusudhana-Rao, A. Long, K. Sault, R. Talwar, H. Hashimoto, K. Nakanishi, S. Okumura, M. Yosoi, M. Ichikawa, M. Itoh, R. Matsuo, T. Terazono, M. Uchida, Y. Iwao, T. Kawabata, T. Murakami, H. Sakaguchi, S. Terashima, Y. Yasuda, J. Zenihiro, H. Akimune, C. Iwamoto, A. Okamoto, K. Kawase, T. Adachi, and M. N. Harakeh	164
Selected topics on nuclear structure in electroweak processes	
E. Moya de Guerra, O. Moreno, and P. Sarriguren	172
Nuclear quests for supernova dynamics and nucleosynthesis	
K. Langanke and G. Martínez-Pinedo	180

Improving the $^{33}\text{S}(p,\gamma)^{34}\text{Cl}$ reaction rate for models of classical nova explosions	
A. Parikh, Th. Faestermann, R. Krücken, V. Bildstein, S. Bishop, K. Eppinger, C. Herlitzius, O. Lepyoshkina, P. Maierbeck, D. Seiler, K. Wimmer, R. Hertenberg, H.-F. Wirth, J. Fallis, U. Hager, D. Hutcheon, Ch. Ruiz, L. Buchmann, D. Ottewell, B. Freeman, Ch. Wrede, A. García, B. Delbridge, A. Knecht, A. Sallaska, A. A. Chen, J. A. Clark, C. M. Deibel, B. Fulton, A. Laird, U. Greife, B. Guo, E. Li, Z. Li, G. Lian, Y. Wang, W. Liu, P. D. Parker, and K. Setoodehnia	188
High accuracy $^{18}\text{O}(p,\alpha)^{15}\text{N}$ reaction rate in the $8\cdot 10^6 - 5\cdot 10^9$ K temperature range	
M. La Cognata, C. Spitaleri, A. Mukhamedzhanov, A. Banu, S. Cherubini, A. Coc, V. Crucillà, V. Goldberg, M. Gulino, B. Irgaziev, G. G. Kiss, L. Lamia, J. Mrazek, R. G. Pizzone, S. M. R. Puglia, G. G. Rapisarda, S. Romano, M. L. Sergi, G. Tabacaru, L. Trache, R. E. Tribble, W. Trzaska, and A. Tumino	195
Development of a Micromegas TPC for low energy heavy ions measurement for nuclear fission and astrophysics applications	
S. Panebianco, M. Axiotis, D. Doré, G. Fanourakis, Th. Geralis, I. Giomataris, S. Harissopulos, A. Lagoyannis, Th. Papaevangelou, and L. Vernoud	200
The structure of excited 0^+ states in nuclei and the effect of the γ degree of freedom	
J. F. Sharpey-Schafer	205
Mapping quadrupole collectivity in the Cd isotopes: The breakdown of harmonic vibrational motion	
P. E. Garrett, K. L. Green, J. Bangay, A. Diaz Varela, C. S. Sumithrarachchi, R. A. E. Austin, G. C. Ball, D. S. Bandyopadhyay, L. Bianco, S. Colosimo, D. S. Cross, G. A. Demand, P. Finlay, A. B. Garnsworthy, G. F. Grinyer, G. Hackman, W. D. Kulp, K. G. Leach, A. C. Morton, J. N. Orce, C. J. Pearson, A. A. Phillips, M. A. Schumaker, C. E. Svensson, S. Triambak, J. Wong, J. L. Wood, and S. W. Yates	211
Study of near-stability nuclei populated as fission fragments in heavy-ion fusion reactions	
N. Fotiades, J. A. Cizewski, R. O. Nelson, M. Devlin, R. Krücken, R. M. Clark, P. Fallon, I. Y. Lee, A. O. Macchiavelli, J. A. Becker, and W. Younes	216

Nuclear ingredients for cross section calculation of exotic nuclei S. Hilaire, S. Goriely, A. J. Koning, and M. Girod	221
Sub-barrier fusion and breakup of light halo nuclei I. Martel, R. Wolski, L. Standyło, L. Acosta, J. L. Aguado, C. Angulo, R. Berjillos, J. P. Bolivar, J. A. Dueñas, M. S. Golovkov, T. Keutgen, M. Mazzocco, A. M. Sánchez-Benítez, C. Signorini, M. Romoli, and K. Rusek	229
Preliminary study of two-neutron states via the ($^{18}\text{O}, ^{16}\text{O}$) reaction at 84 MeV M. Cavallaro, F. Cappuzzello, D. Carbone, A. Cunsolo, A. Foti, S. Tudisco, M. Bondi, G. Santagati, G. Taranto, R. Chen, R. Linares, F. Azaiez, S. Franchoo, M. Niikura, and J. A. Scarpaci	234
Gamma-ray strength functions and their relation to astrophysics A. C. Larsen, S. Goriely, E. Algin, U. Agvaanluvsan, A. Bürger, A. Görge, M. Guttormsen, T. W. Hagen, T. Lönnroth, G. E. Mitchell, H. T. Nyhus, J. B. Rekstad, T. Renstrøm, S. J. Rose, I. E. Ruud, A. Schiller, S. Siem, N. U. H. Syed, H. K. Toft, G. M. Tveten, A. Voinov, and K. Wikan	239
On the nature of the dipole pygmy resonance E. G. Lanza, A. Vitturi, M. V. Andrés, F. Catara, and D. Gambacurta	247
The γSF method H. Utsunomiya, S. Goriely, H. Akimune, T. Yamagata, T. Kondo, C. Iwamoto, A. Okamoto, H. Harada, F. Kitatani, S. Goko, H. Toyokawa, K. Yamada, Y.-W. Lui, S. Hilaire, and A. J. Koning	255
Splitting of the pygmy dipole resonance J. Endres, P. Butler, M. N. Harakeh, S. Harissopulos, R.-D. Herzberg, R. Krücken, A. Lagoyannis, E. Litvinova, N. Pietralla, V. Yu. Ponomarev, L. Popescu, P. Ring, D. Savran, M. Scheck, K. Sonnabend, V. I. Stoica, H. J. Wörtche, and A. Zilges	260
Photon strength functions at the low-energy tail of the GEDR obtained from different reactions M. Krtička and F. Bečvář	265
^{12}C formation: A classical quest in new light O. Tengblad, M. Alcorta, M. J. G. Borge, M. Cubero, M. Madurga, A. Perea, H. O. U. Fynbo, K. Riisager, O. Kirsebom, S. Hyldegaard, B. Jonson, G. Nyman, T. Nilsson, D. G. Diget, and B. Fulton	270

Influence of strange matter admixtures on macroscopic properties of neutron stars	
M. Urbanec, E. Běták, and Z. Stuchlík	275
First charge-exchange measurements with SHARAQ	
K. Miki, H. Sakai, and NP0811-SHARAQ72 Collaboration	280
Recent advances in multi-channel algebraic scattering	
S. Karataglidis, P. R. Fraser, K. Amos, L. Canton, G. Pisent, J. P. Svenne, and D. van der Knijff	286
Signatures of structural changes in neutron-rich Sr, Zr and Mo isotopes	
R. Rodríguez-Guzmán, P. Sarriguren, and L. M. Robledo	291
Suppression of alpha formation probability around the $N = 126$ shell closure	
Chong Qi, A. N. Andreyev, M. Huyse, R. J. Liotta, P. Van Duppen, and R. Wyss	296
Investigation of ^{246}Fm : In-beam spectroscopy at the limits	
J. Piot, O. Dorvaux, B. J.-P. Gall, P. T. Greenlees, L. L. Andersson, D. M. Cox, F. Dechery, T. Grahn, K. Hauschild, G. Henning, A. Herzan, R.-D. Herzberg, F. P. Heßberger, U. Jakobsson, P. Jones, R. Julin, S. Juutinen, S. Ketelhut, T.-L. Khoo, M. Leino, J. Ljungvall, A. Lopez-Martens, P. Nieminen, P. Papadakis, E. Parr, P. Peura, P. Rakhila, S. Rinta-Antila, J. Rubert, P. Ruotsalainen, M. Sandzelius, J. Sarén, C. Scholey, D. Seweryniak, J. Sorri, B. Sulignano, C. Theisen, and J. Uusitalo	301
Nuclear structure at the extremes; in-beam γ-ray spectroscopy of ^{180}Pb	
J. Pakarinen, P. Rakhila, D. G. Jenkins, C. Gray-Jones, P. T. Greenlees, U. Jakobsson, P. Jones, R. Julin, S. Juutinen, S. Ketelhut, H. Koivisto, M. Leino, P. Nieminen, M. Nyman, P. Papadakis, S. Paschalis, M. Petri, P. Peura, O. Roberts, T. Ropponen, P. Ruotsalainen, J. Sarén, C. Scholey, J. Sorri, A. G. Tuff, J. Uusitalo, R. Wadsworth, M. Bender, and P.-H. Heenen	306
Measurement of absolute $E2$ transition strengths in ^{176}W: Signatures for a rapid shape change	
Ch. Fransen, A. Dewald, G. Friessner, M. Hackstein, J. Jolie, O. Möller, T. Pissulla, W. Rother, and K.-O. Zell	311

DPUNS—A differential-plunger for lifetime measurements of tagged exotic/unbound nuclear states
D. M. Cullen 316

Alpha-particle capture reactions in inverse kinematics relevant to p-process nucleosynthesis
P. Ujić, A. Lagoyannis, T. J. Mertzimekis, F. de Oliveira Santos, S. Harissopulos, P. Demetriou, L. Perrot, Ch. Stodel, M.-G. Saint-Laurent, O. Kamalou, A. Lefebvre-Schuhl, A. Spyrou, M. A. Amthor, S. Grevy, L. Caceres, H. Koivisto, M. Laitinen, J. Uusitalo, and R. Julin 321

POSTER CONTRIBUTIONS

The spectroscopic study of ^{33}Ar
N. Adimi, R. Dominguez-Reyes, M. Alcorta, A. Bey, B. Blank, M. J. G. Borge, F. de Oliveira Santos, C. Dossat, H. O. U. Fynbo, J. Giovinazzo, H. H. Knudsen, M. Madurga, I. Matea, A. Perea, K. Sümmerer, O. Tengblad, and J. C. Thomas 329

Cadmium mass measurements between the neutron shell closures at $N = 50$ and 82
Ch. Borgmann, M. Breitenfeldt, G. Audi, S. Baruah, D. Beck, K. Blaum, Ch. Böhm, R. B. Cakirli, R. F. Casten, P. Delahaye, M. Dworschak, S. George, F. Herfurth, A. Herlert, A. Kellerbauer, M. Kowalska, S. Kreim, D. Lunney, E. Minaya-Ramirez, S. Naimi, D. Neidherr, M. Rosenbusch, R. Savreux, S. Schwarz, L. Schweikhard, and C. Yazidjian 332

Yield of radioactive products of transfer reactions induced by ^6He ions on ^{197}Au target
T. V. Chuvilskaya, N. A. Demekhina, A. A. Kulko, Yu. E. Penionzhkevich, N. K. Skobelev, and A. A. Shirokova 335

Elastic scattering of ^9Li on ^{208}Pb at energies around the Coulomb barrier
M. Cubero, J. P. Fernández-García, J. A. Lay, L. Acosta, M. Alcorta, M. A. G. Alvarez, M. J. G. Borge, L. Buchmann, D. G. Diget, B. Fulton, H. O. U. Fynbo, D. Galaviz, J. Gómez-Camacho, I. Martel, A. M. Moro, I. Mukha, T. Nilsson, A. M. Sánchez-Benítez, A. Shotter, O. Tengblad, and P. Walden 338

Improved relativistic QRPA calculations of the γ-ray strength I. Daoutidis, S. Goriely, D. Pena Arteaga, and P. Ring	341
Clusterization and phase-transitions in atomic nuclei J. Darai, J. Cseh, and P. O. Hess	344
^{17}F breakup reactions: A touchstone for indirect measurements M. De Napoli, G. Raciti, C. Sfienti, P. Capel, D. Baye, F. Giacoppo, E. Rapisarda, G. Cardella, P. Descouvemont, C. Mazzocchi, and J.-M. Sparenberg	347
Fusion cross section in the $^{4,6}\text{He}+^{64}\text{Zn}$ collisions around the Coulomb barrier M. Fisichella, A. Di Pietro, P. Figuera, C. Marchetta, M. Lattuada, M. Milin, A. Musumarra, M. G. Pellegriti, V. Scuderi, N. Skukan, E. Strano, D. Torresi, and M. Zadro	350
Nucleosynthesis in neutrino-driven, aspherical supernova explosion of a massive star S. Fujimoto, M. Hashimoto, M. Ono, K. Kotake, and N. Ohnishi	353
Gogny HFB prediction of nuclear structure properties S. Goriely, S. Hilaire, and M. Girod	356
Latest development of the combinatorial model of nuclear level densities S. Goriely, S. Hilaire, and M. Girod	359
Photoneutron cross sections for Au O. Itoh, H. Utsunomiya, H. Akimune, T. Yamagata, T. Kondo, M. Kamata, H. Toyokawa, H. Harada, F. Kitatani, S. Goko, C. Nair, and Y.-W. Lui	362
Energy-dependent nucleus-nucleus potential Yoritaka Iwata, Hans Feldmeier, and Joachim A. Maruhn	365
Transfer reactions using a low-energy ^{11}Be beam Jacob Johansen, IS430 Collaboration, and MINIBALL Collaboration	368
Evidence for the scissors mode in ^{160}Tb from the two-step gamma cascades measurement J. Kroll, F. Bečvář, M. Krtička, and I. Tomandl	371

Dipole bands in ^{196}Hg	
J. J. Lawrie, E. A. Lawrie, B. Msezane, M. Benatar, M. Federke, G. K. Mabala, S. M. Mullins, K. P. Mutshena, N. J. Ncapayi, R. T. Newman, J. F. Sharpey-Schafer, F. D. Smit, and P. Vymers	374
B(M1) staggering in two-quasiparticle chiral bands	
Obed Shirinda and Elena Lawrie	377
Qweak—A search for new physics	
John P. Leckey IV and Qweak Collaboration	380
Electron screening in metals	
M. Lipoglavšek and U. Mikac	383
Onset of collectivity in neutron-rich iron isotopes: Toward a new island of inversion?	
J. Ljungvall	386
Asymmetric neutrino reactions from magnetized proto-neutron stars in fully relativistic framework including hyperons	
T. Maruyama, N. Yasutake, T. Kajino, M.-K. Cheoun, and C.-Y. Ryu	389
Possible chiral bands in ^{194}Tl	
P. L. Masiteng, E. A. Lawrie, T. M. Ramashidzha, J. J. Lawrie, R. A. Bark, J. Kau, F. Komati, R. Lindsay, S. M. Maliage, I. Matamba, S. M. Mullins, P. Mutshena, S. H. T. Murray, J. F. Sharpey-Schafer, P. A. Vymers, and Y. Zhang	392
The ground state g factor of ^{44}Cl: A probe for the reduced gaps at $Z=16$ and $N=28$	
Theo J. Mertzimekis and GANIL E513 Collaboration	395
Symmetric and non-symmetric muonic helium atoms studies	
S. Mohammadi	398
Reaction dynamics and nuclear structure via deep inelastic collisions with heavy-ions: Search for particle-vibration couplings in ^{49}Ca	
D. Montanari, S. Leoni, G. Benzoni, N. Blasi, G. Bocchi, A. Bracco, S. Brambilla, F. Camera, A. Corsi, F. C. L. Crespi, B. Million, R. Nicolini, O. Wieland, L. Corradi, G. de Angelis, F. Della Vedova, E. Fioretto, A. Gadea, B. Guiot, D. R. Napoli, R. Orlandi, F. Recchia, R. Silvestri, A. M. Stefanini, R. P. Singh, S. Szilner, J. J. Valiente-Dobon, D. Bazzacco, E. Farnea, S. M. Lenzi, S. Lunardi, P. Mason, D. Mengoni, G. Montagnoli, F. Scarlassara, C. Ur, G. Lo Bianco, A. Zucchiatti, M. Kmiecik, A. Maj, W. Meczynski, and G. Pollarolo	402

Cold hybrid star properties H. R. Moshfegh, M. Darehmoradi, and M. G. Mojarad	405
Nuclear shell structure in semi-realistic mean-field approach H. Nakada	408
Nucleosynthesis in magnetohydrodynamical jets from collapsars M. Ono, M. Hashimoto, S. Fujimoto, K. Kotake, and S. Yamada	411
Proton-capture nucleosynthesis in low mass stars: Effects of new reaction rates S. Palmerini, M. Busso, M. La Cognata, and S. Cristallo	414
A recoil-beta tagging study of N=Z nucleus ^{66}As P. Ruotsalainen, C. Scholey, R. Wadsworth, D. G. Jenkins, B. S. Nara Singh, T. S. Brock, P. T. Greenlees, U. Jakobsson, P. Jones, R. Julin, S. Juutinen, S. Ketelhut, M. Leino, N. M. Lumley, P. J. R. Mason, P. Nieminen, M. Nyman, I. Paterson, P. Peura, M. G. Procter, P. Rakhila, J. Sarén, J. Sorri, and J. Uusitalo	417
R-process nucleosynthesis in supernova explosion M. Saruwatari, M. Hashimoto, K. Kotake, and S. Yamada	420
Experiments for the astrophysical p process with the in-beam method A. Sauerwein, M. Elvers, J. Endres, J. Hasper, A. Hennig, L. Netterdon, and A. Zilges	423
Elastic scattering and fusion of ^6Li on ^{64}Zn at the barrier V. Scuderi, E. Strano, F. Amorini, A. Di Pietro, P. Figuera, M. Fisichella, O. Goryunov, C. Maiolino, M. Lattuada, A. Musumarra, V. Ostashko, M. Papa, M. G. Pellegriti, F. Rizzo, D. Santonocito, D. Torresi, and M. Zadro	426
Reaching degeneracy in two-quasiparticle chiral bands O. Shirinda and E. A. Lawrie	429
Dynamical dipole mode in heavy-ion fusion-evaporation and fission reactions in the ^{192}Pb mass region R. Silvestri, D. Pierroutsakou, C. Parascandolo, C. Agodi, R. Alba, V. Baran, A. Boiano, M. Colonna, R. Coniglione, E. De Filippo, A. Del Zoppo, M. Di Toro, U. Emanuele, F. Farinon, A. Guglielmetti, G. Inglima, M. La Commara, C. Maiolino, B. Martin, M. Mazzocco, C. Mazzocchi, C. Rizzo, M. Romoli, M. Sandoli, D. Santonocito, C. Signorini, A. Trifirò, and M. Trimarchi	432

Gamow-Teller transitions starting from $T_z = +3/2$ nucleus ^{45}Sc	
G. Susoy, H. Fujita, Y. Fujita, T. Adachi, A. Algora, M. Csatlos, J. Deaven, E. Estevez, E. Ganioglu, C. Guess, J. Gulyás, K. Hatanaka, K. Hirota, D. Ishikawa, A. Krasznahorkay, H. Matsubara, R. Meharchand, F. Molina, H. Okamura, Y. Oktem, H. J. Ong, G. Perdikakis, B. Rubio, C. Scholl, T. Suzuki, A. Tamii, J. Thies, R. G. T. Zegers, and J. Zenihiro	435
Structure of neutron-rich calcium isotopes and roles of three-body interaction	
T. Suzuki and T. Otsuka	438
Microscopic description of the alpha-clustering phenomenon in (2s-1d)-shell nuclei	
I. A. Gnilozub, S. D. Kurgalin, and Yu. M. Tchuvil'sky	441
Studying ^{12}B via ^8Li-α resonant scattering	
D. Torresi, L. Cosentino, A. Di Pietro, C. Ducoin, P. Figuera, M. Fisichella, M. Lattuada, T. Lonroth, C. Maiolino, A. Musumarra, M. Papa, M. G. Pellegriti, M. Rovituro, D. Santonocito, G. Scalia, V. Scuderi, E. Strano, and M. Zadro	444
Striking behavior of photoneutron cross sections for ^{90}Zr near threshold	
H. Utsunomiya, S. Goriely, H. Akimune, T. Yamagata, T. Kondo, C. Iwamoto, O. Itoh, M. Kamata, M. Io, K. Kususe, T. Teramoto, H. Harada, F. Kitatani, S. Goko, H. Toyokawa, K. Yamada, and Y.-W. Lui	447
Application of the γSF method to palladium	
H. Utsunomiya, S. Goriely, D. P. Arteaga, I. Daoutidis, H. Akimune, T. Yamagata, T. Kondo, C. Iwamoto, M. Kamata, O. Itoh, H. Harada, F. Kitatani, S. Goko, H. Toyokawa, K. Yamada, Y.-W. Lui, S. Hilaire, and A. J. Koning	450
γ-spectroscopy of positive parity bands in the ^{156}Gd nucleus	
A. Vancraeynest, D. Guinet, D. Curien, O. Stezowski, Q. T. Doan, N. Redon, J. Dudek, P. T. Greenlees, and P. Jones	453
Finite-range separable pairing interaction within new N^3LO DFT approach	
P. Vesely, J. Dobaczewski, N. Michel, and J. Toivanen	456

The $^{237}\text{Np}(n,f)$ cross section at the CERN n-TOF facility	
D. Karadimos, R. Vlastou, V. Vlachoudis, P. Pavlopoulos, V. Konovalov, M. Diakaki, U. Abbondanno, G. Aerts, H. Álvarez, F. Alvarez-Velarde, S. Andriamonje, J. Andrzejewski, P. Assimakopoulos, L. Audouin, G. Badurek, P. Baumann, F. Bečvář, J. Benlliure, E. Berthoumieux, F. Calviño, D. Cano-Ott, R. Capote, A. Carrillo de Albornoz, V. Chepel, E. Chiaveri, N. Colonna, G. Cortes, D. Cortina, A. Couture, J. Cox, S. David, R. Dolfini, C. Domingo-Pardo, A. Dorochenko, W. Dridi, I. Duran, Ch. Eleftheriadis, M. Embid-Segura, L. Ferrant, A. Ferrari, R. Ferreira-Marques, L. Fitzpatrick, H. Fraiss-Koelbl, K. Fujii, W. Furman, I. Goncalves, R. Gallino, P. Cennini, E. Gonzalez-Romero, A. Goverdovski, F. Gramegna, E. Griesmayer, C. Guerrero, F. Gunsing, B. Haas, R. Haight, M. Heil, A. Herrera-Martinez, M. Igashira, S. Isaev, E. Jericha, Y. Kadi, F. Käppeler, D. Karamanis, M. Kerveno, V. Ketlerov, P. Koehler, D. Kolokolov, E. Kossionides, M. Krtička, C. Lamboudis, H. Leeb, A. Lindote, I. Lopes, M. Lozano, S. Lukic, J. Marganec, L. Marques, S. Marrone, P. Mastinu, A. Mengoni, P. M. Milazzo, C. Moreau, M. Mosconi, F. Neves, H. Oberhummer, S. O'Brien, M. Oshima, J. Pancin, C. Papachristodoulou, C. Papadopoulos, C. Paradela, N. Patronis, A. Pavlik, L. Perrot, R. Plag, A. Plompen, A. Plukis, A. Poch, C. Pretel, J. Quesada, T. Rauscher, R. Reifarth, M. Rosetti, C. Rubbia, G. Rudolf, P. Rullhusen, J. Salgado, L. Sarchiapone, I. Savvidis, M. Sedysheva, C. Stephan, G. Tagliente, J. L. Tain, L. Tassan-Got, L. Tavora, R. Terlizzi, G. Vannini, P. Vaz, A. Ventura, D. Villamarin, M. C. Vincente, F. Voss, H. Wendler, M. Wiescher, and K. Wisshak, and n_TOF Collaboration	459
NACRE II: An update of the NACRE compilation of $A_{\text{target}} < 16$ charged-particle thermonuclear reaction rates for astrophysics	
Y. Xu, K. Takahashi, S. Goriely, and M. Arnould	463
Alpha-particle capture reactions in inverse kinematics relevant to p-process nucleosynthesis	
P. Ujčić, A. Lagoyannis, T. J. Mertzimekis, F. de Oliveira Santos, S. Harissopulos, P. Demetriou, L. Perrot, Ch. Stodel, M.-G. Saint-Laurent, O. Kamalou, A. Lefebvre-Schuhl, A. Spyrou, M. A. Amthor, S. Grevy, L. Caceres, H. Koivisto, M. Laitinen, J. Uusitalo, and R. Julin	543
Author Index	487