

Rutherford Centennial Conference on Nuclear Physics 2011

Journal of Physics: Conference Series Volume 381

**Manchester, United Kingdom
8-12 August 2011**

**ISBN: 978-1-62276-848-6
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© (2011) by the Institute of Physics
All rights reserved.

Printed by Curran Associates, Inc. (2013)

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: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

INVITED CONTRIBUTIONS

012001 Rutherford, Radioactivity and the Origins of Nuclear Physics	1
<i>J Hughes</i>	
012002 Perspectives on Nuclear Physics Over the Past 100 Years	13
<i>J P Schiffer</i>	
012003 Double Beta Decay	25
<i>S R Elliott</i>	
012004 Glimpsing Colour in a World of Black and White	33
<i>M R Pennington</i>	
012005 High-momentum Components of the Nuclear Wave Function: Short Range Correlations, Eme Effect, and the Tensor Parts of the N-N Interaction	41
<i>E Piasetzky</i>	
012006 Precise Form Factors from Elastic Electron Scattering	49
<i>J C Bernauer</i>	
012007 Probing the States of Nucleons in Exotic Nuclei	57
<i>J A Tostevin</i>	
012008 Uncovering the Properties of Exotic Nuclei Via Reactions with Relativistic Radioactive Beams	65
<i>T Aumann</i>	
012009 Simplicity from Complexity	73
<i>M Freer, S Almaraz-Calderon, J Carter, A Aprahamian, N I Ashwood, M Barr, B Bucher, P Copp, M Couder, N Curtis, X Fang, F Jung, S Leshner, W Lu, J D Malcolm, A Roberts, R Smit, W P Tan, C Wheldon, V A Ziman</i>	
012010 Precise Measurements of Electromagnetic Transitions in Light Nuclei: What We Can Learn and Why it Matters	81
<i>C J (Kim) Lister</i>	
012011 Results from the First Heavy Ion Run at the LHC	88
<i>J Schukraft</i>	
012012 Hard Probes of QCD Matter at RHIC and the Beginning of the LHC	96
<i>C A Salgado</i>	
012013 Precision Mass Measurements for Nuclear Astro- and Neutrino Physics	104
<i>K Blaum, S Eliseev, T Eronen, Y Litvinov</i>	
012014 Neutron Halo Structure Probed by Breakup Reactions	112
<i>T Nakamura</i>	
012015 Nuclear Physics Constraints on the Characteristics of Astrophysical Thermonuclear Flashes	120
<i>J W Truran</i>	
012016 Supernova Dynamics and Explosive Nucleosynthesis	128
<i>K Langanke</i>	
012017 Ab Initio Calculation of the Hoyle State and a New Look at Clustering in Nuclei	136
<i>U-G Meibner</i>	
012018 The 3D Structure of the Proton	142
<i>R Kaiser</i>	
012019 The "Little Bang" at RHIC and at the LHC	150
<i>R Snellings</i>	
012020 Nuclear Force and Nuclear Physics from Lattice Quantum Chromodynamics	158
<i>T Hatsuda</i>	
012021 The Early Stages of a High Energy Heavy Ion Collision	166
<i>F Gelis</i>	

012022 Pushing the Limits: Nuclear Structure of Heavy Elements	174
<i>P T Greenlees</i>	

CONTRIBUTED PAPERS

HADRON PHYSICS

012023 Open Charm Scenarios	182
<i>Q Zhao</i>	
012024 Eta Photoproduction on the Proton	188
<i>J Mancell, I J D Macgregor</i>	
012025 Meson Photoproduction from a Transversely Polarised Target at MAMI	193
<i>P Hall Barrientos</i>	
012026 Recent Progress in N* Physics from Kaon Photoproduction Experiments at CLAS	199
<i>K Livingston</i>	
012027 the Use of Nested Sampling in the Extraction of Polarisation Observables at CLAS	204
<i>S Lewis</i>	
012028 Test of the OZI Rule in Vector Meson Production with the COMPASS Experiment	210
<i>J Bernhard</i>	
012029 Hadron Spectroscopy with COMPASS at CERN	216
<i>K Schönning</i>	
012030 Spin Physics at COMPASS	222
<i>C Schill</i>	
012031 Chaos in Hadrons	228
<i>L Muñoz, C Fernández-Ramírez, A Relaño, J Retamosa</i>	

RELATIVISTIC HEAVY ION COLLISIONS

012032 Effect of the Density Dependent Symmetry Energy on Fragmentation	234
<i>K S Vinayak, S Kumar</i>	
012033 Measurement of Nuclear Modification of Lepton Production from Heavy Flavour Decays in Pb-Pb Collisions with ALICE at the LHC	239
<i>M J Kweon</i>	
012034 Inclusive Open Charm Production in pp and Pb-Pb Collisions with the ALICE Detector	245
<i>R Bala</i>	
012035 Production of Identified Charged and Neutral Hadrons in Pp and Pb-Pb Collisions at LHC with ALICE Detector	251
<i>M Spyropoulou-Stassinaki</i>	
012036 Electromagnetic Emission from Hot Medium Measured by the PHENIX Experiment at RHIC	257
<i>T Sakaguchi</i>	
012037 Nuclear Fragmentation Study at ITEP Heavy Ion Facility	263
<i>B M Abramov, P N Alekseev, Yu A Borodin, S A Bulychjov, I A Dukhovskoy, A B Kaidalov, A I Khanov, A P Krutenkova, V V Kulikov, M A Martemianov, M A Matsyuk, E N Turdakina</i>	
012038 Observation of the Antimatter Partner of Rutherford's α-particle – ^4He	268
<i>A Tang</i>	
012039 A Study of Diffractive Production in ALICE	274
<i>O Villalobos Baillie</i>	
012040 Nuclear Modification of Hadron Production Measured by ALICE	281
<i>R Lietava</i>	
012041 Charge Separation Measurements in Pb–Pb Collisions at LHC Energies	287
<i>P Christakoglou</i>	
012042 New Information on the Dynamics of Relativistic Nucleus-nucleus Collisions	293
<i>Al Jipa, C Besliu, O Ristea, C Ristea, M Calin, D Argintaru, T Esanu, I Lazanu, V Covlea, C Bordeianu, C Iosif, I Grossu, A Scurtu, S Velica, V Baban, A Birzu, S Cioranu, A Paduraru, S Paragina, F Paragina, D Stoica</i>	

WEAK INTERACTIONS

012043 Constraining Neutrinoless Double β Decay Matrix Elements in ^{130}Te	299
<i>S A McAllister, B P Kay, S J Freeman, J P Schiffer, C M Diebel, T Bloxham, A M Howard, P D Parker, D K Sharp, J S Thomas</i>	

012044 the MAJORANA Experiment: an Ultra-low Background Search for Neutrinoless Double-beta Decay	303
<i>D G Phillips II, E Aguayo, F T Avignone III, H O Back, A S Barabash, M Bergevin, F E Bertrand, M Boswell, V Brudanin, M Busch, Y-D Chan, C D Christofferson, J I Collar, D C Combs, R J Cooper, J A Detwiler, P J Doe, V Efremenko, V Egorov, H Ejiri, S R Elliott, J Esterline, J E Fast, N Fields, P Finnerty, F M Fraenkle, V M Gehman, G K Giovanetti, M P Green, V E Guiseppe, K Gusey, A L Hallin, R Hazama, R Henning, A Hime, E W Hoppe, M Horton, S Howard, M A Howe, R A Johnson, K J Keeter, C Keller, M F Kidd, A Knecht, O Kochetov, S I Kononov, R T Kouzes, B LaFerriere, B H LaRoque, J Leon, L E Leviner, J C Loach, S MacMullin, M G Marino, R D Martin, D-M Mei, J Merriman, M L Miller, L Mizouni, M Nomachi, J L Orrell, N R Overman, A W P Poon, G Perumpilly, G Prior, D C Radford, K Rielage, R G H Robertson, M C Ronquest, A G Schubert, T Shima, M Shirchenko, K J Snively, D Steele, J Strain, K Thomas, V Timkin, W Tornow, I Vanyushin, R L Varner, K Vetter, K Vorren, J F Wilkerson, B A Wolfe, E Yakushev, A R Young, C -H Yu, V Yumatov, C Zhang</i>	

NUCLEAR STRUCTURE

012045 Isospin Mixing at Finite Temperature in ⁸⁰Zr	309
<i>A Corsi, A Bracco, F Camera, F C L Crespi, A Giaz, S Leoni, D Montanari, R Nicolini, V Vandone, O Wieland, G Benzoni, N Blasi, S Brambilla, B Million, V L Kravchuk, M Cinausero, M Degerlier, F Gramegna, T Marchi, S Barlini, L Bardelli, M Bini, G Casini, A Nannini, G Pasquali, G Poggi, G Baiocco, M Bruno, M D'Agostino, L Morelli, G Vannini, M Ciemala, M Kmiecik, A Maj, K Mazurek, W Meczynski, S Myalski</i>	
012046 Complete γ-spectroscopy of n-rich Nuclei around ⁴⁸Ca with Multi-Nucleon Transfer reactions	315
<i>S Leoni, D Montanari, G Benzoni, G Bocchi, S Bottoni, A Bracco, P F Bortignon, P Casati, G Colò, F C L Crespi, D Mengoni, J J Valiente-Dobon</i>	
012047 On the Origin of Low-lying M1 Strength in Even-even Nuclei	321
<i>G Rainovski, M Danchev, N Pietralla, A Gargano, A Covello, C Baktash, J R Beene, C R Bingham, Galindo-Uribarri A, K A Gladniskhi, C J Gross, V Yu Ponomarev, D C Radford, L L Riedinger, M Scheck, A E Stuchbery, J Wambach, C-H Yu, N V Zamfir</i>	
012048 on Quadrupole Vibrations in Nearly Spherical Nuclei	327
<i>S W Yates</i>	
012049 Lessons from Two Paradigmatic Developments; Rutherford's Nuclear Atom and Halo Nuclei	332
<i>J S Vaagen, S N Ershov, M V Zhukov</i>	
012050 Elastic Scattering and Direct Reactions of the 1n Halo ¹¹Be Nucleus on ⁶⁴Zn Near the Barrier	338
<i>V Scuderi, A Di Pietro, L Acosta, F Amorini, M J G Borge, P Figuera, M Fisichella, L M Fraile, J Gomez-Camacho, H Jeppesen, M Lattuada, I Martel, M Milin, A Musumarra, M Papa, M G Pellegriti, F Perez-Bernal, R Raabe, G Scandisi, F Rizzo, D Santonocito, G Scalia, O Tengblad, D Torresi, A M Vidal, M Zadro</i>	
012051 A Geant4 Simulation Package for the SAGE Spectrometer	344
<i>P Papadakis, D M Cox, J Konki, P A Butler, P T Greenlees, K Hauschild, R-D Herzberg, J Pakarinen, P Rakhila, M Sandzelius, J Sorri</i>	
012052 Prolate-oblate Shape Transition in Heavy Neutron-rich Nuclei	350
<i>Z Podolyák</i>	
012053 β Decay of ¹⁰²Y Produced in Projectile Fission of ²³⁸U	356
<i>A M Bruce, A M D Bacelar, G Benzoni, A Gadea, M Górska, A Gottardo, S Pietri, Zs Podolyák, J J Valiente-Dobón, J A Alcántara-Núñez, N Al-Dahan, A Algora, N Alkhomashi, P R P Allegro, Y Ayyad, P Boutachkov, M Bowry, M Bunce, E Casarejos, M L Cortés, A Y Deo, C Domingo-Prado, M Doncel, K Eppinger, F Farinon, G F Farrelly, H Geissel, J Gerl, N Goel, J Grebosz, E Gregor, T Haberman, R Hoischen, R Janik, S Klupp, I Kojouharov, N Kurz, S Lunardi, S Mandal, R Menegazzo, D Mengoni, F Naqvi, R Nicolini, C Nociforo, T Pissulla, A Prochazka, W Prokopowicz, P H Regan, D Rudolph, E Sahin, H Schaffner, A Sharma, B Sitar, Davinder Siwal, K Steiger, P Strmen, I Szarka, P M Walker, H Weick, H-J Wollersheim</i>	
012054 Resonance Structure of the Gamow-teller (GT) and First-forbidden (FF) β^+/EC Decay Strength Functions	362
<i>I N Izosimov, V G Kalinnikov, A A Solnyshkin</i>	
012055 Systematic Calculation of Fine Structure in the α Decay of Deformed Nuclei	368
<i>D Ni, Z Ren</i>	
012056 Decay Heat Measurements Using Total Absorption Gamma-ray Spectroscopy	374
<i>S Rice, E Valencia, A Algora, J L Tañ, P H Regan, Z Podolyák, J Agramunt, W Gelletly, A L Nichols</i>	
012057 Electromagnetic Transition Rate Measurements in the N=80 Isotone, ¹³⁸Ce	380
<i>T Alharbi, P J R Mason, P H Regan, N Marginean, Zs Podolyák, A Algora, N Alazemi, A M Bruce, R Britton, M R Bunce, D Bucurescu, N Cooper, D Deleanu, D Filipescu, W Gelletly, D Ghita, T Glodariu, G Ilie, S Kisyov, J Lintott, S Lalkovski, S Liddick, C Mihai, K Mulholland, R Marginean, A Negret, M Nakhostin, O J Roberts, S Rice, J F Smith, L Stroe, T Sava, C Townsley, E Wilson, V Werner, M Zhekova, N V Zamfir</i>	

012058 Technique for Resolving Low-lying Isomers in the Experimental Storage Ring (ESR) and the Occurrence of an Isomeric State in ¹⁹²Re.....	386
<i>M W Reed, P M Walker, I J Cullen, Yu A Litvinov, K Blaum, F Bosch, C Brandau, J J Carroll, D M Cullen, A Y Deo, B Dewiler, C Dimopoulou, G D Dracoulis, F Farinon, H Geissel, E Haettner, M Heil, R S Kempley, R Knöbel, C Kozhuharov, J Kurcewicz, N Kuzminchuk, S Litvinov, Z Liu, R Mao, C Nociforo, F Nolden, WR Plaß, A Prochazka, C Scheidenberger, D Shubina, M Steck, Th Stöhlker, B Sun, T P D Swan, G Trees, H Weick, N Winckler, M Winkler, P J Woods, T Yamaguchi</i>	
012059 Effect of Odd-multipolarity Deformations on Fission Barriers in Superheavy Nuclei	391
<i>S J Zheng, S M Wang, F R Xu</i>	
012060 Isomers and Alignments in ¹⁹¹Ir and ¹⁹²Os.....	397
<i>G D Dracoulis, G J Lane, A P Byrne, H Watanabe, R O Hughes, N Palalani, F G Kondev, M P Carpenter, D Seweryniak, S Zhu, R V F Janssens, C J Lister, T Lauritsen, P Chowdhury, Y Shi, F R Xu</i>	
012061 Structure of Dipole Bands in ¹¹²In: Through Lifetime Measurement	403
<i>T Trivedi, R Palit, J Sethi, S Saha, S Kumar, Z Naik, V V Parkar, B S Naidu, A Y Deo, A Raghav, P K Joshi, H C Jain, S Siotra, D Mehta, A K Jain, D Choudhury, D Negi, S Roy, S Chattopadhyay, A K Singh, P Singh, D C Biswas, R K Bhowmik, S Muralithar, R P Singh, R Kumar, K Rani</i>	
012062 X(5) Critical-point Symmetries in ¹³⁸Gd	409
<i>M G Procter, D M Cullen, P Ruotsalainen, T Braunroth, A Dewald, C Fransen, T Grahn, P T Greenlees, M Hackstein, K Hauschild, U Jakobsson, P M Jones, R Julin, S Juutinen, S Ketelhut, A Lopez-Martens, M Leino, J Litzinger, P J R Mason, P Nieminen, P Peura, P Rakkila, M W Reed, S Rice, S Rinta-Antilla, W Rother, M Sandzelius, J Sarén, C Scholey, J Sorri, M J Taylor, J Uusitalo, A Vitturi, L Fortunato, Y Shi, F R Xu</i>	
012063 Half-life of the I^π = 4⁻ Intruder State in ³⁴P Using LaBr₃:Ce Fast Timing.....	415
<i>P J R Mason, T Alharbi, P H Regan, N Marginean, Zs Podolyák, N Alkhomashi, P C Bender, M Bowry, M Bostan, D Bucurescu, A M Bruce, G Cata-Danil, I Cata-Danil, R Chakrabarti, D Deleanu, P Detistov, M N Erduran, D Filipescu, U Garg, T Glodariu, D Ghita, S S Ghugre, A Kusoglu, R Marginean, C Mihai, M Nakhostin, A Negret, S Pascu, C Rodríguez Triguero, T Sava, E C Simpson, A K Sinha, L Stroe, G Suliman, N V Zamfir</i>	
012064 To the Continuum and Beyond: Structure of U Nuclei	420
<i>R O Hughes, C W Beausang, T J Ross, J T Burke, N D Scielzo, M S Basunia, C M Campbell, R J Casperson, H L Crawford, J Munson, L Phair, J J Ressler</i>	
012065 Collective Structures Up to Spin ~ 65 in the N = 90 Isotones 158Er and 157Ho.....	426
<i>X Wang, M A Riley, J Simpson, E S Paul, R V F Janssens, A D Ayangeakaa, H C Boston, M P Carpenter, C J Chiara, U Garg, P Hampson, D J Hartley, C R Hoffman, D S Judson, F G Kondev, T Lauritsen, N M Lumley, J Matta, S Miller, P J Nolan, J Ollier, M Petri, D C Radford, J M Rees, J P Revill, L L Riedinger, S V Rigby, C Unsworth, S Zhu, I Ragnarsson</i>	
012066 Relative Quadrupole Moments of Exotic Shapes at Ultrahigh Spin in ¹⁵⁴Er: Calibrating the TSD/SD Puzzle	432
<i>J P Revill, E S Paul, X Wang, M A Riley, J Simpson, J Ollier, A J Boston, M P Carpenter, C J Chiara, C Hoffman, R V F Janssens, F G Kondev, T Lauritsen, P J Nolan, J M Rees, S V Rigby, C Unsworth, S Zhu, I Ragnarsson</i>	
012067 DSA Lifetime Measurements of ¹²⁴Cs and the Time-reversal Symmetry.....	437
<i>E Grodner, A A Pasternak, J Srebný, M Kowalczyk, J Mierzejewski, M Kisielinski, P Decowski, Ch Droste, J Perkowski, T Abraham, J Andrzejewski, K Hadynska-Klek, L Janiak, A Kasperek, T Marchlewski, P Napiorkowski, J Samorajczyk</i>	
012068 A Shell Model Study of the High Spin States of ⁸⁸Y	443
<i>M Bunce, P H Regan, V Werner, V Anagnostatou, C W Beausang, M Bowry, R J Casperson, D Chen, N Cooper, P Goddard, R O Hughes, G Ilie, P J R Mason, B Pauerstein, M W Reed, T J Ross</i>	
012069 Tops-on-top Model for Triaxial, Strongly Deformed Bands in ¹⁶⁴Lu	449
<i>K Sugawara-Tanabe, K Tanabe</i>	
012070 Development of the CRIS (Collinear Resonant Ionisation Spectroscopy) Beam Line	455
<i>T J Procter, H Aghaei-Khozani, J Billowes, M L Bissell, F Le Blanc, B Cheal, T E Cocolios, K T Flanagan, H Hori, T Kobayashi, D Lunney, K M Lynch, B A Marsh, G Neyens, J Papuga, M M Rajabali, S Rothe, G Simpson, A J Smith, H H Stroke, W Vanderheijden, K Wendt</i>	
012071 Laser Spectroscopy of Gallium Isotopes Beyond N = 50	461
<i>B Cheal, J Billowes, M L Bissell, K Blaum, F C Charlwood, K T Flanagan, D H Forest, Ch Geppert, M Kowalska, K Kreim, A Krieger, J Krämer, K M Lynch, E Mané, I D Moore, R Neugart, G Neyens, W Nörterhäuser, J Papuga, T J Procter, M M Rajabali, H H Stroke, P Vingerhoets, D T Yordanov, M Žáková</i>	
012072 Early Onset of Deformation in the Neutron-deficient Polonium Isotopes.....	467
<i>T E Cocolios, A N Andreyev, S Antalic, A E Barzakh, B Bastin, J Büscher, I G Darby, W Dexters, D V Fedorov, V N Fedosseev, K T Flanagan, S Franchoo, S Fritzsche, G Huber, M Huyse, M Keupers, U Köster, Yu Kudryavtsev, E Mané, B A Marsh, P L Molkanov, R D Page, M D Seliverstov, A M Sjödin, I Stefan, J Van De Walle, P Van Duppen, M Venhart, S G Zemlyanov</i>	
012073 Sub-barrier Coulomb Excitation of ¹⁰⁷Sn	473
<i>D D Dijulio, J Cederkall, A Ekström, C Fahlander, M Hjorth-Jensen</i>	

012074 Spin-gap Isomer in ^{96}Cd	478
<i>R Wadsworth, B S Nara Singh, Z Liu, H Grawe, T S Brock, P Boutachkov, N Braun, A Blazhev, M Gorska, S Pietri, D Rudolph, C Domingo-Pardo, S J Steer, A Atac, L Bettermann, L Caceres, K Eppinger, T Engert, T Faestermann, F Farinon, F Finke, K Geibel, J Gerl, R Gernhauser, N Goel, A Gottardo, J Grebosz, C Hinke, R Hoischen, G Ilie, H Iwasaki, J Jolie, A Kaskas, I Kojouharov, R Krucken, N Kurz, E Merchan, C Nociforo, J Nyberg, M Pfutzner, A Prochazka, Zs Podolyak, P H Regan, P Reiter, S Rinta-Antila, C Scholl, H Schaffner, P-A Soderstrom, N Warr, H Weick, H-J Wollersheim, P J Woods, F Nowacki, K Sieja</i>	
012075 Lifetime Measurements of Unbound Nuclear States	484
<i>D M Cullen, M G Procter, M J Taylor</i>	
012076 Fundamental Information from Nuclear Data Analysis	489
<i>S Sukhoruchkin</i>	
012077 Study of states in ^{14}C via the $^{10}\text{Be}(^4\text{He},^4\text{He})^{10}\text{Be}$ Reaction	495
<i>J D Malcolm, M Freer, N I Ashwood, N Curtis, T Munoz-Britton, C Wheldon, V A Ziman, W N Catford, S Brown, G Wilson, N Soic, D Bardayan, S D Pain, N L Achouri, K Chipps, K Crzywacz-Jones</i>	
012078 Absolute Decay Width Measurements in ^{16}O	499
<i>C Wheldon, N I Ashwood, M Barr, N Curtis, M Freer, Tz Kokalova, J D Malcolm, S J Spencer, V A Ziman, Th Faestermann, R Krücken, H-F Wirth, R Hertenberger, R Lutter, A Bergmaier</i>	
012079 Does a 4-α Linear Chain Exist in ^{16}O?	505
<i>N Curtis, S Almaraz-Calderon, A Aprahamian, N I Ashwood, M Barr, B Bucher, P Copp, M Couder, X Fang, M Freer, G Goldring, F Jung, S R Lesher, W Lu, J D Malcolm, A Roberts, W P Tan, C Wheldon, V A Ziman</i>	
012080 Studies of Light Neutron-excess Nuclei from Bound to Continuum	510
<i>M Ito</i>	
012081 Shell and Cluster Structure in Atomic Nuclei	516
<i>J Cseh</i>	
012082 Spectroscopy of Neutron-rich Co Nuclei Populated in the $^{70}\text{Zn}+^{238}\text{U}$ Reaction	522
<i>F Recchia, S M Lenzi, S Lunardi, E Farnea, A Gadea, N Marginean, J J Valiente-Dobón, M Axiotis, S Aydın, D Bazzacco, G Benzoni, P G Bizzeti, A M Bizzeti-Sona, A Bracco, D Bucurescu, F Camera, L Corradi, G De Angelis, F Della Vedova, E Fioretto, M Ionescu-Bujor, A Iordachescu, S Leoni, R Marginean, P Mason, R Menegazzo, D Mengoni, B Million, G Montagnoli, D R Napoli, F Nowacki, R Orlandi, G Pollarolo, A Poves, E Sahin, K Sieja, F Scarlassara, R P Singh, A M Stefanini, S Szilner, C A Ur, O Wieland</i>	
012083 Evidence for an Oblate-shape Isomer in Neutron-rich ^{109}Nb	526
<i>H Watanabe</i>	
012084 Development of Axial Asymmetry in the Neutron-rich Isotope ^{110}Mo	532
<i>H Watanabe</i>	
012085 Scattering of the Halo Nucleus ^{11}Li and Its Core ^9Li on ^{208}Pb at Energies Around the Coulomb Barrier	538
<i>M J G Borge, M Cubero, J P Fernández-García, L Acosta, M Alcorta, M A G Alvarez, L Buchmann, C A Diget, H Al Falou, B Fulton, H O U Fynbo, D Galaviz, J Gómez-Camacho, R Kanungo, J A Lay, M Madurga, I Mukha, T Nilsson, A M Sánchez-Benítez, A Shoter, O Tengblad, P Walden</i>	

NUCLEAR REACTIONS

012086 Geiger-marsden Experiments: 100 Years On	545
<i>N Rowley</i>	
012087 Elastic Scattering a Hundred Years On; What Can it Tell Us?	551
<i>N Keeley</i>	
012088 Elastic Scattering Studies of ^{16}C at 50 MeV/A on Proton and Deuteron Targets with the CHIMERA Multidetector at INFN-INS	557
<i>L Grassi, C Agodi, F Amorini, A Anzalone, L Auditore, G Cardella, M B Chatterjee, E De Filippo, E Geraci, A Grzeszczuk, E La Guidara, G Lanzalone, I Lombardo, S Lo Nigro, D Loria, C Maiolino, T Minniti, A Pagano, M Papa, S Pirrone, G Politi, F Porto, F Rizzo, E Rosato, P Russotto, S Santoro, A Trifirò, M Trimarchi, G Verde, M Vigilante</i>	
012089 The Nuclear Fission Process As Brownian Motion: Modifying the Kramers Fission Rates	563
<i>I I Gontchar, R A Kuzynkin, E G Pavlova, N E Aktaev</i>	
012090 Production of Spin-aligned RI Beam Via Two-step Fragmentation with Dispersion Matching	569
<i>Y Ichikawa, H Ueno, Y Ishii, T Furukawa, A Yoshimi, D Kameda, H Watanabe, N Aoi, K Asahi, D L Balabanski, R Chevrier, J M Daugas, N Fukuda, G Georgiev, H Hayashi, H Iljima, N Inabe, T Inoue, M Ishihara, T Kubo, T Nanao, T Ohnishi, K Suzuki, M Tsuchiya, H Takeda, M M Rajabali</i>	
012091 Projectile Structure Effects in Multi-nucleon and Cluster Transfers in $^{16,18}\text{O}+^{164}\text{Dy}, ^{208}\text{Pb}$ Reactions	574
<i>D C Biswas, Pratap Roy, Y K Gupta, B N Joshi, B K Nayak, L S Danu, B V John, R P Vind, N Deshmukh, S Mukherjee, A K Jain, R K Choudhury</i>	

012092 Prediction of Repulsive Potential for High-energy Heavy-ion Scatterings	580
<i>T Furumoto, Y Sakuragi, Y Yamamoto</i>	
012093 N/Z Effects on Dynamics of Ca+Ca Collisions at 25 MeV/Nucleon	586
<i>I Lombardo, L Acosta, C Agodi, F Amorini, A Anzalone, L Audatore, I Berceanu, G Cardella, S Cavallaro, M B Chatterjee, E Defilippo, E Geraci, G Giuliani, L Grassi, J Han, E Laguidara, G Lanzalone, D Loria, C Maiolino, A Pagano, M Papa, S Pirrone, G Politi, F Porto, F Rizzo, P Russotto, A Trifirò, M Trimarchi, G Verde, M Vigilante</i>	
012094 States of ¹⁴C and ¹⁵C via the (¹⁸O, ¹⁶O) Two-neutron Transfer Reaction at 84 MeV	592
<i>M Cavallaro, F Cappuzzello, D Carbone, A Cunsolo, A Foti, M Bondi, G Santagati, G Taranto, R Linares, F Azaiez, S Franchoo, M Niikura, J A Scarpaci</i>	
012095 HELIOS - Progress and Possibilities	598
<i>B P Kay, M Alcorta, B B Back, S I Baker, S Bedoor, T Bloxham, J A Clark, C M Deibel, S J Freeman, C R Hoffman, A M Howard, J C Lighthall, S T Marley, A J Mitchell, K E Rehm, J P Schiffer, D K Sharp, D V Shetty, J S Thomas, A H Wuosmaa, S Zhu</i>	
012096 Soft Spin-dipole Resonances in ⁴⁰Ca	604
<i>L Stuhl, A Krasznahorkay, M Csatlós, T Marketin, E Litvinova, T Adachi, A Algora, J Daeven, E Estevez, H Fujita, Y Fujita, C Guess, J Gulyás, K Hatanaka, K Hirota, H J Ong, D Ishikawa, H Matsubara, R Meharchand, F Molina, H Okamura, G Perdikakis, B Rubio, C Scholl, T Suzuki, G Susoy, A Tamii, J Thies, R Zegers, J Zenihiro</i>	
012097 Towards ²⁶Na via (d,p) with SHARC and TIGRESS and a Novel Zero-degree Detector	610
<i>G L Wilson, W N Catford, C Aa Diget, N A Orr, P Adsley, H Al-Falou, R Ashley, R A E Austin, G C Ball, J C Blackmon, A J Boston, H J Boston, S M Brown, A A Chen, J Chen, R M Churchman, D S Cross, J Dech, M Djongolov, T E Drake, U Hager, S P Fox, B R Fulton, N Galinski, A B Garnsworthy, G Hackman, D Jamieson, R Kanungo, K Leach, J-P Martin, J N Orce, C J Pearson, M Porter-Peden, F Sarazin, S Sjue, C Sumithrarachchi, C E Svensson, S Triambak, C Unsworth, R Wadsworth, S J Williams</i>	
012098 Neutron-hole Strength in the N = 81 Isotones	616
<i>A M Howard, S J Freeman, J P Schiffer, T Bloxham, J A Clark, C M Deibel, B P Kay, P D Parker, D K Sharp, J S Thomas</i>	
012099 Investigating Trends in Proton Single-particle States in Z = 51 Isotopes Using Transfer Reactions	622
<i>A J Mitchell, S J Freeman, J P Schiffer, J A Clark, C M Deibel, C R Hoffman, A M Howard, B P Kay, P D Parker, D K Sharp, J S Thomas</i>	
012100 Trends in the g_{7/2} and h_{11/2} Neutron Single-particle Energies in N = 51 Isotones	628
<i>D K Sharp, B P Kay, S J Freeman, J P Schiffer, B B Back, T Bloxham, J A Clark, C M Deibel, C R Hoffman, A M Howard, J C Lighthall, S T Marley, A J Mitchell, P D Parker, J S Thomas, A H Wuosmaa</i>	
012101 Quasi Elastic Cross Sections for the ²⁰⁹Bi(e,e'p)²⁰⁸Pb Reaction: Jefferson Lab Experiment E06007	634
<i>J C Cornejo, J L Herraiz, A Camsonne, A Saha, J M Udias, G Urciuoli, J R Vignote, K A Aniol</i>	

NUCLEAR THEORY

012102 Symmetry Energy of Nuclear Matter at Low Densities and Clustering at the Nuclear Surface	640
<i>Z Sauli, N Abdullah, K Anwar, Q N Usmani</i>	
012103 Microscopic Approach to Large-amplitude Deformation Dynamics with Local QRPA Inertial Masses	646
<i>K Sato, N Hinohara, T Nakatsukasa, M Matsuo, K Matsuyanagi</i>	
012104 Study of Pygmy Dipole Resonance with a New Time-dependent Mean Field Theory	652
<i>S Ebata, T Nakatsukasa, T Inakura</i>	
012105 The Tensor-kinetic Field in Nuclear Collisions	658
<i>P D Stevenson, S Fracasso, E B Suckling</i>	
012106 Spin-aligned Neutron-proton Pair Coupling in the Era of Large Scale Computing	663
<i>C Qi, R J Liotta, R Wyss</i>	
012107 Systematic Study of Proton-neutron Pairing Correlations in the Nuclear Shell Model	669
<i>Y Lei, S Pittel, N Sandulescu, A Poves, B Thakur, Y M Zhao</i>	
012108 Spectroscopy and Correlations Probed in Direct Two-nucleon Knockout Reactions	675
<i>E C Simpson</i>	
012109 Three-body-model Calculations for ²²C	681
<i>Y Kucuk, J A Tostevin</i>	
012110 Quark Degrees of Freedom in the Deuteron and Their Testing in Nucleon-deuteron Scattering	687
<i>M N Platonova, V I Kukulin</i>	
012111 Extended Brueckner-Hartree-Fock theory with Pionic Correlation in Finite Nuclei	693
<i>Y Ogawa, H Toki</i>	

012112 Structure Properties of Medium and Heavy Exotic Nuclei	699
<i>M K Gaidarov</i>	

NUCLEAR ASTROPHYSICS

012113 Nuclear Structure Studies in the 0s1d Shell Applied to Astrophysical Rp-process Calculations	705
<i>W A Richter, B Alex Brown</i>	
012114 $^{30}\text{P}(p,\gamma)^{31}\text{S}$ Reaction Rate for Classical Novae: An Indirect Approach	709
<i>D Irvine</i>	
012115 Coulomb Dissociation of ^{27}P	713
<i>S Beceiro Novo, K Sümmerer, D Cortina-Gil, C Wimmer, R Plag, H Alvarez-Pol, T Aumann, K Behr, K Boretzky, E Casarejos, A Chatillon, U Datta-Pramanik, Z Elekes, Z Fulop, D Galaviz, H Geissel, S Giron, U Greife, F Hammache, M Heil, J Hoffman, H Johansson, C Karagiannis, O Kiselev, N Kurz, K Larsson, T Le Bleis, Y Litvinov, K Mahata, C Muentz, C Nociforo, W Ott, S Paschalis, W Prokopowicz, C Rodriguez-Tajes, D Rossi, H Simon, M Stanoiu, J Stroth, S Typel, A Wagner, F Wamers, H Weick</i>	
012116 Complete Kinematics Measurement of the $^{11}\text{B}(p,\gamma)^{12}\text{C}$ Reaction	718
<i>C Aa Diget, H O U Fynbo, K L Laursen, K O Madsbøl, L Jørgensen, O S Kirsebom, K Riisager</i>	
012117 Nuclear Physics and Space Radiation	724
<i>J W Norbury</i>	
012118 Nuclear Weak Processes and Astrophysical Applications	728
<i>T Suzuki, M Honma</i>	
012119 Electron Capture in Core-collapse Supernovae Investigated Through Configuration Mixing in Neutron-rich Nuclei	734
<i>C Aa Diget, T Baugher, D Bazin, M A Bentley, J S Berryman, J R Brown, K A Chipps, P J Davies, B R Fulton, A Gade, H Iwasaki, A M Laird, A Lemasson, S McDaniel, A Ratkiewicz, L Scruton, A Shore, S R Stroberg, D Weisshaar, K Wimmer, R Winkler</i>	
012120 Does the $^{12}\text{C}+^{12}\text{C}$ Fusion Reaction Trigger Superburst?	739
<i>X D Tang, H Esbensen, X Fang, B Bucher, C L Jiang, K E Rehm, C J Lin, E Brown</i>	
012121 The Role of $^{12}\text{C}(^{12}\text{C},n)$ in the Astrophysical S-Process	745
<i>B Bucher, J Browne, S Almaraz-Calderon, A Alongi, A D Ayangeakaa, A Best, M Couder, J Deboer, X Fang, W Lu, M Notani, D Patel, N Paul, A Roberts, R Talwar, W Tan, X D Tang, A Villano</i>	

EXPERIMENTAL METHODS

012122 Gamma-ray Multiplicity Measurements Using STEFF	751
<i>A J Pollitt, A G Smith, I Tsekhanovich, J A Dare</i>	
012123 A New Plunger Device to Measure Lifetimes of Unbound States in Tagged Exotic Nuclei	757
<i>M J Taylor, D M Cullen, M G Procter, A J Smith, V Twist, P M Jones, P Nieminen, T Grahn, P A Butler, M Scheck</i>	
012124 Development of a Fast-timing LaBr3(Ce) Array for NuSTAR	762
<i>O J Roberts</i>	

ADDITIONAL CONTRIBUTED PAPER

012125 Vector and Tensor Analyzing Powers in Deuteron-proton Breakup Reaction	768
<i>E Stephan, St Kistryn, N Kalantar-Nayestanaki</i>	

POSTER CONTRIBUTIONS

012126 The Isomeric Structure of ^{132}Pr	772
<i>G A Alharshan, D M Cullen, M J Taylor, M G Procter, N M Lumley, T Grahn, P T Greenless, K Hauschild, A Herzon, U Jakobsson, P M Jones, R Julin, S Juutinen, S Ketelhut, M Leino, A Lopez-Martens, P Nieminen, J Pantanen, P Peura, P Rahkila, S Rinta-Antilla, P Ruatsalainen, H M Sandzelius, J Saren, C Scholey, J Sorri, S Stolze, J Uusitalo</i>	
012127 The 1961 Rutherford Jubilee Conference: Perspectives from 2011	777
<i>N P M Todd</i>	
012128 Laser Assisted Decay Spectroscopy at the CRIS Beam Line at ISOLDE	783
<i>K M Lynch, M M Rajabali, H Aghaei-Khozani, J Billowes, M L Bissell, F Le Blanc, B Cheal, T E Cocolios, S De Schepper, K Dewolf, K T Flanagan, M Hori, T Kobayashi, B A Marsh, G Neyens, J Papuga, T J Procter, S Rothe, G Simpson, A J Smith, H H Stroke, K Wendt</i>	

012129 Quadrupole Moments Calculation of Deformed Nuclei	789
<i>S Mohammadi</i>	
012130 Phenomenological and Semi-microscopic Analysis for ¹⁶O and ¹²C Elastically Scattering on the Nucleus of ¹⁶O and ¹²C at Energies Near the Coulomb Barrier	794
<i>Sh Hamada, N Burtebayev, N Amangeldi, K A Gridnev, K Rusek, Zh Kerimkulov, N Maltsev</i>	
012131 Generalization of the Geiger-Nuttall Law and Alpha Clustering in Heavy Nuclei	800
<i>C Qi, R J Liotta, R Wyss</i>	
012132 Spectator Fragmentation in Nucleus-nucleus Collisions: Phase Space Approach.....	806
<i>Y K Vermani, A Jangid</i>	
012133 Microscopic Study of Deformation Systematics in Some Isotones in the A ≈ 100 Mass Region.....	812
<i>A Bharti, C Sharma, S Singh, S K Khosa</i>	
012134 Energy Response of LaBr₃	818
<i>S Ertürk, A Maj, M Ciemala, O Stezowski, S Courtin, J Strachan, S Kumar</i>	
012135 Nuclear Neutron Densities and Parity Violating Electron Scattering	824
<i>T K Dong, Y Y Chu, Z Z Ren</i>	
Author Index	