

12th International Spring Seminar on Nuclear Physics 2017

Current Problems and Prospects for
Nuclear Structure

Journal of Physics: Conference Series Volume 966

Ischia, Italy
15 - 19 May 2017

Editors:

Angela Gargano
Luigi Coraggio
Nunzio Itaco

ISBN: 978-1-5108-5896-1
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© (2017) 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. (2018)

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

Volume 966

12th International Spring Seminar on Nuclear Physics: Current Problems and Prospects for Nuclear Structure

15–19 May 2017, Sant'Angelo d'Ischia, Italy

Accepted papers received: 31 January 2018

Published online: 22 February 2018

Preface

[12th International Spring Seminar on Nuclear Physics: Current Problems and Prospects for Nuclear Structure](#)

[Program](#)

[List of Participants](#)

[Photo](#)

[Peer review statement](#)

Papers

[Electron capture and the neutrino mass](#)

Amand Faessler.....1

[Recent Results from ISOLDE and HIE-ISOLDE](#)

María J. G. Borge.....7

[Di-neutron correlations and decay dynamics of nuclei near and beyond drip line](#)

Hiroyuki Sagawa and Kouichi Hagino.....13

[Chiral Effective Field Theory for Nucleonic Matter](#)

Francesca Sammarruca.....19

[Nuclear-Structure Physics with MINIBALL at HIE-ISOLDE](#)

P. Reiter for the MINIBALL collaboration.....26

[Charge symmetry breaking in light \$\Lambda\$ hypernuclei](#)

Avraham Gal and Daniel Gazda.....32

[Odd nuclei spectroscopy within a self-consistent multiphonon approach](#)

G. De Gregorio, F. Knapp, N. Lo Iudice and P. Veselý.....39

[A view of recent results and perspectives on nuclear structure with MAGNEX at the INFN-LNS laboratory](#)

F Cappuzzello, C. Agodi, D. Carbone and M. Cavallaro.....45

[Nuclear Structure for Double Beta Decay](#)

Mihai Horoi.....49

[\$^8\text{B} + ^{208}\text{Pb}\$ Elastic Scattering at Coulomb Barrier Energies](#)

M. La Commara, M. Mazzocco, A. Boiano, C. Boiano, C. Manea, C. Parascandolo, D. Pierroutsakou, C. Signorini, E. Strano, D. Torresi, H. Yamaguchi, D. Kahl, P. Di Meo, J. Grebosz, N. Imai, Y. Hirayama, H. Ishiyama, N. Iwasa, S.C. Jeong, H.M. Jia, Y.H. Kim, S. Kimura, S. Kubono, C.J. Lin, H. Miyatake, M. Mukai, T. Nakao, M. Nicoletto, Y. Sakaguchi, A.M. Sánchez-Benítez, F. Soramel, T. Teranishi, Y. Wakabayashi, Y.X. Watanabe, L. Yang and Y.Y. Yang.....55

[Consistent, high-quality two-nucleon potentials up to fifth order of the chiral expansion](#)

R. Machleidt.....59

[EXOGAM at the ILL: the EXILL campaign](#)

G. de France, A. Blanc, F. Drouet, M. Jentschel, U. Köster, P. Mutti, J.M. Régis, G. Simpson, T. Soldner, O. Stezowski, C.A. Ur, W. Urban and A. Vancrayenest.....65

[Effect of short-range correlations on the single proton \$3s_{1/2}\$ wave function in \$^{206}\text{Pb}\$](#)

S. Shlomo, I. Talmi, M. R. Anders and G. Bonasera.....71

[Nuclear physics from an expansion around the unitarity limit](#)

U van Kolck.....77

[Recent Applications of Self-Consistent Green's Function Theory to Nuclei](#)

Carlo Barbieri, Francesco Raimondi and Christopher McIlroy.....83

[Nuclear structure studies performed using the \(\$^{18}\text{O}, ^{16}\text{O}\$ \) two-neutron transfer reactions](#)

D. Carbone, C. Agodi, F. Cappuzzello, M. Cavallaro, J. L. Ferreira, A. Foti, A. Gargano, S.M. Lenzi, R. Linares, J. Lubian and G. Santagati.....89

[Nuclear matrix elements for the \$\beta\beta\$ decay of \$^{76}\text{Ge}\$](#)

B. A. Brown, D. L. Fang and M. Horoi.....94

[Experiments with brilliant gamma beams at ELI-NP: A glimpse in the future](#)

Dimiter L. Balabanski.....100

[Electromagnetic reactions from coupled-cluster theory](#)

Sonia Bacca, Mirko Miorelli and Gaute Hagen.....106

[How sharp is the transition into the N=20 island of inversion for the Mg isotopes ?](#)

B. Fernández-Domínguez, B. Pietras, W.N. Catford, N.A. Orr, M. Petri, M. Chartier, S. Paschalis, N. Patterson, J.S. Thomas, M. Caamaño, T. Otsuka, A. Poves, N. Tsunoda, N.L. Achouri, J-C. Angélique, N.I. Ashwood, A. Banu, B. Bastin, R. Borcea, J. Brown, F. Delaunay, S. Franchoo, M. Freer, L. Gaudefroy, S. Heil, M. Labiche, B. Laurent, R.C. Lemmon, A. O. Macchiavelli, F. Negoita, E.S. Paul, C. Rodríguez-Tajes, P. Roussel-Chomaz, M. Staniou, M. Taylor, L. Trache and G.L. Wilson.....112

[Measuring nuclear reaction cross sections to extract information on neutrinoless double beta decay](#)

M. Cavallaro, F. Cappuzzello, C. Agodi, L. Acosta, N. Auerbach, J. Bellone, R. Bijker, D. Bonanno, D. Bongiovanni, T. Borello-Lewin, I. Boztosun, V. Branchina, M. P. Busa, S. Calabrese, L. Calabretta, A. Calanna, D. Calvo, D. Carbone, E.R. Chávez Lomelí, A. Coban, M. Colonna, G. D'Agostino, G. De Geronimo, F. Delaunay, N. Deshmukh, P.N. de Faria, C. Ferraresi, J.L. Ferreira, P. Finocchiaro, M. Fisichella, A. Foti, G. Gallo, U. Garcia, G. Giraud, V. Greco, A. Hacisalihoglu, J. Kotila, F. Iazzi, R. Introzzi, G. Lanzalone, A. Lavagno, F. La Via, J.A. Lay, H. Lenske, R. Linares, G. Litrico, F. Longhitano, D. Lo Presti, J. Lubian, N. Medina, D. R. Mendes, A. Muoio, J.R.B. Oliveira, A. Pakou, L. Pandola, H. Petrascu, F. Pinna, S. Reito, D. Rifuggiato, M.R.D. Rodrigues, A. D. Russo, G. Russo, G. Santagati, E. Santopinto, O. Sgouros, S.O. Solakci, G. Souliotis, V. Soukeras, A. Spatafora, D. Torresi, S. Tudisco, R.I.M. Vsevolodovna, R.J. Wheadon, A. Yildirin and V.A.B. Zagatto.....118

[Ab initio calculation of one-nucleon halo states](#)

D M Rodkin and Yu M Tchuvil'sky.....122

[Shell Model Far From Stability: Island of Inversion Mergers](#)

F. Nowacki and A. Poves.....128

[\$\beta\$ -decay properties in the Cs decay chain](#)

G. Benzoni, R. Lică, M.J.G. Borge, L.M. Fraile for the IDS collaboration.....134

[New proton drip-line nuclei relevant to nuclear astrophysics](#)

L.S. Ferreira.....140

[Shell-model studies of the \$^{34g,m}\text{Cl}\(p,\gamma\)^{35}\text{Ar}\$ rp reaction rates](#)

W. A. Richter and B. A. Brown.....145

[Quantum self-organization and nuclear collectivities](#)

T Otsuka, Y Tsunoda, T Togashi, N Shimizu and T Abe.....149

[Spes: An intense source of Neutron-Rich Radioactive Beams at Legnaro](#)

A Andrighetto, M Manzolaro, S Corradetti, D Scarpa, A Monetti, M Rossignoli, M Ballan, F Borgna, F D'Agostini, F Gramegna, G Prete, G Meneghetti, M Ferrari and A Zenoni.....155

[Enhanced collectivity along the \$N = Z\$ line: lifetime measurements in \$^{44}\text{Ti}\$, \$^{48}\text{Cr}\$, and \$^{52}\text{Fe}\$](#)

K. Arnsward, P. Reiter, L. Coraggio, B. Birkenbach, A. Blazhev, T. Braunroth, A. Dewald, C. Fransen, B. Fu, A. Gargano, H. Hess, R. Hirsch, N. Itaco, S. M. Lenzi, L. Lewandowski, J. Litzinger, C. Müller-Gatermann, M. Queiser, D. Rosiak, D. Schneiders, M. Seidlitz, B. Siebeck, T. Steinbach, A. Vogt, K. Wolf and K. O. Zell.....161

[Structure of two-neutron halo in light drip-line nuclei](#)

Toshio Suzuki and Takaharu Otsuka.....167

[LOW-ENERGY MAGNETIC RADIATION ENHANCEMENT WITHIN THE NUCLEAR SHELL MODEL](#)

S. Karampagia, B. A. Brown and V. Zelevinsky.....173

[NUCLEAR LEVEL DENSITY, QUANTUM CHAOS AND RELATED PHYSICS](#)

V. Zelevinsky and S. Karampagia.....180

[The AGATA Campaign at GANIL](#)

Silvia M. Lenzi and Emmanuel Clement.....186

[Theoretical interpretation of the nuclear structure of \$^{88}\text{Se}\$ within the ACM and the QPM models.](#)

I. N. Gratchev, G. Thiamova, P. Alexa, G.S. Simpson and M. Ramdhane.....192

[Investigation of the \$\gamma\$ -decay behavior of \$^{52}\text{Cr}\$ with the \$\gamma^3\$ setup at HI \$\gamma\$ S](#)

J. Wilhelmy, P. Erbacher, U. Gayer, J. Isaak, B. Löher, M. Müscher, S.G. Pickstone, N. Pietralla, P. Ries, C. Romig, D. Savran, M. Spieker, W. Tornow, V. Werner, A. Zilges and M. Zweidinger.....198

[Cluster structure of light nuclei](#)

Francesco Iachello.....203

[Experimental Tests of the Algebraic Cluster Model](#)

Moshe Gai.....209

[Rotating and vibrating tetrahedrons in heavy nuclei](#)

Andreas Heusler.....212

[Cluster-shell model: I. Structure of \$^9\text{Be}\$, \$^9\text{B}\$](#)

Valeria Della Rocca and Francesco Iachello.....217

[Experimental investigation of exotic clustering in \$^{13}\text{B}\$ and \$^{14}\text{C}\$ using the resonance scattering method](#)

A. Di Pietro, J. P. Fernández-García, F. Ferrera, P. Figuera, M. Fisichella, M. Lattuada, S. Marletta, C. Marchetta, D. Torresi, M. Alcorta, M. J. G. Borge, T. Davinson, S. Heinritz, A. M. Laird, A. C. Shotter, D. Schumann, N. Soic, O. Tengblad and M. Zadro.....223

[On the way to a microscopic derivation of covariant density functionals in nuclei](#)

Peter Ring.....229

[Realistic Gamow shell model for resonance and continuum in atomic nuclei](#)

F.R. Xu, Z.H. Sun, Q. Wu, B.S. Hu and S.J. Dai.....235

[Aspects of Shape Coexistence in the Geometric Collective Model of Nuclei](#)

P. E. Georgoudis and A. Leviatan.....241

[Quartetting in even-even and odd-odd N=Z nuclei](#)

M Sambataro and N Sandulescu.....247

[Interplay of break-up and transfer processes in reactions involving weakly-bound systems](#)

Andrea Vitturi and Laura Moschini.....252

[Beyond mean-field description of Gamow-Teller resonances and \$\beta\$ -decay](#)

Yifei Niu, Gianluca Colò, Enrico Vigezzi, Chunlin Bai, Zhongming Niu and Hiroyuki Sagawa.....258

[Quasiparticle formulation of a multiphonon method and its application to the \$^{20}\text{O}\$ nucleus](#)

P. Veselý, G. De Gregorio, F. Knapp and N. Lo Iudice.....264

[Neutron knockout from \$^{68,70}\text{Ni}\$ ground and isomeric states.](#)

F. Recchia, D. Weisshaar, A. Gade, J. A. Tostevin, R. V. F. Janssens, M. Albers, V. M. Bader, T. Baugher, D. Bazin, J. S. Berryman, B. A. Brown, C. M. Campbell, M. P. Carpenter, J. Chen, C. J. Chiara, H. L. Crawford, C. R. Hoffman, F. G. Kondev, A. Korichi, C. Langer, T. Lauritsen, S. N. Liddick, E. Lunderberg, S. Noji, C. Prokop, S. R. Stroberg, S. Suchyta, K. Wimmer and S. Zhu.....270

[Pre-equilibrium GDR in a heavy composite system](#)

C Parascandolo, D Pierroutsakou, R Alba, A Del Zoppo, C Maiolino, D Santonocito, C Agodi, V Baran, A Boiano, M Colonna, R Coniglione, E De Filippo, M Di Toro, U Emanuele, F Farinon, A Guglielmetti, M La Commara, B Martin, C Mazzocchi, M Mazzocco, C Rizzo, M Romoli, C Signorini, R Silvestri, F Soramel, E Strano, D Torresi, A Trifirò and M Trimarchi.....276

[Subtraction method in the Second Random Phase Approximation](#)

Danilo Gambacurta.....282

[Surface Flows of Soft Monopole Modes of \$^{40}\text{Mg}\$](#)

J.C. Pei, Kai Wang and M. Kortelainen.....288

[Opportunities for nuclear astrophysics at FAIR](#)

K. Langanke.....293

[Hard two-photon contribution to elastic lepton-proton scattering determined by the OLYMPUS experiment](#)

D K Hasell for the OLYMPUS Collaboration.....299

[Role of exact pairing in the description of nuclear level density and radiative strength function](#)

N. Dinh Dang, N. Quang Hung and L.T. Quynh Huong.....305

[Fundamental Physics with Electroweak Probes of Nuclei](#)

Saori Pastore.....311

[Merging first principle structure studies and few-body reaction formalism](#)

R. Crespo, E. Cravo, A. Arriaga, R. Wiringa, A. Deltuva and R. Diego.....316

[Study of the \$^{249-251}\text{Cf} + ^{48}\text{Ca}\$ reactions: recent results and outlook](#)

A A Voinov, Yu Ts Oganessian, F Sh Abdullin, N T Brewer, S N Dmitriev, R K Grzywacz, J H Hamilton, M G Itkis, K Miernik, A N Polyakov, J B Roberto, K P Rykaczewski, A V Sabelnikov, R N Sagaidak, I V Shirokovsky, M V Shumeiko, M A Stoyer, V G Subbotin, A M Sukhov, Yu S Tsyganov, V K Utyonkov and G K Vostokin.....321

[Shell evolution and \$E2\$ collectivity: new spectroscopic information](#)

N Pietralla, C Kremer, M Lettmann, S Aslanidou, A Krugmann, C Lizarazo, P von Neumann-Cosel, V Werner and W Witt.....325

[Nuclear deformation in the configuration-interaction shell model](#)

Y. Alhassid, G.F. Bertsch, C.N. Gilbreth and M.T. Mustonen.....331

[Experimental evidence of chaos in the bound states of \$^{208}\text{Pb}\$](#)

L. Muñoz, R. A. Molina, J. M. G. Gómez and A. Heusler.....337

[Shell-model investigation of odd-mass nuclei in the \$^{132}\text{Sn}\$ region](#)

H. Naïdja and F. Nowacki.....343

[A STUDY ON 4 REACTIONS FORMING \$^{46}\text{Ti}^*\$](#)

M. Cicerchia, T. Marchi, F. Gramegna, M. Cinausero, D. Fabris, G. Mantovani, M. Degerlier, L. Morelli, M. Bruno, M. D'Agostino, C. Frosin, S. Barlini, S. Piantelli, S. Valdrè, M. Bini, G. Pasquali, G. Casini, G. Pastore, D. Gruyer, P. Ottanelli, A. Camaiani, N. Gelli, A. Olmi, G. Poggi, I. Lombardo, D. Dell'Aquila and N. Cieplicka-Orynczak.....349

[Nonnegative Tensor Factorization Approach Applied to Fission Chamber's Output Signals Blind Source Separation](#)

M. Laassiri, E-M. Hamzaoui and R. Cherkaoui El Moursli.....355

[Pulse Shape Discrimination with EJ299 scintillators](#)

A Muoio, F Cappuzzello, D Carbone, M Cavallaro, G Lanzalone, A Pappalardo, G Santagati, A Trifirò and S Tudisco.....361