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Newsletter archive: <http://npg.dl.ac.uk/OutreachNewsletter/index.html>

Nuclear Physics Public Engagement Website: [NuclearPhysicsForYou](#)

[Nuclear Physics Outreach Poster](#) – order hardcopies from STFC free of charge [here](#)

1. Nuclear Physics Publications for December (also includes missed publications from previous months)

If you are publishing a paper that you think would be of media value please contact [Wendy Ellison](#), STFC Press Officer. She can help with press releases and publicity. If you get in touch with her before publication she can also get material ready in advance for the day of publication.

This month's publication list includes some articles published in the Phys. Rev. C 50th anniversary edition (<https://journals.aps.org/prc/50th>)

Phys. Rev. C **102**, 064616 (Editor's Pick)
<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.064616>

Three-nucleon force contribution to the deuteron channel in (d,p) reactions

[N. K. Timofeyuk](#), [M. J. Dinmore](#), and [J. S. Al-Khalili](#)

Published 18 December 2020

Eur. J. Phys. **42** 015805
<https://iopscience.iop.org/article/10.1088/1361-6404/abbca3>

Undergraduate experiments with a ⁴⁴Ti source

[S Pirrie](#)^{2,1}, [G Tungate](#)¹, [Tz Kokalova](#)¹, [C Wheldon](#)¹, [K Nikolopoulos](#)¹, [P Santa Rita](#)¹ and [A Turner](#)¹

Published 14 December 2020

Phys. Lett. B **811** 135873
<https://www.sciencedirect.com/science/article/pii/S0370269320306766>

Spectroscopy of proton-rich ⁷⁹Zr: Mirror energy differences in the highly-deformed *fpg* shell

[R.D.O.Llewellyn](#)^a, [M.A.Bentley](#)^a, [R.Wadsworth](#)^a, [J.Dobaczewski](#)^{ab}, [W.Satuła](#)^b, [H.Iwasaki](#)^{cd}, [G.de Angelis](#)^e, [J.Ash](#)^{cd}, [D.Bazin](#)^{cd}, [P.C.Bender](#)^{c1}, [B.Cederwall](#)^f, [B.P.Crider](#)^{c2}, [M.Doncel](#)^g, [R.Elder](#)^{cd}, [B.Elman](#)^{cd}, [A.Gade](#)^{cd}, [M.Grinder](#)^{cd}, [T.Haylett](#)^a, [D.G.Jenkins](#)^a, [I.Y.Lee](#)^h, [B.Longfellow](#)^{cd}, [E.Lunderberg](#)^{cd}, [T.Mijatović](#)^{c3}, [S.A.Milne](#)^a, [D.Rhodes](#)^{cd}, [D.Weisshaar](#)^c

Published 10 December 2020

Phys. Rev. C **102**, 064315

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.064315>

Search for evidence of rotational cluster bands in ^{18}O

[S. Pirrie¹](#), [C. Wheldon¹](#), [Tz. Kokalova¹](#), [J. Bishop^{1,*}](#), [Th. Faestermann²](#), [R. Hertenberger³](#), [H.-F. Wirth³](#), [S. Bailey¹](#), [N. Curtis¹](#), [D. Dell'Aquila^{4,†}](#), [D. Mengoni⁵](#), [R. Smith^{1,‡}](#), [D. Torresi^{1,§}](#), and [A. Turner¹](#)

Published 14 December 2020

Phys. Rev. C **102**, 064611

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.064611>

Reaction channel contributions to the triton optical potential

[N. Keeley](#) and [R. S. Mackintosh](#)

Published 11 December 2020

Phys. Rev. C **102**, 064004

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.064004>

Novel observation of isospin structure of short-range correlations in calcium isotopes

[D. Nguyen *et al.*](#) (Jefferson Lab Hall A Collaboration)

Published 14 December 2020

Phys. Rev. C **102**, 064302

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.064302>

High-spin structure of the sd shell nuclei ^{25}Na and ^{22}Ne

[J. Williams^{1,*}](#), [G. C. Ball¹](#), [A. Chester^{2,†}](#), [P. Choudhary³](#), [T. Domingo²](#), [A. B. Garnsworthy¹](#), [G. Hackman¹](#), [J. Henderson^{1,‡}](#), [R. Henderson¹](#), [R. Krücken^{1,4}](#), [R. S. Lubna¹](#), [J. Measures^{1,5}](#), [O. Paetkau¹](#), [J. Park^{1,4,§}](#), [J. Smallcombe^{1,||}](#), [P. C. Srivastava³](#), [K. Starosta²](#), [C. E. Svensson⁶](#), [K. Whitmore²](#), and [M. Williams¹](#)

Published 1 December 2020

Phys. Rev. C **102**, 064304

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.064304>

Determination of β -decay ground state feeding of nuclei of importance for reactor applications

[V. Guadilla^{*}](#), [J. L. Tain](#), [A. Algora[†]](#), [J. Agramunt](#), [D. Jordan](#), [M. Monserrate](#), [A. Montaner-Pizá](#), [S. E. A. Orrigo](#), [B. Rubio²](#), [E. Valencia](#), [J. A. Briz](#), [A. Cucoanes](#), [M. Estienne](#), [M. Fallot](#), [L. Le Meur](#), [A. Porta](#), [T. Shiba](#), [A.-A. Zakari-Issoufou](#), [J. Äystö](#), [T. Eronen⁴](#), [D. Gorelov](#), [J. Hakala](#), [A. Jokinen](#), [A. Kankainen](#), [V. S. Kolhinen[‡]](#), [J. Koponen](#), [I. D. Moore](#), [H. Penttilä](#), [I. Pohjalainen](#), [J. Reinikainen](#), [M. Reponen](#), [S. Rinta-Antila](#), [K. Rytkönen](#), [V. Sonnenschein⁵](#), [A. Voss](#), [L. M. Fraile](#), [V. Vedia](#), [E. Ganioglu](#), [W. Gelletly](#), [M. Lebois](#), [J. N. Wilson](#), [T. Martinez](#), [E. Nácher](#) and [A. A. Sonzogni](#)

Published 2 December 2020

Phys. Rev. C **102**, 064321

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.064321>

First observation of excited states in the $^{154}\text{Ce}_{96}$ nucleus: Rigid rotation at $Z=58$

[W. Urban¹](#), [T. Rzača-Urban¹](#), [A. G. Smith²](#), [G. S. Simpson²](#), and [J. P. Greene³](#)

Published 24 December 2020

Phys. Rev. C **102**, 064323

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.064323>

Prompt and delayed γ spectroscopy of neutron-rich ^{94}Kr and observation of a new isomer

[R.-B. Gerst^{1,*}](#), [A. Blazhev¹](#), [N. Warr¹](#), [J. N. Wilson²](#), [M. Lebois²](#), [N. Jovančević²](#), [D. Thisse²](#), [R. Canavan³](#), [M. Rudigier^{3,4}](#), [D. Étasse⁵](#), [E. Adamska⁶](#), [P. Adsley²](#), [A. Algora⁷](#), [M. Babo²](#), [K. Belvedere³](#), [J. Benito⁸](#), [G. Benzoni⁹](#), [A. Boso¹⁰](#), [S. Bottoni^{11,9}](#), [M. Bunce¹⁰](#), [R. Chakma²](#), [N. Cieplicka-Oryńczak¹²](#), [S. Courtin^{13,14}](#), [M. L. Cortés¹⁵](#), [P. Davies¹⁶](#), [C. Delafosse²](#), [M. Fallot¹⁷](#), [B. Fornal¹²](#), [L. M. Fraile⁸](#), [D. Gjestvang¹⁸](#), [A. Gottardo¹⁹](#), [V. Guadilla¹⁷](#), [G. Häfner^{1,2}](#), [K. Hauschild²](#), [M. Heine¹³](#), [C. Henrich⁴](#), [I. Homm⁴](#), [F. Ibrahim²](#), [Ł. W. Iskra^{9,12}](#), [P. Ivanov¹⁰](#), [S. Jazrawi^{3,10}](#), [A. Korgul⁶](#), [P. Koseoglou^{4,20}](#), [T. Kröll⁴](#), [T. Kurtukian-Nieto²¹](#), [L. Le Meur¹⁷](#), [S. Leoni^{11,9}](#), [J. Ljungvall²](#), [A. Lopez-Martens²](#), [R. Lozeva²](#), [I. Matea²](#), [K. Miernik⁶](#), [J. Nemer²](#), [S. Oberstedt²²](#), [W. Paulsen¹⁸](#), [M. Piersa⁶](#), [Y. Popovitch²](#), [C. Porzio^{11,9,23}](#), [L. Qi²](#), [D. Ralet²⁴](#), [P. H. Regan^{3,10}](#), [D. Reygadas-Tello²⁵](#), [K. Rezykina²⁶](#), [V. Sánchez-Tembleque⁸](#), [C. Schmitt¹³](#), [P.-A. Söderström⁴](#), [C. Sürder⁴](#), [G. Tocabens²](#), [V. Vedia⁸](#), [D. Verney²](#), [B. Wasilewska¹²](#), [J. Wiederhold⁴](#), [M. Yavachova²⁷](#), [F. Zeiser¹⁸](#), and [S. Ziliani^{11,9}](#)

Published 24 December 2020

Phys. Rev. C **102**, 064602

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.064602>

Search for elements 119 and 120

[J. Khuyagbaatar^{1,2,*}](#), [A. Yakushev²](#), [Ch. E. Düllmann^{1,2,3}](#), [D. Ackermann^{2,†}](#), [L.-L. Andersson¹](#), [M. Asai⁴](#), [M. Block²](#), [R. A. Boll⁵](#), [H. Brand²](#), [D. M. Cox^{6,‡}](#), [M. Dasgupta⁷](#), [X. Derckx^{1,3}](#), [A. Di Nitto^{3,8}](#), [K. Eberhardt^{1,3}](#), [J. Even^{4,||}](#), [M. Evers⁷](#), [C. Fahlander⁸](#), [U. Forsberg⁸](#), [J. M. Gates⁹](#), [N. Gharibyan¹⁰](#), [P. Golubev⁸](#), [K. E. Gregorich⁹](#), [J. H. Hamilton¹¹](#), [W. Hartmann^{2,*}](#), [R.-D. Herzberg⁶](#), [F. P. Heßberger^{1,2}](#), [D. J. Hinde⁷](#), [J. Hoffmann²](#), [R. Hollinger²](#), [A. Hübner²](#), [E. Jäger²](#), [B. Kindler²](#), [J. V. Kratz³](#), [J. Krier²](#), [N. Kurz²](#), [M. Laatiaoui²](#), [S. Lahiri¹²](#), [R. Lang²](#), [B. Lommel²](#), [M. Maiti^{12,¶}](#), [K. Miernik⁵](#), [S. Minami²](#), [A. K. Mistry^{2,6}](#), [C. Mokry^{1,3}](#), [H. Nitsche^{9,*}](#), [J. P. Omtvedt¹³](#), [G. K. Pang⁹](#), [P. Papadakis^{6,14}](#), [D. Renisch³](#), [J. B. Roberto⁵](#), [D. Rudolph⁸](#), [J. Runke²](#), [K. P. Rykaczewski⁵](#), [L. G. Sarmiento⁸](#), [M. Schädel^{2,4}](#), [B. Schausten²](#), [A. Semchenkov¹³](#), [D. A. Shaughnessy¹⁰](#), [P. Steinegger^{15,16}](#), [J. Steiner²](#), [E. E. Tereshatov^{10,††}](#), [P. Thörle-Pospiech^{1,3}](#), [K. Tinschert²](#), [T. Torres De Heidenreich²](#), [N. Trautmann³](#), [A. Türler^{15,16}](#), [J. Uusitalo¹⁴](#), [M. Wegrzecki¹⁷](#), [N. Wiehl^{1,3}](#), [S. M. Van Cleve⁵](#), and [V. Yakusheva¹](#)

Published 2 December 2020

Phys. Rev. C **102**, 064618

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.064618>

Production of transuranium isotopes in ^{20}Ne -induced incomplete fusion reactions

[Rafael Van den Bossche](#) and [Alexis Diaz-Torres](#)

Published 21 December 2020

Phys. Rev. C **102**, 065203

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.065203>

Photoproduction of η mesons off the proton for $1.2 < E_\gamma < 4.7 \text{ GeV}$ using CLAS at Jefferson Laboratory

[T. Hu et al.](#) (CLAS Collaboration)

Published 14 December 2020

Published 2 December 2020

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.065801>

Outer crust of a cold, nonaccreting neutron star within the quark-meson-coupling model

[S. Antić^{1,*}](#), [J. R. Stone^{2,3}](#), [J. C. Miller³](#), [K. L. Martinez¹](#), [P. A. M. Guichon⁴](#), and [A. W. Thomas¹](#)

Published 2 December 2020

Phys. Rev. Lett. **125**, 252501

<https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.125.252501>

Surface Localization of the Dineutron in ^{11}Li

[Y. Kubota^{1,2,*}](#), [A. Corsi³](#), [G. Authelet³](#), [H. Baba¹](#), [C. Caesar⁴](#), [D. Calvet³](#), [A. Delbart³](#), [M. Dozono²](#), [J. Feng⁵](#), [F. Flavigny^{6,†}](#), [J.-M. Gheller³](#), [J. Gibelin⁷](#), [A. Giganon³](#), [A. Gillibert³](#), [K. Hasegawa⁸](#), [T. Isobe¹](#), [Y. Kanaya⁹](#), [S. Kawakami⁹](#), [D. Kim¹⁴](#), [Y. Kikuchi^{10,1,11}](#), [Y. Kiyokawa²](#), [M. Kobayashi²](#), [N. Kobayashi¹²](#), [T. Kobayashi⁸](#), [Y. Kondo¹³](#), [Z. Korkulu^{14,15}](#), [S. Koyama¹²](#), [V. Lapoux³](#), [Y. Maeda⁹](#), [F. M. Marqués⁷](#), [T. Motobayashi¹](#), [T. Miyazaki¹²](#), [T. Nakamura¹³](#), [N. Nakatsuka¹⁶](#), [Y. Nishio¹⁷](#), [A. Obertelli^{3,*}](#), [K. Ogata^{18,11}](#), [A. Ohkura¹⁷](#), [N. A. Orr⁷](#), [S. Ota²](#), [H. Otsu¹](#), [T. Ozaki¹³](#), [V. Panin¹](#), [S. Paschalis^{4,†}](#), [E. C. Pollacco³](#), [S. Reichert¹⁹](#), [J.-Y. Rousse³](#), [A. T. Saito¹³](#), [S. Sakaguchi¹⁷](#), [M. Sako¹](#), [C. Santamaria³](#), [M. Sasano¹](#), [H. Sato¹](#), [M. Shikata¹³](#), [Y. Shimizu¹](#), [Y. Shindo¹⁷](#), [L. Stuhl^{14,1}](#), [T. Sumikama⁸](#), [Y. L. Sun^{3,*}](#), [M. Tabata¹⁷](#), [Y. Togano¹³](#), [J. Tsubota¹³](#), [Z. H. Yang¹](#), [J. Yasuda¹⁷](#), [K. Yoneda¹](#), [J. Zenihiro¹](#), and [T. Uesaka^{1,20}](#)

Published 16 December 2020

Phys. Rev. Lett. **125**, 252502

<https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.125.252502>

Final Results of GERDA on the Search for Neutrinoless Double- β Decay

[M. Agostini *et al.*](#) (GERDA Collaboration)

Published 17 December 2020

Phys. Rev. C 50th Anniversary Papers

Phys. Rev. C **51**, 78

[URL](#)

In-beam γ -ray spectroscopy above ^{100}Sn using the new technique of recoil decay tagging

[E. S. Paul](#), [P. J. Woods](#), [T. Davinson](#), [R. D. Page](#), [P. J. Sellin](#), [C. W. Beausang](#), [R. M. Clark](#), [R. A. Cunningham](#), [S. A. Forbes](#), [D. B. Fossan](#), [A. Gizon](#), [J. Gizon](#), [K. Hauschild](#), [I. M. Hibbert](#), [A. N. James](#), [D. R. LaFosse](#), [I. Lazarus](#), [H. Schnare](#), [J. Simpson](#), [R. Wadsworth](#), and [M. P. Waring](#)

Published 1 January 1995

Phys. Rev. C **68**, 014313

[URL](#)

Observation of nuclear scaling in the $A(e,e')$ reaction at $x_B > 1$

[K. Sh. Egiyan *et al.*](#) (CLAS Collaboration)

Published 29 July 2003

Phys. Rev. C **72**, 014904

[URL](#)

Azimuthal anisotropy in Au+Au collisions at $\sqrt{s_{NN}}=200\text{GeV}$

[J. Adams *et al.*](#) (STAR Collaboration, STAR-RICH Collaboration)

Published 14 July 2005

Phys. Rev. C **72**, 055502

[URL](#)

Electron energy spectra, fluxes, and day-night asymmetries of 8B solar neutrinos from measurements with NaCl dissolved in the heavy-water detector at the Sudbury Neutrino Observatory

[B. Aharmim *et al.*](#) (SNO Collaboration)

Published 30 November 2005

Phys. Rev. C **88**, 025501

[URL](#)

Combined analysis of all three phases of solar neutrino data from the Sudbury Neutrino Observatory

[B. Aharmim *et al.*](#) (SNO Collaboration)

Published 1 August 2013

Phys. Rev. C **5**, 626

[URL](#)

Hartree-Fock Calculations with Skyrme's Interaction. I. Spherical Nuclei

D. Vautherin and D. M. Brink

Published 1 March 1972

2. News to Report

a. Nuclear Physics Group Early Career Prize: Call for Nominations

IOP Nuclear Physics Early Career Researcher Prize

A reminder that nominations for the IOP Nuclear Physics Group Early Career Researcher Prize can still be submitted. This prize is awarded to an individual who has made a significant contribution to either experimental or theoretical nuclear physics research in either fundamental or applied areas.

Researchers who are within 6 years of the completion of their Ph.D. or, for those without a Ph.D, within 10 years of the start of their first employment contract where research is the primary function of their role are eligible. The winner receives £250 and is invited to present at the annual IOP Nuclear Physics Conference.

Details of the award can be found on our [webpage](#) along with a nomination form for download. This should be sent, along with a supporting statement from a referee external to the nominee's current place of study or work, to the Secretary of the Nuclear Physics Group, James Benstead, at james.benstead@awe.co.uk no later than

5 February 2021.

We also support anyone wishing to self-nominate, though students should have the support of their supervisor in doing so.

*Contribution by David Sharp
(University of Manchester)*

3. Outreach Activity

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4. Media Interactions

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