UK Nuclear Activity

September 2021 Issue 99

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

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1. Nuclear Physics Publications for September (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.

Nature Communications **volume 12**, Article number: 5920 **(Editor's pick)**
https://www.nature.com/articles/s41467-021-26179-x
Precision measurements on oxygen formation in stellar helium burning with gamma-ray beams and a Time Projection Chamber
R. Smith, M. Gai, S. R. Stern, D. K. Schweitzer & M. W. Ahmed
Published 11 October 2021

Phys. Rev. C **104**, L032803
https://journals.aps.org/prc/abstract/10.1103/PhysRevC.104.L032803
Destruction of the cosmic γ-ray emitter ^{26}Al in massive stars: Study of the key ^{26}Al(n,α) reaction
C. Lederer-Woods *et al.* (n_TOF Collaboration)
Published 22 September 2021

Phys. Rev. C **104**, 034307
https://journals.aps.org/prc/abstract/10.1103/PhysRevC.104.034307
^{145}Ba and ^{145,146}La structure from lifetime measurements
B. Olaizola, A. Babu, R. Umashankar, A. B. Garnsworthy, G. C. Ball, V. Bildstein, M. Bowry, C. Burbadge, R. Cabellero-Folch, I. Dillmann, A. Diaz-Varela, R. Dunlop, A. Estradé, P. E. Garrett, G. Hackman, A. D. MacLean, J. Measures, C. J. Pearson, B. Shaw, D. Southall, C. E. Svensson, J. Turko, K. Whitmore, and T. Zidar
Published 9 September 2021

Phys. Rev. C **104**, 034313
https://journals.aps.org/prc/abstract/10.1103/PhysRevC.104.034313
Neutron-unbound states in ^{31}Ne
D. Chrisman, A. N. Kuchera, T. Baumann, A. Blake, B. A. Brown, J. Brown, C. Cochran, P. A. DeYoung, J. E. Finck, N. Frank, P. Guèye, H. Karrick, H. Liu, J. McDonaugh, T. Mix, B. Monteagudo, T. H. Redpath, W. F. Rogers, R. Seaton-Todd, A. Spyrou, K. Stiefel, M. Thoennessen, J. A. Tostevin, and D. Votaw
Published 15 September 2021

Phys. Rev. C **104**, 034318
https://journals.aps.org/prc/abstract/10.1103/PhysRevC.104.034318
Coulomb and nuclear excitations of ^{70}Zn and ^{68}Ni at intermediate energy
S. Calinescu1, O. Sorlin2, I. Matea3, F. Carstoiu1, D. D. Dao4, F. Nowacki4, G. de Angelis5, R. Astabatyan6, S. Bagchi7, C. Borcea1, R. Borcea1, L. Cáceres2, M. Ciemála8, E. Clément2, Z. Dombrádi9, S. Franchoo3, A. Gottardo5, S. Grévy10, H. Guerin10, M. N. Harakeh7, I. M. Harca1, O. Kamalou2, M. Kmiecik8, A. Krasznahorkay9, M. Krzysiek8, I. Kuti9, A. Lepailleur2, S. Lukyanov6, A. Maj8, V. Maslov6, K. Mazurek8, P. Morfouace3, J. Mrazek11, F. Negoita1, M. Niikura3, L. Olivier3, Y. Penionzhkevich6, L. Perrot3, C. Petrone1,12, Z. Podolyák13, C. Rigollet7, T. Roger2, F. Rotaru1, D. Sohler9, M. Stanoiu1, I. Stefan3, L. Stuhl9, J. C. Thomas2, Z. Vajta9, M. Vandebrouck14, and O. Wieland15
Published 23 September 2021

Phys. Rev. C **104**, 034614
https://journals.aps.org/prc/abstract/10.1103/PhysRevC.104.034614
Three-body optical potentials in (d,p) reactions and their influence on indirect study of stellar nucleosynthesis
M. J. Dinmore, N. K. Timofeyuk, and J. S. Al-Khalili
Published 10 September 2021

Phys. Rev. Lett. **127**, 112501
https://journals.aps.org/prl/references/10.1103/PhysRevLett.127.112501
Mass Measurements of Neutron-Deficient Yb Isotopes and Nuclear Structure at the Extreme Proton-Rich Side of the N=82 Shell
Sönke Beck1,2,*, Brian Kootte3,4, Irene Dedes5,6, Timo Dickel1,2, A. A. Kwiatkowski3,7, Eleni Marina Lykiardopoulou8,3, Wolfgang R. Plaß1,2, Moritz P. Reiter1,3,9, Corina Andreoiu10, Julian Bergmann1, Thomas Brunner11, Dominique Curien12, Jens Dilling3,8, Jerzy Dudek12,6, Eleanor Dunling3,13, Jake Flowerdew14, Abdelghafar Gaamouci15, Leigh

Graham3, Gerald Gwinner4, Andrew Jacobs8,3, Renee Klawitter3, Yang Lan8, Erich Leistenschneider8,3, Nikolay Minkov16, Victor Monier3, Ish Mukul3, Stefan F. Paul3, Christoph Scheidenberger1,2,17, Robert I. Thompson14, James L. Tracy, Jr.3, Michael Vansteenkiste3, Hua-Lei Wang18, Michael E. Wieser14, Christian Will1, and Jie Yang6,18
Published 10 September 2021

Phys. Rev. Lett. **127**, 112701
https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.127.112701

First Direct Measurement of an Astrophysical p-Process Reaction Cross Section Using a Radioactive Ion Beam

G. Lotay1, S. A. Gillespie2,†, M. Williams2,3, T. Rauscher4,5, M. Alcorta2, A. M. Amthor6, C. A. Andreoiu7, D. Baal2, G. C. Ball2, S. S. Bhattacharjee2,‡, H. Behnamian8, V. Bildstein8, C. Burbadge8,*, W. N. Catford1, D. T. Doherty1, N. E. Esker2, F. H. Garcia7, A. B. Garnsworthy2, G. Hackman2, S. Hallam1, K. A. Hudson2,9, S. Jazrawi1, E. Kasanda8, A. R. L. Kennington1, Y. H. Kim10, A. Lennarz2, R. S. Lubna2, C. R. Natzke2,11, N. Nishimura12, B. Olaizola2,§, C. Paxman1,2, A. Psaltis13,‖, C. E. Svensson8, J. Williams2, B. Wallis3, D. Yates2,14, D. Walter2, and B. Davids2,9
Published 10 September 2021

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2. News to Report

a. IOP Nuclear Physics Group Early Career Prize nominations

We would like to announce the call for nominations for the IOP Nuclear Physics Group Early Career Researcher Prize. This prize is awarded to an individual, at an early stage of their career, 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. Nominees should be employed by, studying at, or obtained their Ph.D. at a UK or Irish institution or be an IOP Nuclear Physics Group member.

The winner receives £250 and is invited to present at the annual IOP Nuclear Physics Conference.

The nomination form will be available soon at: Nuclear Physics Early Career Researcher Prize | Institute of Physics (iop.org) or can be obtained by emailing the Group's Secretary at james.benstead@awe.co.uk.

This completed form should be sent to the Secretary of the Nuclear Physics Group at james.benstead@awe.co.uk by 30th November 2021, with a supporting statement from a referee external to the nominee's current place of study or work sent no later than 7th December 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
(IOP Nuclear Physics Group Chair)

b. Prof Marialuisa Aliotta awarded Giuseppe Occhialini Medal and Prize

Prof Marialuisa Aliotta received the Giuseppe Occhialini Medal and Prize in recognition of her work in nuclear astrophysics.
The Giuseppe Occhialini Medal and Prize is awarded jointly by the Institute of Physics and the Italian Physical Society for distinguished work by a physicist based in Italy or the UK/Ireland.

Prof Aliotta received this award "for her major contributions to nuclear astrophysics experiments, in particular to the study of key hydrogen-burning reactions relevant to quiescent stellar evolution and nucleosynthesis, in the framework of the international LUNA experiments at the Laboratori Nazionali del Gran Sasso, INFN (Istituto Nazionale di Fisica Nucleare)."

Contribution by Marialuisa Aliotta (University of Edinburgh)

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3. Outreach Activity

a. Nature blog post by Robin Smith

Robin Smith of Sheffield Hallam University has written a blog post following an invitation from Nature. The post on "Shining a spotlight on stellar evolution with gamma-beams" can be read at: https://go.nature.com/3DprTc5

Contribution by Robin Smith (Sheffield Hallam University)

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4. Media Interactions

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