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   Published 28 September 2020


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Newsletter archive: [http://npg.dl.ac.uk/OutreachNewsletter/index.html](http://npg.dl.ac.uk/OutreachNewsletter/index.html)

Nuclear Physics Public Engagement Website: [NuclearPhysicsForYou](http://npg.dl.ac.uk/OutreachNewsletter/index.html)

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

**Phys. Rev. C 102, 034616**

**Measurement of muon-induced high-energy neutrons from rock in an underground Gd-doped water detector**


Published 28 September 2020


**Examination of the inversion of isobaric analogue states in mirror nuclei**

J. Henderson and S. R. Stroberg

Published 28 September 2020

First direct measurement of photoproduction of the a(211)Pa meson on the proton


(On leave from National Laboratory for Nuclear Sciences, Guangzhou, Guangdong 510640, China)

(Received 26 October 2020; published 23 September 2021)

We have measured the a(211)Pa photoproduction cross section on carbon in the 14–450-MeV photon energy range. The reaction was studied at a fixed center-of-mass laboratory angle of 173°. The results show a significant angular momentum transfer, which could be used to probe the structure of the a meson. Our cross-section results are compared with previous measurements and calculations. Our results suggest that the a meson has a size significantly larger than that calculated by the relativistic quark model. We also observe an enhancement of the a(211)Pa production cross section in the 200–400-MeV energy region, which is consistent with the discovery of the a(238)Pa meson by the CLAS Collaboration. These results are consistent with experiments performed by the CLAS Collaboration, which observed the a(238)Pa meson in the photoproduction of Ni75.
Published 10 September 2020
Phys. Rev. C 102, 034319
https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.034319

Isomeric and collective structures in neutron-rich hafnium isotopes
F. Amirzadeh, A. Kardan, P. M. Walker, and Hai-Liang Ma
Published 16 September 2020

Phys. Rev. C 102, 034323
https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.034323

Photo response of 164Dy
O. Papst1,2, V. Werner1,2, J. Isaak1, N. Pietralla1, T. Beck1, C. Bernards2, M. Bhike3, N. Cooper2, B. P. Crider4, U. Friman-Gaylor1, J. Kleemann5, Krishichayan5, B. Löhner5, F. Naqvi14, E. E. Peters5, F. M. Prados-Estévez6,8, R. S. Ilieva2,7, T. J. Ross6, D. Savran4, W. Tornow8, and J. R. Vanhoy8
Published 21 September 2020

Phys. Rev. C 102, 034324
https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.034324

Evolution of proton single-particle states in neutron-rich Sb isotopes beyond N=82
Published 23 September 2020

Phys. Rev. C 102, 034325
https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.034325

Shell structure of 43S and collapse of the N=28 shell closure
Published 25 September 2020

Phys. Rev. C 102, 034609
https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.034609

Multi-neutron transfer in 8He-induced reactions near the Coulomb barrier
I. Martel, N. Keeley, K. W. Kemper, and K. Rusek
Published 10 September 2020

Phys. Rev. C 102, 035205
https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.035205

Extracting the spin polarizabilities of the proton by measurement of Compton double-polarization observables
Dr Paul Stevenson, Head of the Nuclear Theory Group at the University of Surrey, has been appointed an AWE William Penney Fellow (WPF). WPFs are academic researchers at the very tops of their respective fields, that AWE sponsor in exchange for research into topics of relevance to their Programme.

Dr Stevenson’s appointment will provide AWE with additional insight into a range of nuclear theory topics, including compound-nucleus population and decay, and time-dependent Hartree-Fock methods.
b. PhD position at the University of Surrey

Applications are invited for a fully-funded (for a UK student) PhD studentship working in the theoretical nuclear physics group at the University of Surrey on the application of quantum computing to the solution of problems in many-body physics as applied to atomic nuclei. You will join a group working on various approaches to the understanding of the properties of nuclear structure and reactions, developing a new approach to using the emerging field of quantum computing as a means of directly simulating the behaviour of nucleons in a nucleus. The project is sponsored by AWE plc and you will be jointly supervised by University of Surrey and AWE staff.

More details can be found at either: https://www.findaphd.com/phds/project/phd-studentship-opportunity-in-quantum-computing-for-nuclear-physics/?p123717 or https://www.surrey.ac.uk/fees-and-funding/studentships

3. Outreach Activity

a. Space week

Virtual World Space Week 2020 – 4th-10th October 2020

Launching from the success of our 2019 high street event and embracing the ways we have adapted to the virtual world the IoP South Central branch are offering a wide variety of virtual activities for World Space Week 2020, and everyone is welcome! Details of each activity are provided below, all of our online events will have closed captioning and audio description available where applicable and with such a variety of activities we believe there will be something for everyone to enjoy. To get all the updates in the lead up to WSW2020 join our Facebook event https://fb.me/e/7iUNnIqOx, in addition to the events below between 12-1pm each weekday we will be sharing ideas for craft activities to try at home during “space”craft hour. We would love to see your pictures showing how you are getting involved with World Space Week 2020, wherever you are, tag us on Twitter using @IOPSouthCentral and Facebook @IOPSCB and use the hashtag #WSW2020.

Space-theme virtual quiz - Friday 9th October at 5-6pm
https://attendee.gotowebinar.com/register/6373727478774345485

Guide to Fake News (online activity and live Q&A) - Tuesday 6th October 12-1pm
https://attendee.gotowebinar.com/register/1742948440930594317

Walk/Run/Cycle the Solar System - Start date 5th October, end date 11th October
https://www.strava.com/clubs/743372

Egg drop challenge - Deadline for entries: 10pm on 10th October 2020
https://drive.google.com/file/d/1HD5vISP6sn27CKOwg9pT4lCzkly5Ph/view?usp=sharing

NPL Where on Earth am I? GPS challenge (online activity and live results talk)
Start date: 29th October at www.npl.co.uk/measurement-at-home/where-am-i
End date: 8th October (for results to be included in live event)
Live event: 10th October 2-3pm (link TBC)

Guildford Astronomical Society – Sunday 4th October
Daytime solar observing 12-1pm:
https://zoom.us/j/95638873982
Evening talk “Sputnik in Context” 5-6pm:
https://zoom.us/j/9702195434
Live storytelling: Ted’s great space adventure (ages 3-5) - Tuesday 6th October 10:30-11:30 - Elizabeth Avery
https://attendee.gotowebinar.com/register/138005611517108749

Storytime and play session (ages 3-5)
Molly and the Moon Wednesday 7th October 10:30-11:30 -
https://www.facebook.com/surreylibrariesUK

Falling Down Question Wednesday 14th October 10:30-11:30 -
https://www.facebook.com/surreylibrariesUK

The Day the Sun Didn’t Come to Breakfast
Wednesday 21st October 10:30-11:30 -
https://www.facebook.com/surreylibrariesUK

Lecture: “Radiation Protection – how to survive a journey to Mars” - Sunday 4th October 3-4pm - Dr Elizabeth Cunningham
https://attendee.gotowebinar.com/register/8324832852495332877

Lecture: To c or not to c - Physics in Science Fiction Writing - Thursday 8th October 5-6pm - David Wilkinson
https://attendee.gotowebinar.com/register/38492112622022669

Contributed by Chantal Nobs (UKAEA)

4. Media Interactions
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