UK Nuclear Activity

June 2022 Issue 108

In this issue,

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

Nuclear Physics Public Engagement Website: NuclearPhysicsForYou

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1. Nuclear Physics Publications for June*

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.

*Also includes missed publications from previous months

Nature **606** 678 (2022) (https://doi.org/10.1038/s41586-022-04827-6)
Observation of a correlated free four-neutron system
M. Duer *et al*.
Published 22 June 2022

Physical Review C **105** 064003 (2022) (https://doi.org/10.1103/PhysRevC.105.064003)
Probing for high-momentum protons in ^{4}He via the ^{4}He(e,e'p)X reactions
S. Iqbal *et al.* (JLab Hall A collaboration)
Published 22 June 2022

Physical Review C **105** 064307 (2022) (https://doi.org/10.1103/PhysRevC.105.064307)
Experimental study of the isomeric state in ^{16}N using the ^{16}N^{g,m}(d,^{3}He) reaction
T. L. Tang *et al.*
Published 21 June 2022

Physical Review C **105** 065201 (2022) (https://doi.org/10.1103/PhysRevC.105.065201)
Beam-recoil transferred polarization in K^{+}Y electroproduction in the nucleon resonance region with CLAS12
D. S. Carman *et al.* (CLAS collaboration)
Published 1 June 2022

Physical Review C **105** 065203 (2022) (https://doi.org/10.1103/PhysRevC.105.065203)
Detailed analysis of excited-state systematics in a lattice QCD calculation of g_A

Jinchen He *et al.*
Published 9 June 2022

Physical Review C **105** 065805 (2022) (https://doi.org/10.1103/PhysRevC.105.065805)
Constraints on key $^{17}O(\alpha,\gamma)^{21}Ne$ resonances and impact on the weak s process
M. Williams, A. M. Laird, A. Choplin, P. Adsley, B. Davids, U. Greife, K. Hudson, D. Hutcheon, A. Lennarz, and C. Ruiz
Published 21 June 2022

Physics Letters B **830** 137123 (2022) (https://doi.org/10.1016/j.physletb.2022.137123)
The β-decay of ^{70}Kr into ^{70}Br: Restoration of the pseudo-SU(4) symmetry
A. Vitéz-Sveiczer *et al.*
Published 10 July 2022

Proc. SPIE **12133** 121330J Quantum Technologies (2022) (https://doi.org/10.1117/12.2632782)
Quantum computing calculations for nuclear structure and nuclear data
I. Hobday, P. D. Stevenson, J. Benstead
Published 31 May 2022

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2. News to Report

a. STFC Knowledge Exchange and Commercialisation Fellow at University of York

The Nuclear Physics Group at the University of York, led by Prof David Jenkins, is pleased to announce that Dr Adam Featherstone has recently joined the team as an STFC Knowledge Exchange & Commercialisation (KEC) Fellow.

Dr Featherstone has degrees in physics and medical imaging from the University of Manchester. Prior to joining the University of York, he worked in various roles related to intellectual property, innovation management, and commercial partnerships.

KEC Fellowships are relatively rare opportunities that allow technology transfer and business development expertise to be embedded within an academic area. Dr Featherstone's primary responsibility will be to lead on industrial liaison to accelerate the impact of York's applied nuclear physics research. Technology licensing, collaborative research and development, and leveraging industry funding will all be explored as means to achieving societal and economic benefit from the group's research.

York already has a good track record of engaging with industry. It will be exciting to see what further impact can be realised in the years to come.

Contribution by Dr. Adam Featherstone and Prof. David Jenkins, University of York

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3. Outreach Activity

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4. Media Interactions

a. Tetraneutron discovery

University of York physicist Dr Stefanos Paschalis and researchers from Technical University of Darmstadt reported on the first unambiguous experimental observation of resonance-like correlations between four free neutrons, the so called tetraneutron system, which has evaded detection for six decades and has sparked numerous debates within the nuclear physics community. The pioneering experiment was proposed by Stefanos in 2014 and carried out in 2017 at the SAMURAI apparatus at RIBF/RIKEN, Japan. In this new

approach, the alpha core from a high intensity radioactive-ion beam of ^{8}He was suddenly removed in a quasi-elastic collision (p,pα) with a liquid hydrogen target leaving the 4 neutrons as spectators and observing their correlations.

As a result of this exciting discovery [Nature **606** 678 (2022)] there were a number of interactions with the media, a selection of which are listed below:

Physics World, "Elusive tetraneutron is discovered at Japanese lab" (https://physicsworld.com/a/elusive-tetraneutron-is-discovered-at-japanese-lab/)

New Scientist, "Elusive exotic matter called a tetraneutron possibly seen in the lab" (https://newscientist.com/article/2325671-elusive-exotic-matter-called-a-tetraneutron-possibly-seen-in-the-lab/)

Science News, "Physicists may have finally spotted elusive clusters of four neutrons" (https://www.sciencenews.org/article/tetraneutron-four-neutron-cluster-physics-nuclear-forces)

Contribution from Dr. Stefanos Paschalis, University of York

b. Article authored by Prof. M. Chartier in The Innovation Platform

Professor Marielle Chartier authored an article in issue 10 of The Innovation Platform. *The Upgraded ALICE Experiment: Preparing for the LHC restart at CERN* describes the physics of the ALICE collaboration, the LHC and hadronic physics in general. The Innovation Platform is a publication containing exciting developments from the technology, science and politics sectors.

The article can be found on page 330 of issue 10 of the publication: https://www.innovationnewsnetwork.com/the-innovation-platform/

Contribution by Prof. Marielle Chartier, University of Liverpool