UK Nuclear Activity

October 2023 Issue 123

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 October*

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. Lett. **131** 162702 (2023) (https://doi.org/10.1103/PhysRevLett.131.162701)
Proton-Capture Rates on Carbon Isotopes and Their Impact on the Astrophysical $^{12}C/^{13}C$ Ratio
J. Skowronski *et al.*
Published 16 October 2023

Phys. Rev. C **108** 044305 (2023) (https://doi.org/10.1103/PhysRevC.108.044305)
Coulomb excitation of $^{74,76}Zn$
A. Illana *et al.*
Published 10 October 2023

Phys. Rev. C **108** 044313 (2023) (https://doi.org/10.1103/PhysRevC.108.044313)
Evolution of nuclear structure in the neutron-rich $^{96,97,99}Nb$ isotopes: Evidence for shape coexistence in N=58, ^{99}Nb
V. Kumar *et al.*
Published 19 October 2023

Phys. Rev. C **108** 044315 (2023) (https://doi.org/10.1103/PhysRevC.108.044315)
Sensitivity study of mirror energy differences in positive parity bands of T=3/2 A=45 nuclei
W. Satuła, M. A. Bentley, A. Jalili and S. Uthayakumaar
Published 20 October 2023

Edited by Jack Henderson, IOP Nuclear Physics Group Committee
jack.henderson@surrey.ac.uk

Phys. Rev. C **108** 045203 (2023) (https://doi.org/10.1103/PhysRevC.108.045203)
Measurement of inclusive J/ψ pair production cross section in pp collisions at √s=13 TeV
S. Acharya *et al.* (ALICE Collaboration)
Published 23 October 2023

Phys. Rev. C **108** 045502 (2023) (https://doi.org/10.1103/PhysRevC.108.045502)
β^- decay Q-value measurement of ^{136}Cs and its implications for neutrino studies
Z. Ge *et al.*
Published 11 October 2023

Phys. Rev. C **108** 045802 (2023) (https://doi.org/10.1103/PhysRevC.108.045802)
Searching for resonance states in ^{22}Ne(p,γ)^{23}Na
D. P. Carrasco-Rojas *et al.*
Published 13 October 2023

Phys. Lett. B **847** 138268 (2023) (https://doi.org/10.1016/j.physletb.2023.138268)
Shape polarization in the tin isotopes near N = 60 from precision g-factor measurements on short-lived $11/2^-$ isomers
T. J. Gray *et al.*
Published online 20 October 2023

Phys. Lett. B **847** 138278 (2023) (https://doi.org/10.1016/j.physletb.2023.138278)
Electromagnetic moments of the antimony isotopes $^{112-133}$Sb
S. Lechner *et al.*
Published online 26 October 2023

Phys. Lett. B **847** 138249 (2023) (https://doi.org/10.1016/j.physletb.2023.138249)
Isospin symmetry in the T = 1,A = 62 triplet
K. Wimmer *et al.*
Published online 20 October 2023

European Physical Journal A **59** 243 (2023) (https://doi.org/10.1140/epja/s10050-023-01140-2)
Preface of AGATA: advancements in science and technology
A. Bracco *et al.*
Published 26 October 2023

European Physical Journal A **59** 241 (2023) (https://doi.org/10.1140/epja/s10050-023-01155-9)
Generic size dependences of pairing in ultrasmall systems: electronic nano-devices and atomic nuclei
A. Pastore, P. Schuck and X. Vinas
Published 25 October 2023

Nature Communications **14** 5961 (2023) (https://doi.org/10.1038/s41467-023-39389-2)
Elucidating the nature of the proton radioactivity and branching ratio on the first proton emitter discovered ^{53m}Co
L. G. Sarmiento *et al.*
Published 25 September 2023

*Also includes missed publications from previous months

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2. News to Report

a. David Jenkins wins 2023 Ernest Rutherford Prize

The 2023 Ernest Rutherford Prize, presented for distinguished contributions to nuclear physics, was awarded to Professor David Jenkins, of the University of York. Professor Jenkins is the head of the nuclear physics group at York and was recognised for his contributions to experimental nuclear physics,

nuclear applications and widening participation in physics.

In particular, he was recognised for his pioneering of novel techniques such as recoil-beta tagging, and those used to study carbon burning in massive stars. The award further recognised his work in the applied radiation detection space, such as his successful knowledge transfer to Kromek Group PLC over the last decade. He was also recognised for his contribution to widening participation, for example through his work with the Global Challenges Research Fund to develop the Modern African Nuclear DEtector LAboratory (MANDELA) across South African universities.

Further details can be found here:
https://www.iop.org/about/awards/2023-ernest-rutherford-medal-and-prize#gref

b. Early Career Researcher Forum 2023

The third UK Nuclear Physics Early Career Researcher Forum was held at the Institute of Physics building in London on the 26th and 27th of October. Invited contributions were heard from both fundamental and applied physics, highlighting where the future of the field may lie in the next decade, with talks from Stefanos Paschalis (University of York), Peter Martin (University of Bristol), Mikhail Bashkanov (University of York) and Gemma Wilson (UKAEA). A career session was also held, with invited contributions from Kara Lynch (University of Manchester) and Thomas Henry (EDF) energy, with a panel session providing attendees the opportunity to ask questions of all the invited speakers.

The event was well-attended, with twelve contributed talks from attendees covering hadronic physics, applied nuclear physics, nuclear structure and nuclear astrophysics. Thanks to sponsorship from the European Physical Journal and IoP Nuclear Physics Group, support was also made available for attendees.

Contribution by Jack Henderson, University of Surrey, ECR Forum Chair

c. IoP Joint HEPP, APP and NP Conference Abstract Submissions Open

Abstract submission is now open for the joint High Energy Particle Physics, Astroparticle Physics and Nuclear Physics IoP conference. The event will be hosted in Liverpool from the 8th-11th of April, 2024. Further details and the abstract submission portal can be found here:
https://iop.eventsair.com/app-hepp-np2024/

d. Workshop on Quasi-Free Scattering with RIB held in Lefkada, Greece

The 5th International Workshop on Quasi-Free Scattering with Radioactive-Ion Beams (QFS-RB 2023) took place in October 2023 (1st – 6th of October 2023) in the beautiful island of Lefkada, Greece. It was a follow-up Workshop after Trento (QFS-RB 2008), Azores (QFS-RB 2013), York (QFS-RB 2017) and Maresias (QFS-RB 2019).

The development of new radioactive ion beam facilities providing intermediate to high energy beams (100 MeV/u - 1GeV/u) combined with new experimental setups and techniques allow for kinematically complete measurements of quasi-free scattering reactions with radioactive-ion beams with high resolution and efficiency. First experimental results are now available and many new experimental programs are currently being developed at the FAIR facility (Germany), as well as at the RIBF (Japan) and the FRIB (USA) facilities. In parallel, a wealth of experimental results have been generated on short-range correlations using quasi-free scattering reactions with electron probes on stable targets at Jefferson Lab in the US. These studies have revealed interesting new phenomena that could be further enhanced in isospin asymmetric nuclei. In order to extract reliable information from the experimental data, the interplay between experiment and reaction and structure theories needs to be addressed.

This workshop aimed at triggering discussions on recent experimental and theoretical results and future plans, and brought together theory and experiment experts on quasifree scattering reactions to discuss the latest developments in the field.

The workshop was led by the UK and had strong UK participation. It was sponsored by the Helmholtz Research Academy Hesse for FAIR, JSPS Grant-in-Aid for Specially Promoted

Research JP21H04975, the Institute of Physics (IOP) and the University of York.

The next QFS-RB workshop will take place in Japan.

Organising committee:
Marina Petri (UK) - Chair
Thomas Aumann (Germany) - co-Chair
Carlos Bertulani (USA)
Dolores Cortina (Spain)
Alexandre Obertelli (Germany)
Stefanos Paschalis (UK)
Tomohiro Uesaka (Japan)

Contribution by Marina Petri, University of York

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3. Outreach Activity

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4. Media Interactions

a. Follow the IoP NPG on Instagram

We are thrilled to announce that the IoP Nuclear Physics group has launched its own Instagram account. You can find exclusive updates, news and insights about UK nuclear physics and our group's projects and events. Don't miss this chance to connect with us and learn more about the fascinating world of nuclear physics. To follow us, simply search for @iop.npg or type IOP nuclear physics group in the search bar on Instagram.

Contribution by David Lee, IoP Nuclear Physics Group member