



UK Nuclear Activity

March 2024 Issue 128

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

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

1. Nuclear Physics Publications for March*

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. **132** 122701 (2024) (<https://doi.org/10.1103/PhysRevLett.132.122701>)
Measurement of the $^{140}\text{Ce}(n,\gamma)$ Cross Section at n_TOF and Its Astrophysical Implications for the Chemical Evolution of the Universe
S. Amaducci et al. (n_TOF Collaboration)
Published 21 March 2024
See Research News: [Heavy Element Quandary in Stars Worsened by New Nuclear Data](#)

Phys. Rev. Lett. **132** 102302 (2024) (<https://doi.org/10.1103/PhysRevLett.132.102302>)
Fraction of χ_c Decays in Prompt J/ ψ Production Measured in pPb Collisions at $\sqrt{s_{\text{NN}}}=8.16$ TeV
R. Aaij et al. (LHCb Collaboration)
Published 8 March 2024

Phys. Rev. Lett. **132** 102301 (2024) (<https://doi.org/10.1103/PhysRevLett.132.102301>)
Measurement of the Centrality Dependence of the Dijet Yield in p+Pb Collisions at $\sqrt{s_{\text{NN}}}=8.16$ TeV with the ATLAS Detector
G. Aad et al. (ATLAS Collaboration)
Published 7 March 2024

Phys. Lett. B **851** 138561 (2024) (<https://doi.org/10.1016/j.physletb.2024.138561>)

Position of the single-particle $3/2^-$ state in ^{135}Sn and the $N=90$ subshell closure
A. Jungclaus *et al.*

Published 7 March 2024

Phys. Lett. B **851** 138584 (2024) (<https://doi.org/10.1016/j.physletb.2024.138584>)

Modification of charged-particle jets in event-shape engineered Pb–Pb collisions at $\sqrt{s_{\text{NN}}}=5.02$ TeV
ALICE Collaboration

Published 18 March 2024

Phys. Rev. C **109** 034613 (2024) (<https://doi.org/10.1103/PhysRevC.109.034613>)

Microscopic optical potentials for medium-mass isotopes derived at the first order of Watson multiple-scattering theory

M. Vorabbi, C. Barbieri, V. Somà, P. Finelli, and C. Giusti

Published 15 March 2024

Phys. Rev. C **109** 034320 (2024) (<https://doi.org/10.1103/PhysRevC.109.034320>)

Isomeric states in neutron-rich $Z=76$ isotopes and $N=116$ isotones

A. Kardan, P. M. Walker, and I. Ragnarsson

Published 28 March 2024

J. Phys. G **51** 045106 (2024) (<https://doi.org/10.1088/1361-6471/ad27e6>)

Dibaryons and where to find them

M. Bashkanov, D. P. Watts, G. Clash, M. Mocanu and M. Nicol

Published 7 March 2024

Eur. Phys. J. A **60** 70 (2024) (<https://doi.org/10.1140/epja/s10050-024-01277-8>)

Measurement of the prompt fission γ -rays from slow neutron-induced fission of ^{235}U with STEFF
The n_ToF Collaboration

Published 19 March 2024

Eur. Phys. J. Special Topics **233** 1 (2024) (<https://doi.org/10.1140/epjs/s11734-024-01096-4>)

K isomers in atomic nuclei

P.M. Walker and F.G. Kondev

Published 02 February 2024

Phys. Rev. A **109** 033719 (2024) (<https://doi.org/10.1103/PhysRevA.109.033719>)

A Stokes parameter representation for Compton scattering of entangled and classically correlated two-photon systems

P. Caradonna, I. D'Amico, D. G. Jenkins, D. P. Watts

Published 20 March 2024

J. Env. Rad. **275** 107414 (2024) (<https://doi.org/10.1016/j.jenvrad.2024.107414>)

Gamma-spectrometry measurements of filtration media from an Advanced Gas-cooled Reactor

A. Petts, J. Burnett, M. Goodwin, B. Milbrath

Published 25 March 2024

Labmate, March 2024

Development of Novel ICP-MS-CRIS Instrumentation Hyphenating Inductively Coupled Plasma Mass Spectrometry with Collinear Resonance Ionisation Spectroscopy (CRIS)

G. Edwards *et al.*

*Also includes missed publications from previous months

2. News to Report

a. Prof. Marialuisa Aliotta wins European Research Council Advanced Grant

Congratulations to Prof. Marialuisa Aliotta (University of Edinburgh), who has received a European Research Council Advanced Grant.

The grant – NUCLEAR (NUclear CLustering Effects in Astrophysical Reactions) - will be used to tackle three long standing questions in astrophysics: the cosmological lithium problem, nucleosynthesis in first stars, and the electron screening puzzle. Despite appearing to be unrelated, these questions may all be reconciled by the quantum effect of nuclear clustering. By adopting a synergistic approach of experimental, theoretical, and computational effort, Prof. Aliotta and her team will break new ground in elucidating the role and strength of nuclear clustering in astrophysical reactions, with far-reaching consequences in nuclear physics, cosmology, and astrophysics.

“I am delighted to have been awarded this ERC Grant – says Prof. Aliotta (PI) – and very much look forward to collaborating with leading experts Dr Guillaume Hupin (IJCL, France), Dr James deBoer (ND, US), and Dr Marco Pignatari (Konkoly, Hungary) towards tackling some of the most intriguing issues of modern nuclear astrophysics”.

Contribution from Marialuisa Aliotta (University of Edinburgh)

b. Theoretical Nuclear Physics Industrial PhD Studentship - University of Surrey

A PhD studentship is available at the University of Surrey in applied theoretical nuclear physics.

Nuclear Data are required inputs for a wide range of scientific calculations. A special class of such data are nuclear reactions induced by neutrons. In this case nuclear data can be measured only for stable isotopes. Interactions of neutrons with short-lived isotopes can only be studied indirectly. One indirect method, called "surrogate reactions" has been an active research field since the early 2000s, pushed mainly by the Lawrence Livermore National Laboratory (LLNL) in the USA with some

contribution from AWE. The current PhD project will involve interactions with AWE and LLNL researchers through the theoretical study of the two-neutron-transfer reaction (p,t) to be used as a surrogate for neutron capture reactions.

The theoretical developments proposed in the PhD project would be in the improved treatment of the (p,t) transfer reaction by introducing better interactions and mechanisms to the reaction model. The theoretical model developed by the student will be compared to the surrogate reaction data supplied by LLNL, with the potential for the student to spend time at LLNL as part of the project. The project results will be presented at national and international conferences. The PhD would be funded by AWE and an AWE Industrial Supervisor would be closely involved in the study.

Please note that the PhD is only open to those qualifying for home fees.

Further details can be found on FindaPhD: <https://www.findaphd.com/phds/project/theoretical-nuclear-physics-industrial-studentship/?p168392>

Contribution from James Benstead (AWE) and Natalia Timofeyuk (University of Surrey).

c. Exotic Hadron Spectroscopy Workshop 2024, Swansea, 2-4 July 2024

We would like to bring to your attention a workshop on Exotic Hadron Spectroscopy at the Department of Physics, Swansea University, 2-4 July 2024.

The purpose of the workshop is to bring together the nuclear and particle physics communities to discuss the latest developments (experimental and theoretical) in exotic and conventional hadron spectroscopy.

This is the fifth in a series of workshops on this topic, following previous events at the University of Edinburgh, University of York, and IPPP Durham University.

The call for abstracts is now open with a submission deadline of 30 April 2024. The deadline for registration is 15 May 2024.

More information is available on the webpage: <https://conference.ippp.dur.ac.uk/event/1304/overview>

Contribution from Dr M Naeem Anwar (University of Swansea) for the organising committee.

d. University of York launches partnership with Indian Institute of Technology Bombay

The University of York has recently embarked upon a two-year partnership with the Indian Institute of Technology Bombay through the UK-India Education and Research Initiative (UKIERI). Nuclear physics and materials science expertise in York will combine with semiconductor fabrication expertise in Mumbai to create radiation detectors for industrial purposes. The planned programme of technology development and knowledge exchange provides an exciting opportunity to capitalise on UK-India research strengths and translate nuclear physics technologies into the marketplace. The partnership is supported on the UK side by the Department for Science, Innovation & Technology and the British Council, and on the Indian side by the

Department of Science & Technology and the Ministry of Education.

An invitation to join the launch event in York (date TBC, likely June) is warmly extended to the UK nuclear physics community. Please email np-partnerships@york.ac.uk if you would like to be kept up to date.

Contribution from Dr Adam Featherstone (University of York)

e. Joint Glasgow - CEA Saclay PhD in Hadron Physics

The Commissariat à l'Énergie Atomique (CEA) de Saclay, in France, has recently advertised a PhD position which is available to be held jointly with the Nuclear and Hadron Physics Research Group at the University of Glasgow. The topic of the PhD is experimental hadron structure, in particular a novel measurement of the pion's 3D internal structure at Jefferson Lab. For more information please contact Dr Maxime Defurne (maxime.defurne@cea.fr) from CEA, as well as Dr Rachel Montgomery (Rachel.Montgomery@glasgow.ac.uk) and Dr David Mahon (David.Mahon@glasgow.ac.uk) from the University of Glasgow.

Contribution from Dr Rachel Montgomery (University of Glasgow)

3. Outreach Activity

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4. Media Interactions

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