UK Nuclear Activity

August 2018 Issue 62

In this issue,

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

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1. Nuclear Physics Publications for August*

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 97, 069901 (2018) https://journals.aps.org/prc/abstract/10.1103/PhysRevC.97.069901
Erratum: Coupling effects in proton scattering from 40Ca [Phys. Rev. C 85, 064603 (2012)]
R. S. Mackintosh and N. Keeley
*Published 1 June 2018

Eur. Phys. J. C 78: 559 (2018) https://link.springer.com/article/10.1140/epjc/s10052-018-6034-3
φ meson production at forward rapidity in Pb–Pb collisions at $\sqrt{s_{NN}}$ = 2.76 TeV
ALICE Collaboration, UK Authors: H. A. Andrews, L. S. Barnby, M. Borri, M. Chartier, D. Evans, K. L. Graham, C. Hills, P. G. Jones, A. Jusko, M. Krivda, R. C. Lemmon, R. Lietava, S. W. Lindsay, J. Norman, O. Villalobos Baillie, E. Willsher, N. Zardoshti
*Published 7 July 2018

Eur. Phys. J. C 78: 562 (2018) https://link.springer.com/article/10.1140/epjc/s10052-018-6027-2
Measurement of the inclusive J/ψ polarization at forward rapidity in pp collisions at $\sqrt{s}$ = 8 TeV
ALICE Collaboration, UK Authors: H. A. Andrews, L. S. Barnby, M. Borri, M. Chartier, D. Evans, K. L. Graham, C. Hills, J.P. Iddon, P. G. Jones, A. Jusko, M. Krivda, R. C. Lemmon, R. Lietava, S. W. Lindsay, J. Norman, O. Villalobos Baillie, E. Willsher, N. Zardoshti
*Published 9 July 2018

J. High Energ. Phys. 2018:103 (2018) https://link.springer.com/article/10.1007/JHEP07%282018%29103
Energy dependence and fluctuations of anisotropic flow in Pb-Pb collisions at $\sqrt{s_{NN}}$ = 5.02 and 2.76 TeV
ALICE Collaboration, UK Authors: H. A. Andrews, L. S. Barnby, M. Borri, M. Chartier, D. Evans, K. L. Graham, C. Hills, J.P. Iddon, P. G. Jones, A. Jusko, M. Krivda, R. C. Lemmon, R. Lietava, S. W. Lindsay, J. Norman, O. Villalobos Baillie, E. Willsher, N. Zardoshti
*Published 16 July 2018

*Also including missed publications from previous months

J. High Energ. Phys. 2018:160 (2018) https://link.springer.com/article/10.1007/JHEP07%282018%29160
Inclusive J/ψ production at forward and backward rapidity in p-Pb collisions at $\sqrt{s_{NN}}$ = 8.16 TeV
ALICE Collaboration, UK Authors: H. A. Andrews, L. S. Barnby, M. Borri, M. Chartier, D. Evans, K. L. Graham, C. Hills, J.P. Iddon, P. G. Jones, A. Jusko, M. Krivda, R. C. Lemmon, R. Lietava, S. W. Lindsay, J. Norman, O. Villalobos Baillie, E. Willsher, N. Zardoshti
*Published 26 July 2018

Comput. Phys. Commun. 229, 211, (2018)
https://www.sciencedirect.com/science/article/pii/S0010465518300845
The TDHF code Sky3D version 1.1
B.Schuetrumpf[abc], P.-G.Reinhard[d], P.D.Stevenson[e], A.S.Umar[f], J.A.Maruhn[g]
Published August 2018

Eur. Phys. J. A, 54:132 (2018) https://rd.springer.com/article/10.1140%2Fepja%2Fi2018-12564-8
Reduction of deuterium content in carbon targets for $^{12}C + ^{12}C$ reaction studies of astrophysical interest
L. Morales-Gallegos, M. Aliotta, C. G. Bruno, R. Buompane, T. Davinson, M. De Cesare, A. Di Leva, A. D'Onofrio, J. G. Duarte, L. R. Gasques, L. Gialanella, G. Imbriani, G. Porzio, D. Rapagnani, M. Romoli, D. Schürmann, F. Terrasi, L. Y. Zhang
Published August 2018

Phys. Rev. C 98, 024302 (2018) https://journals.aps.org/prc/abstract/10.1103/PhysRevC.98.024302
Decay of a 19^- isomeric state in ^{156}Lu
M. C. Lewis[1], E. Parr[1], R. D. Page[1], C. McPeake[1], D. T. Joss[1], F. A. Ali[1,2,*], K. Auranen[3,†], A. D. Briscoe[1], L. Capponi[4], T. Grahn[3], P. T. Greenlees[3], J. Henderson[5,‡], A. Herzáň[1,§], U. Jakobsson[3,‖], R. Julin[3], S. Juutinen[3], J. Konki[3,¶], M. Labiche[6], M. Leino[3], P. J. R. Mason[6], M. Nyman[3,**], D. O'Donnell[4], J. Pakarinen[3], P. Papadakis[3,††], J. Partanen[3], P. Peura[3,‡‡], P. Rahkila[3], J. P. Revill[1], P. Ruotsalainen[3], M. Sandzelius[3], J. Sarén[3], B. Saygı[1,§§], C. Scholey[3], J. Simpson[6], J. F. Smith[4], M. Smolen[4], J. Sorri[3], S. Stolze[3,‖‖], A. Thornthwaite[1], and J. Uusitalo[3]
Published 1 August 2018

Phys. Rev. Lett. 121, 052001 (2018) https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.121.052001
Isotensor Dibaryon in the $pp \rightarrow pp\pi^+\pi^-$ Reaction?
P. Adlarson *et al.* (WASA-at-COSY Collaboration)
Published 1 August 2018

Phys. Rev. C 98, 024603 (2018) https://journals.aps.org/prc/abstract/10.1103/PhysRevC.98.024603
Structure of ^{13}Be studied in proton knockout from ^{14}B
G. Ribeiro *et al.* (R3B Collaboration)
Published 3 August 2018

Eur. Phys. J. C. 78:624 (2018) https://link.springer.com/article/10.1140/epjc/s10052-018-6013-8
Neutral pion and η meson production in p–Pb collisions at $\sqrt{s_{NN}}$ = 5.02 TeV
ALICE Collaboration, UK Authors: H. A. Andrews, L. S. Barnby, M. Borri, M. Chartier, D. Evans, K. L. Graham, C. Hills, J.P. Iddon, P. G. Jones, A. Jusko, M. Krivda, R. C. Lemmon, R. Lietava, S. W. Lindsay, J. Norman, O. Villalobos Baillie, E. Willsher, N. Zardoshti
Published 6 August 2018

Phys. Rev. C 98, 025501 (2018) https://journals.aps.org/prc/abstract/10.1103/PhysRevC.98.025501
Inclusive electron-nucleus cross section within the self-consistent Green's function approach
N. Rocco and C. Barbieri
Published 8 August 2018

Physics Letters B 783, 95 (2018) https://www.sciencedirect.com/science/article/pii/S0370269318304234
Constraints on jet quenching in p–Pb collisions at $\sqrt{s_{NN}}$=5.02 TeV measured by the event-activity dependence of semi-inclusive hadron-jet distributions
ALICE Collaboration, UK Authors: H. A. Andrews, L. S. Barnby, M. Borri, M. Chartier, D. Evans, K. L. Graham, C. Hills, J.P. Iddon, P. G. Jones, A. Jusko, M. Krivda, R. C. Lemmon, R. Lietava, S. W. Lindsay, J. Norman, O. Villalobos Baillie, E. Willsher, N. Zardoshti
Published 10 August 2018

Phys. Rev. C 98, 024306 (2018) https://journals.aps.org/prc/abstract/10.1103/PhysRevC.98.024306
One- and two-neutron removal cross sections of ^{24}O
D. A. Divaratne[1,2], C. R. Brune[1], H. N. Attanayake[1], T. Baumann[3], D. Bazin[3], A. Gade[3,4], S. M. Grimes[1], P. M. King[1], M. Thoennessen[3,4], and J. A. Tostevin[5]
Published 13 August 2018

Phys. Rev. C 98, 024310 (2018) https://journals.aps.org/prc/abstract/10.1103/PhysRevC.98.024310
Quenching of the N=32 neutron shell closure studied via precision mass measurements of neutron-rich vanadium isotopes
M. P. Reiter[1,2,*], S. Ayet San Andrés[1,3], E. Dunling[2,4], B. Kootte[2,5], E. Leistenschneider[2,6], C. Andreoiu[7], C. Babcock[2], B. R. Barquest[2], J. Bollig[2,8], T. Brunner[2,9], I. Dillmann[2,10], A. Finlay[2,6], G. Gwinner[5], L. Graham[2], J. D. Holt[2], C. Hornung[1], C. Jesch[1], R. Klawitter[2,11], Y. Lan[2,6], D. Lascar[2,12], J. E. McKay[2,10], S. F. Paul[2,8], R. Steinbrügge[2,†], R. Thompson[13], J. L. Tracy, Jr.[2], M. E. Wieser[13], C. Will[1], T. Dickel[1,3], W. R. Plaß[1,3], C. Scheidenberger[1,3], A. A. Kwiatkowski[2,10], and J. Dilling[2,6]
Published 15 August 2018

Phys. Rev. C 98, 024313 (2018) https://journals.aps.org/prc/abstract/10.1103/PhysRevC.98.024313
Terminating states in the positive-parity structures of ^{67}As
R. Wadsworth[*], N. S. Kelsall, D. G. Jenkins, I. Ragnarsson, S. M. Fischer, D. P. Balamuth, P. A. Hausladen[†], G. C. Ball, M. P. Carpenter, R. V. F. Janssens[‡], T. Lauritsen, C. J. Lister[§], D. Seweryniak, R. M. Clark, P. Fallon, A. O. Macchiavelli, and C. E. Svensson[‖], S. J. Freeman, D. G. Sarantites
Published 21 August 2018

Phys. Rev. C 98, 024624 (2018) https://journals.aps.org/prc/abstract/10.1103/PhysRevC.98.024624
Remarkable independence of dynamical polarization potentials of the underlying potential
R. S. Mackintosh[*], N. Keeley[†]
Published 28 August 2018

Phys. Rev. C 98, 024319 (2018) https://journals.aps.org/prc/abstract/10.1103/PhysRevC.98.024319
Level structure above the 17^+ isomeric state in $^{152}_{69}Tm_{83}$
B. S. Nara Singh[1,*], D. M. Cullen[1], M. J. Taylor[1,2], P. C. Srivastava[3,4], P. Van Isacker[3], O. Beeke[1], B. Dodson[1], C. Scholey[5], D. O'Donell[6], U. Jakobson[5,7], T. Grahn[5], P. T. Greenlees[5], P. M. Jones[5,8], R. Julin[5], S. Khan[1], M. Leino[5], A.-P. Leppänen[5,9], S. Eeckhaudt[5], K. Mäntyniemi[5], J. Pakarinen[5], P. Peura[5,10], P. Rahkila[5], J. Sarén[5], J. Sorri[5,11], J. Uusitalo[5], and M. Venhart[12]
Published 28 August 2018

Phys. Rev. C 98, 025804 (2018) https://journals.aps.org/prc/abstract/10.1103/PhysRevC.98.025804
Microscopic predictions of the nuclear matter liquid-gas phase transition
Arianna Carbone[1,*], Artur Polls[2,†], and Arnau Rios[3,‡]
Published 28 August 2018

Phys. Rev. C 98, 024321 (2018) https://journals.aps.org/prc/abstract/10.1103/PhysRevC.98.024321
Fine structure in the α decay of high-spin isomers in ^{155}Lu and ^{156}Hf
E. Parr[1,*], R. D. Page[1], D. T. Joss[1], F. A. Ali[1,‡], K. Auranen[2,§], L. Capponi[3,4,‖], T. Grahn[2], P. T. Greenlees[2], J. Henderson[5,¶], A. Herzáň[2,#], U. Jakobsson[2,**], R. Julin[2], S. Juutinen[2], J. Konki[2,††], M. Labiche[6], M. Leino[2], P. J. R. Mason[6], C. McPeake[1], D. O'Donnell[1,‡‡], J. Pakarinen[2], P. Papadakis[2,§§], J. Partanen[2], P. Peura[2], P. Rahkila[2], J. P. Revill[1], P. Ruotsalainen[2], M. Sandzelius[2], J. Sarén[2], C. Scholey[2], J. Simpson[6], J. F. Smith[3,4], M. Smolen[3,4], J. Sorri[2], S. Stolze[2,‖‖], A. Thornthwaite[1], and J. Uusitalo[2]
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2. News to Report

a. Dr Christian Diget has been awarded an STFC Leadership Fellowship in Public Engagement.

Article taken from: York Physics News

Science and Technology Facilities Council (STFC) Leadership Fellows in Public Engagement undertake high quality programmes of engagement and outreach while concurrently acting as champions for the value and practice of engagement with research in their host institution and research community. The fellowship award is funded by STFC with substantial contributions from University of York and the National STEM Learning Centre.

Dr Diget in his public statement about the project said, 'In my Engaging Education with Binding Blocks' project I aim to engage school students with cutting-edge STFC Nuclear Physics in an interactive inquiry-based approach. Binding Blocks centres around an interactive construction of a seven-metre nuclear chart of isotopes built of LEGO(R) bricks. Through engaging with the chart, participants get a hands-on experience of key areas of nuclear science, astrophysics, and energy. Binding Blocks is used with large audiences at public events or in smaller groups with schools. The entire chart can be built in half a day by hundreds of visitors, children and adults alike, or by 60 highly competitive teachers in half an hour of a training day'.

Christian continues, 'The Fellowship project is focussed particularly on integrating Binding Blocks within UK A-level (and equivalent) delivery of nuclear physics. This is facilitated through large Nuclear Masterclasses, Teacher Training, and smaller scale in-school teaching by team members and teachers. The programme furthermore includes university student training, both taught and "on-the-job" training, as well as an extensive internship programme. Through these influencers, we will implement Binding Blocks in schools using the nuclear chart to study cutting-edge research in nuclear science, linked with the secondary-school curriculum. This includes study of nuclear isotopes, nuclear decay, nuclear energy, and the astrophysical origin of the chemical elements we are made of. The face-to-face engagement is complemented by a Free Online Course which will be implemented both as a self-contained learning environment and integrated with the Nuclear Masterclass programme.

During the fellowship, the Binding Blocks programme will thereby become a full-scale educational programme in collaboration with hundreds of schools and thousands of pupils. During the project, the Binding Blocks programme will furthermore grow organically through the development of partnerships and support for students who may become Binding Blocks ambassadors in their local area in the future. Throughout the programme, partner institutions and individuals will be supported in developing their own Binding Blocks programmes, through seeding and joint internships and projects, yielding a long-lasting impact across the UK on universities, schools, and individuals'.

Dr Diget has conceived, developed, and led the Binding Blocks public engagement programme (2015-present). This has so far reached approximately: 17,000 people at public events; 1100 secondary school students; 200 secondary-school teachers; 1000 academics and university students. It has received initial funding through three grants prior to the present Fellowship, and has expanded to a team of 50 members across more than 15 institutions in nine countries.

Read the announcement from STFC here.

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3. Outreach Activity

Playing with protons @CERN

On 1st August Elizabeth Cunningham (STFC/Surrey) and Jo Lewis (STFC/RAL) ran a teacher training workshop at CERN for 10 UK primary teachers as part of the Playing with Protons programme.

The session covered the applications of particle accelerators and how they can be used to understand what things are made of, linking to the materials part of the primary curriculum.

The visit was organised by CERN and the Ogden Trust and supported through the H2020 CREATIONS project by STFC and the University of Birmingham.

Contribution by Elizabeth Cunningham
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4. Media Interactions

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