UK Nuclear Activity

February 2021 Issue 92

In this issue,

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

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1. Nuclear Physics Publications for February (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.

The editors at Nature Communications have put together an Editors' Highlights webpage of recent research called "Nuclear and particle physics". A paper from this collection with UK-based authors is included below.

Nature Communications 10, 2473 (2019)
https://www.nature.com/articles/s41467-019-10494-5 **(Editor's Pick)**
The observation of vibrating pear-shapes in radon nuclei
P. A. Butler, L. P. Gaffney, P. Spagnoletti, J. Konki, M. Scheck, J. F. Smith, K. Abrahams, M. Bowry, J. Cederkäll, T. Chupp, G. de Angelis, H. De Witte, P. E. Garrett, A. Goldkuhle, C. Henrich, A. Illana, K. Johnston, D. T. Joss, J. M. Keatings, N. A. Kelly, M. Komorowska, T. Kröll, M. Lozano, B. S. Nara Singh, D. O'Donnell, J. Ojala, R. D. Page, L. G. Pedersen, C. Raison, P. Reiter, J. A. Rodriguez, D. Rosiak, S. Rothe, T. M. Shneidman, B. Siebeck, M. Seidlitz, J. Sinclair, M. Stryjczyk, P. Van Duppen, S. Vinals, V. Virtanen, N. Warr, K. Wrzosek-Lipska & M. Zielinska
Published 9 October 2020

Phys Lett. B 814, 136088
https://www.sciencedirect.com/science/article/pii/S0370269321000289?via%3Dihub
Beta decay of the axially asymmetric ground state of 192Re
H.Watanabe[abc], Y.X.Watanabe[c], Y.Hirayama[c], A.N.Andreyev[de], T.Hashimoto[f], F.G.Kondev[g], G.J.Lane[h], Yu.A.Litvinov, [i]J.J.Liu[j], H.Miyatake[c], J.Y.Moon[f], A.I.Morales[k], M.Mukai[bcl], S.Nishimura[b], T.Niwase[bm], M.Rosenbusch[c], P.Schury[c], Y.Shi[n], M.Wada[c], P.M.Walker[o]
Published 21 January 2021

Phys. Rev. Lett. 126, 072301
https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.126.072301
Medium-Induced Modification of Z-Tagged Charged Particle Yields in Pb+Pb Collisions at 5.02 TeV with the ATLAS Detector
G. Aad et al. (ATLAS Collaboration)
Published 19 February 2021

Phys. Rev. Lett. 126, 072501
https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.126.072501
Shape Changes in the Mirror Nuclei 70Kr and 70Se
K. Wimmer[1,2,3,*], W. Korten[4], P. Doornenbal[3], T. Arici[5,6], P. Aguilera[7], A. Algora[8,9], T. Ando[2], H. Baba[3], B. Blank[10], A. Boso[11], S. Chen[3], A. Corsi[4], P. Davies[12], G. de Angelis[13], G. de France[14], J.-P. Delaroche[15], D. T. Doherty[4], J. Gerl[5], R. Gernhäuser[16], M. Girod[15], D. Jenkins[12], S. Koyama[2], T. Motobayashi[3], S. Nagamine[2], M. Niikura[2], A. Obertelli[4,†], J. Libert[15], D. Lubos[16], T. R. Rodríguez[17], B. Rubio[8], E. Sahin[18], T. Y. Saito[2], H. Sakurai[2,3], L. Sinclair[12], D. Steppenbeck[3], R. Taniuchi[2], R. Wadsworth[12], and M. Zielinska[4]
Published 18 February 2021

Phys. Rev. Lett. 126, 082501
https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.126.082501
Quasifree Neutron Knockout Reaction Reveals a Small s-Orbital Component in the Borromean Nucleus 17B
Z. H. Yang[1,2,*], Y. Kubota[2,3,†], A. Corsi[4], K. Yoshida[5], X.-X. Sun[6,7], J. G. Li[8], M. Kimura[9,10,1], N. Michel[11,12], K. Ogata[1,13], C. X. Yuan[14], Q. Yuan[8], G. Authelet[4], H. Baba[2], C. Caesar[15], D. Calvet[4], A. Delbart[4], M. Dozono[3], J. Feng[8], F. Flavigny[16,‡], J.-M. Gheller[4], J. Gibelin[17], A. Giganon[4], A. Gillibert[4], K. Hasegawa[18], T. Isobe[2], Y. Kanaya[19], S. Kawakami[19], D. Kim[20], Y. Kiyokawa[3], M. Kobayashi[3], N. Kobayashi[21], T. Kobayashi[18], Y. Kondo[22], Z. Korkulu[20,23], S. Koyama[21], V. Lapoux[4], Y. Maeda[19], F. M. Marqués[17], T. Motobayashi[2], T. Miyazaki[21], T. Nakamura[22], N. Nakatsuka[24], Y. Nishio[25], A. Obertelli[4,†], A. Ohkura[25], N. A. Orr[17], S. Ota[3], H. Otsu[2], T. Ozaki[22], V. Panin[2], S. Paschalis[15,§], E. C. Pollacco[4], S. Reichert[26], J.-Y. Roussé[4], A. T. Saito[22], S. Sakaguchi[25], M. Sako[2], C. Santamaria[4], M. Sasano[2], H. Sato[2], M. Shikata[22], Y. Shimizu[2], Y. Shindo[25], L. Stuhl[20,2], T. Sumikama[18], Y. L. Sun[4,†], M. Tabata[25], Y. Togano[22,27], J. Tsubota[22], F. R. Xu[8], J. Yasuda[25], K. Yoneda[2], J. Zenihiro[2], S.-G. Zhou[6,7], W. Zuo[11,12], and T. Uesaka[2,28]
Published 23 February 2021

Phys. Rev. C 103, 024310
https://journals.aps.org/prc/abstract/10.1103/PhysRevC.103.024310
Spectroscopic studies of neutron-rich 129In and its β-decay daughter, 129Sn, using the GRIFFIN spectrometer
F. H. Garcia[1,*], C. Andreoiu[1], G. C. Ball[2], N. Bernier[2,3,†], H. Bidaman[4], V. Bildstein[4], M. Bowry[2,‡], D. S. Cross[1], M. R. Dunlop[4], R. Dunlop[4], A. B. Garnsworthy[2], P. E. Garrett[4], J. Henderson[2,§], J. Measures[2,5], B. Olaizola[2,‖], K. Ortner[1], J. Park[2,3,¶], C. M. Petrache[6], J. L. Pore[1,#], K. Raymond[1], J. K. Smith[2,**], D. Southall[2,††], C. E. Svensson[4], M. Ticu[1], J. Turko[4], K. Whitmore[1], and T. Zidar[4] (GRIFFIN Collaboration)
Published 8 February 2021

Phys. Rev. C 103, 024312
https://journals.aps.org/prc/abstract/10.1103/PhysRevC.103.024312
Electric and magnetic dipole strength in 66Zn
R. Schwengner[1], R. Massarczyk[2], M. Scheck[3], W. Tornow[4,5], G. Battaglia[6], T. Beck[7], D. Bemmerer[1], N. Benouaret[8], R. Beyer[1], M. Butterling[1], F. Fiedler[1], S. W. Finch[4,5], C. Fransen[9], U. Friman-Gayer[5,10], A. Frotscher[1,*], R. Gonzalez[5,10], M. Grieger[1,11], A. Hartmann[1], T. Hensel[1,11], E. Hoemann[9], H. Hoffmann[1], R. V. F. Janssens[5,10], S. Johnson[5,10], M. D. Jones[5,10], A. R. Junghans[1], N. Kelly[3], J. Kleemann[7], Krishichayan[4,5], D. R. Little[10], F. Ludwig[1,11], S. E. Müller[1], D. O'Donnell[3], O. Papst[7], E. Pirovano[1,†], J. Sinclair[3], M. P. Takács[1,†], S. Turkat[11], S. Urlaß[1,12], A. Wagner[1], V. Werner[7], O. Wieland[13], and J. Wilhelmy[9]
Published 11 February 2021

Phys. Rev. C 103, 024316
https://journals.aps.org/prc/abstract/10.1103/PhysRevC.103.024316
Isobaric-multiplet mass equation in a macroscopic-microscopic approach
O. Klochko[1,2,*] and N. A. Smirnova[3,†]
Published 16 February 2021

Phys. Rev. C 103, 024319
https://journals.aps.org/prc/abstract/10.1103/PhysRevC.103.024319
Consistency of nucleon-transfer sum rules in well-deformed nuclei
B. P. Kay[1,*], J. P. Schiffer[1], S. J. Freeman[2], T. L. Tang[1], B. D. Cropper[2], T. Faestermann[3,4], R. Hertenberger[5], J. M. Keatings[6], P. T. MacGregor[2], J. F. Smith[6], and H.-F. Wirth[5]
Published 23 February 2021

Phys. Rev. C 103, 025206
https://journals.aps.org/prc/abstract/10.1103/PhysRevC.103.025206
Differential cross sections for Λ(1520) using photoproduction at CLAS
U. Shrestha *et al.* (The CLAS Collaboration)
Published 24 February 2021

Phys. Rev. C 103, 025802
https://journals.aps.org/prc/abstract/10.1103/PhysRevC.103.025802
Neutron activation of 69Ga and 71Ga at kBT≈25keV
Kathrin Göbel[1,*], Clemens Beinrucker[1], Benjamin Brückner[1], Philipp Erbacher[1], Stefan Fiebiger[1], Micaela Fonseca[2,3], Michael Heftrich[1], Tanja Heftrich[1], Franz Käppeler[4], Antonin Krása[5,6], Deniz Kurtulgil[1], Claudia Lederer-Woods[1,7], Ralf Plag[1,8], Arjan Plompen[5], René Reifarth[1], Stefan Schmidt[1], Kerstin Sonnabend[1], and Mario Weigand[1]
Published 12 February 2021

Phys. Rev. C 103, 025811
https://journals.aps.org/prc/abstract/10.1103/PhysRevC.103.025811
Mass measurements of neutron-rich indium isotopes for r-process studies
C. Izzo[1,*], J. Bergmann[2], K. A. Dietrich[1,3], E. Dunling[1,4], D. Fusco[5], A. Jacobs[1,6], B. Kootte[1,7], G. Kripkó-Koncz[2,†], Y. Lan[1,6], E. Leistenschneider[1,6], E. M. Lykiardopoulou[1,6], I. Mukul[1], S. F. Paul[1,3], M. P. Reiter[1,2,8], J. L. Tracy, Jr.[1], C. Andreoiu[9], T. Brunner[1,10], T. Dickel[2,11], J. Dilling[1,6], I. Dillmann[1,12], G. Gwinner[7], D. Lascar[1,13], K. G. Leach[14], W. R. Plaß[2,11], C. Scheidenberger[2,11], M. E. Wieser[15], and A. A. Kwiatkowski[1,12]
Published 25 February 2021

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2. News to Report

a. More Game Changers Challenges

Game Changers have announced a series of challenges on behalf of the Advanced Fuel Cycle Programme (AFCP).

AFCP is part of the Department for Business, Energy and Industrial Strategy's (BEIS) £505m Energy Innovation Programme, investigating the role of advanced nuclear fuels and fuel cycles for a Net Zero future. Led in partnership with the National Nuclear Laboratory (NNL), AFCP is delivering a suite of 11 fuel cycle themes covering Advanced Nuclear Fuels through to Advanced Recycling and Sustainability.

Through Game Changers, funding is available for organisations who can offer solutions to the following challenges:

- Shape sorting of coated particle fuel: supporting the development of nuclear fuels of the future
- Treatment of nitrogen oxides from nuclear fuel recycling off-

gases: minimising the environmental impact of advanced recycling while ensuring industry can effectively meet regulatory standards
- Controlling oxygen and moisture levels in salts during pyrochemical processing: refining the chemical and physical processes utilised to transform used nuclear reactor material into new fuel

Workshops will be held on the 1st, 3rd and 4th March to explore the challenges in more technical detail and to explain the Game Changers process and funding available.

More information about all of the challenges and workshops can be found on the Game Changers website https://www.gamechangers.technology/challenge

Contribution by Jo Tunney (FIS360)

b. Vacancies at UKAEA (Fusion Technology)

Three vacancies have recently been opened within the Fusion Technology Department at UKAEA, with roles ranging from more lab-based work to more computer-based. Links to the three roles are provided below, any questions about the roles and UKAEA can be directed to Dr Chantal Nobs (chantal.nobs@ukaea.uk).

https://ccfe.ukaea.uk/job/radiometric-scientist/

https://ccfe.ukaea.uk/job/neutronics-scientist-engineer/

https://ccfe.ukaea.uk/job/senior-neutronics-and-radiometric-scientist/

Contribution by Chantal Nobs (UKAEA)

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3. Outreach Activity

a. Virtual tour of ATLAS

The Institute of Physics South Central Branch is organising a virtual tour of the ATLAS experiment at CERN in collaboration with CERN and the IoP South West Branch. The underground tour will be followed by a virtual quiz for the chance to win a CERN and ATLAS goodie bag! The event is scheduled for 23rd April at 3-4.30pm and will take place on Zoom. Details for the event can be found on the IoP South Central Facebook page https://www.facebook.com/events/1235251513535332/ and on the IoP events calendar: https://events.iop.org/atlas-experiment-live-behind-scenes-tour-south-central-south-west-prestige-event.

Please share this event with friends and family far and wide, the IoP are particularly keen for schools and in particular A-Level students to attend this inspirational behind the scenes tour!

Contribution by Chantal Nobs (UKAEA)

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4. Media Interactions

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