UK Nuclear Activity

August 2017 Issue 50

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

Nuclear Physics Public Engagement Website: www.stfc.ac.uk/NuclearPhysicsForYou

Nuclear Physics Outreach Poster – order hardcopies from STFC free of charge here

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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.

J. High Energy Phys. (2017) 2017:52 https://link.springer.com/article/10.1007/JHEP07(2017)052
Measurement of electrons from beauty-hadron decays in p-Pb collisions at $\sqrt{s_{NN}}$ = 5.02 TeV and Pb-Pb collisions at $\sqrt{s_{NN}}$ = 2.76 TeV
ALICE Collaboration, UK Authors: D. Alexandre, H. A. Andrews, L. S. Barnby, M. Borri, M. Chartier, D. Evans, K. L. Graham, P. G. Jones, A. Jusko, M. Krivda, R. C. Lemmon, R. Lietava, J. Norman, O. Villalobos Baillie, N. Zardoshti
*Published 11 July 2017

Appl. Radiat. Isot. 126, 279 (2017) http://www.sciencedirect.com/science/article/pii/S0969804316305395
Reference materials produced for a European metrological research project focussing on measurements of NORM
C. Larijani, A. K. Pearce, P. H Regan, B. C. Russell, S. M. Jerome, M. T. Crespo, P. de Felice, G. Lutter, F. Maringer, M. Mazánová
Published August 2017

Phys. Rev. C 96, 021301(R) (2017) https://journals.aps.org/prc/abstract/10.1103/PhysRevC.96.021301
Reduced transition probabilities along the yrast line in ^{166}W
B. Saygı[1,2], D. T. Joss[1], R. D. Page[1], T. Grahn[3], J. Simpson[4], D. O'Donnell[1,5], G. Alharshan[6], K. Auranen[3], T. Bäck[7], S. Boening[8], T. Braunroth[9], R. J. Carroll[1], B. Cederwall[7], D. M. Cullen[6], A. Dewald[9], M. Doncel[1], L. Donosa[1], M. C. Drummond[1], F. Ertuğral[1,10], S. Ertürk[11], C. Fransen[9], P. T. Greenlees[3], M. Hackstein[9], K. Hauschild[3], A. Herzan[1], U. Jakobsson[7], P. M. Jones[3], R. Julin[3], S. Juutinen[3], J. Konki[3], T. Kröll[8], M. Labiche[4], A. Lopez-Martens[3], C. G. McPeake[1], F. Moradi[7], O. Möller[8], M. Mustafa[1], P. Nieminen[3], J. Pakarinen[3], J. Partanen[3], P. Peura[3],

*Also including missed publications from previous months.

M. Procter[6], P. Rahkila[3], W. Rother[9], P. Ruotsalainen[3], M. Sandzelius[3], J. Sarén[3], C. Scholey[3], J. Sorri[3], S. Stolze[3], M. J. Taylor[12], A. Thornthwaite[1], and J. Uusitalo[3]
Published 2 August 2017

Phys. Rev. C 96, 025801 (2017) https://journals.aps.org/prc/abstract/10.1103/PhysRevC.96.025801
First measurement of the $^{34}S(p,\gamma)^{35}Cl$ reaction rate through indirect methods for presolar nova grains
S. A. Gillespie[1,*], A. Parikh[2,3], C. J. Barton[1], T. Faestermann[4,5], J. José[2,3], R. Hertenberger[5,6], H.-F. Wirth[5,6], N. de Séréville[7], J. E. Riley[1], and M. Williams[1,8]
Published 2 August 2017

Nature 548, 62 (2017) http://www.nature.com/nature/journal/v548/n7665/full/nature23004.html
Global Λ hyperon polarization in nuclear collisions
The STAR Collaboration
Published 3 August 2017

Phys. Lett. B 771, 385 (2017) http://www.sciencedirect.com/science/article/pii/S0370269317304483
Evolution of nuclear structure in neutron-rich odd-Zn isotopes and isomers
C. Wraith a,∗, X.F. Yang b,∗, L. Xie c, C. Babcock a, J. Bieron´ d, J. Billowes c, M.L. Bissell b,c, K. Blaum e, B. Cheal a, L. Filippin f , R.F. Garcia Ruiz b,c, W. Gins b, L.K. Grob g, G. Gaigalas h, M. Godefroid f , C. Gorges i , H. Heylen b, M. Honma j , P. Jönsson k, S. Kaufmann g, M. Kowalska l , J. Krämer i , S. Malbrunot-Ettenauer l , R. Neugart e,g, G. Neyens b, W. Nörtershäuser g,i , F. Nowacki m, T. Otsuka n, J. Papuga b, R. Sánchez o, Y. Tsunoda p, D.T. Yordanov q
Published 10 August 2017

Physics Letters B, 771, 467 (2017) http://www.sciencedirect.com/science/article/pii/S0370269317304239
Measurement of the production of high-p_T electrons from heavy-flavour hadron decays in Pb–Pb collisions at $\sqrt{s_{NN}}$ = 2.76 TeV
ALICE Collaboration, UK Authors: D. Alexandre, H. A. Andrews, L. S. Barnby, M. Borri, M. Chartier, D. Evans, K. L. Graham, P. G. Jones, A. Jusko, M. Krivda, R. C. Lemmon, R. Lietava, J. Norman, O. Villalobos Baillie, N. Zardoshti
Published 10 August 2017

J. Phys. G: Nucl. Part. Phys. 44, 094003 (2017) http://iopscience.iop.org/article/10.1088/1361-6471/aa8207
A new statistical method for the structure of the inner crust of neutron stars
A Pastore[1,3,4], M Shelley[1], S Baroni[2] and C A Diget[1]
Published 11 August 2017

Phys. Rev. C 96, 024905 (2017) https://journals.aps.org/prc/abstract/10.1103/PhysRevC.96.024905
Measurements of jet quenching with semi-inclusive hadron+jet distributions in Au+Au collisions at $\sqrt{s_{NN}}$=200GeV
L. Adamczyk *et al.* (STAR Collaboration)
Published 14 August 2017

Phys. Rev. C 96, 024309 (2017) https://journals.aps.org/prc/abstract/10.1103/PhysRevC.96.024309
K selection in the decay of the $(\nu 5/2[532]\otimes 3/2[411])4^-$ isomeric state in ^{102}Zr
F. Browne[1,2,*], A. M. Bruce[1], T. Sumikama[3,2], I. Nishizuka[3], S. Nishimura[2], P. Doornenbal[2], G. Lorusso[2,4,5], P.-A. Söderström[2], H. Watanabe[2,6], R. Daido[7], Z. Patel[2,4], S. Rice[2,4], L. Sinclair[2,8], J. Wu[2,9], Z. Y. Xu[10,11], A. Yagi[7], H. Baba[2], N. Chiga[3,2], R. Carroll[4], F. Didierjean[12], Y. Fang[7], N. Fukuda[2], G. Gey[13,14], E. Ideguchi[7], N. Inabe[2], T. Isobe[2], D. Kameda[2], I. Kojouharov[15], N. Kurz[15], T. Kubo[2], S. Lalkovski[16], Z. Li[9], R. Lozeva[12,17], N. Nishibata[7], A. Odahara[7], Zs. Podolyák[4], P. H. Regan[4,5], O. J. Roberts[1], H. Sakurai[2], H. Schaffner[15], G. S. Simpson[13], H. Suzuki[2], H. Takeda[2], M. Tanaka[7,18], J. Taprogge[2,19,20], V. Werner[21,22], and O. Wieland[23]
Published 15 August 2017

Eur. Phys. J. C (2017) 77:550 https://link.springer.com/article/10.1140/epjc/s10052-017-5090-4
Measurement of D-meson production at mid-rapidity in pp collisions at √s = 7 TeV
ALICE Collaboration, UK Authors: D. Alexandre, H. A. Andrews, L. S. Barnby, M. Borri, M. Chartier, D. Evans, K. L. Graham, P. G. Jones, A. Jusko, M. Krivda, R. C. Lemmon, R. Lietava, J. Norman, O. Villalobos Baillie, N. Zardoshti
Published 17 August 2017

Phys. Rev. C 96, 024321 (2017) https://journals.aps.org/prc/abstract/10.1103/PhysRevC.96.024321
High-spin structures in ^{132}Xe and ^{133}Xe and evidence for isomers along the N=79 isotones
A. Vogt[1,*], M. Siciliano[2,3], B. Birkenbach[1], P. Reiter[1], K. Hadyńska-Klęk[3], C. Wheldon[4], J. J. Valiente-Dobón[3], E. Teruya[5], N. Yoshinaga[5], K. Arnswald[1], D. Bazzacco[6], A. Blazhev[1], A. Bracco[7], B. Bruyneel[8], R. S. Chakrawarthy[9], R. Chapman[10], D. Cline[11], L. Corradi[3], F. C. L. Crespi[7], M. Cromaz[12], G. de Angelis[3], J. Eberth[1], P. Fallon[12], E. Farnea[6,†], E. Fioretto[3], C. Fransen[1], S. J. Freeman[9], B. Fu[1], A. Gadea[13], W. Gelletly[14], A. Giaz[7], A. Görgen[15,16,12], A. Gottardo[3], A. B. Hayes[11], H. Hess[1], R. Hetzenegger[1], R. Hirsch[1], H. Hua[11], P. R. John[2,6], J. Jolie[1], A. Jungclaus[17], V. Karayonchev[1], L. Kaya[1], W. Korten[16], I. Y. Lee[12], S. Leoni[7], X. Liang[10], S. Lunardi[2,6], A. O. Macchiavelli[12], R. Menegazzo[6], D. Mengoni[18,2,6], C. Michelagnoli[19], T. Mijatović[20], G. Montagnoli[2,6], D. Montanari[21], C. Müller-Gatermann[1], D. Napoli[3], C. J. Pearson[22], Zs. Podolyák[14], G. Pollarolo[23], A. Pullia[7], M. Queiser[1], F. Recchia[2,6], P. H. Regan[14,24], J.-M. Régis[1], N. Saed-Samii[1], E. Şahin[15], F. Scarlassara[2,6], M. Seidlitz[1], B. Siebeck[1], G. Sletten[25], J. F. Smith[10], P.-A. Söderström[26], A. M. Stefanini[3], O. Stezowski[27], S. Szilner[20], B. Szpak[28], R. Teng[11], C. Ur[6], D. D. Warner[29,†], K. Wolf[1], C. Y. Wu[30], and K. O. Zell[1]
Published 24 August 2017

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2. News to Report

a. COST Action PHAROS

The COST Action PHAROS ("The multi-messenger PHysics and Astrophysics of neutROn Stars"), has been approved. COST Actions are bottom-up science and technology networks, open to researchers and stakeholders for a duration of four years, with an average budget of 130.000 euros/year. They provide funding to a range of networking tools (via open calls among the PHAROS community), such as workshops, conferences, training schools and short-term (days to months) scientific visits between institutes. All of these activities could be of interest to the UK nuclear physics community. PHAROS will officially start in Autumn 2017, and a dedicated webpage is being prepared, but in the meantime you can join PHAROS by signing up into the following email list:
http://www.ice.csic.es/cgi-bin/mailman/listinfo/pharos
and/or adding your name and affiliation here:
https://docs.google.com/document/d/1g4UllJHKdFOyVxmRZrT7Sm9VenopOyrE_fsNGE6iEPI/edit
Please forward these details to any interested students/post-docs/staff from any scientific background that could potentially be interested to propose or join activities related to neutron star research.
Contribution by Arnau Rios Huguet a.rios@surrey.ac.uk (Surrey)

b. QFS-RB 17

The 3rd International Workshop on Quasi-Free Scattering with Radioactive-Ion Beams (QFS-RB 17) took place at the King's Manor venue, in the centre of the historic city of York between the 24th and 26th of July, hosted by the University of York and sponsored by HIC for FAIR, the University of York and the Institute of Physics.
https://www.york.ac.uk/physics/news/events/groups/nuclear-physics/qfs-workshop/
The main focus of the Workshop was recent theoretical and experimental results on quasi-free scattering reactions used as a tool to investigate properties of exotic nuclei. The talks were nicely complemented with recent work on knockout and transfer reactions with radioactive beams. A wealth of new experimental results from facilities around the world were presented including results from the R3B and EXL setups at the FAIR facility at GSI, as well as at the SAMURAI setup at the RIBF facility at RIKEN, and the NSCL/FRIB facility.
The Workshop also hosted talks in the area of short-range correlations with experimental results from quasi-free scattering reactions with electron or hadron probes on stable targets at JLAB in the US. These studies have revealed interesting new phenomena that could be further enhanced in isospin asymmetric nuclei. One of the main aims and outcomes of the Workshop has been to bring together people from neighbouring yet different communities and discuss new ideas and synergies.
The Workshop opened with a welcoming note by Brian Fulton (University of York) and included several participants from UK institutions including the following invited speakers: Andrea Idini (University of Surrey), Wilton Catford (University of Surrey), Daniel Watts (University of Edinburgh) and Marc Labiche (Daresbury Laboratory).
Contribution by Stefanos Paschalis stefanos.paschalis@york.ac.uk (York)

3. Outreach Activity

Winchester Science Festival

The Winchester Science Festival took place on 28th – 30th July at the Winchester Discovery Centre. Throughout the weekend thousands of visitors attended the festival, enjoying a wide range of interactive exhibits, and attending talks covering a variety of STEM topics.

Representatives from the South Central Branch Committee, Chantal Nobs, Tracey Holmes, Martin Jones, Helen Clark, and volunteers Rebecca Nettleship and Chris Clark, encouraged visitors to try out a number of physics busking activities and handed out hundreds of IoP goodie bags. The activities included straw oboes, amazing marshmallows, balloon kebabs and bouncing bubbles, all organized by South Central Branch Committee member Chantal Nobs.

Details of these experiments and many other physics busking activities can be found on the Physics to go web page. Chantal also provided the closing talk for the festival, comparing the differences between nuclear fission and fusion, and discussing her current research at the Culham Centre for Fusion Energy. Chantal designed two demonstrations for her talk: a mousetrap fission reactor, and a beach ball fusion reactor, ending the festival with a bang!

The IoP stall was packed throughout the entire weekend, and even saw repeat visitors. Chantal's talk generated loads of interesting questions, especially from the younger members of the audience, including "Why don't you fuse something heavier in JET, like iron?" and "If you could invent anything you want to make fusion easier, what would it be?"

Contribution by Chantal Nobs
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(Culham Centre for Fusion Energy)

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4. Media Interactions

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