UK Nuclear Activity

November 2013 Issue 5

In this issue,

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

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1. Nuclear Physics Publications for November

If you are publishing a paper that you think would be of media value please let Wendy Ellison wendy.ellison@stfc.ac.uk , STFC Press Officer, know. 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. Lett. B 726 (2013) 610 http://www.sciencedirect.com/science/article/pii/S0370269313007399
Centrality dependence of the pseudorapidity density distribution for charged particles in Pb–Pb collisions at $\sqrt{s_{NN}}$=2.76 TeV
E. Abbas et al., ALICE Collaboration, UK Authors: L.S. Barnby, D. Evans, L.D. Hanratty, P.G. Jones, A. Jusko, M. Krivda, G.R. Lee, R. Lietava, R.C. Lemmon, A. Palaha, P. Petrov, R. Romita, P.A. Scott, O. Villalobos-Baillie
Published 4 November 2013

Phys. Lett. B. 726, 665 (2013) http://www.sciencedirect.com/science/article/pii/S0370269313007855
Low-lying T = 0 T=0 states in the odd–odd N = Z N=Z nucleus ^{62}Ga
H.M. David[a], P.J. Woods[a], G. Lotay[a], D. Seweryniak[b], M. Albers[b], M. Alcorta[b], M.P. Carpenter[b], C.J. Chiara[b, c], T. Davinson[a], D.T. Doherty[a], C.R. Hoffman[b], R.V.F. Janssens[b], T. Lauritsen[b], A.M. Rogers[b], S. Zhu[b]
Published 4 November 2013

Phys. Lett. B. 726, 675 (2013) http://www.sciencedirect.com/science/article/pii/S0370269313007338
Quasi-particle and collective magnetism: Rotation, pairing and blocking in high-*K* isomers
N.J. Stone[a, b], J.R. Stone[a, b], P.M. Walker[c], C.R. Bingham[b, d]
Published 4 November 2013

Phys. Lett. B. 726, 791 (2013) http://www.sciencedirect.com/science/article/pii/S0370269313007193
Dynamical trapping and relaxation of scalar gravitational fields
C.H.-T. Wang[a, b], A.O. Hodson[a], A.St.J. Murphy[c], T.B. Davies[a], J.T. Mendonça[d, b], R. Bingham[b, e]
Published 4 November 2013

Phys. Rev. C 88, 054304 (2013) http://prc.aps.org/abstract/PRC/v88/i5/e054304
Mass spectrometry and decay spectroscopy of isomers across the *Z*=82 shell closure
J. Stanja[1,*], Ch. Borgmann[2,†], J. Agramunt[3], A. Algora[3,4], D. Beck[5], K. Blaum[2], Ch. Böhm[2], M. Breitenfeldt[6], T. E. Cocolios[7,8], L. M. Fraile[9], F. Herfurth[5], A. Herlert[10], M. Kowalska[7], S. Kreim[2], D. Lunney[11], V. Manea[11], E. Minaya Ramirez[5,12], S. Naimi[11,13], D. Neidherr[5], M. Rosenbusch[14], L. Schweikhard[14], G. Simpson[15], F. Wienholtz[14], R. N. Wolf[14], and K. Zuber[1]
Published 6 November 2013

Phys. Rev. C 88, 054307 (2013) http://prc.aps.org/abstract/PRC/v88/i5/e054307
Competing single-particle and collective states in the low-energy structure of ^{113}I
M. J. Taylor[1,*], D. M. Cullen[1], M. G. Procter[1], T. Bäck[2], B. Cederwall[2], M. Doncel[2], T. Braunroth[3], A. Dewald[3], J. Pakarinen[4], T. Grahn[4], P. T. Greenlees[4], K. Auranen[4], U. Jakobsson[4], R. Julin[4], S. Juutinen[4], A. Herzáñ[4], J. Konki[4], M. Leino[4], R. Liotta[4], J. Partanen[4], P. Peura[4], P. Rahkila[4], P. Ruotsalainen[4], M. Sandzelius[4], J. Sarén[4], J. Sorri[4], S. Stolze[4], J. Uusitalo[4], W. Y. Liang[5], and F. R. Xu[5]
Published 7 November 2013

Eur. Phys. J. C (2013) 73:2617 http://link.springer.com/article/10.1140/epjc/s10052-013-2617-1
Charmonium and e+ e− pair photoproduction at mid-rapidity in ultra-peripheral Pb–Pb collisions at $\sqrt{s_{NN}}$=2.76 TeV
E. Abbas et al., ALICE Collaboration, UK Authors: D. Alexandre, L.S. Barnby, D. Evans, L.D. Hanratty, P.G. Jones, A. Jusko, M. Krivda, G.R. Lee, R.C. Lemmon, R. Lietava, A. Palaha, P. Petrov, R. Romita, P.A. Scott, O. Villalobos-Baillie
Published 9 November 2013

Phys. Rev. C 88, 051302(R) (2013) http://prc.aps.org/abstract/PRC/v88/i5/e051302
Quadrupole-octupole coupling in the light actinides
L. M. Robledo[1,*] and P. A. Butler[2]
Published 11 November 2013

Phys. Rev. Lett. 111 212501 (2013) http://prl.aps.org/abstract/PRL/v111/i21/e212501
Collinear Resonance Ionization Spectroscopy of Neutron-Deficient Francium Isotopes
K. T. Flanagan[1,*], K. M. Lynch[1,2], J. Billowes[1], M. L. Bissell[3], I. Budinčević[3], T. E. Cocolios[1,2], R. P. de Groote[3], S. De Schepper[3], V. N. Fedosseev[4], S. Franchoo[5], R. F. Garcia Ruiz[3], H. Heylen[3], B. A. Marsh[4], G. Neyens[3], T. J. Procter[1], R. E. Rossel[4,6], S. Rothe[4], I. Strashnov[1], H. H. Stroke[7], and K. D. A. Wendt[6]
Published 19 November 2013

NIM A 729, 64 (2013) http://www.sciencedirect.com/science/article/pii/S0168900213009753
Improving the effectiveness of a low-energy Compton suppression system
R. Britton[a], J.L. Burnett[b], A.V. Davies[b], P.H. Regan[a]
Published 21 November 2013

NIM A 729, 198 (2013) http://www.sciencedirect.com/science/article/pii/S0168900213010024
Direct determination of the hit locations from experimental HPGe pulses
P. Désesquelles[a], A.J. Boston[b], H.C. Boston[b], J.R. Cresswell[b], M.R. Dimmock[b], I.H. Lazarus[c], J. Ljungvall[a], L. Nelson[b], D.-T. Nga[a], P.J. Nolan[b], S.V. Rigby[b], J. Simpson[c], N.-T. Van-Oanh[d]
Published 21 November 2013

NIM A 729, 541 (2013) http://www.sciencedirect.com/science/article/pii/S0168900213011005
Application of pulse-shape discrimination to coplanar CdZnTe detectors
M. Nakhostin, Zs. Podolyak, P.J. Sellin
Published 21 November 2013

Phys. Rev. Lett. (2013) 111, 222301 http://prl.aps.org/abstract/PRL/v111/i22/e222301
K_S^0 and Λ Production in Pb-Pb Collisions at $\sqrt{s_{NN}}$=2.76 TeV
B. Abelev et al., ALICE Collaboration, UK Authors: D. Alexandre, L.S. Barnby, D. Evans, L.D. Hanratty, P.G. Jones, A. Jusko, M. Krivda, G.R. Lee, R.C. Lemmon, R. Lietava, A. Palaha, P. Petrov, R. Romita, P.A. Scott, O. Villalobos-Baillie
Published 25 November 2013

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2. News to report

a. Liverpool in ALICE. UK presence in the ALICE collaboration at the LHC has been strengthened earlier this year with the addition of the University of Liverpool. There are now four institutes representing the UK; the universities of Birmingham and Liverpool, and the STFC Daresbury and Rutherford Appleton Laboratories. The Liverpool team currently has 4 members: Marielle Chartier (team leader), two postdoctoral researchers (Rosa Romita and Marcel Figueredo) and a PhD student (Jaime Norman).
The Liverpool ALICE team is particularly interested in heavy flavour physics and

especially the open charm. Charm quarks are ideal probes for investigating the Quark Gluon Plasma created during heavy ion collisions in ALICE; they are formed in the very early stage of the heavy ion collisions and propagate in the hot and dense matter before they aggregate to form hadron particles. They experience the complete heavy ion collision history.
This research at Liverpool complements work on heavy ion collisions at lower energies with fixed targets at GSI in Germany and RIKEN in Japan to study the equation of state of dense asymmetric nuclear matter. Using ALICE, Liverpool will now also be exploring the phase diagram of strongly interacting matter at lower densities and much higher temperatures.
Contribution by Marielle Chartier M.Chartier@liverpool.ac.uk *(Liverpool)*

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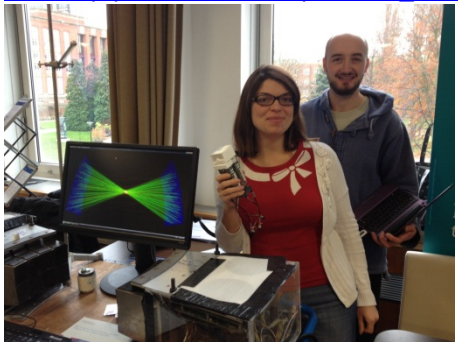
3. Outreach Activity

Public Talk. On 16th October Bill Gelletly gave a presentation to the U3S group in Odiham entitled 'Living in a radioactive world' to an audience of about 40.
Contribution by Bill Gelletly w.gelletly@surrey.ac.uk *(Surrey)*

School Talk. On 14th November John Roberts gave a presentation to Bolton Schools Girl's Division sixth form on 'Nuclear Energy – The Facts Behind The Fuss'.
Contribution by John Roberts j.w.roberts@manchester.ac.uk *(Manchester)*

Public Engagement Symposium. 25th November 2013, University of Birmingham. Members of the Nuclear Physics Group at the University of Birmingham took park in the lunchtime exhibition at the STFC PE Symposium, giving attendees a chance to see the positron imaging demonstration the group uses at its outreach events www.np.ph.bham.ac.uk/pic/uses_demo



Tzany Kokalova-Wheldon and Thomas Leadbeater demonstrated the technique of Positron Emission Particle Tracking (PEPT) developed at Birmingham using a small radioactive source (50 kBq of Na-22 in 2mm glass bead) placed between 2 banks of position sensitive radiation detectors. The positrons released by the source quickly annihilate with electrons emitting two gamma rays. On the computer screen behind the source, the data from the detector system is displayed; the green lines show each of the detected trajectories for the pairs of gamma photons. These converge at the position of the source particle; where the PEPT algorithm is used to draw a small box for each location. Typically this technique is used to study physical and industrial systems, and can be used on opaque systems with considerable thickness of material. It is expected that a particle can be located at a frequency of 1kHz, with precision of around 0.5mm in 3 dimensions.
Videos of this demonstration, can be found https://www.youtube.com/user/UoBPIC?feature=watch, the out-take of the dancing robot is particularly good.
Contribution by Thomas Leadbeater t.leadbeater@bham.ac.uk *(Birmingham) and Elizabeth Cunningham* e.cunningham@surrey.ac.uk *(Surrey)*

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4. Media Interactions

Yasser Arafat 'may have been poisoned with polonium'
http://www.bbc.co.uk/news/world-middle-east-24838061
Investigation into Yasser Arafat's death.
http://www.nature.com/news/no-firm-proof-arafat-was-poisoned-1.14130
http://edition.cnn.com/2013/11/06/world/meast/arafat-remains-polonium/
Contribution by Paddy Regan p.regan@surrey.ac.uk *and Elizabeth Cunningham* e.cunningham@surrey.ac.uk *(Surrey)*