UK Nuclear Activity

August 2014 Issue 14

In this issue,

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

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

---

*1. Nuclear Physics Publications for August**

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.

Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC), IEEE, pp.1,3, Oct. 27-Nov. 2 2013
http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6829546&isnumber=6829008
The Total Absorption Spectroscopy technique for reactor technology and basic nuclear physics,
Zakari-Issoufou, A.-A. ; Algora, A. ; Agramunt, J. ; Äystö, J. ; Bowry, M. ; Bui, V.M. ; Caballero-Folch, R. ; Cano-Ott, D. ; Eloma, V. ; Estevez, E. ; Fallot, M. ; Farrelly, G.F. ; Garcia, A. ; Gelletly, W. ; Gomez-Hornillos, M.B. ; Gorlychev, V. ; Hakala, J. ; Jokinen, A. ; Jordan, M.D. ; Kankainen, A. ; Kondev, F.G. ; Martinez, T. ; Mendoza, E. ; Molina, F. ; Moore, I. ; Perez, A. ; Porta, A. ; Podolyak, Z. ; Penttila, H. ; Regan, P.H. ; Rice, S. ; Rissanen, J. ; Rubio, B. ; Tain, J.L. ; Valencia, E. ; Weber, C.

Nucl. Data Sheets, 120, 59, (2014) http://www.sciencedirect.com/science/article/pii/S009037521400458X
Sub-nanosecond Half-life Measurement of the Yrast $I^{\pi}=5^{-}$ State in the N=78 Nucleus $_{58}{}^{136}$Ce using Fast-timing Coincident Gamma-ray Spectroscopy
T. Alharbi[a, b], P.H. Regan[a, c,], N. Mărginean[d], Zs. Podolyák[a], A. Bajoga[a], R. Britton[a], D. Bucurescu[d], D. Deleanu[d], D. Filipescu[d], D. Ghiță[d], T. Glodariu[d], C. Mihai[d], K. Mulholland[e], R. Mărginean[d], A. Negret[d], C.R. Nita[d], Z. Patel[a], O.J. Roberts[f], L. Stroe[d], T. Sava[d], C. Townsley[a], N.V. Zamfir[d]
*Published June 2014

Nucl. Data Sheets, 120, 197 http://www.sciencedirect.com/science/article/pii/S0090375214004979
^{13,14}B(n, γ) via Coulomb Dissociation for Nucleosynthesis towards the *r*-Process
S.G. Altstadt[a, b,], T. Adachi[c], Y. Aksyutina[b, d], J. Alcantara[e], H. Alvarez-Pol[e], N. Ashwood[f], L. Atar[g], T. Aumann[g, b], V. Avdeichikov[h], M. Barr[f], S. Beceiro[e], D. Bemmerer[i], J. Benlliure[e], C.A. Bertulani[j], K. Boretzky[b], M.J.G. Borge[k], G. Burgunder[l], M. Caamano[e], C. Caesar[g], E. Casarejos[m], W. Catford[n], J. Cederkäll[h], S. Chakraborty[o], M. Chartier[p], L. Chulkov[q, d], D. Cortina-Gil[e], U. Datta Pramanik[o], P. Diaz Fernandez[e], I. Dillmann[b], Z. Elekes[i], J. Enders[g], O. Ershova[a], A. Estrade[b], F. Farinon[b], L.M. Fraile[r], M. Freer[f], M. Freudenberger[g], H.O.U. Fynbo[s], D. Galaviz[t],
*Also including missed publications from previous months.

H. Geissel[b], R. Gernhäuser[u], K. Göbel[a], P. Golubev[h], D. Gonzalez Diaz[g], J. Hagdahl[v], T. Heftrich[a], M. Heil[b], M. Heine[g], A. Heinz[v], A. Henriques[t], M. Holl[g], J.D. Holt[w,x], G. Ickert[b], A. Ignatov[g], B. Jakobsson[h], H.T. Johansson[v], B. Jonson[v], N. Kalantar-Nayestanaki[c], R. Kanungo[y], A. Kelic-Heil[b], R. Knöbel[b], T. Kröll[g], R. Krücken[u], J. Kurcewicz[b], N. Kurz[b], M. Labiche[z], C. Langer[a], T. Le Bleis[u], R. Lemmon[z], O. Lepyoshkina[u], J. Machado[t], J. Marganiec[d], V. Maroussov[aa], J. Menéndez[g,d], M. Mostazo[e], A. Movsesyan[g], M.A. Najafi[c], T. Nilsson[v], C. Nociforo[b], V. Panin[g], A. Perea[k], S. Pietri[b], R. Plag[a], A. Prochazka[b], A. Rahaman[o], G. Rastrepina[b], R. Reifarth[a], G. Ribeiro[k], M.V. Ricciardi[b], C. Rigollet[c], K. Riisager[s], M. Röder[ab,i], D. Rossi[b], J. Sanchez del Rio[k], D. Savran[d,ac], H. Scheit[g], A. Schwenk[d,g], H. Simon[b], J. Simonis[g,d], K. Sonnabend[a], O. Sorlin[l], V. Stoica[c], B. Streicher[c], J. Taylor[p], O. Tengblad[k], S. Terashima[b], R. Thies[v], Y. Togano[d], E. Uberseder[ad], J. Van de Walle[c], P. Velho[t], V. Volkov[g], A. Wagner[i], F. Wamers[g,b], H. Weick[b], M. Weigand[a], C. Wheldon[f], G. Wilson[ae], C. Wimmer[a], J.S. Winfield[b], P. Woods[af], D. Yakorev[i], M.V. Zhukov[v], A. Zilges[aa], M. Zoric[b], K. Zuber[ab], R3B collaboration
*Published June 2014

Phys. Rev. C 89, 065805 (2014) http://journals.aps.org/prc/abstract/10.1103/PhysRevC.89.065805
Nucleosynthesis of ^{26}Al in massive stars: New ^{27}Al states above α and neutron emission thresholds
S. Benamara[1,2], N. de Séréville[2,*], A. M. Laird[3], F. Hammache[2], I. Stefan[2], P. Roussel[2], S. Ancelin[2], M. Assié[2], A. Coc[4], I. Deloncle[4], S. P. Fox[3], J. Kiener[4], L. Lefebvre[2], A. Lefebvre-Schuhl[4], G. Mavilla[2], P. Morfouace[2], Á. M. Sánchez-Benítez[5,†], L. Perrot[2], M. Sinha[6], V. Tatischeff[4], and M. Vandebrouck[2]
*Published 25 June 2014

J. Environ. Radioactiv. 134, 1 (2014) http://www.sciencedirect.com/science/article/pii/S0265931X1400068X
Maximising the sensitivity of a *γ* spectrometer for low-energy, low-activity radionuclides using Monte Carlo simulations
R. Britton[a,b,], J.L. Burnett[b], A.V. Davies[b], P.H. Regan[a]
Published August 2014

Phys. Rev. C 90, 024302 (2014) http://journals.aps.org/prc/abstract/10.1103/PhysRevC.90.024302
Energy levels of ^{18}F from the ^{14}N+α resonant reaction
S. Bailey, M. Freer, Tz. Kokalova, S. Cruz, H. Floyd, and D. J. Parker
Published 5 August 2014

Phys. Rev. C 90, 021301(R) (2014) https://journals.aps.org/prc/abstract/10.1103/PhysRevC.90.021301
Shape evolution in the neutron-rich osmium isotopes: Prompt γ-ray spectroscopy of ^{196}Os
P. R. John[1,2,*], V. Modamio[3], J. J. Valiente-Dobón[3], D. Mengoni[1,2], S. Lunardi[1,2], T. R. Rodríguez[4,5], D. Bazzacco[2], A. Gadea[6], C. Wheldon[7], T. Alexander[8], G. de Angelis[3], N. Ashwood[7], M. Barr[7], G. Benzoni[9,10], B. Birkenbach[11], P. G. Bizzeti[12,13], A. M. Bizzeti-Sona[12,13], S. Bottoni[9,10], M. Bowry[8], A. Bracco[9,10], F. Browne[14], M. Bunce[8], F. Camera[9,10], B. Cederwall[15], L. Corradi[3], F. C. L. Crespi[9,10], P. Désesquelles[16], J. Eberth[11], E. Farnea[2,†], E. Fioretto[3], A. Görgen[17,18], A. Gottardo[1,3], J. Grebosz[19], L. Grente[17], H. Hess[11], A. Jungclaus[20], Tz. Kokalova[7], A. Korichi[16], W. Korten[17], A. Kuşoğlu[21], S. Lenzi[1,2], S. Leoni[9,10], J. Ljungvall[16], G. Maron[3], W. Meczynski[19], B. Melon[12,13], R. Menegazzo[1,2], C. Michelagnoli[1,2,‡], T. Mijatović[22], B. Million[10], P. Molini[1,2], G. Montagnoli[1,2], D. Montanari[1,2,§], D. R. Napoli[3], P. Nolan[23], Ch. Oziol[24], Zs. Podolyák[8], G. Pollarolo[25,26], A. Pullia[9,10], B. Quintana[27], F. Recchia[1,2], P. Reiter[11], O. J. Roberts[14], D. Rosso[3], E. Şahin[3,¶], M.-D. Salsac[17], F. Scarlassara[1,2], M. Sferrazza[28], J. Simpson[29], P.-A. Söderström[30,‖], A. M. Stefanini[3], O. Stezowski[31], S. Szilner[22], Ch. Theisen[17], C. A. Ur[2,#], and J. Walshe[7]
Published 13 August 2014

Eur. Phys. J. C 74:2974 (2014) http://link.springer.com/article/10.1140/epjc/s10052-014-2974-4
Measurement of quarkonium production at forward rapidity in pp collisions at √s = 7 TeV
B. Abelev et al. ALICE Collaboration, UK Authors: D. Alexandre, L.S. Barnby, D. Evans, M. A. S. Figueredo, L.D. Hanratty, P.G. Jones, A. Jusko, M. Krivda, G.R. Lee, R.C. Lemmon, R. Lietava, R. Romita, O. Villalobos-Baillie
Published 13 August 2014

---

2. News to Report

a. PKU-CUSTIPEN Nuclear Reaction Workshop. Phil Walker and Zsolt Podolyak gave invited talks at the CUSTIPEN conference "Reactions and Spectroscopy of Unstable Nuclei" (11-14 August) in Beijing, as part of four days of talks covering a wide range of topical experimental and theoretical nuclear physics research.

Phil Walker's talk had the title "Stored exotic nuclei", while Zsolt Podolyak spoke about the "Population of high-spin states in projectile fragmentation".

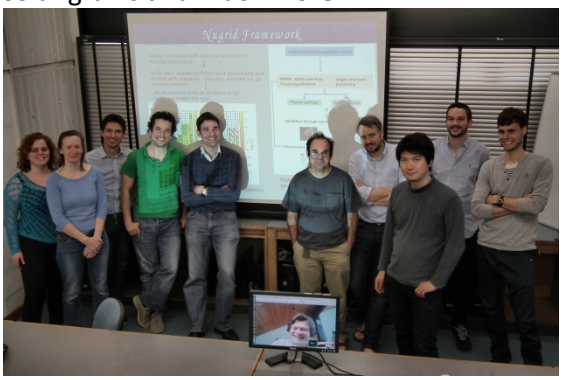
There were about 100 people at the meeting, with about 2/3 from China. All the conference

presentations can be found at http://custipen.pku.edu.cn/meetings.html. There is tremendous growth underway in Chinese scientific research, and there are now great opportunities for cultural and scientific exchange.

Contribution by Phil Walker, p.walker@surrey.ac.uk (Surrey)

b. Stars, Supernovae and Nucleosynthesis.
The BRIDGCE UK network is running a two-day meeting at Keele University on 16th-17th September.
This meeting, which will be organised on an annual basis, will bring together all the scientists involved in the BRIDGCE network activities to disseminate recent results, share new ideas and make future plans. Since most chemical elements are formed in stars and supernovae, the first day of the meeting will focus on the evolution and the explosion of stars, while the second day will focus on galactic chemical evolution, meteoritic grains and nuclear astrophysics.
More details can be found at: http://www.astro.keele.ac.uk/bridgce/events/nuclear-astrophysics-massive-stars-and-supernovae-meetings.
Contribution by Alison Laird alison.laird@york.ac.uk (York)

c. NuGRID Collaboration Meeting.
The York Nuclear Physics Group hosted the annual NuGRID (http://www.nugridstars.org) collaboration meeting from 26th May to 6th June. The Nucleosynthesis Grid (NuGrid) project develops and maintains tools for large scale post-processing nucleosynthesis simulations, and applies these to complete sets of quiescent and explosive nuclear production environments. York has been a member of the collaboration since 2013. The meeting was attended by 15 researchers from across Europe and North America, and the discussions during the two week meeting were wide ranging. Topics included massive star evolution and explosions, AGB models, ^{26}Al production sites and nuclear uncertainties, Hauser-Feshbach calculations, galactic chemical evolution, pre-solar grains and much more.



Contribution by Alison Laird alison.laird@york.ac.uk (York)

d. A new laser at CRIS offers new perspectives. The Collinear Resonance Ionisation Spectroscopy experiment at ISOLDE has received on Tuesday 12 August a new laser system for operation at 100-200Hz. This custom-made apparatus, from the UK laser company Litron, consists in two 100 Hz Nd:YAG laser heads and their doubling optics, providing up to 80 mJ/pulse of 1064 nm light, or 50 mJ/pulse of 532 nm light. This laser is part of a Rutherford Grant from the STFC, which supports the CRIS research programme on the gallium isotopes (IS571).
This laser will allow operation of the CRIS experiment at a rate 10 times higher than currently available, meaning that 10 times more beam can be handled and isotopes with lower production rates, or lower purity levels, will become accessible. It will also be used as a primary laser for a tuneable pulsed dye laser, recently acquired through Manchester's Photon Science Institute, which will enable the use of laser excitation schemes with three transitions for higher selectivity.
The installation of the laser system went very smoothly and its performance has already been validated. Its first online operation is foreseen for the end of September during the IS471 experiment on the francium isotopes. It will then allow us to access the isomer in 203Fr and 201Fr, with half-lives of only ~50ms and high isobaric thallium contamination, with which we will study the shape of the s1/2 proton intruder state in these odd-Z isotopes.
Contribution by Thomas Elias Cocolios thomas.elias.cocolios@cern.ch (Manchester)

3. Outreach Activity

Outreach Grant Success!
The York nuclear group, led by their outreach officer Katherine Leech and Thomas Henry were successful in attaining £7500 from BIS for nuclear physics outreach projects with diverse audiences. They will be using the money to buy detectors and other equipment for nuclear physics based workshops.
Contribution by Thomas Henry twh509@york.ac.uk (York).

Talk to Teachers
Paddy Regan gave two outreach talks at the IoP Teachers Training conference at Charterhouse School, Godalming, Surrey. The first on Thursday 10th July was called 'Fallout from Fukushima?' and the second on Thursday 17th July 2014 was entitled 'The nuclear (astrophysics) of Poisonous Polonium-210'.
Contribution by Paddy Regan p.regan@surrey.ac.uk (NPL/Surrey)

Talk to Teachers
Elizabeth Cunningham gave the evening lecture at the IoP stimulating physics network teacher summer school at Homerton College Cambridge on the 6th August. She spoke for an hour about nuclear astrophysics to an audience of approximately 100 teachers (with non-physics backgrounds) who teach secondary level physics.
Contribution by Elizabeth Cunningham elizabeth.cunningham@stfc.ac.uk (STFC/Surrey)

Glasgow's public 'Meets the Experts' again
The University of Glasgow's Nuclear Physics Group public outreach team were again under the public spotlight in a 3 day "Meet the Experts" event at the Glasgow Science Centre (http://www.glasgowsciencecenter.org). Following on from the successes of previous events in which several hundreds of visitors engaged in discussions and demonstrations to learn about fundamental physics, applications of nuclear physics technology and radioactivity in the environment, the nuclear physicists were joined by a medical physicist colleague (representing IPEM) from the University of Glasgow's British Heart Foundation Centre and NHS Scotland. With everything from highlighting the uses of radiation in medicine to judging the public's attempts at the hands on challenge of removing contaminated gloves and clothing, this new addition to the outreach package proved to be a real hit with visitors and Science Centre management.
Contribution by Bjoern Seitz bjoern.seitz@glasgow.ac.uk (Glasgow)

Media and Communications Training. The Science and Technology Facilities Council offers free one-day Media Awareness and Communications Skills courses for researchers, as part of its Public Engagement programme.
The Media course develops skills in working with television, radio, newspapers and other media. The next course date is 3 November 2014 in London
The Communications course includes how to write clearly without using jargon, structure a talk, use visual aids effectively, how to chair conferences, and how to run question and answer sessions. The next course date is 24 September 2014 in London.
Two-day residential Media and Communications training courses are also available and are held at the Kavli Royal Society International Centre in Buckinghamshire. The next dates are 6/7 October 2014.
STFC offers bursaries to pay the course fees and T&S costs for eligible researchers. The courses are run for us by the Royal Society. To book a place visit the Royal Society website
Once you have a place, go to the STFC website to apply for an STFC bursary.
The STFC contact for more information is Jane.Butt@stfc.ac.uk Tel: 01793 442030.

Outreach Funding. STFC has announced that the 2014B Small Awards scheme round is open. The closing date is Thursday 9th October 2014 at 4.00pm.
The Public Engagement Small Awards Scheme provides funds for small, local or 'pilot' projects promoting STFC science and technology. Almost anyone can apply, including grant-funded research groups, STFC research facility users, schools, museums, etc. Awards range from £500 to £10,000 and the expenditure can go towards materials, salaries and travel & subsistence.

Projects must be relevant to publicising engagement or teaching about the STFC science and technology areas, namely:
• particle physics;
• nuclear physics;
• space, ionospheric, solar & planetary science;
• astronomy;
• astrophysics;
• cosmology;
• studying materials with muon & neutron sources;
• studying materials with synchrotron light sources;
• research using laser facilities;
• other science areas;

Applicants should also consult the STFC Public Engagement Strategy in advance of submitting your proposal and are also encouraged (if applicable) to consider working with under-represented audiences such as girls and young women in engineering and physics, groups in areas geographically remote from STEM activity and underperforming schools.
Please see the notes for guidance for further information.
All applications must be submitted through the RCUK Joint electronic submission (Je-S) system. E-mailed or hard copy applications will not be accepted.
The STFC contact is: Andy Thompson Tel: 01793 442098.

---

4. Media Interactions

BBC Radio 4. The Report.
Litvinenko: The miniature nuclear attack.

http://www.bbc.co.uk/programmes/b04cfnz2
Paddy Regan interviewed on the use of polonium-210 as a poison.

Contribution by Paddy Regan
p.regan@surrey.ac.uk (NPL/Surrey)