UK Nuclear Activity

March 2016 Issue 33

In this issue,

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

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

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1. Nuclear Physics Publications for March*

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.

J. Phys.: Conf. Ser. 665 012039 (2016)
http://iopscience.iop.org/article/10.1088/1742-6596/665/1/012039
Investigation of the Photon Strength Function in ^{130}Te
J Isaak[1,2], J Beller[3], E Fiori[1,2], J Glorius[4], M Krtička[5], B Löher[1,2], N Pietralla[3], C Romig[3], G Rusev[6], D Savran[1,2],M Scheck[3,7,8], J Silva[1,2], K Sonnabend[4], A P Tonchev[9], W Tornow[10,11], H R Weller[10,11] and M Zweidinger[3]
*Published online: 5 January 2016

Phys. Rev. C 93, 011303(R) (2016) http://journals.aps.org/prc/abstract/10.1103/PhysRevC.93.011303
Low-lying isovector 2^+ valence-shell excitations of ^{212}Po
D. Kocheva[1], G. Rainovski[1,*], J. Jolie[2], N. Pietralla[3], C. Stahl[3], P. Petkov[4,5], A. Blazhev[2], A. Hennig[2], A. Astier[6], Th. Braunroth[2], M. L. Cortés[3], A. Dewald[2], M. Djongolov[1], C. Fransen[2], K. Gladnishki[1], V. Karayonchev[2], J. Litzinger[2], C. Müller-Gatermann[2], M. Scheck[3,†], Ph. Scholz[2], R. Stegmann[3], P. Thöle[2], V. Werner[3], W. Witt[3], D. Wölk[2], and P. Van Isacker[7]
*Published 19 January 2016

Appl. Radiat. Isot. 109, 479 (2016) http://www.sciencedirect.com/science/article/pii/S0969804315303663
A preliminary evaluation of naturally occurring radioactivity concentration levels across the State of Kuwait
H. Shams[a,b,d], A.D. Bajoga[a,c,d], N. Alazemi[a,b], D.A. Bradley[a], P.H. Regan[a,d,]
Published March 2016

*Also including missed publications from previous months.

Appl. Radiat. Isot. 109, 507 (2016) http://www.sciencedirect.com/science/article/pii/S0969804315303870
Development of the NPL gamma-ray spectrometer NANA for traceable nuclear decay and structure studies
G. Lorusso[a,b], R. Shearman[a,b], P.H. Regan[a,b,,], S.M. Judge[a,b], S. Bell[a,b], S.M. Collins[a], C. Larijani[a,b], P. Ivanov[a], S.M. Jerome[a], J.D. Keightley[a], S. Lalkovski[b], A.K. Pearce[b], Zs Podolyak[a]
Published March 2016

J. Phys. G: Nucl. Part. Phys. 43 045113 (2016)
http://iopscience.iop.org/article/10.1088/0954-3899/43/4/045113
NPTool: a simulation and analysis framework for low-energy nuclear physics experiments
A Matta[1,6], P Morfouace[2], N de Séréville[3], F Flavigny[3], M Labiche[4] and R Shearman[1,5]
Published 7 March 2016

Phys. Rev. C 93, 034307 (2016) http://journals.aps.org/prc/abstract/10.1103/PhysRevC.93.034307
Excited states in the proton-unbound nuclide ^{158}Ta
R. J. Carroll[1,*], R. D. Page[1], D. T. Joss[1], D. O'Donnell[1,†], J. Uusitalo[2], I. G. Darby[1,‡], K. Andgren[3],K. Auranen[2], S. Bönig[4], B. Cederwall[3], M. Doncel[3], M. C. Drummond[1], S. Eeckhaudt[2], T. Grahn[2],C. Gray-Jones[1], P. T. Greenlees[2], B. Hadinia[3,§], A. Herzáň[2], U. Jakobsson[2,¶], P. M. Jones[2,**], R. Julin[2], S. Juutinen[2], J. Konki[2], T. Kröll[4], M. Leino[2], A.-P. Leppänen[2,††], C. McPeake[1], M. Nyman[2,‡‡], J. Pakarinen[2], J. Partanen[2], P. Peura[2,§§], P. Rahkila[2], J. Revill[1], P. Ruotsalainen[2,¶¶], M. Sandzelius[2,3], J. Sarén[2], B. Sayğı[1], C. Scholey[2], D. Seweryniak[5], J. Simpson[6], J. Sorri[2], S. Stolze[2], M. J. Taylor[7], and A. Thornthwaite[1]
Published 8 March 2016

Phys. Rev. C 93, 034309 (2016) http://journals.aps.org/prc/abstract/10.1103/PhysRevC.93.034309
Lifetime measurements in ^{166}Re: Collective versus magnetic rotation
H. J. Li[1,2,*], B. Cederwall[1], M. Doncel[1], J. Peng[3], Q. B. Chen[4], S. Q. Zhang[4], P. W. Zhao[4], J. Meng[4,5,6], T. Bäck[1], U. Jakobsson[1,7], K. Auranen[7], S. Bönig[8], M. Drummond[9], T. Grahn[7], P. Greenlees[7], A. Herzáň[7], D. T. Joss[9], R. Julin[7], S. Juutinen[7], J. Konki[7], T. Kröll[8], M. Leino[7], C. McPeake[9], D. O'Donnell[9], R. D. Page[9], J. Pakarinen[7], J. Partanen[7], P. Peura[7,†], P. Rahkila[7], P. Ruotsalainen[7,‡], M. Sandzelius[7], J. Sarén[7], B. Sayğı[9,§], C. Scholey[7], J. Sorri[7], S. Stolze[7], M. J. Taylor[10], A. Thornthwaite[9], J. Uusitalo[7], and Z. G. Xiao[2]
Published 8 March 2016

Phys. Lett. B, 754, 288 (2016) http://www.sciencedirect.com/science/article/pii/S0370269316000563
First direct mass measurements of stored neutron-rich^{129,130,131}Cd isotopes with FRS-ESR
R. Knöbel[a,,], M. Diwisch[b,1], F. Bosch[a], D. Boutin[a], L. Chen[a,b], C. Dimopoulou[a], A. Dolinskii[a], B. Franczak[a], B. Franzke[a], H. Geissel[a,b], M. Hausmann[c], C. Kozhuharov[a], J. Kurcewicz[a], S.A. Litvinov[a], G. Martinez-Pinedo[d,a], M. Matoš[a], M. Mazzocco[a], G. Münzenberg[a], S. Nakajima[e], C. Nociforo[a], F. Nolden[a],T. Ohtsubo[f], A. Ozawa[g], Z. Patyk[h], W.R. Plaß[a,b], C. Scheidenberger[a,b], J. Stadlmann[a], M. Steck[a], B. Sun[i,a], T. Suzuki[e], P.M. Walker[j], H. Weick[a], M.-R. Wu[d], M. Winkler[a], T. Yamaguchi[e]
Published 10 March 2016

NIM A, 812, 24 (2016) http://www.sciencedirect.com/science/article/pii/S0168900215016125
Determination of absolute internal conversion coefficients using the SAGE spectrometer
J. Sorri[a,,], P.T. Greenlees[a], P. Papadakis[a], J. Konki[a], D.M. Cox[a,b], K. Auranen[a], J. Partanen[a], M. Sandzelius[a], J. Pakarinen[a], P. Rahkila[a], J. Uusitalo[a], R.-D. Herzberg[b], J. Smallcombe[c,1], P.J. Davies[c],C.J. Barton[c], D.G. Jenkins[c]
Published 11 March 2016

NIM A, 812, 134 (2016) http://www.sciencedirect.com/science/article/pii/S0168900215016344
Pulse processing routines for neutron time-of-flight data
P. Žugec[a,,], C. Weiß[b], C. Guerrero[c], F. Gunsing[d], V. Vlachoudis[b], M. Sabate-Gilarte[b,c], A. Stamatopoulos[e], T. Wright[f], J. Lerendegui-Marco[c], F. Mingrone[g], J.A. Ryan[f], S.G. Warren[f], A. Tsinganis[b,e], M. Barbagallo[h], On behalf of the n_TOF Collaboration[1]
Published 11 March 2016

Phys. Rev. C 93, 031601(R) (2016) http://journals.aps.org/prc/abstract/10.1103/PhysRevC.93.031601
One-neutron pickup into ^{49}Ca: Bound neutron $g_{9/2}$ spectroscopic strength at N=29
A. Gade[1,2], J. A. Tostevin[3], V. Bader[1,2], T. Baugher[1,2], D. Bazin[1], J. S. Berryman[1], B. A. Brown[1,2],D. J. Hartley[4], E. Lunderberg[1,2], F. Recchia[1], S. R. Stroberg[1,2], Y. Utsuno[5,6], D. Weisshaar[1], and K. Wimmer[1,7,*]
Published 14 March 2016

Phys. Rev. C 93, 034318 (2016) http://journals.aps.org/prc/abstract/10.1103/PhysRevC.93.034318
Neutron-proton multiplets in the odd-odd nucleus $^{90}_{37}Rb_{53}$
M. Czerwiński[1], T. Rząca-Urban[1], W. Urban[1], P. Bączyk[1], K. Sieja[2], J. Timár[3], B. M. Nyakó[3], I. Kuti[3], T. G. Tornyi[3], L. Atanasova[4], A. Blanc[5], M. Jentschel[5], P. Mutti[5], U. Köster[5], T. Soldner[5], G. de France[6], G. S. Simpson[7,8], and C. A. Ur[9]
Published 16 March 2016

Phys. Rev. Lett. 116, 112503 (2016) http://journals.aps.org/prl/abstract/10.1103/PhysRevLett.116.112503
Direct Evidence of Octupole Deformation in Neutron-Rich ^{144}Ba
B. Bucher[1,*], S. Zhu[2], C. Y. Wu[1], R. V. F. Janssens[2], D. Cline[3], A. B. Hayes[3], M. Albers[2], A. D. Ayangeakaa[2], P. A. Butler[4], C. M. Campbell[5], M. P. Carpenter[2], C. J. Chiara[2,6,†], J. A. Clark[2], H. L. Crawford[7,‡], M. Cromaz[5], H. M. David[2,§], C. Dickerson[2], E. T. Gregor[8,9], J. Harker[2,6], C. R. Hoffman[2], B. P. Kay[2], F. G. Kondev[2], A. Korichi[2,10], T. Lauritsen[2], A. O. Macchiavelli[5], R. C. Pardo[2], A. Richard[7], M. A. Riley[11], G. Savard[2], M. Scheck[8,9], D. Seweryniak[2], M. K. Smith[12], R. Vondrasek[2], and A. Wiens[5]
Published 17 March 2016

Phys. Rev. Lett. 116, 122502 (2016) http://journals.aps.org/prl/abstract/10.1103/PhysRevLett.116.122502
Direct Lifetime Measurements of the Excited States in ^{72}Ni
K. Kolos[1,2,*], D. Miller[3], R. Grzywacz[1,4], H. Iwasaki[5,6], M. Al-Shudifat[1], D. Bazin[5], C. R. Bingham[1,4], T. Braunroth[7], G. Cerizza[1], A. Gade[5,6], A. Lemasson[5], S. N. Liddick[5,8], M. Madurga[1], C. Morse[5,6], M. Portillo[5], M. M. Rajabali[3], F. Recchia[5], L. L. Riedinger[1,4], P. Voss[9], W. B. Walters[10], D. Weisshaar[5], K. Whitmore[5,6], K. Wimmer[11], and J. A. Tostevin[12]
Published 22 March 2016

Phys. Rev. C 93, 034333 (2016) http://journals.aps.org/prc/abstract/10.1103/PhysRevC.93.034333
Spectroscopy of ^{35}P using the one-proton knockout reaction
A. Mutschler[1,2], O. Sorlin[2], A. Lemasson[2,3], D. Bazin[3], C. Borcea[4], R. Borcea[4], A. Gade[3], H. Iwasaki[3], E. Khan[1], A. Lepailleur[2], F. Recchia[3], T. Roger[2], F. Rotaru[4], M. Stanoiu[4], S. R. Stroberg[3,5], J. A. Tostevin[6], M. Vandebrouck[1,2], D. Weisshaar[3], and K. Wimmer[3,7,8]
Published 28 March 2016

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2. News to Report

a. Bringing together a scientific community with NPTool. A universal and open framework for simulation and analysis of low-energy nuclear physics experiments:
A Matta *et al* 2016 *J. Phys. G: Nucl. Part. Phys.* 43 045113.
Since the first radioactive ion beam produced more than 50 years ago, we have come a long way in the development of radioactive ion beam facilities and opened new doors to our understanding of both nuclear reactions and nuclear structures. Wandering far from the valley of stability and approaching the drip line where nuclei are in their most extreme conditions came at a cost, driving the community toward lower beam intensity, degraded beam optics and a wider use of the more complex inverse kinematic.
The result is a steep increase in the complexity and variety of the experimental devices used to perform such experiments and with it more and more time spent on data analysis. On the other hand Monte Carlo simulation became the standard approach to better understand those complex experimental setups allowing for all the correlated effects at play to be taken into account consistently.
In our paper, published in *Journal of Physics G: Nuclear and Particle Physics*, we present the NPTool framework, a novel ROOT and GEANT4 based framework designed to help low-energy nuclear physicists analyse and simulate their experiments. For the first time the community is offered a truly universal tool with no ties to specific detector or beam facility. Read more here.
Contribution by Adrien Matta a.matta@surrey.ac.uk (Surrey).

b. EPSRC Energy Fellowship. The University of Manchester have received their first EPSRC Postdoctoral Fellowship in the Global-Challenge area of Energy. Dr Tobias Wright has been awarded the three year fellowship which will allow him to continue his research into nuclear data measurements and evaluation, within the Manchester Nuclear Physics Group. Dr Wright is currently the network manager of the recently-established UK Nuclear Data Network (UKNDN) but will relinquish this role in July to take up the fellowship.

Contribution by Gavin Smith gavin.smith@manchester.ac.uk (Manchester).

c. News from NuPECC.

ECT* Trento March 2016. The Nuclear Physics European Coordination Committee, NuPECC, typically has three regular meetings each year. Following an additional Strategy meeting held at GSI in January, the first regular meeting of the year was held in Trento at the ECT* on 11 and 12 March. The main topic on the agenda was the development of the next Long Range Plan, but there were additional updates from the major nuclear physics facilities.

Long Range Plan. The first part of the meeting was dedicated to status reports from the six working groups. Good progress has been made, with all convenors, NuPECC liaisons, and Working Group members defined. Most Working Groups have held open meetings inviting contributions for content, and condensing that input in to text and priorities has begun. The first drafts from all the groups, plus the sections on facilities, theory and education, will be considered at the next NuPECC meeting in June, to be held in Uppsala.

IKP Juelich. An apparent desire to consolidate in particular areas means that restructuring of the Juelich laboratory threatens to end all nuclear and particle physics related activity. This would have a significant impact on projects such as FAIR, HESR and PANDA. There is also potential damage to other programmes in which IKP is currently involved. NuPECC will send a letter to the Laboratory Management commenting on the detrimental impact this move would cause to the wider European Nuclear Physics community.

ESFRI roadmap. The 2016 ESFRI strategy report on research infrastructures has been published, see http://www.esfri.eu/roadmap-2016. FAIR, SPIRAL2, ELI-NP and HL-LHC are included on the revised roadmap. All are landmark facilities.

ENSAR2: Following on from the ENSAR project, this project has been selected by the European Commission for funding of 10 M€. There are 9 TNAs plus ECT*, including new contributions from NLC (Poland – Warsaw, Krakow) and ELI-NP (Romania). There are also network activities and JRAs. The final accepted proposal will be sent to NuPECC for information. The start date was March 1st 2016, and it has a duration of 4 years.

Hadron Physics Horizon: The proposal continues to be under development, with ECT* included in the bid. While the proposal is dominated by Germany and Italy, there are four UK institutions involved. Submission is expected at end of March 2016.

The **ECT*** itself reports that 18 scientific events, to take place in 2016, have been accepted from a total of 24 proposals. The budget for ECT* is stable for 2016 although the local FBK contribution will be cut from 2017, resulting in a senior research associate and an administration position not being filled. NuPECC will write a letter of support. The change of structures within the European Science Foundation is becoming clearer. NuPECC is an expert board within **ESF/Connect**, a new organisation that will have its first Council meeting in June 2016. Its role is now more focused on service, and they will perform occasional evaluations of NuPECC.

Contribution by Alex Murphy a.s.murphy@ed.ac.uk (Edinburgh) and Paul Nolan P.J.Nolan@liverpool.ac.uk (Liverpool).

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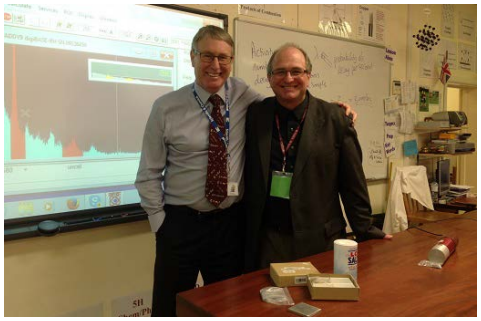
3. Outreach Activity

Outreach Lectures

Paddy Regan gave a talk entitled: 'Seeing the smallest things' to ~40 Year 7 students at Cranmore School, West Horsley, Surrey during their part of National Science Week on Tuesday 15th March. This included being greeted by some of their students dressed up as Galileo, Einstein, Newton and Lavoisier:

Photo of the students greeting Paddy.



Picture of Paddy and Mr. Colin Preece (Science teacher at Cranmore) with nice gamma-ray spectrum of some 'radium rocks' in the background.
Contribution by Paddy Regan p.regan@surrey.ac.uk (Surrey).

Laura Harkness-Brennan gave a talk on 'Gamma rays: imaging the invisible' at the University of Surrey IOP South Central Branch lecture on Wednesday 16th March. She spoke to ~60 people about environmental imaging at Fukushima and medical (nuclear) imaging using SPECT.
Contribution by Elizabeth Cunningham elizabeth.cunningham@stfc.ac.uk (STFC/Surrey).

Public Engagement Small Awards Scheme
The Public Engagement Small Awards Scheme provides funds for small, local or 'pilot' projects promoting STFC science and technology. 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.

The call for applications to the 2016A Small Awards round opened on Wed 17th February 2016. Applications will be accepted up to 4.00pm on Thu 28th April 2016.

Projects must be relevant to publicising engagement or teaching about the STFC science and technology areas, namely: *particle physics; nuclear physics; space, solar and planetary science; astronomy; astrophysics; cosmology; studying materials with muon and neutron sources; studying materials with synchrotron light sources; research using laser facilities.*
All applications **must** be submitted through the RCUK Joint electronic submission (Je-S) system. E-mailed or hard copy applications will not be accepted. Please see the notes for guidance for further information.
Contact STFC Public Engagement Team.

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4. Media Interactions