



UK Nuclear Activity

June 2019 Issue 72

In this issue,

1. [Nuclear Physics Publications for June](#)
2. [News to Report](#)
3. [Outreach Activity](#)
4. [Media Interactions](#)

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1. Nuclear Physics Publications for June*

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.

Fusion Eng. Des. <https://doi.org/10.1016/j.fusengdes.2019.04.074>

Neutron spectrum unfolding for the development of a novel neutron detector for fusion

C.R. Nobs, L.W. Packer, P. Batistoni, B. Colling, Z. Ghani, M.R. Gilbert, S. Loreti, K. Mergia, S. Messoloras, I. Michelakaki, M. Pillon, M.I. Savva, I.E. Stamatelatos, K. Triantou, and T. Vasilopoulou

Available online 20 May 2019

Phys. Lett. B **795**, p122-128

<https://www.sciencedirect.com/science/article/pii/S037026931930365X?via%3Dihub>

Direct measurements of low-energy resonance strengths of the $^{23}\text{Na}(p,\gamma)^{24}\text{Mg}$ reaction for astrophysics

A.Boeltzig^{abcd}, A.Best^{ef}, F.R.Pantaleo^{gh}, G.Imbriani^{ef}, M.Junker^{da}, M.Aliottaⁱ, J.Balibrea-Correa^{ef}, D.Bemmerer^j, C.Broggini^l, C.G.Brunoⁱ, R.Buompane^{fk}, A.Caciolli^{ml}, F.Cavannaⁿ, T.Chilleryⁱ, G.F.Ciani^{ad}, P.Corvisiero^{on}, L.Csedreki^{da}, .Davinsonⁱ, R.J.deBoer^{bc}, R.Depalo^{ml}, A.Di Leva^{ef}, Z.Elekes^p, F.Ferraro^{on}, E.M.Fiore^{gh}, A.Formicola^d, Zs.Fülöp^p, G.Gervino^{qr}, A.Guglielmettist, C.Gustavino^u, Gy.Gyürky^p, I.Kochanek^d, M.Lugaro^v, P.Marigo^{lm}, R.Menegazzo^l, V.Mossa^{gh}, F.Munnik^j, V.Paticchio^h, R.Perrino^{h1}, D.Piatti^{m,j}, P.Prati^{on}, L.Schiavulli^{gh}, K.Stöckel^{iw}, O.Straniero^{xd}, F.Strieder^y, T.Szücs^j, M.P.Takács^{iw2}, D.Trezzist, M.Wiescher^{bc}, and S.Zavatarelli

Published 10 August 2019

*Also includes missed publications from previous months

Nature Communications **10**, 2473 (2019) <https://www.nature.com/articles/s41467-019-10494-5>

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. Strycyczyk, P. Van Duppen, S. Vinals, V. Virtanen, N. Warr, K. Wrzosek-Lipska and M. Zielinska

Published 6 June 2019

Phys. Rev. C **99**, 064302 <https://journals.aps.org/prc/abstract/10.1103/PhysRevC.99.064302>

Effects of one valence proton on seniority and angular momentum of neutrons in neutron-rich $^{122-131}\text{Sb}$ isotopes

S. Biswas^{1,*}, A. Lemasson^{1,†}, M. Rejmund¹, A. Navin¹, Y. H. Kim^{1,†}, C. Michelagnoli^{1,†}, I. Stefan², R. Banik^{3,4}, P. Bednarczyk⁵, S. Bhattacharya^{3,4}, S. Bhattacharyya^{3,4}, E. Clément¹, H. L. Crawford⁶, G. de France¹, P. Fallon⁶, G. Frémont¹, J. Goupil¹, B. Jacquot¹, H. J. Li¹, J. Ljungvall⁷, A. Maj⁵, L. Ménager¹, V. Morel¹, R. Palit⁸, R. M. Pérez-Vidal⁹, J. Ropert¹, D. Barrientos¹⁰, G. Benzoni¹¹, B. Birkenbach¹², A. J. Boston¹³, H. C. Boston¹³, B. Cederwall¹⁴, J. Collado¹⁵, D. M. Cullen¹⁶, P. Désesquelles⁷, C. Domingo-Pardo⁹, J. Dudouet^{7,17}, J. Eberth¹², V. González¹⁵, L. J. Harkness-Brennan¹³, H. Hess¹², A. Jungclaus¹⁸, W. Korten¹⁹, M. Labiche²⁰, A. Lefevre¹, R. Menegazzo²¹, D. Mengoni^{21,22}, B. Million¹¹, D. R. Napoli²³, A. Pullia^{11,24}, B. Quintana²⁵, D. Ralet^{7,26,27}, F. Recchia^{21,22}, P. Reiter¹², F. Saillant¹, M. D. Salsac¹⁹, E. Sanchis¹⁵, O. Stezowski¹⁷, Ch. Theisen¹⁹, J. J. Valiente-Dobón²³, and M. Zielińska¹⁹

Published 3 June 2019

Phys. Rev. C **99**, 064310 <https://journals.aps.org/prc/abstract/10.1103/PhysRevC.99.064310>

Identification of a 6.6 μs isomeric state in ^{175}Ir

S. A. Gillespie^{1,2,*}, A. N. Andreyev^{1,3}, M. Al Monthery¹, C. J. Barton¹, S. Antalic⁴, K. Auranen^{5,†}, H. Badran⁵, D. Cox^{5,†}, J. G. Cubiss¹, D. O'Donnell⁶, T. Grahn⁵, P. T. Greenlees⁵, A. Herzan^{5,8}, E. Higgins⁷, R. Julin⁵, S. Juutinen⁵, J. Klimo⁸, J. Konki^{5,¶}, M. Leino⁵, M. Mallaburn⁵, J. Pakarinen⁵, P. Papadakis^{5,7}, J. Partanen⁵, P. M. Prajapati⁸, P. Rahkila⁵, M. Sandzelius⁵, C. Scholey⁵, J. Sorri⁵, S. Stolze^{5,†}, R. Urban⁸, J. Uusitalo⁵, M. Venhart⁸, and F. Weaving⁷

Published 7 June 2019

Phys. Rev. C **99**, 064317 <https://journals.aps.org/prc/abstract/10.1103/PhysRevC.99.064317>

Fine structure in the α decay of ^{218}At

J. G. Cubiss^{1,2,*}, A. N. Andreyev^{1,2,3}, A. E. Barzakh⁴, B. Andel⁵, S. Antalic⁵, T. E. Cocolios^{6,2}, T. Day Goodacre^{7,8,†}, D. V. Fedorov⁴, V. N. Fedosseev⁷, R. Ferrer⁶, D. A. Fink^{9,10}, L. P. Gaffney⁶, L. Ghys^{6,11}, M. Huyse⁶, Z. Kalaninová^{5,12}, U. Köster¹³, B. A. Marsh⁷, P. L. Molkanov⁴, R. E. Rossel^{7,14}, S. Rothe^{7,14}, M. D. Seliverstov^{1,4}, S. Sels⁶, A. M. Sjödin⁹, M. Strycyczyk⁶, V. L. Truesdale¹, C. Van Beveren⁶, P. Van Duppen⁶, and G. L. Wilson¹

Published 14 June 2019

Phys. Rev. C **99**, 064325 <https://journals.aps.org/prc/abstract/10.1103/PhysRevC.99.064325>

Structure of 0^+ excitations in the mass $A \approx 100$ region: 0_{+2} bands in ^{98}Sr and ^{100}Zr

W. Urban¹, T. Rząca-Urban¹, J. Wiśniewski¹, I. Ahmad², A. G. Smith³, and G. S. Simpson³

Published 21 June 2019

Phys. Rev. C **99**, 064330 <https://journals.aps.org/prc/abstract/10.1103/PhysRevC.99.064330>

Spectroscopy and lifetime measurements near the proton drip line: ^{26,27,28}p

[B. Longfellow](#)^{1,2}, [A. Gade](#)^{1,2,3}, [B. A. Brown](#)^{1,2}, [D. Bazin](#)^{1,2}, [P. C. Bender](#)^{1,*}, [M. Bowry](#)^{1,†}, [P. D. Cottle](#)⁴, [B. Elman](#)^{1,2}, [E. Lunderberg](#)^{1,2}, [A. Magilligan](#)^{1,2}, [M. Spieker](#)¹, [D. Weisshaar](#)¹, and [S. J. Williams](#)^{1,‡}

Published 26 June 2019

Phys. Rev. C **99**, 064332 <https://journals.aps.org/prc/abstract/10.1103/PhysRevC.99.064332>

α -cluster structure above double closed shells

[T. T. Ibrahim](#)¹, [A. C. Merchant](#)², [S. M. Perez](#)^{3,4,*}, and [B. Buck](#)²

Published 28 June 2019

Phys. Rev. C **99**, 064612 <https://journals.aps.org/prc/abstract/10.1103/PhysRevC.99.064612>

Effects of an induced three-body force in the incident channel of (d,p) reactions

[M. J. Dinmore](#), [N. K. Timofeyuk](#), [J. S. Al-Khalili](#), and [R. C. Johnson](#)

Published 18 June 2019

Phys. Rev. C **99**, 064901 <https://journals.aps.org/prc/abstract/10.1103/PhysRevC.99.064901>

Production of the $p(770)^0$ meson in pp and Pb-Pb collisions at $\sqrt{s_{NN}}=2.76\text{TeV}$

[S. Acharya et al.](#) (ALICE Collaboration)

Published 4 June 2019

Phys. Rev. C **99**, 065801 <https://journals.aps.org/prc/abstract/10.1103/PhysRevC.99.065801>

Doppler broadening in $^{20}\text{Mg}(\beta\gamma)^{19}\text{Ne}$ decay

[B. E. Glassman](#)^{1,2,*}, [D. Pérez-Loureiro](#)^{2,†}, [C. Wrede](#)^{1,2,‡}, [J. Allen](#)³, [D. W. Bardayan](#)³, [M. B. Bennett](#)^{1,2}, [K. A. Chippis](#)^{4,5}, [M. Febraro](#)^{4,5}, [M. Friedman](#)², [C. Fry](#)^{1,2}, [M. R. Hall](#)³, [O. Hall](#)³, [S. N. Liddick](#)^{6,2}, [P. O'Malley](#)³, [W.-J. Ong](#)^{1,2}, [S. D. Pain](#)⁴, [S. B. Schwartz](#)^{1,2}, [P. Shidling](#)⁷, [H. Sims](#)⁸, [L. J. Sun](#)^{2,9}, [P. Thompson](#)^{4,5}, and [H. Zhang](#)^{1,2}

Published 4 June 2019

Phys. Rev. Lett. **122**, 222501 <https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.122.222501>

Is the Structure of ^{42}Si Understood?

[A. Gade](#)^{1,2}, [B. A. Brown](#)^{1,2}, [J. A. Tostevin](#)³, [D. Bazin](#)^{1,2}, [P. C. Bender](#)^{1,*}, [C. M. Campbell](#)⁴, [H. L. Crawford](#)⁴, [B. Elman](#)^{1,2}, [K. W. Kemper](#)⁵, [B. Longfellow](#)^{1,2}, [E. Lunderberg](#)^{1,2}, [D. Rhodes](#)^{1,2}, and [D. Weisshaar](#)¹

Published 4 June 2019

Phys. Rev. Lett. **122**, 222502 <https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.122.222502>

Improved Value for the Gamow-Teller Strength of the ^{100}Sn Beta Decay

[D. Lubos](#)^{1,2}, [J. Park](#)^{3,4,*}, [T. Faestermann](#)^{1,5,†}, [R. Gernhäuser](#)¹, [R. Krücken](#)^{1,3,4}, [M. Lewitowicz](#)⁶, [S. Nishimura](#)², [H. Sakurai](#)⁷, [D. S. Ahn](#)², [H. Baba](#)², [B. Blank](#)⁸, [A. Blazhev](#)⁹, [P. Boutachkov](#)¹⁰, [F. Browne](#)^{2,11}, [I. Čeliković](#)^{6,12}, [G. de France](#)⁶, [P. Doornenbal](#)², [Y. Fang](#)¹³, [N. Fukuda](#)², [J. Giovannozzo](#)⁸, [N. Goel](#)¹⁰, [M. Górski](#)¹⁰, [S. Ilieva](#)¹⁴, [N. Inabe](#)², [T. Isobe](#)², [A. Jungclaus](#)¹⁵, [D. Kameda](#)², [Y. K. Kim](#)^{16,17}, [I. Kojuharov](#)¹⁰, [T. Kubo](#)², [N. Kurz](#)¹⁰, [Y. K. Kwon](#)¹⁶, [G. Lorusso](#)², [K. Moschner](#)⁹, [D. Murai](#)², [I. Nishizuka](#)¹⁸, [Z. Patel](#)^{2,19}, [M. M. Rajabali](#)^{3,20}, [S. Rice](#)^{2,19}, [H. Schaffner](#)¹⁰, [Y. Shimizu](#)², [L. Sinclair](#)^{2,21}, [P.-A. Söderström](#)², [K. Steiger](#)¹, [T. Sumikama](#)¹⁸, [H. Suzuki](#)², [H. Takeda](#)², [Z. Wang](#)³, [N. Warr](#)⁹, [H. Watanabe](#)²², [J. Wu](#)^{2,23}, and [Z. Xu](#)⁷

Published 7 June 2019

Phys. Rev. Lett. **122**, 232503 <https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.122.232503>

Mechanisms Suppressing Superheavy Element Yields in Cold Fusion Reactions

[K. Banerjee^{1,*}](#), [D. J. Hinde^{1,†}](#), [M. Dasgupta¹](#), [E. C. Simpson¹](#), [D. Y. Jeung¹](#), [C. Simenel¹](#), [B. M. A. Swinton-Bland¹](#), [E. Williams¹](#), [I. P. Carter^{1,‡}](#), [K. J. Cook¹](#), [H. M. David²](#), [Ch. E. Düllmann^{2,3,4}](#), [J. Khuyagbaatar^{2,3}](#), [B. Kindler²](#), [B. Lommel²](#), [E. Prasad^{1,§}](#), [C. Sengupta¹](#), [J. F. Smith^{1,||}](#), [K. Vo-Phuoc¹](#), [J. Walshe¹](#), and [A. Yakushev^{2,3}](#)

Published 14 June 2019

Phys. Rev. Lett. **122**, 232701 <https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.122.232701>

Constraining the Neutron Star Compactness: Extraction of the ²³Al(p,γ) Reaction Rate for the rp Process

[C. Wolf¹](#), [C. Langer^{1,*}](#), [F. Montes^{2,3}](#), [J. Pereira^{2,3}](#), [W.-J. Ong^{2,3,4}](#), [T. Poxon-Pearson^{2,4}](#), [S. Ahn^{2,3}](#), [S. Ayoub^{2,4}](#), [T. Baumann²](#), [D. Bazin²](#), [P. C. Bender²](#), [B. A. Brown^{2,4}](#), [J. Browne^{2,4}](#), [H. Crawford⁵](#), [R. H. Cyburt^{2,3}](#), [E. Deleeuw^{2,4}](#), [B. Elman^{2,4}](#), [S. Fiebiger¹](#), [A. Gade^{2,3,4}](#), [P. Gastis^{6,3}](#), [S. Lipschutz^{2,4}](#), [B. Longfellow^{2,4}](#), [Z. Meisel^{7,3}](#), [F. M. Nunes^{2,4}](#), [G. Perdikakis^{6,2,3}](#), [R. Reifarh¹](#), [W. A. Richter^{8,9}](#), [H. Schatz^{2,3,4}](#), [K. Schmidt^{2,3,†}](#), [J. Schmitt^{2,3}](#), [C. Sullivan^{2,3,4}](#), [R. Titus^{2,4}](#), [D. Weisshaar²](#), [P. J. Woods¹⁰](#), [J. C. Zamora^{2,3,4}](#), and [R. G. T. Zegers^{2,3,4}](#)

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2. News to Report

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3. Outreach Activity

Fully Charged LIVE

On 9th June Dr Chantal Nobs (UKAEA) was invited to be a panellist at Fully Charged LIVE 2019. Located at Silverstone this is only the second year the event has run and it attracted around 10,000 visitors. Fully Charged is a YouTube channel produced and hosted by Robert Llewellyn that discusses topics around electric vehicles and future clean energy sources. Chantal was invited to discuss

advances and challenges in her field of fusion energy research on a panel titled 'The next wave: Fusion, Hydrogen, Tidal & Wave' alongside Neil Kermode from EMEC and Kerry-Ann Adamson from Advisian, and chaired by Helen Czerski.

<https://www.fullychargedshow.co.uk/>

Contribution by Chantal Nobs (UKAEA)

4. Media Interactions

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