



UK Nuclear Activity

July 2020 Issue 85

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1. *Nuclear Physics Publications for June (also includes missed publications from previous months)*

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.

Eur. Phys. J. A **56**, 181 (2020)

(Editor's pick)

<https://rd.springer.com/article/10.1140/epja/s10050-020-00141-9>

The joint evaluated fission and fusion nuclear data library, JEFF-3.3

A. J. M. Plompen, O. Cabellos, C. De Saint Jean, M. Fleming, A. Algora, M. Angelone, P. Archier, E. Bauge, O. Bersillon, A. Blokhin, F. Cantargi, A. Chebboubi, C. Diez, H. Duarte, E. Dupont, J. Dyrda, B. Erasmus, L. Fiorito, U. Fischer, D. Flammini, D. Foligno, M. R. Gilbert, J. R. Granada, W. Haeck, F.-J. Hamsch, P. Helgesson, S. Hilaire, I. Hill, M. Hursin, R. Ichou, R. Jacqmin, B. Jansky, C. Jouanne, M. A. Kellett, D. H. Kim, H. I. Kim, I. Kodeli, A. J. Koning, A. Yu. Konobeyev, S. Kopecky, B. Kos, A. Krása, L. C. Leal, N. Leclaire, P. Leconte, Y. O. Lee, H. Leeb, O. Litaize, M. Majerle, J. I Márquez Damián, F. Michel-Sendis, R. W. Mills, B. Morillon, G. Noguère, M. Pecchia, S. Pelloni, P. Pereslavtsev, R. J. Perry, D. Rochman, A. Röhrmoser, P. Romain, P. Romojaro, D. Roubtsov, P. Sauvan, P. Schillebeeckx, K. H. Schmidt, O. Serot, S. Simakov, I. Sirakov, H. Sjöstrand, A. Stankovskiy, J. C. Sublet, P. Tamagno, A. Trkov, S. van der Marck, F. Álvarez-Velarde, R. Villari, T. C. Ware, K. Yokoyama & G. Žerovnik

Published: 14 July 2020

Fus. Eng. & Des. **159**, 111743

<https://www.sciencedirect.com/science/article/pii/S092037962030291X>

Computational evaluation of N-16 measurements for a 14 MeV neutron irradiation of an ITER first wall component with water circuit

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Available online 17 June 2020

Phys. Lett. B 807 (2020) 135575

<https://www.sciencedirect.com/science/article/pii/S0370269320303798>

First measurement in the Gamow window of a reaction for the γ -process in inverse kinematics: $^{76}\text{Se}(\alpha, \gamma) ^{80}\text{Kr}$

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A.Lennarz^a P.O'Malley^{d5} S.J.Quinn^{efg} J.Riley^b A.Rojas^a C.Ruiz^a M.Williams^{ba}

Published 3 July 2020

Phys. Lett. B 807 (2020) 135539

https://www.sciencedirect.com/science/article/pii/S0370269320303439?dgcid=rss_sd_all

First inverse kinematics measurement of key resonances in the $^{22}\text{Ne}(p,\gamma)^{23}\text{Na}$ reaction at stellar temperatures

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Available online 5 June 2020

Phys. Rev. C **102**, 015801

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.015801>

Status of the $^{24}\text{Mg}(\alpha,\gamma)^{28}\text{Si}$ reaction rate at stellar temperatures

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Published 7 July 2020

Phys. Rev. C **102**, 014002

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.014002>

Measurement of neutron-proton capture in the SNO+ water phase

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A. Bialek¹⁰, S. D. Biller¹¹, E. Blucher¹², R. Bonventre^{3,4}, M. Boulay¹, E. Caden^{8,10}, E. J. Callaghan^{3,4}, J.
Caravaca^{3,4}, D. Chauhan¹⁰, M. Chen¹, O. Chkvorets⁸, B. Cleveland^{8,10}, M. A. Cox^{2,13}, M. M. Depatie⁸, J.
Dittmer¹⁴, F. Di Lodovico¹⁵, A. D. Earle¹⁶, E. Falk¹⁶, N. Fatemighomi¹⁰, V. Fischer¹⁷, E. Fletcher¹, R.
Ford^{8,10}, K. Frankiewicz¹⁸, K. Gilje⁵, D. Gooding¹⁸, C. Grant¹⁸, J. Grove⁸, A. L. Hallin⁵, D. Hallman⁸, S.
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Kormos²², B. Krar¹, C. Kraus⁸, C. B. Krauss⁵, T. Kroupova¹¹, I. Lam¹, B. J. Land⁹, A. LaTorre¹², I. Lawson^{8,10},
L. Lebanowski⁹, E. J. Leming¹¹, A. Li¹⁸, J. Lidgard¹¹, B. Liggins²³, Y. H. Lin¹⁰, Y. Liu¹, V. Lozza^{2,6}, M. Luo⁹, S.
Maguire¹⁹, A. Maio^{2,6}, S. Manecki^{1,10}, J. Maneira^{2,6}, R. D. Martin¹, E. Marzec⁹, A. Mastbaum¹², N.
McCauley¹³, A. B. McDonald¹, P. Mekarski⁵, M. Meyer¹⁴, C. Mills¹⁶, I. Morton-Blake¹¹, S. Nae^{2,6}, M.
Nirkko¹⁶, L. J. Nolan²³, H. M. O'Keefe²², G. D. Orebi Gann^{3,4}, M. J. Parnell²², J. Paton¹¹, S. J. M. Peeters¹⁶,
T. Pershing¹⁷, L. Pickard¹⁷, G. Prior², A. Reichold¹¹, S. Riccetto¹, R. Richardson⁸, M. Rigan¹⁶, J. Rose¹³, R.
Rosero¹⁹, P. M. Rost⁸, J. Rumleskie⁸, I. Semeneć¹, F. Shaker⁵, M. K. Sharma²⁴, K. Singh⁵, P. Skensved¹, M.
Smiley^{3,4}, M. I. Stringer²³, R. Svoboda¹⁷, B. Tam¹, L. Tian¹, J. Tseng¹¹, E. Turner¹¹, R. Van Berg⁹, J. G. C.
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Wilson¹⁵, P. Woosaree⁸, A. Wright¹, J. P. Yanez⁵, M. Yeh¹⁹, T. Zhang¹⁷, Y. Zhang⁵, K. Zuber^{14,28}, and A.
Zummo⁹ (The SNO+ Collaboration)

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Phys. Rev. C **102**, 014301

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.014301>

Examining the N=28 shell closure through high-precision mass measurements of 46–48Ar

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S. George², F. Herfurth¹⁰, A. Herlert¹¹, J. D. Holt¹², J. Kartheim^{2,7}, D. Lunney¹, V. Manea^{2,7}, P. Navrátil¹², D.
Neidherr¹⁰, M. Rosenbusch^{13,§}, L. Schweikhard¹³, A. Schwenk^{14,15,2}, V. Somà⁸, A. Welker^{3,7}, F.
Wienholtz^{13,7,||}, R. N. Wolf^{2,16}, and K. Zuber³

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Phys. Rev. C **102**, 014304

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.014304>

Spectroscopy of ^{99}Cd and ^{101}In from β decays of ^{99}In and ^{101}Sn

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Published 6 July 2020

Phys. Rev. C **102**, 014307

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.014307>

In-beam γ -ray and electron spectroscopy of $^{249,251}\text{Md}$

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Published 9 July 2020

Phys. Rev. C **102**, 014311

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.014311>

Signatures of enhanced octupole correlations at high spin in ^{136}Nd

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Phys. Rev. C **102**, 014314

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.014314>

Electromagnetic transition rates of ^{12}C and ^{16}O in rotational-vibrational models

[C. J. Halcrow^{1,*}](#) and [J. I. Rawlinson^{2,†}](#)

Published 17 July 2020

Phys. Rev. C **102**, 014316

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.014316>

Single-particle and collective excitations in the $N=28$ isotones ^{54}Fe and ^{53}Mn

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Published 21 July 2020

Phys. Rev. C **102**, 014318

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.014318>

Shape coexistence in neutron-deficient ^{188}Hg investigated via lifetime measurements

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Phys. Rev. C **102**, 014319

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.014319>

β -delayed fission of isomers in ^{188}Bi

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Phys. Rev. C **102**, 014323

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Transition strengths in the neutron-rich $^{73,74,75}\text{Ni}$ isotopes

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Phys. Rev. C **102**, 014328

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.014328>

Detailed spectroscopy of doubly magic ^{132}Sn

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Phys. Rev. C **102**, 014602

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.014602>

Projected sensitivity of the LUX-ZEPLIN experiment to the $0\nu\beta\beta$ decay of ^{136}Xe

D. S. Akerib^{1,2}, et al (LUX-ZEPLIN (LZ) Collaboration)

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Phys. Rev. C **102**, 014616

<https://journals.aps.org/prc/abstract/10.1103/PhysRevC.102.014616>

Investigation of the $^{240}\text{Pu}(n,f)$ reaction at the n_TOF/EAR2 facility in the 9 meV–6 MeV range

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Differential cross sections for neutron-proton scattering in the region of the $d^*(2380)$ dibaryon resonance

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2. News to Report

a. Online Nuclear Physics Masterclass

During summer 2020, the Liverpool Nuclear Physics Group is hosting an online *Nuclear Physics Masterclass*. Led by Laura Harkness-Brennan, it is a series of online resources aimed to encourage A-level students in the subject of nuclear physics and is designed to promote the work performed by the local group. Topics include both fundamental nuclear behaviour and applications of the latest detector technology to other scientific fields such as medical imaging. Several of our group members, both lecturers and students, have provided video content.

This is the first time the event has been delivered online. In the past, traditional lectures and presentations were given at Liverpool University and Daresbury Laboratory. Over 900 students and their teachers have already registered for this new online event, which is available at the following address: <https://livnuclear.co.uk>. The website and content was developed by Tom Calverley, Adam Caffrey, Charlie Devlin

and Ellis Rintoul from the Liverpool Nuclear Physics Group.

Contributed by Edward Paul (Univ. Liverpool)

b. Lockdown Seminars Continue

The online series of UK nuclear physics lockdown seminars are still going on. The website for this series is:

<http://ns.ph.liv.ac.uk/lockdownseminars>



Figure: Masterclass homepage.

3. Outreach Activity

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4. Media Interactions

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