

## Andrew W. Jackura — *Curriculum Vitae*

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### CONTACT INFORMATION

Old Dominion University  
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### PROFESSIONAL EXPERIENCE

<b>Postdoctoral Fellow</b> , Old Dominion University	June 2019 to present
<b>Research Assistant</b> , Indiana University	Jan. 2014 to May 2019
<b>Nuclear Engineering Associate</b> , Argonne National Lab	Jan. 2013 to Jan. 2014
<b>Research Aide</b> , Argonne National Lab	Aug. 2012 to Jan. 2013

### EDUCATION

<b>Ph.D.</b> , Physics, Indiana University, Thesis: <i>Studies in Multiparticle Scattering Theory</i> Adviser: Professor Adam P. Szczepaniak	May 2019
<b>M.S.</b> , Physics, Indiana University,	Aug. 2017
<b>B.S.</b> , Physics, Purdue University Northwest,	May 2013
<b>B.S.</b> , Mechanical Engineering, Purdue University Northwest,	May 2011

### AWARDS, FELLOWSHIPS, & GRANTS

- Recipient of “The 2021 Jefferson Science Associates Postdoctoral Prize”, 2021. \$10,000
- Konopinski Dissertation Award, Spring 2019
- Outstanding Graduate Student in Research Award, Spring 2019
- JSA Junior Scientist Travel Award, 2017, 2018, and 2019
- The Professor Brian D. Serot Fellowship Fall 2018

### REFEREED JOURNAL PUBLICATIONS

- [1] R. A. Briceño, A. W. Jackura, F. G. Ortega-Gama and K. H. Sherman, *On-shell representations of two-body transition amplitudes: single external current*, Phys. Rev. D **103**, no.11, 114512 (2021)
- [2] A. W. Jackura, R. A. Briceño, S. M. Dawid, M. H. E. Islam and C. McCarty, *Solving relativistic three-body integral equations in the presence of bound states*, Phys. Rev. D **104**, no.1, 014507 (2021)
- [3] R. A. Briceño, M. T. Hansen and A. W. Jackura, *Consistency checks for two-body finite-volume matrix elements: II. Perturbative systems*, Phys. Rev. D **101**, no.9, 094508 (2020)
- [4] R. A. Briceño, M. T. Hansen and A. W. Jackura, *Consistency checks for two-body finite-volume matrix elements: I. Conserved currents and bound states*, Phys. Rev. D **100**, no. 11, 114505 (2019)
- [5] V. Mathieu *et al.* [JPAC Collaboration], *Moments of angular distribution and beam asymmetries in  $\eta\pi^0$  photoproduction at GlueX*, Phys. Rev. D **100**, no. 5, 054017 (2019)

- [6] A. W. Jackura *et al.* [JPAC Collaboration], *Equivalence of three-particle scattering formalisms*, Phys. Rev. D **100**, no. 3, 034508 (2019)
- [7] M. Mikhasenko *et al.* [JPAC Collaboration], *Three-body scattering: Ladders and Resonances*, JHEP **1908**, 080 (2019)
- [8] C. Fernández-Ramírez *et al.* [JPAC Collaboration], *Interpretation of the LHCb  $P_c(4312)^+$  Signal*, Phys. Rev. Lett. **123**, no. 9, 092001 (2019)
- [9] A. Rodas *et al.* [JPAC Collaboration], *Determination of the pole position of the lightest hybrid meson candidate*, Phys. Rev. Lett. **122**, no. 4, 042002 (2019)
- [10] M. Mikhasenko *et al.* [JPAC Collaboration], *Pole position of the  $a_1(1260)$  from  $\tau$ -decay*, Phys. Rev. D **98**, no. 9, 096021 (2018)
- [11] A. Jackura *et al.* [JPAC Collaboration], *Phenomenology of Relativistic  $3 \rightarrow 3$  Reaction Amplitudes within the Isobar Approximation*, Eur. Phys. J. C **79**, no. 1, 56 (2019)
- [12] J. A. Silva-Castro *et al.* [JPAC Collaboration], *Regge phenomenology of the  $N^*$  and  $\Delta^*$  poles*, Phys. Rev. D **99**, no. 3, 034003 (2019)
- [13] V. Mathieu *et al.* [JPAC Collaboration], *Structure of Pion Photoproduction Amplitudes*, Phys. Rev. D **98**, no. 1, 014041 (2018)
- [14] J. Nys *et al.* [JPAC Collaboration], *Global analysis of charge exchange meson production at high energies*, Phys. Rev. D **98**, no. 3, 034020 (2018)
- [15] A. Pilloni *et al.* [JPAC Collaboration], *What is the right formalism to search for resonances? II. The pentaquark chain*, Eur. Phys. J. C **78**, no. 9, 727 (2018)
- [16] M. Albaladejo *et al.* [JPAC Collaboration], *Khuri–Treiman equations for  $\pi\pi$  scattering*, Eur. Phys. J. C **78**, no. 7, 574 (2018)
- [17] V. Mathieu *et al.* [JPAC Collaboration], *Vector Meson Photoproduction with a Linearly Polarized Beam*, Phys. Rev. D **97**, no. 9, 094003 (2018)
- [18] M. Mikhasenko *et al.* [JPAC Collaboration], *What is the right formalism to search for resonances?*, Eur. Phys. J. C **78**, no. 3, 229 (2018)
- [19] J. Nys *et al.* [JPAC Collaboration], *Features of  $\pi\Delta$  Photoproduction at High Energies*, Phys. Lett. B **779**, 77 (2018)
- [20] V. Mathieu *et al.*, [JPAC Collaboration], *Analyticity Constraints for Hadron Amplitudes: Going High to Heal Low Energy Issues*, EPL **122**, no. 4, 41001 (2018)
- [21] A. Jackura *et al.* [JPAC and COMPASS Collaborations], *New analysis of  $\eta\pi$  tensor resonances measured at the COMPASS experiment*, Phys. Lett. B **779**, 464 (2018)
- [22] V. Mathieu, J. Nys, C. Fernández-Ramírez, A. Jackura, M. Mikhasenko, A. Pilloni, A. P. Szczepaniak and G. Fox, *On the  $\eta$  and  $\eta'$  Photoproduction Beam Asymmetry at High Energies*, Phys. Lett. B **774**, 362 (2017)
- [23] A. Pilloni *et al.* [JPAC Collaboration], *Amplitude analysis and the nature of the  $Z_c(3900)$* , Phys. Lett. B **772**, 200 (2017)
- [24] J. Nys *et al.* [JPAC Collaboration], *Finite-energy sum rules in eta photoproduction off a nucleon*, Phys. Rev. D **95**, no. 3, 034014 (2017)
- [25] A. N. Hiller Blin, C. Fernández-Ramírez, A. Jackura, V. Mathieu, V. I. Mokeev, A. Pilloni and A. P. Szczepaniak, *Studying the  $P_c(4450)$  resonance in  $J/\psi$  photoproduction off protons*, Phys. Rev. D **94**, no. 3, 034002 (2016)

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| WHITEPAPERS                   | [26] R. A. Briceño <i>et al.</i> , <i>Issues and Opportunities in Exotic Hadrons</i> , Chin. Phys. C <b>40</b> , no. 4, 042001 (2016)  |
| CONFERENCE<br>PROCEEDINGS     | [27] A. W. Jackura, <i>Matrix Elements of Bound States in a Finite Volume</i> , PoS <b>LATTICE2019</b> , 079 (2019) doi:10.22323/1.363.0079<br>[28] A. N. Hiller Blin, C. Fernández-Ramírez, A. Jackura, V. Mathieu, V. I. Mokeev, A. Pilloni and A. P. Szczepaniak, <i>Studying the <math>P_c(4450)</math> resonance in <math>J/\psi</math> photoproduction off protons</i> , Few Body Syst. <b>59</b> , no. 5, 104 (2018)<br>[29] A. Jackura [JPAC and COMPASS Collaborations], <i>Tensor resonances in <math>\eta\pi</math> using COMPASS data</i> , PoS Hadron <b>2017</b> , 035 (2018)<br>[30] M. Mikhasenko, A. Jackura, B. Ketzer and A. Szczepaniak, <i>Unitarity approach to the mass-dependent fit of <math>3\pi</math> resonance production data from the COMPASS experiment</i> , EPJ Web Conf. <b>137</b> , 05017 (2017)<br>[31] A. Jackura, M. Mikhasenko and A. Szczepaniak, <i>Amplitude analysis of resonant production in three pions</i> , EPJ Web Conf. <b>130</b> , 05008 (2016)  |
| INVITED TALKS<br>AND SEMINARS | [1] <i>TRIUMF</i> , online, October 27, 2021, <i>Invited talk</i> “Few-Body Nuclear Phenomena from Lattice Quantum Chromodynamics”<br>[2] <i>2021 Jefferson Lab Users Organization Annual Meeting</i> , online, June 21-23, 2021, <i>Invited talk</i> “JSA Postdoctoral Award Talk – Three-Body Nuclear Phenomena from QCD” [slides]<br>[3] <i>Berkeley Lab</i> , online, November 10, 2020, <i>Invited Seminar</i> “Three-body nuclear interactions from QCD” [slides]<br>[4] <i>Accessing and Understanding the QCD Spectra</i> , INT 20-2c, online, August 17 - September 4, 2020, <i>Invited Talk</i> “Solving relativistic integral equations for three body systems” [slides].<br>[5] <i>MIT</i> , Cambridge, MA (USA), October 24, 2019, <i>Invited Seminar</i> “Finite-Volume Matrix Elements of Two-Hadron States”<br>[6] <i>Jefferson Laboratory</i> , Newport News, VA (USA), October 9, 2019, <i>Seminar</i> “Finite-volume matrix elements of two hadron-states” [slides].<br>[7] <i>XVI International Workshop on Hadron Structure and Spectroscopy</i> , Aveiro, Portugal, June 24-26, 2019, <i>Invited Talk</i> “Update on JPAC Activities in Hadron Spectroscopy”<br>[8] <i>8<sup>th</sup> Workshop of the APS Topical Group on Hadronic Physics</i> , Denver, CO (USA), April 10-12, 2019, <i>Invited Talk</i> “Towards an Analytical Description of Three Particle Scattering”<br>[9] <i>Argonne National Laboratory</i> , Lemont, IL (USA), January 16, 2019, <i>Seminar</i> “Phenomenology of Three Particle Scattering Amplitudes”<br>[10] <i>Jefferson Laboratory</i> , Newport News, VA (USA), October 29, 2018, <i>Seminar</i> “Phenomenology of $3 \rightarrow 3$ Scattering” [slides].<br>[11] <i>International Workshop on Partial Wave Analyses and Advanced Tools for Hadron Spectroscopy (PWA10/ATHOS5)</i> , IHEP, Beijing (China), July 16-20, 2018, <i>Invited Talk</i> “Dispersive approach to three body scattering” [slides]. |

CONFERENCE  
TALKS

- [12] *The 84<sup>th</sup> Annual Meeting of the APS Southeastern Section*, Milledgeville, GA (USA), November 16-18, 2017, *Invited Talk* "Hadron Spectroscopy and JPAC Activities"
- [13] *2021 Fall Meeting of the APS Division of Nuclear Physics*, online, October 11-14, 2021, "Progress in relativistic three-hadron scattering from lattice QCD"
- [14] *The 38<sup>th</sup> International Symposium on Lattice Field Theory*, online, July 26-30, 2021, "Connecting Matrix Elements to Multi-Hadron Form-Factors" [slides].
- [15] *19th International Conference on Hadron Spectroscopy and Structure (HADRON 2021)*, online, July 26-31, 2021, "Progress in relativistic three-hadron scattering from lattice QCD" [slides].
- [16] *9<sup>th</sup> Workshop of the APS Topical Group on Hadronic Physics*, online, April 13-16, 2021, "Integral equations for relativistic three-hadron scattering" [slides]
- [17] *2020 Fall Meeting of the APS Division of Nuclear Physics*, online, October 29-November 1, 2020, "Finite volume relations for two hadron matrix elements and form factors"
- [18] *Asia-Pacific Symposium for Lattice Field Theory (APLAT 2020)*, online, August 4-7, 2020, "Connecting Matrix Elements to Multi-Hadron Form-Factors" [slides].
- [19] *The 37<sup>th</sup> International Symposium on Lattice Field Theory*, Wuhan, China, June 16-22, 2019, "Matrix Elements of Bound States in a Finite Volume" [slides].
- [20] *Scattering from the Lattice: application to phenomenology and beyond*, Dublin (Ireland), May 14-18, 2018, "Phenomenology of 3-to-3 Scattering" [slides].
- [21] *Multi-Hadron Systems from Lattice QCD*, INT, Seattle, WA (USA), February 5-9, 2018, "Dispersive approach to three-particle systems" [slides].
- [22] *2<sup>nd</sup> Workshop on Future Directions in Spectroscopy Analysis*, Mexico City (Mexico), November 7-11, 2017, "Tensor resonances in  $\eta\pi$  production at COMPASS"
- [23] *Fall Meeting of the APS Division of Nuclear Physics*, Pittsburgh, PA (USA), October 25-28, 2017, "Peripheral Production of  $\eta\pi$  Resonances"
- [24] *XVII International Conference on Hadron Spectroscopy (HADRON 2017)*, Salamanca (Spain), September 25-29, 2017, "Tensor Resonances in  $\eta\pi$  Using COMPASS Data" [slides].
- [25] *4<sup>th</sup> PIKIO Meeting*, Lexington, KY (USA), September 16, 2017, "Exotica in Hadron Spectroscopy"
- [26] *International Workshop on Partial Wave Analyses and Advanced Tools for Hadron Spectroscopy (PWA9/ATHOS4)*, Bad Honnef (Germany), March 13-17, 2017, "Amplitude analysis for diffractive resonance production" [slides].
- [27] *3<sup>rd</sup> PIKIO Meeting*, Bloomington, IN (USA), March 4<sup>th</sup>, 2017, "Phenomenological studies on hadronic reactions and resonances extraction"
- [28] *7<sup>th</sup> Workshop of the APS Topical Group on Hadronic Physics*, Washington, D.C. (USA), February 1-3, 2017, "Unitarized amplitudes for diffractive production of three pion resonances"

- [29] *2016 Fall Meeting of the APS Division of Nuclear Physics*, Vancouver, BC (Canada), October 13-16, 2016, "Partial wave analysis of  $3\pi$  with pion and photon beams"
- [30] 14th International Workshop on Meson Production, Properties and Interaction (MESON), Kraków (Poland), June 2-7, 2016, "Amplitude analysis of resonant production in three pions" [slides].
- [31] *XVI International Conference on Hadron Spectroscopy (HADRON 2015)*, Newport News, VA (USA), September 13-18, 2015, "Amplitude Analysis of Exotic XYZ Quarkonium States" [slides].
- [32] *XXVIII Midwest Theory Get-Together*, Argonne National Laboratory, Lemont, IL (USA), September 11-12, 2015, "Amplitude Analysis of Exotic Hadrons"

#### POSTERS

- [33] *SURA Board of Trustees Meeting*, JLab, Newport News, Virginia (USA), April 25-26, 2018, "Studies of Exotica and the Global Analysis Efforts at JPAC"
- [34] *National Nuclear Physics Summer School*, MIT, Cambridge Massachusetts (USA), July 18-29, 2016, "Partial Wave Analysis of  $3\pi$  Systems"

#### TEACHING EXPERIENCE

*Supervisor of REU students,*

- T. Powell (Old Dominion Univserity). w/ R. Briceño Summer 2021  
Topic: Solving Relativistic Three-Body Integral Equations in the Presence of Bound States and Resonances
- Ajah Harris (James Madison University). w/ R. Briceño Summer 2021  
Topic: Studying n-Body Subatomic Reactions using LQCD
- Kevin Saldaña (CSU, Bakersfield). w/ A. Szczepaniak Summer 2018  
Topic: One Particle Exchange Models in Three Body Scattering

*Lecturer*, INT Summer School on Problem Solving in Lattice QCD

Subject: Hadron Spectroscopy June 28-July 16, 2021.

*Lecturer*, Introduction to Lattice Field Theory (Informal study ODU) Summer 2020

*Lecturer*, Indiana University

- International Summer School on Reaction Theory Summer 2017

*Associate Instructor*, Indiana University Fall 2017

- P410/609 Computational Physics Spring 2017
- P222 Introductory Physics II Spring 2015
- P222 Introductory Physics II Fall 2014
- P301 Modern Physics Fall 2013
- P201 Introductory Physics I

*Lecturer*, Argonne National Laboratory

- Education through Experimentation Fall 2013
- Exercises in Probabilistic Safety Assessment Fall 2012
- Four (Six) Factor Formula & Neutron Life Cycle Fall 2012

*Limited-Term Lecture*, Purdue University Northwest

- University Physics II laboratory Fall 2011- Spring 2013

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| SUMMER SCHOOLS<br>& WORKSHOPS<br>ATTENDED | <ul style="list-style-type: none"> <li>• INT Summer School on Problem Solving in Lattice QCD, online, June 28-July 16, 2021.</li> <li>• Workshop, Accessing and Understanding the QCD Spectra - INT Workshop INT-20-2c, online, August 17-September 4, 2020.</li> <li>• Summer school, National Nuclear Physics Summer School MIT, Boston, MA (USA), July 18-19, 2016.</li> <li>• Workshop, Modern Exotic Hadrons - INT Workshop INT-15-60W Seattle, WA (USA) November 2-13, 2015</li> <li>• Workshop, Future Directions in Spectroscopy Analysis Jefferson Laboratory, Newport News, VA (USA), November 18-20, 2014.</li> <li>• Summer school, Hadron Physics Summer School 2014 Forschungszentrum Jülich, (Germany), September 1-5, 2014.</li> <li>• Summer school, 29th Annual Hampton University Graduate Studies Program Jefferson Lab, Newport News, VA (USA), June 2-20, 2014.</li> <li>• Conference, Nuclear Structure 2012</li> </ul> |
| PROFESSIONAL<br>SERVICE &<br>OUTREACH     | <ul style="list-style-type: none"> <li>• <i>Convener</i>, 22nd edition of Particles and Nuclei International Conference (PANIC) 2021, 5-10 September, 2021.</li> <li>• <i>Referee</i>, Physical Review Letters, Physical Review D, Journal of High-Energy Physics</li> <li>• <i>Organizer</i>, Summer school, 2017 International Summer Workshop on Reaction Theory Indiana University, Bloomington (USA), June 12-22, 2017.</li> <li>• <i>Organizer</i>, Summer school, 2015 International Summer Workshop on Reaction Theory Indiana University, Bloomington (USA), June 8-19, 2015.</li> <li>• <i>Organizer</i>, Particle Theory Journal Club, Indiana University, Fall 2017-Fall 2018</li> <li>• <i>Volunteer</i>, Regional Science Olympiad, Purdue University Calumet, 2010-2013</li> </ul>  |