Sean Bartz

sean.bartz@indstate.edu
(612) 751-1979

Indiana State University
600 Chestnut Street
Terre Haute, IN 47809

Education

PhD Physics, University of Minnesota — 2014
Meson Spectra from a Dynamical Three-Field Model of AdS/QCD

BS Physics and Mathematics, summa cum laude, Xavier University — 2008

Professional Appointments

Associate Professor, Indiana State University — effective Aug. 2025
Assistant Professor, Indiana State University — 2018-2025
Visiting Assistant Professor, Macalester College — 2014-2018

Fellowships

University of Minnesota Doctoral Dissertation Fellow — 2013-2014
U.S. Department of Energy Office of Science Graduate Fellow — 2010-2013

Grants

University Research Committee Grant — 2021
Extra-Dimensional Models of Hot and Dense Nuclear Matter
$2,586 for faculty and student researcher stipends

Career Readiness Faculty Summer Stipend — 2019
Indiana State University Career Services
Honors Rocket Science for Intro Physics

One Tweet, One Percent — 2018
Mindlin Foundation
$4,000 for high-power rocketry certification

Wallace Scholarly Activities Fund — 2015
Macalester College
$4,500 for undergraduate research student

Beltmann Fund Research Grant — 2015, 2016
Macalester College
$4,500 for undergraduate research student

Refereed Publications

** Indicates undergraduate co-authors*

N-body linear force law allowing analytic solutions 2025
Selected for **AAPT Journal Highlights**
J. West, **S. Bartz**
American Journal of Physics (Vol. 93, Issue 5)

Chiral transition and meson melting within improved holographic soft wall models 2025
A. Ballon Bayona, **S. Bartz**, L. Mamani, D. Rodrigues
Physical Review D 111 (2), 026011

Chiral phase transition in soft-wall AdS/QCD with scalar-dilaton coupling 2024
S. Bartz, R. Meadows,* G. Brock*
Physical Review D 110 (2), 026027

Gravity effects in mass-spring-damper models of inelastic collisions 2023
S. Bartz
Eur. J. Phys. **44** (2), 025003

Numerical simulation of non-central collisions of spherical magnets 2022
S. Bartz, J. Shaw*
Eur. J. Phys. **44** (1), 015003

Delayed Rebounds in the Two-Ball Bounce Problem 2022
S. Bartz
Eur. J. Phys. **43** 035002

Dynamical AdS/Yang-Mills Model 2018
S. Bartz, A. Dhumuntarao,* J. Kapusta
Phys. Rev. D 98, 026019

Chiral phase transition at finite chemical potential in 2+1-flavor soft-wall AdS/QCD 2018
S. Bartz, T. Jacobson*
Phys. Rev. C 97 (4), 044908

Chiral phase transition and meson melting in a soft-wall AdS/QCD model 2016
S. Bartz, T. Jacobson*
Phys. Rev. D 94, 075022

Dynamical Three-Field AdS/QCD Model 2014
S. Bartz, J. Kapusta
Phys. Rev. D 90, 074034

Pseudoscalar Mass Spectrum in a Soft-Wall Model of AdS/QCD 2011
T. Kelley, **S. Bartz**, J. Kapusta
Phys. Rev. D 83, 016002

Invited Talks

Butler University Physics Colloquium September 27, 2019
"Particle Zoo, Melted Nuclei, and Frozen Stars"

University of Wisconsin - La Crosse Physics Seminar October 11, 2017
"Melting the nucleus in five dimensions"

University of Minnesota Nuclear Theory Seminar October 21, 2016
"Chiral phase transition in soft-wall AdS/QCD"

Brookhaven National Laboratory Nuclear Theory Seminar June 23, 2014
"Dynamical Three-Field AdS/QCD Model"

Contributed Talks

American Physical Society, Division of Nuclear Physics October 2024
Boston, Massachusetts
"Critical point in the chiral phase diagram of soft-wall holographic QCD"

5th Joint Meeting of the APS Division of Nuclear Physics and
the Physical Society of Japan October 2018
Waikoloa, Hawai'i
"Chemical Potential Effects on Chiral Phase Transition in AdS/QCD"

Critical Point and Onset of Deconfinement August 2017
Stony Brook, New York
"Chiral phase diagram in soft-wall AdS/QCD"
*PoS(CPOD2017)*064

American Physical Society, Division of Nuclear Physics October 2016
Vancouver, British Columbia
"Quark-gluon plasma effects on hadrons in AdS/QCD"

American Physical Society, April Meeting April 2016
Salt Lake City, Utah
"Meson Spectra from a Three-Field Model of AdS/QCD"

Conference on the Intersection of Particle and Nuclear Physics June 2015
Vail, Colorado
"Light meson spectra from dynamical three-field AdS/QCD"

American Physical Society, April Meeting — April 2014
Savannah, Georgia
"Meson Spectra from a Three-Field Model of AdS/QCD"

American Physical Society, April Meeting — April 2013
Denver, Colorado
"A Potential for Soft-Wall AdS/QCD"

Hot Quarks 2012 — October 2012
Copamarina, Puerto Rico
"Meson Spectra and Thermodynamics in Soft-Wall AdS/QCD"
2013 *J. Phys.: Conf. Ser.* 446 012019

7th International Workshop on Chiral Dynamics — August 2012
Jefferson National Accelerator Facility, Newport News, Virginia
"Three-Field Potential for Soft-Wall AdS/QCD"
PoS CD12 (2013) 029

Light Cone 2012 — July 2012
Krakow, Poland
"Three-Field Potential for Soft-Wall AdS/QCD"
Acta Phys. Polon. Supp. 6 (2013) 13-18

Conference on the Intersection of Particle and Nuclear Physics — June 2012
St. Petersburg, Florida
"Three-Field Potential for Soft-Wall AdS/QCD"
AIP Conf. Proc. 1560, 456 (2013).

Eleventh Workshop on Non-Perturbative Quantum Chromodynamics — June 2011
Paris, France
"Pions and Strange Mesons in a Modified Soft-Wall Model of AdS/QCD"

American Physical Society, April Meeting — April 2011
Anaheim, California
"Pseudoscalar Mass Spectrum in a Soft-Wall Model of AdS/QCD"

Poster Presentations

American Physical Society, April Meeting — April 2023
Robert Meadows, student presenter
Minneapolis, Minnesota
"AdS/QCD critical point via scalar-dilaton coupling"

American Physical Society, March Meeting — March 2020
Beixi Hao, student presenter

Denver, Colorado
"Machine learning for classifying the chiral phase transition in AdS/QCD"
Note: last-minute cancellation due to COVID

American Association of Physics Teachers Summer Meeting July 2017
Cincinnati, Ohio
"Relaxation Method Modeling of Non-ideal Parallel Plate Capacitor"

Quark Matter 2017 February 2017
Chicago, Illinois
"Chiral phase transition in a soft-wall model of AdS/QCD"

Workshop on QCD Under eXtreme Conditions (XQCD) June 2014
Stony Brook University, New York
"Meson spectra from holographic QCD"

American Physical Society, Division of Plasma Physics November 2007
Orlando, Florida
"A smart filtering method for space-charge dominated beam simulations"

Teaching Experience

Assistant Professor, Indiana State University 2018-present
Electricity and Magnetism II
Physics as a Creative Process
Rocket Science for Intro Physics (Honors Conversion)
General Physics I
General Physics I Laboratory
Modern Physics I
Modern Physics I Lab
Modern Physics II
Modern Physics II Lab

Visiting Assistant Professor, Macalester College 2014-2018
Principles of Physics I
Principles of Physics II
Modern Physics
Statistical Mechanics
Electromagnetic Theory
Classical Mechanics
Independent Project

Teaching Assistant, University of Minnesota 2008-2010

Introductory Physics for Pre-Medicine I Lab
Introductory College Physics II Lab

Student Mentoring

Summer undergraduate research students, 10-week program, unless noted

Alex Waggoner 2024-2025
Fall 2024: informal experience with computational physics
Spring 2025: PHYS 399 course on meson melting in holographic QCD

Mark McKinney 2024
Sycamore Undergraduate Research Fellowship (SURF) program
Dynamics of Colliding and Spinning Magnets

Glenn Brock 2023
Student research assistant (URC grant) spring 2023
Critical point in holographic QCD. Co-authored journal article

Michael Lemmons 2023
SURE, half-time

Robert Meadows 2021-2023
Critical point in holographic QCD.
Half-time SURE 2021, student research (URC grant) fall 2022.
Presented poster at APS April Meeting 2023, co-authored journal article

Antonio Tamayo 2021
Phase transitions in holographic QCD. SURE summer research program at ISU.

Beixi Hao 2019
Machine learning for phase transitions in nuclear matter.
SURE summer research program at ISU.
Poster at American Physical Society meeting.

Theodore Jacobson 2016-2017
Chiral phase transition of quark-gluon plasma in AdS/QCD. Co-authored two publications. Awarded travel grant to present poster at DNP annual meeting in 2016 and 2017. Supervised independent study.

Elias Lilleskov 2015
Deconfinement of quark matter in AdS/CFT. Awarded travel grant to present poster at DNP annual meeting.

Joshua Rollag 2015
Scalar meson-glueball mixing in AdS/QCD. Poster accepted for DNP annual

meeting.

Aditya Dhumuntarao 2015-2018
Glueballs in AdS/QCD. University of Minnesota REU, informal advising and collaboration. Co-authored paper.

Academic Service

Service to Department

Society of Physics Students advisor	2018-present
Physics social media and ISU Live	2019-present
Hiring Committee: Instructor of physics	2019, 2023
Undergraduate Research Committee	2019-present
Physics Assessment Committee	2018-present
Physics Curriculum Committee	2018-present

Service to College

Chair, Eclipse task force	2023-2024
Member, CAS Faculty council	2022-2024
Member, CAS Social Justice Committee	2020

Service to Indiana State University

ISU Representative, Terre Haute eclipse planning committee	2022-2024
Affiliate Director, Indiana Space Grant Consortium (NASA)	2020-present
Give to Blue Day social media ambassador	2021
Presidential Scholars interviewer	2019

Service to Profession

Referee, *American Journal of Physics*	2025
Referee, *Nonlinearity*	2025
Abstract Reviewer, DNP Conference Experience for Undergraduates	2016-2017
Grant Pre-application Reviewer, Mindlin Foundation	2018
Referee, *Physical Review Letters*	2020
Referee, *Physical Review D*	2017-2025
Referee, *Physical Review C*	2016
Referee, *Physics Letters B*	2010

Outreach

Guest speaker, Indiana State University science camp	2023
Moderator, Indiana Regional Middle School Science Bowl	2021
Moderator, Minnesota High School Science Bowl	2017-2018
Scientific Judge, Minnesota High School Science Bowl	2015-2016
Scientific Demonstrator, Tennis2College Program	2015-2017

Honors And Awards

Trusted Reviewer, Institute of Physics 2025
Notable Chapter, Society of Physics Students 2022
Travel Award, APS Forum for Graduate Student Affairs 2014
U.S. Delegate, Lindau Nobel Laureate Meeting, U.S. Dept. of Energy 2012
Outstanding Physics Teaching Assistant, University of Minnesota 2009

Professional Memberships

American Association of Physics Teachers 2017-2025
American Physical Society 2011-2025
Partnership for Integration of Computation into Undergraduate Physics 2016-2025

Professional Development

AI Innovators program, Indiana State University 2025-2026
Peer Review Excellence course, Institute of Physics 2025
AI/ChatGPT in the Classroom certificate, ISU FCTE 2024
American Physical Society April Meeting attendee 2023
Council on Undergraduate Research Dialogues, virtual conference 2023
Partnership for Integration of Computation into Undergraduate Physics Capstone Conference 2021
National Association of Rocketry high power Level 1 certification 2019
Lilly Conference on College Teaching 2019
American Association of Physics Teachers New Faculty Workshop 2018
Teaching Computation in the Sciences Using MATLAB: Workshop 2016
Partnership for Integration of Computation into Undergraduate Physics Summer Faculty Development Workshop 2016
Midstates Consortium Summer Workshop for Early Career Success 2014

Peer-Reviewed Teaching Materials

Relaxation Method for a real parallel-plate capacitor September 2016
S. Bartz and J. Heyman
Computational and laboratory exercise published in the SERC collection