

Dipangkar Dutta

Curriculum Vitae

Mississippi State University

10C Hilbun Hall, Box 5167

Mississippi State, MS 39762

☎ (662) 325-3105 • 📠 (662) 325-8898

✉ d.dutta@msstate.edu • 🌐 dd285.physics.msstate.edu

Academic Appointments

Mississippi State University, Mississippi State, Mississippi

Professor	2016 – Present
Associate Professor	2012 - 2016
Assistant Professor	2006 - 2012

Duke University, Durham, North Carolina

Assistant Research Professor	2003 - 2006
------------------------------	-------------

Massachusetts Institute of Technology, Cambridge, Massachusetts

Senior Postdoctoral Research Associate	2001 - 2002
Postdoctoral Research Associate	1999 - 2001

Education

Northwestern University, Evanston, Illinois

Ph.D. in Physics, *June 1999*

Thesis title: *The $(e, e'p)$ Reaction Mechanism in the Quasi-Elastic Region.*

Thesis Advisors: Dr. Don Geesaman & Prof. Ralph Segel

Indian Institute of Technology, Bombay, India

B.Tech. in Engineering Physics, *May 1992*

Thesis: *Heavy ion scattering cross-sections using a novel region-wise analysis technique.*

Thesis adviser: Prof. Y. K. Gambhir

Honors

SEC faculty achievement award (2021)	Arts & Sciences faculty research award (2020)
Henry Family Dean's Eminent Scholar (2010)	JSA Sabbatical Support Award (2010 & 2015)
Argonne National Lab, Graduate Fellowship (1994-1998)	

Publications & Presentation

Publications Summary

144 peer reviewed journal articles, with an average of 71.6 citations per article;
1 articles with over 500 citations 9 articles with over 250-499 citations; 19 articles with 100-249 citations; 29 articles with 50-99 citations, and h number of 55.

5 most important publications

“Ruling out color transparency in quasielastic $^{12}\text{C}(\text{e},\text{e}'\text{p})$ up to Q^2 of 14.2 (GeV/c) 2 ,” D. Bhetuwal *et al.*, Phys. Rev. Lett. **126**, 082301 (2021).

“A small proton charge radius from an electron–proton scattering experiment,” W. Xiong *et al.*, Nature **575**, 7781 (2019).

“Precision measurement of the weak charge of the proton,” D. Androic *et al.*, Nature **557**, 207 (2018).

“Precision Electron-Beam Polarimetry at 1 GeV Using Diamond Microstrip Detectors,” A. Narayan *et al.*, Phys. Rev. X **6**, 011013 (2016).

“Measurement of Nuclear Transparency for the $\text{A}(\text{e},\text{e}'\pi^+)$ Reaction,” B. Clasie *et al.*, Phys. Rev. Lett. **99**, 242502 (2007).

5 other important publications

A novel comparison of Møller and Compton electron-beam polarimeters, J. A. Magee *et al.*, Phys. Lett. B **766**, 339 (2017).

“A Test of Local Lorentz Invariance with Compton Scattering Asymmetry,” P. Mohan-murthy, A. Narayan and D. Dutta, Mod. Phys. Lett. A **31**, 1650220 (2016).

Color transparency: Past, present and future, D. Dutta, K. Hafidi and M. Strikman, Prog. Part. Nucl. Phys. **69**, 1 (2013).

“Pion-induced Drell-Yan processes and the flavor-dependent EMC effect,” D. Dutta, J-C.Peng, I. Cloet and D. Gaskell, Phys. Rev. C **83**, 042201R (2011).

“Nuclear transparency with the $\gamma n \rightarrow \pi^- p$ process in ^4He , D. Dutta *et al.* Phys. Rev. C **68**, 021001R (2003).

Presentations Summary

59 invited presentations

33 colloquium and seminars

Press Coverage

“Nuclear Physicists Hunt for Clues of Color Transparency in Protons,” appeared in Newswise DOE science news zine (Aug. 13, 2021)

“Nuclear Physicists on the hunt for squeezed protons,” appeared in the JLab online Newsletter (Feb. 25, 2021).

“Jefferson Lab helping to resolve the “proton radius puzzle,” Daily Press of Newport News, VA, Nov. 15, 2019.

“The puzzle of a proton’s proportions,” Cosmos magazine, Nov 12, 2019.

"Progress on the proton-radius puzzle," appeared in Nature news and comments (Nov. 6, 2019).

"New measurement yields smaller proton radius," appeared in the JLab online Newsletter (Nov. 06, 2019).

"Mississippi State Physicists Net High Impact Experimental Result on the Weak Force," appeared in Newswise DOE science news zine (May 31, 2018).

"Getting a better measure of spin with diamond," appeared in the JLab online Newsletter (May 3, 2016).

"Skinny Pions Sail Through Nucleus," appeared in OnTarget, the JLab e-Newsletter (March 2008).

"Transparent Nuclei," appeared in Physical Review Focus (Dec 21, 2007).

Student Awards

Edward Leggett - Honors Undergraduate Research Fellowship (2008)

Prajwal Mohanmurthy - Honors Undergraduate Research Fellowship (2010, 2011); Clinton E. Wallace Student Excellence Undergraduate Research Award (2011), Jefferson Science Associates, Undergraduate Research Award (2012), SPS Herbert Levy Memorial Scholarship (2012).

John Madsen - Honors Research Fellowship (Summer 2013, 2014), NEMDJ Undergraduate Research Award (2013), Goldwater Scholarship, honorable mention (2015)

Nic Ezzel - Goldwater Scholarship (2018).

Reese Dunne - Fulbright Fellowship (2020), Goldwater Scholarship (2021).

Deepak Bhetuwal - Cook Physics Graduate Student achievement award (2020).

Abishek Karki - JSA Graduate Student fellowship (2021).

Hem Bhatt - JSA Graduate Student fellowship (2022).

Synergistic Activities

Lead organizer of workshop - The Future of Color Transparency and Hadronization Studies at Jefferson Lab and Beyond, June 7-8, 2021.

APS Inclusion, Diversity, and Equity Alliance (APS-IDEA), 2020- present

Bridge program with local HBCU, Tougaloo College, 2015- present

Jefferson Lab, User Group Board of Directors, 2013 - 2015

Jefferson Lab, Hall-C Steering Committee, 2009 - 2010, 2018-2021

Jefferson Lab, Hall-A Collaboration Committee, 2010 - 2012

Jefferson Lab, JSA Travel Grant Committee, 2009 - present

Reviewer for Physical Review Letters and Physics Letters B.

Grant Proposal Reviewer for US Department of Energy and National Science Foundation; German National Science Foundation; Research Foundation – Flanders (Belgium); Canada Foundation for Innovation (Canada).

Academic Review Board, MSU 2020 - present

Robert Holland Faculty Senate, MSU 2016 - 2020

Faculty Research Advancement Committee, MSU 2019 - 2020

Grants

U.S. Department of Energy, “Precision measurements at medium energy.” PI, 2010 - 2013 (with co-PI J. Dunne), 2013 - 2016 (with co-PI J. Dunne), 2016 - 2019 (co-PIs J. Dunne and L. El-Fassi), 2019-2022 (with co-PIs J. Dunne and L. El-Fassi), 2022 - 2025 (with co-PI L. El-Fassi).

National Science Foundation, “New Source and Test Masses and their Metrology for G Experiments,” PI, 2017 - 2020.

Jefferson Lab, “Bridge faculty position for Dr. Lamiaa El-Fassi,” PI, 2014-2019.

National Science Foundation, “MRI: Development of a Windowless Hydrogen Gas Flow Target for a High Precision Measurement of the Proton Charge Radius,” co-PI, 2012-2014.

Brookhaven National Lab, “Development of a Spin-Light Polarimeter for the EIC,” PI, 2012, 2013, 2014.

Oak Ridge Associated Universities, “ A new search for the neutron electric dipole moment,” PI, 2012-2015.

National Science Foundation, “MRI Consortium: Development of a Kaon Detection System for Hall C at 12 GeV JLab,” co-PI, 2010-2012.

U.S. Department of Energy, “Electron detector for the Jefferson Lab Hall-C Compton Polarimeter,” PI, 2007 - 2010.

Approved & Conditionally Approved JLab Experiments

E01-107 - Measurement of Pion Transparency in Nuclei (co-spokesperson, contact person); completed.

E12-11-106 - High Precision Measurement of the Proton Charge Radius (co-spokesperson); completed.

E12-06-107 - The Search for Color Transparency at 12 GeV (co-spokesperson, contact person); partially completed.

E12-09-002 - Precise Measurement of π^+/π^- Ratios in Semi-inclusive Deep Inelastic Scattering: Charge Symmetry violating Quark Distributions (co-spokesperson); completed.

C12-15-006 - Measurement of Tagged Deep Inelastic Scattering (co-spokesperson, contact person).

E12-14-005 - Wide Angle Exclusive Photoproduction of π^0 Mesons (co-spokesperson, contact person).

E12-20-004 - PRad-II: A New Upgraded High Precision Measurement of the Proton Charge Radius (co-spokesperson).

E12-19-003 - Studying Short-Range Correlations with Real Photon Beams at GlueX (co-spokesperson); completed.

E12-21-003 - A Direct Detection Search for Hidden Sector New Particles in the 3-60 MeV Mass Range (co-spokesperson).

C12-21-004 - Semi-Inclusive Deep Inelastic Scattering Measurements of $A = 3$ Nuclei with CLAS12 in Hall B (co-spokesperson).

E12-22-003 - Precision Measurement of the Neutral Pion Transition Form Factor (co-spokesperson).

Students and Post-docs Mentored

Post-doctoral Researchers

Aruni Nadeeshani (2023 - present)
Carlos Gayoso (2019- 2022)
Krishna Adhikari (2014 - 2017)

Catherine Ayuso (2020 - 2022)
Latif-ul Kabir (2017 - 2019)
Mitra Shabestari (2011 - 2014)

Graduate Students

Bhesha Devkota (PhD expected 2024)
Hem Bhatt (PhD 2023)
Edward Leggett (MS 2011)
Li Ye (PhD 2018)
Yipeng Jiang (MS 2015)
Nuruzamman (MS 2010)
Erik Wrightson (PhD expected 2028)

Abishek Karki (PhD 2022)
Kofi Assumin-Gyimah (PhD 2023)
Deepak Bhetuwal (PhD 2021)
Abdullah Altayer (MS 2017)
Amrendra Narayan (PhD 2015)
Buddhiman Tamang (PhD expected 2028)

Undergraduate Students

Prashant Neupane (2024 - present)
May Holt (2021)
Joseph Frascogna (2021 - 2022)
Reese Dunne (2019)
Christian Kingery (2017 - 2019)
Nic Ezzell (2016 - 2017)
Mikhail Gaerlan (2013 - 2016)
Adam Powers (2013)
Nishi Sunthwal (2011 - 2012)
Prajwal Mohanmurthy (2009 - 2013)
Charles Vaughn (2007 - 2008)

Jackson Koloc (2022 - present)
Juan Jimenez-Rojas (2020 - 2024)
James Browning (2019)
Cameron Moffat (2017 - 2020)
Ben Emmich (2016 - 2017)
John Madsen (2012 - 2016)
Amy Ray (2012 - 2013)
Johnathan Sandlin (2013)
Robert Jacobson (2010 - 2011)
Edward Leggett (2008 - 2009)
Daniel Brown (2006 - 2007)

Courses Taught

Undergraduate

Guesstimation, PH1001 (first year seminar course, Fall 2009)

Physics for Scientists and Engineers-I, PH2213 (introductory physics, Spring 2007, Spring 2008, Fall 2009, Spring 2019 (honors) & Fall 2019 (honors)).

Initiatives: Peer Instruction, clickers, Just-in-time quizzes, demonstrations, writing (honors only), measured learning gains (35-40 %).

Physics for Scientists and Engineers-III, PH2233 (introductory physics, Spring 2009, & Spring 2011, & Spring 2013).

Initiatives: Peer Instruction, clickers, Just-in-time quizzes, demonstrations, measured learning gains (38-40 %).

Modern Physics, PH3613 (upper level required course for physics majors, Fall 2006, Fall 2018, Fall 2024).

Initiatives: Extensive written lecture notes, bi-weekly tutorials and demonstrations.

Electronics for Scientists, PH4113/PH6113 (upper level required course for physics majors, Fall 2008, Fall 2009, Fall 2010, Fall 2011, Fall 2012, & Fall 2016).

Initiatives: Upgraded to modern modular equipment, low-cost e-book.

Introduction to Nuclear and Particle Physics, PH4613/PH6613 (upper level course for physics majors, Spring 2008, Spring 2012, Spring 2017, Spring 2020, Spring 2022 & Spring 2024).

Initiatives: Bi-weekly tutorials, simulations and animations, written lecture notes.

Introduction to Quantum Mechanics, PH4713/PH6713 (upper level required course for physics majors, Fall 2013, Fall 2014, Fall 2015, Spring 2016, & Fall 2017).

Initiatives: Bi-weekly tutorials using QuILT, simulations and animations, written lecture notes, measured learning gains (35-38 %).

Applications of Quantum Mechanics, PH4723/PH6723 (upper level course for physics majors, Spring 2014).

Initiatives: Bi-weekly tutorials, simulations and animations, written lecture notes.

Graduate

Nuclear Physics, PH8613 (graduate level nuclear physics, Fall 2007, & Fall 2010).

Initiatives: Bi-weekly tutorials, simulations and animations, written lecture notes.

Classical Electrodynamics, PH8313 (graduate level E&M, Fall 2020, Fall 2021, Fall 2022, Fall 2023).

Initiatives: Bi-weekly tutorials, written lecture notes, recorded and streamed lectures.

Classical Electrodynamics -II, PH8323 (graduate level E&M -II, Spring 2021).

Initiatives: Bi-weekly tutorials, written lecture notes, recorded and streamed lectures.

Classical Mechanics, PH8213 (graduate level classical dynamics, Spring 2023).

Initiatives: Bi-weekly tutorials, written lecture notes, recorded and streamed lectures.