VIDUSHI ADLAKHA

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EDUCATION

Doctor of Philosophy in Physics May 2021
University of Houston, TX, USA
Dissertation: *Decomposition of Anomalous Diffusion in Various Stochastic Processes*

Bachelor of Technology in Engineering Physics June 2016
Delhi Technological University (formerly Delhi College of Engineering), New Delhi, India
Project: *Networking Society – Rise and Fall*

SKILLS

- Language Skills: R, C/C++, MATLAB

FELLOWSHIPS & AWARDS

- American Physical Society Forum on Education Personal Mini-Grant, 2024
- Physical Review PER Editor's Suggestion: Critical issues in statistical causal inference for observational physics education research, 2023
- American Physical Society Braslau Family Travel Grant, 2023
- List of Excellent Teachers, Univ Physics: Quantum Physics, UIUC, Spring 2023
- American Physical Society Women in Physics (WiP) Group Grant, University of Houston, 2020-2021
- Cullen Fellowship Travel Grant, University of Houston, 2019-2020
- Shortlisted for Group Teaching Excellence Award, University of Houston, 2019-2020
- Teaching Excellence Award (university-wide), University of Houston, 2018-2019
- American Association for University Women (AAUW) International Fellowship, 2018-2019
- Vice Chancellor's Gold Medal, Delhi Technological University, Bachelor of Technology, Engineering Physics, Batch 2012-2016
- Meritorious Student Gold Medal, Delhi Technological University, Department of Applied Physics, Batch 2012-2016

TEACHING & MENTORSHIP EXPERIENCE

Student Mentorship

- Katie Gifford, Doctoral candidate (May 2024 – Present)
  Department of Physics, University of Illinois Urbana-Champaign
- Vaishali Vijay Shinde, M.S. in Health Informatics (May 2024 – Dec 2024)
  STEM Education Innovation and Research Institute, Indiana University Indianapolis, Indianapolis

Department of Physics, University of Illinois Urbana-Champaign

Lab Coordinator Jan 2023 – Dec 2023

- Led a team of teaching assistants for lab sections of University Physics – Electricity & Magnetism (800+ students).
- Led a team of teaching assistants for lab sections of University Physics – Quantum and Thermal Physics (500+ students).
- Coordinated the creation of midterms and final exams for University Physics – Electricity &

Magnetism.
- Instructor for a lab section (32 students) of University Physics – Quantum and Thermal Physics.

Department of Physics, University of Houston

Lead Teaching Assistant Jun 2020 – May 2021

- Led a team of 4 teaching assistants to prepare online exams for all undergraduate physics courses.
- Held problem-solving sessions for calculus-based mechanics and electrodynamics courses.

Graduate Teaching Assistant Aug 2019 – May 2020

- Helped and guided students for various graduate physics courses like *Classical Mechanics, Statistical Mechanics, and Advanced Statistical Mechanics.*

Lab Teaching Assistant Aug 2016 – Jul 2019

- Taught lab sections (24 students) on introductory physics and calculus-based university physics, which incorporate computer-based data acquisition methods (PASCO Capstone).
- Prepared lectures and provided assessments on students' quizzes and exams.

Teaching Assistant and In-class Facilitator Aug 2017 – Dec 2018

- Taught an introductory physics course by adapting instructional technology and PhET simulations.

RESEARCH EXPERIENCE

Indiana University Indianapolis, Indianapolis, IN Jan 2024 – Present
Postdoctoral Fellow, STEM Education Innovation and Research Institute

- Leading mixed-methods research on how Peer-Led Team Learning (PLTL) impacts undergraduate chemistry students' epistemological beliefs, growth mindset, and sense of belonging.
- Developing and validating a Health, Economic, and Familial Stressors (HEFS) survey instrument to measure external stressors and internal stressors affecting student success.
- Investigating how AI influences educational pathways and prepares students for workforce development.
- Examining how students interact with educational chatbots and how these interactions affect their learning.
- Serving as an internal consultant and evaluator for SEIRI Seed Grant projects
    - Curriculum Integration: Integrating the nature of geoscience into earth sciences introductory course; student success in algebra through active engagement focusing on active learning in gateway math courses.
    - Assessment Development: Creating tools to assess students' achievement of computational learning objectives in undergraduate physics.
    - Girls STEM Institute: Examining the impact of informal STEM learning on females' academic self-efficacy, outcome expectations, interests and goals.

University of Illinois Urbana-Champaign, Urbana, IL Dec 2022 – Dec 2023
Postdoctoral Research Associate, Physics Education

- Analyzed interviews conducted with introductory physics students and employed thematic analysis techniques to identify and elucidate key themes regarding the impact of course structures on collaborative experiences and on students' beliefs.
- Designed comprehensive survey designs to foster E-G-B (Epistemological, Growth Mindset, Belonging, Challenge/Threat) beliefs, benchmarking results, and integrating with research questions for robust data analysis.

- Utilized instructional design expertise to revise introductory physics homework assignments, ensuring alignment with fostering E-G-B beliefs and creating an empowering and equitable learning experience for undergraduate students.
- Developed a causal inference primer to inform the analysis of observational studies in physics education.
- Ongoing projects
    - Exploring the relationship between collaborative learning activities and students' epistemological, ability, and belonging beliefs and not just learning outcomes.
    - Evaluating the effectiveness of departmental support structures in STEM fields for gender minorities and assess the impact of initiatives such as mentorship programs, and outreach efforts on the retention, and success of women in STEM.

Visiting Scholar, Physics Education Aug 2022 – Nov 2022

- Simulated synthetic datasets to understand causal diagrams (directed acyclic graphs) and assessed the impacts of controlling variables in complex models observed in physics education research.

Postdoctoral Research Associate, Biological Physics (theoretical) Jul 2021 – Jun 2022

- Mentored and tutored graduate students under the FUTURE-MINDS-QB (Fisk-UIUC Training of Under-represented Minds in Data Science and Quantitative Biology) program.
- Studied the correlation between the DNA methylation and histone modification datasets for leiomyoma patients.

University of Houston, Houston, TX Aug 2017 – May 2021
Graduate Student

- Simulated and studied the decomposition of anomalous diffusion into its constitutive effects for various random processes (including heterogeneous diffusion).
- Simulated a model of aging the Pomeau-Manneville map and calculated scaling exponents quantifying the constitutive effects using analytic methods.
- Applied numerical time-series analysis to a model of non-linearly coupled Lévy walks and compared results with theoretical predictions.

ACTIVE RESEARCH GRANTS

Collaborative Research: Creating Tools to Assess Students' Achievement of Computational Learning Objectives in Undergraduate Physics Aug 2025 – Present
National Science Foundation (NSF), Senior Personnel, $460,849

Indiana Genomics Research Training Program for Data Scientists (INGEN4DS) Jan 2024 – Present
National Institutes of Health (NIH), Co-Evaluator, $256,983

JOURNAL ARTICLES

- C. Morton, D. Smith-Mutegi, D. Maric, **V. Adlakha** and R. Jackson, Girls STEM Institute: Impacting Black girls' self-efficacy and interest in STEM careers. *Journal of Black Excellence in Engineering, Science, & Technology* (2026)
- **V. Adlakha,** V. V. Shinde, & P. Varma-Nelson, An exploratory study: Impact of Peer-Led Team Learning on epistemology, self-efficacy, and belonging in chemistry. *Chem. Educ. Res. Pract.,* 2025, DOI: 10.1039/D5RP00206K.
- **V. Adlakha** and E. Kuo, Critical issues in statistical causal inference for observational physics

education research, *Phys. Rev. Phys. Educ. Res.* 19, 020160 (2023)

- E. Aghion, P. G. Meyer, **V. Adlakha**, H. Kantz and K. E. Bassler, Moses, Noah and Joseph effects in Lévy walks, *New J. Phys.* 23, 023002 (2021)
- P. G. Meyer, **V. Adlakha**, H. Kantz and K. E. Bassler, Anomalous diffusion and the Moses effect in an aging deterministic model, *New J. Phys.* 20, 113033 (2018)

MANUSCRIPTS UNDERGOING REVIEW

- E. Ouellette, S. Lewsirirat, **V. Adlakha**, M. Lundsgaard, C. Krist and E. Kuo, Structural Factors Associated with Students' Comfort and Sense of Community in an Undergraduate Physics Course. *International Journal of STEM Education*

PUBLISHED PROCEEDINGS

- **V. Adlakha** and A. S. Rao, Networking Society: Rise and Fall, *5th International Symposium on Fusion of Science and Technology (ISFT)*, Delhi, India (2016)

MANUSCRIPTS IN PREPARATION

- Quantitative exploration of PLTL on epistemology, self-efficacy, and belonging in chemistry education
- Stress, Structure, and STEM: a validated instrument to understand student experience and success
- From classroom to career: investigating AI's impact on workforce development and educational strategies

INVITED TALKS

- "*Connecting Student Beliefs to Course Structures in STEM Education: Insights from Physics and Chemistry*", Physics Department Colloquium, Indiana University Indianapolis (2024)
- "*Decomposition of Anomalous Diffusion in Generalized Lévy Walks into its Constitutive Effects*", Scholars International Conference on Physics and Quantum Physics, London, United Kingdom (2023)

CONTRIBUTED TALKS (presenting author only)

- Session Chair, *Breaking Barriers in Physics*, APS April Meeting (2024)
- **V. Adlakha**, K. Gifford and E. Kuo, *Making Navigation Visible II: How Skills and Supports Shape Graduate Student Experiences*, American Physical Society Global Physics Summit (2026)
- **V. Adlakha** and P. Varma-Nelson, *Exploring the Impact of Peer-Led Team Learning (PLTL) on Student Beliefs in Chemistry,* International Society for Exploring Teaching & Learning (2025)
- **V. Adlakha** and P. Varma-Nelson, *Exploring the Impact of Peer-Led Team Learning (PLTL) on Student Beliefs in Chemistry,* Assessment Institute Indianapolis (2024)
- **V. Adlakha** and E. Kuo, *Adopting Causal Inference Methods in Quantitative Physics Education Research,* American Association of Physics Teachers Summer Meeting (2023)
- **V. Adlakha** and E. Kuo, Applying Causal Inference Principles to the Analysis of Observational Studies in Physics Education, American Physical Society April Meeting (2023)
- **V. Adlakha**, P. Meyer, H. Kantz and K.E. Bassler, Anomalous Diffusion and the Moses Effect in an aging Deterministic Model, American Physical Society March Meeting (2019)

WORKSHOPS

- Logic Model Development Workshop: Foundations of Logic Models
  *Facilitated by **Vidushi Adlakha** & Patrick Wilson*

Indiana University Indianapolis, Indianapolis Fall 2024, Spring 2025, Fall 2025

- Quantitative Research Hands-on Workshop
  *Facilitated by **Vidushi Adlakha**, Danka Maric & Lu Shi*
  Indiana University Indianapolis, Indianapolis Summer 2025
- Intro to Quantitative Methods for Research
  *Facilitated by **Vidushi Adlakha** & Danka Maric*
  Indiana University Indianapolis, Indianapolis Spring 2025
- Logic Model Development Workshop Part 2: Applying Logic Models to Your Projects
  *Facilitated by **Vidushi Adlakha** & Patrick Wilson*
  Indiana University Indianapolis, Indianapolis Fall 2024

PROFESSIONAL SERVICE

Reviewer

- American Physical Society (APS), Physical Review Physics Education Research
- American Association of Physics Teachers (AAPT) – The Physics Teacher
- American Society for Microbiology (ASM), Journal of Microbiology and Biology Education
- American Educational Research Association (AERA) Annual Conference Proposals

American Physical Society – Forum for Early Career Scientists Jan 2025 – Present
Executive Committee Member – Member at Large

- Part of the APS Distinguished Student Program award selection committee.
- Support activities that address the professional and career development needs of early career physicists.

American Physical Society - Committee on the Status of Women in Physics Jan 2022 – Dec 2024
Committee Member

- Part of the APS Braslau Family Travel Grant selection committee.
- Part of the APS March/April meeting talk sponsorship review subcommittee.
- Part of the APS Innovation Fund subcommittee to review and recommend proposals.
- Part of the CSWP M. Hildred Blewett selection committee.

Women in Physics Society (APS), University of Houston Jan 2020 – May 2021
President and Co-Founder

- Conducted outreach events to inspire the Houston youth to pursue careers in science.
- Organized (and facilitated) multiple meetings (in-person and virtual) for newly admitted graduate students to discuss research opportunities in the department.

NSM Graduate Student Advisory Board, University of Houston Aug 2019 – May 2021
Representative, Department of Physics

- Provided two-way communication between the college and the graduate student community.
- Organized events to enhance the graduate school experience for the students.

Graduate Women Association (GWA), University of Houston Aug 2019 – May 2021
President and Co-Founder

- Organized workshops to raise awareness about various fellowships and opportunities for women.
- Planned outreach activities to encourage young girls to take up careers in science.

PROFESSIONAL AFFILIATION

- Member, American Physical Society (APS)
- Member, American Association of Physics Teachers (AAPT)