Luisa Velasco Cirriculum Vitae

CONTACT INFORMATION

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EDUCATION

Department of Mathematics, The University of Texas at Austin
Ph.D. Student, Mathematics　　　　　　　　　　　　August 2022 - Present
Advised by Nataša Pavlović

Departments of Mathematics and Physics, University of Dallas
B.S. in Mathematics and Physics　　　　　　　　　　August 2018 - May 2022
Thesis: *Developing a Machine Learning-enabled Monte Carlo Event Generator.*
Advised by Richard Olenick

RESEARCH INTERESTS

Mathematical physics, analysis, probability

PUBLICATIONS

Submitted for Publication:

On the Diophantine equations of the form $\lambda_1 U_{n_1} + \lambda_2 U_{n_2} + \ldots + \lambda_k U_{n_k} = w p_1^{z_1} p_2^{z_2} \cdots p_s^{z_s}$. (with E. Goedhart, B. Ha, and L. McBeath) Submitted for publication 2023, arXiv:2212.11945

Refereed Articles:

cFAT-GAN: Conditional Simulation of Electron–Proton Scattering Events with Variate Beam Energies by a Feature Augmented and Transformed Generative Adversarial Network. In: Wani M.A., Raj B., Luo F., Dou D. (eds) Deep Learning Applications, Volume 3 (2022). Advances in Intelligent Systems and Computing, vol 1395. Springer, Singapore.

Simulation of Electron-Proton Scattering Events by a Feature-Augmented and Transformed Generative Adversarial Network (FAT-GAN) Thirtieth International Joint Conference on Artificial Intelligence, IJCAI-21, edited by Zhi-Hua Zhou (International Joint Conferences on Artificial Intelligence Organization, 2021) pp. 2126 - 2132

cFAT-GAN: Conditional Simulation of Electron-Proton Scattering Events with Variate Beam Energies by a Feature Augmented and Transformed Generative Adversarial Network 2020 19th IEEE International Conference on Machine Learning and Applications (ICMLA), 2020, pp. 372-375.

RESEARCH TALKS

An Introduction to Wave Turbulence and the Wave Kinetic Equation　　April 2024
　　Junior Analysis Seminor, UT Austin - Austin, TX

Brownian Motion and the Heat Equation   November 2023
     Junior Analysis Seminar, UT Austin - Austin, TX

Convergence of Single-Layer Neural Network   April 2023
     Junior Analysis Seminar, UT Austin - Austin, TX

Deriving the Boltzmann Equation in the Case of Hard Spheres   March 2023
     Texas Women in Math Symposium, UT Austin - Austin, TX

Introduction to the Euler Equations for Fluid Dynamics   November 2022
     Junior Analysis Seminar, UT Austin - Austin, TX

Calculus of Variations   October 2022
     Sophex Seminar, UT Austin - Austin, TX

Writing a Product of Prime Powers as a Sum of Recurrence Terms   October 2021
     Gulf Coast Undergraduate Research Symposium, Rice University - Virtual

Writing a Product of Prime Powers as a Sum of Recurrence Terms   August 2021
     Young Mathematicians Conference, Ohio State University - Virtual

cFAT-GAN: Conditional Simulation of Electron-Proton Scattering   December 2020
     Events with Variate Beam Energies by a Feature Augmented
     and Transformed Generative Adversarial Network
     International Conference for Machine Learning Applications - Virtual

Improving the Particle Multiplicity Generator for the Empirically   October 2019
     Trained Hadronic Event Regenerator
     Division of Nuclear Physics Conference - CEU Undergraduate Poster Session

CONFERENCES ATTENDED

Summer School on Effective Approximation and Dynamics of Many-Body Quantum Systems
Summer school on many-body quantum systems at Lorraine University, UFR Mathematics, Informatics and Mechanics / Institute Élie Cartan of Lorraine (Participant)
June 24 - June 27, 2024

Mathematical Aspects of Fluid Flows
Summer school on recent mathematical (PDE) theories relevant to processes involving fluids sponsored by the European Mathematical Society (Participant)
May 12 - May 17, 2024

Summer School of Wave Turbulence
Summer school on Wave Turbulence sponsored by the Simons collaboration (Participant)
July 24 - July 28, 2023

Stability and Dynamics in Fluid Mechanics and Kinetic Theory
Summer School at Imperial College, London (Participant)
July 10 - July 14, 2023

AWARDS AND HONORS

NSF Graduate Research Fellowship, NSF	2024
Frank Gerth III Teaching Excellence Award, University of Texas at Austin	2023
Frank Gerth III Graduate Excellence Award, University of Texas at Austin	2023

	Dean's Strategic Fellowship, University of Texas at Austin	August 2022
	Outstanding Math Major, University of Dallas	May 2022
	First Academic Honors, University of Dallas	May 2022
	Goldwater Scholar, Goldwater Foundation	May 2020
	Outstanding Teaching Assistant, University of Dallas	Spring 2019
	Honorable Mention, Mathematical Contest in Modeling	January 2019
	Trustee Scholarship, University of Dallas	August 2018
	Physics Departmental Scholarship, University of Dallas	August 2018

RESEARCH EXPERIENCE

NSF REU: Diophantine Equations
SMALL at Williams College, Williamstown, MA — June 2021 - August 2021

Jefferson Sciences Associates (JSA) Intern: Theoretical Nuclear Physics
Jefferson National Lab - Virtual — September 2019 - December 2020

NSF REU: Theoretical Nuclear Physics
Old Dominion University, Norfolk, VA — May 2019 - August 2019

TEACHING EXPERIENCE

Teaching Assistant, University of Texas at Austin
M 408C: Differential and Integral Calculus — Fall 2023
Teaching Assistant, University of Dallas
PHYS 2311: General Physics I (Calculus) — Spring 2020
PHYS 2312: General Physics II (Calculus) — Spring 2019

OUTREACH

Organizer Distinguished Women in Math Colloquium — April 2023-present
Conference Organizer Texas Women in Math Symposium — March 2023

Mentor in Directed Reading Program, UT Austin — Fall 2022-present
Fall 2022: Asim Suhail – Analytic Number Theory
Spring 2024: Samantha Ward – Functional Analysis
Summer 2024: Jessica Loyola – Point-set Topology

Officer of Math Club, University of Dallas — 2021-2022

Mathematics Tutor at University of Dallas — Fall 2021 - Spring 2022