

NADIE YILUO LITENN

nadie@brandeis.edu, litenn.com, www.linkedin.com/in/yiluo-photon/

EDUCATION

Brandeis University Jul. 2022 - Present
PhD Candidate in Theoretical Physics (PI: Brian Swingle)

University of California, Santa Barbara Aug. 2017 - Jun. 2022
Honors Bachelor of Science, Physics, College of Creative Studies

GENERAL RESEARCH INTERESTS

Bridging Experiment and Theory on Quantum Gravity and Information, Practical Quantum Computing

RESEARCH EXPERIENCES

Quantum Information Group Jul. 2022 - Present
PI: Prof. Brian Swingle *Brandeis*

- Conducted a detailed analysis, both analytical and numerical, of the phase transition, observed experimentally with Adanmantane molecule NMR experiment previously, in the dressed Out of Time Order Correlators using Brownian random circuits, aimed at understanding the response of quantum chaos to varying Hamiltonian perturbations. Manuscript currently in preparation.
- Developing a quantum observable learning method for fermionic systems within the classical shadow framework using the parity preserving Clifford group. This method is designed to be scalable and dependent only on observable properties, not system size.
- Collaborating with experimental groups to design theoretical models for measuring information scrambling, exploring the emergence of geometry from entanglement, and establishing fundamental bounds in quantum dynamics through experiments in optical cavities and Rydberg atom quantum simulators.

Gravity Theory Group May. 2021 - Aug. 2022
PI: Prof. Xi Dong, Co-mentor: Sean McBride *UCSB*

- Executed numerical calculations of entanglement entropy in boundary subregions within random tensor networks (RTN), contributing to advancements in the understanding of holographic entanglement entropy. [Slides][Senior Thesis]

AMO Experiment Group Apr. 2019 - Jan. 2020
PI: Prof. Andrew Jayich *UCSB*

- Developed quantum error correction codes for qudits, specifically for Sr87+ ions. Achieved simulation of magnetic field insensitive ions through radio-frequency magnetic field dressing, leading to their encoding into decoherence-free subspaces for enhanced quantum information processing. [Poster]

Geological and Planetary Science Group Jun. 2018 - Sep. 2018
PI: Prof. Michael Brown, Co-Mentor: Samantha Trumbo *Caltech*

- Utilized a global thermal diffusion model and an albedo map of the Galilean satellites to generate a comprehensive thermal inertial map. This analysis, in conjunction with over 300 unpublished Galileo Mission PPR data, enabled the identification of local internal activities, such as cryovolcanism, and the characterization of potential thermal anomalies on Europa. [Presentation][Poster][Slides]

Near Earth Asteroid Group

Jun. 2016 - Aug. 2016

Advisor: Prof. Michael Dubson Sommers Bausch Observatory, University of Colorado, Boulder

- Analyzed original observational data to determine the apparent magnitude and orbit of Near-Earth Asteroid 40329 (1999ML) using Gauss's method, implemented with Python and Fortran, for preliminary orbit element calculation and iterative least squares method. The results were accepted by the Minor Planet Center. [Paper]

Experimental Cosmology Group

Jun. 2015 - Aug. 2015

PI: Prof. Philip Lubin, Co-Mentor: Qicheng Zhang UCSB

- Improved Low Earth Orbit (LEO) laser-propelled spacecraft simulation by optimizing laser energy usage and minimizing backfiring pulses. Achieved increased energy output and overall reduced time cost for spacecraft to escape Earth by establishing orbital resonance between laser and spacecraft. Also enhanced the predictability of time costs under varying spacecraft launch times. [Presentation][Paper]Poster

TECHNICAL SKILLS

(E = Expert, I = Intermediate)

Programming Language

Python(E), Java(I), C++(I), Ada(I)

Software

Qiskit(I), NumPy(E), MATLAB(I), Mathematica(I)

Hardware

Raspberry Pi(I), Arduino(E), Ruff(I)

SELECTED COURSEWORK

Graduate Classes:

Numerical Methods for Scientific Computing, Quantum Information and Quantum Computation, Quantum Thermodynamics, Quantum Gravity Path Integral, Quantum Field Theories in the Curved Space, Holography, Many-Body Physics, Condensed Matter, Quantum Field Theory, General Relativity, High Energy Astrophysics

Undergrad Classes

Group Theory, Tensor Analysis, Cosmology, Fluid Dynamics, Graph Theory, Teaching Physics

Other

Quantum Machine Learning(edX), Deep Learning Specialization(Coursera), Machine Learning(Coursera), Chartered Financial Analyst(CFA) Level I

SELECTED TALKS AND PRESENTATIONS

N.Y. LiTenn (2022), "Black Hole Information Problem - A Comprehensive Pedestrian's Version", Long Table Physics@Boston, Harvard University

N.Y. LiTenn (2021), "Black Hole, Entropy, Holography: Then and Now with Random Tensor Network", Undergraduate Physics Research Symposium, UC Santa Barbara, California

N.Y. LiTenn (2020), "Black Hole Information Paradox - A Pedestrian's Roadmap", Society of Physics Students Undergraduate Seminar, UC Santa Barbara, California

N.Y. LiTenn (2020), "Entropy and Computational Power of the Universe", Society of Physics S Undergraduate Seminar, UC Santa Barbara, California

N.Y. LiTenn (2020), “Introduction to Theoretical Quantum Error Correction”, Guest lecture at INT CS 10, Full Stack Quantum Computing class, UC Santa Barbara, California

N.Y. LiTenn, M. Fan, A.M. Jayich (2019), “Magnetic Field Insensitive Radio-Frequency Dressed Qubit”, Research and Creative Activities Conference, UC Santa Barbara, California

N.Y. LiTenn, S. Trumbo, M.E. Brown (2018), “Temperatures of the Galilean Satellites”, KITP Undergraduate Physics Research Symposium, UC Santa Barbara, California

N.Y. LiTenn, Q. Zhang, P. Lubin (2015), “Push that Craft Faster Every Single Time - Optimization for Laser-Propelled Spacecraft at All Launching Times”, Research Mentorship Program Symposium, UC Santa Barbara, California

AWARDS AND FELLOWSHIPS

Bachelor’s Honor Thesis	UCSB, 2022
Research Honors Award	UCSB, 2022
Summer Undergraduate Research Fellowship (SURF)	Dean’s Fellow, UCSB, 2019
Traveling Undergraduate Research Fellowship (TURF)	UCSB, 2019
Visiting Undergraduate Research Program (VURP)	Caltech, 2018
Goldman Sachs Best Data Visualization	MHacks X, University of Michigan, 2017
Grand Prize First Place	i-Lab Entrepreneurship Hackathon, Shanghai, China, 2017
Grand Prize Second Place	HackNanjing, Nanjing, China, 2017

TEACHING EXPERIENCES

Teaching Assistant	<i>Brandeis</i>
PHYS 18B, Introductory Physics Lab, with Prof. Seth Fraden	Jan - May. 2023
PHYS 18A, Introductory Physics Lab, with Prof. Seth Fraden	Sep. - Dec. 2022

Learning Assistant	<i>UCSB</i>
PHYS 150, Group Theory, with Prof. Anthony Zee	Apr. - Jun. 2022
PHYS 150, Fly by Night Physics, with Prof. Anthony Zee	Jan. - Mar. 2022
PHYS 120, California Physics (Fluid Dynamics), with Prof. Anthony Zee	Sep. - Dec. 2021
PHYS 8, Intro to Math Methods for Physics, with Dr. Tengiz Bibilashvili	Sep. - Dec. 2021
PHYS 131, General Relativity, with Prof. Steve Giddings	Apr. - Jun. 2021
PHYS 150, Group Theory, with Prof. Anthony Zee	Apr. - Jun. 2021
PHYS 21, Mechanics and Waves, with Dr. Tengiz Bibilashvili	Jan. - Mar. 2021
PHYS 150, Fly by Night Physics, with Prof. Anthony Zee	Jan. - Mar. 2021
PHYS 20, Newtonian Mechanics, with Prof. Don Marolf	Sep. - Dec. 2020
PHYS 101, Complex Analysis, with Prof. Jean Carlson	Jan. - Mar. 2020
INT 84AH, Honors Special Relativity, with Dr. Tengiz Bibilashvili	Jan. - Mar. 2019
PHYS 24, Electricity and Magnetism, with Prof. Paula Popescu	Jan. - Mar. 2019

Grader	Aug. - Sep. 2019
PHYS 104, Advanced Mechanics, with Eric Jones	<i>UCSB</i>

PROFESSIONAL SERVICES

Co-organizer	Aug. 2022 - Present
<i>Long Table Physics@Boston, Boston Chinese Young Physicists Seminar</i>	<i>Harvard</i>

Invited Juror Jan. 2019 - Present
US Invitational Young Physicists' Tournament

Mentor Aug. - Dec. 2021
Summer Science Program Connect (SSP Connect)

Student Director Oct. 2018 - Dec. 2021
KITP Undergraduate Physics Research Symposium UCSB

Chair of Journal Club Oct. 2020 - Mar. 2021
Society of Physics Student UCSB

Research Mentor, Jayich Lab Jun. - Aug. 2019
Research Mentorship Program (mentors are usually at least graduate students) UCSB

- Student: Brian Ji from Burnaby North Secondary School (Now at University of Pennsylvania)
- Project: Characterization of Collimated Atomic Beaming for Ra-225 Qubit Isolation

OTHER EXPERIENCES

General Aviation Jul 2022. - Present
Private Pilot License Boston

- Actively pursuing an advanced ground instructor certificate and instrument rating

THE Hack Hackathon Feb 2017. - Aug. 2018
Co-Founder. Corporate Relation and Treasury Shanghai

- Spearheaded the planning and organization of China's largest hackathon, catering to high school and college students. Successfully secured \$65K in cash sponsorship and established collaborations with over 60 companies, showcasing strong leadership and project management skills.

Website Software Engineer Intern Jul. - Sep. 2017
InitialView Beijing

- Led the redesign and implementation of the front-end for the interview video player interface, significantly enhancing user experience and clarity.

Hardware Intern May. - Jul. 2017
Ruff.io Shanghai

- Developed instructional demos and tutorials for the Ruff IoT board and designed a smart home entrance gate reader for smart home exhibit in Shanghai. Contributed to the company's global outreach by translating the website into English.