

# NADIE YILUO LITENN

nadie@brandeis.edu, litenn.com

## EDUCATION

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**Brandeis University** Jul. 2022 - Present  
Doctor of Philosophy, Theoretical Physics

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

## GENERAL RESEARCH INTERESTS

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Quantum Gravity and Information Theory, Condensed Matter Theory, Experimental Tests of Theories

## RESEARCH EXPERIENCES

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

- Generalizing the BKP model, a 1D minimal quantum many-body system for chaos, to the k-regular graph for a maximally chaotic behavior, and toward experimentally simulating such model
- Working on state structure and state preparation in random tensor network

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

- Worked on numerically calculating the entanglement entropy in the random tensor network (RTN), and understanding how RTN reproduces features of holography [Slides]

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

- Worked on quantum error correction code for qudits, specifically for Sr87+ ions; simulated magnetic field insensitive ions by dressing them with radio-frequency magnetic fields, and encoding them into the decoherence free subspaces for quantum information processing [Poster]

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

- Applied the simple global thermal diffusion model with our generated surface albedo map of the Galilean satellites to capture the overall expected thermal inertial map and compared with over 300 unpublished Galileo Mission PPR data, which allowed us to identify local internal activities, such as cryovolcanoes, that are not revealed by albedo map, and allowed us to characterize the 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*

- Took original observation data and determined the apparent magnitude and the orbit of the Near-Earth Asteroid 40329 (1999ML) with Gauss's method for calculating preliminary orbit elements and least square method to solve iteratively; results accepted by the Minor Planet Center [Paper]

**Experimental Cosmology Group** Jun. 2015 - Aug. 2015  
*PI: Prof. Philip Lubin, Co-Mentor: Qicheng Zhang* *UCSB*

- Improved the laser-spacecraft simulation by determining and eliminating laser energy that will back-fire; maximized energy output and minimized time cost by putting laser and spacecraft in orbital resonance; and reduced uncertainty in time cost when varying the spacecraft launching time [Presentation][Paper]Poster

## INDEPENDENT STUDIES

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### High Energy Journal Club

Jun. 2021 - Jun. 2022

*SB Graduate Theory Group*

*UCSB*

- Replica wormhole method in black hole information problem
- Holographic entanglement entropy and its refinements
- 2D CFTs [Slides]

### Term Projects

Mar. 2019 - Jun. 2021

- Canonical Formulation of General Relativity [Paper][Slides]
- Hydrodynamics in Astrophysical Accretion Disks [Paper]
- Entropy, Information, and the Universe [Paper]
- Young Tableaux and Its Applications [Paper]

### Directed Reading

Dec. 2019 - Jun. 2021

- Quantum field theory with Prof. Anthony Zee
- Quantum field theory in the curved spacetime with Prof. Don Marolf

## SELECTED TALKS AND PRESENTATIONS

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**N.Y. LiTenn** (2022), “Black Hole Information Problem - A Comprehensive Pedestrian’s Version”, Boston Chinese Young Physicists Seminar, Harvard University

**N.Y. LiTenn** (2022), “TT-Bar Deformation”, Summer Holography Journal Club, Brandeis University

**N.Y. LiTenn** (2022), “Replica Wormholes in Black Hole Information Problem”, High Energy Journal Club, UC Santa Barbara, California

**N.Y. LiTenn** (2021), “Ryu-Takayanagi, Lewkowycz-Maldacena, and Quantum Extremal Surfaces”, High Energy Journal Club - Black Hole Information Problem, UC Santa Barbara, California

**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** (2021), “What the heck is CFT, I”, High Energy Journal Club - 2D CFTs, UC Santa Barbara, California

**N.Y. LiTenn** (2021), “Canonical Formulation of General Relativity”, PHYS 231C Quantum Gravity Path Integral, Baby Universes, and Black Information Problem, UC Santa Barbara, California

**N.Y. LiTenn** (2020), “Black Hole Information Paradox - A Pedestrian’s Roadmap”, SPS Undergraduate Seminar, UC Santa Barbara, California

**N.Y. LiTenn** (2020), “Entropy and Computational Power of the Universe”, SPS 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

## TEACHING EXPERIENCES

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**Teaching Assistant** *Brandeis*  
PHYS 18A, Introductory Physics Lab, with Prof. Seth Fraden Sep. - Dec. 2022

**Learning Assistant** *UCSB*  
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 *UCSB*

## PROFESSIONAL SERVICES

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**Co-organizer** Aug. 2022 - Present  
*Boston Chinese Young Physicists Seminar* *Harvard*

**Invited Juror** Jan. 2019 - 2023  
*US Invitational Young Physicists' Tournament*

**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***Research Mentorship Program (mentors are usually at least graduate students)*

Jun. - Aug. 2019

UCSB

- Student: Brian Ji from Burnaby North Secondary School
- Project: Characterization of Collimated Atomic Beaming for Ra-225 Qubit Isolation

**AWARDS AND FELLOWSHIPS**

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**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

**WORK EXPERIENCES**

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**THE Hack Hackathon**

Feb 2017. - Aug. 2018

*Co-Founder**Shanghai*

- Largest hackathon in China, inclusive for high school, college students, and beyond

**Website Software Engineer Intern**

Jul. - Sep. 2017

*InitialView**Beijing*

- Re-design and implemented the front-end for interview video player user interface

**Hardware Intern**

May. - Jul. 2017

*Ruff.io**Shanghai*

- Wrote demos and tutorials for the Ruff IoT board; designed an entrance gate reader for exhibition purpose; translated websites