Huan Q. Bui

Colby College, 8347 Mayflower Hill, Waterville, ME, 04901
hqbui21@colby.edu | huanqbui.com | in | 301-704-6958

EDUCATION

Colby College ('21), Waterville, ME **GPA: 4.17/4.30**
Bachelor of Arts, Majors: Physics & Mathematics, Minor: Statistics Class rank: 1/560

Summer school, Perimeter Institute for Theoretical Physics, *June 2020*
Topics: Path Integrals, Quantum Information, Numerical Methods, Symmetries.

Relevant Coursework: (*) denotes "Independent Study"

- **Physics:** experimental atomic physics (thesis), quantum field theory*, quantum information, massive gravity*, classical field theory*, quantum mechanics, general relativity, experimental soft matter physics, classical mechanics, E&M, thermo & statmech
- **Mathematics:** applied mathematics (thesis), functional analysis, real analysis, complex analysis, algebraic geometry, abstract algebra, matrix analysis, linear algebra, ordinary differential equations, partial differential equations, probability theory, vector calculus, honors calculus
- **Statistics:** mathematical statistics, statistical modeling, applied longitudinal data analysis

RESEARCH EXPERIENCE

Undergraduate Researcher, Perimeter Institute for Theoretical Physics *May—Aug 2020*
PI: Timothy Hsieh

- Topic: Quantum many-body physics on quantum hardware

Research Assistant, Colby College Department of Mathematics & Statistics *Oct 2019—*
PI: Evan Randles

- Convolution powers of complex functions on $\mathbb{Z}^d$ whose attractors involve oscillatory integrals
- Compute convolution powers & highly oscillatory associated attractors
- Generate examples indicative of a new local limit theorem
- Prove a new local limit theorem (in preparation)

Research Assistant, Joint Quantum Institute - NIST & UMD, College Park *Summer 2019, Jan 2020*
PI: Steven Rolston, University of Maryland, College Park

- Studying ∞-range interactions of Rb near an optical nanofiber (ONF) via collective decay measurements
- Built a polarization optimization system for a future ONF standing-wave dipole trap
- Developed an stand-alone experimental control program with NI-DAQmx in Python

Research Assistant, Colby College Department of Physics & Astronomy *Nov 2017—*
PI: Charles Conover

- 2017-2019: Precision measurement experiments on ultracold potassium in Rydberg states
- 2019-2020: Lifetime measurements of ultracold potassium $4p$.
- Data acquisition & analysis; Built ECDL's & frequency-stabilizer electronics for ECDL's
- Controlled photon-counting modules, waveform generators for MOT field-switching, spectroscopy, etc.

Teaching Assistant, Colby College Dept. of Physics & Dept. of Math & Stats *Sep 2017—*

- Current course: Linear Algebra, Quantum Mechanics
- Past courses: Linear Algebra, 2× Modern Physics I & II, EM & Optics, Intro to Mechanics, Ordinary Differential Equations
- Grade psets and conduct weekly TA sessions; Prepared lab equipment for EM & Optics

Physics & Math Tutor, Colby College Dean of Studies *Nov 2018—*

- Provide academic assistance through reviewing course material and solving problems

PROJECTS

Personal Website/Archive, GitHub, huanqbui.com: notes from class and independent projects.
Experimental Physics: Advisor: Charles Conover; Lifetime measurements of ultracold potassium $4p$
Theoretical Physics: Advisor: Robert Bluhm; Massive Gravity
Applied Mathematics: Advisor: Evan Randles; Convolution powers of complex functions & harmonic analysis

HONORS, AWARDS, FUNDS

William A. Rogers Prize in Physics and Astronomy, Colby College *May 2020*
Phi Beta Kappa (US national academic honor society) *Apr 2020*
Mu Sigma Rho (US national statistics honor society) *Apr 2020*
Honorable Mention, COMAP Mathematical Contest in Modeling, *S' 20*
Linda K. Cotter Internship Fund, for Jan 2020 internship at JQI *Jan 2020*
Phi Beta Kappa Scholastic Achievement Award *Sep 2019*
Julius Seelye Bixler Scholar *Sep 2018, Sep 2019*

Meritorious Winner, COMAP Mathematical Contest in Modeling *S'19*
Dean's List *F'17, S'18, F'18, S'19, F'19*

CONFERENCES/PRESENTATIONS

DAMOP20: Measurements of f-, g-, and h-state quantum defects in Rydberg states of ^{39}K.
CLAS 2020: Massive Gravity (*canceled due to COVID-19*)
CLAS 2020: Topics in Quantum Information (*canceled due to COVID-19*)
DAMOP19: Millimeter-wave precision spectroscopy of d-d transitions in potassium Rydberg states
CLAS 2019: Matrices in Quantum Computing: A 2-qubit entanglement circuit
CUSRR2018: Precision measurement of potassium energy levels at highly excited states

SKILLS

Technical: IGOR Pro, R, MATLAB, Python, Mathematica, NI-MAX, LaTeX, Adobe Illustrator, Adobe Lightroom, HTML & CSS, MS Office
Languages: English (fluent/proficient), Vietnamese (native)