

Charles Daryl Brown II
Curriculum Vitae

Department of Physics, Yale University
217 Prospect St.
New Haven, CT 06511

email: charles.d.brown@yale.edu
website: brownlab.yale.edu

EDUCATION

- 2019 Ph.D., Physics
 Yale University
 Thesis: Optical, Mechanical and Thermal Properties of Superfluid Liquid Helium Drops Magnetically Levitated in Vacuum
 Advisor: Professor Jack G. E. Harris
- 2013 B.S. *cum laude*, Physics
 The University of Minnesota

EMPLOYMENT

- Jan 1, 2023 – Assistant Professor of Physics, Yale University
- 2019 – 2022 Postdoctoral Associate, UC Berkeley
 Advisor: Professor Dan M. Stamper-Kurn
- 2013 – 2019 Research Assistant, Yale University

REFEREED JOURNAL ARTICLES

- 2023 C. D. Brown, Y. Wang, M. Namazi, G. I. Harris, M. Uysal, J. G. E. Harris, “Superfluid Helium Drops Levitated in High Vacuum” *Phys. Rev. Lett.* **130**, 216001 (2023) – Editor’s Suggestion
- 2022 C. D. Brown, S. W. Chang, M. N. Schwarz, V. Kozii, A. Avdoshkin, T. H. Leung, J. E. Moore, D. M. Stamper-Kurn, “A Direct Geometric Probe of Singularities in Band Structure”, *Science* **377**, 1319-1322 (2022)
- 2020 T. H. Leung, M. N. Schwarz, S. W. Chang, C. D. Brown, G. Unnikrishnan, D. Stamper-Kurn, “Interaction-Enhanced Group Velocity of Bosons in the Flat Band of an Optical Kagome Lattice”, *Phys. Rev. Lett.* **125**, 133001 (2020)
- 2019 A. B. Shkarin, A. D. Kashkanova, C. D. Brown, S. Garcia, K. Ott, J. Reichel, J. G. E. Harris, “Quantum optomechanics in a liquid” *Phys. Rev. Lett.* **122** 153601 (2019)

- 2017 L. Childress, M. P. Schmidt, A. D. Kashkanova, C. D. Brown, G.I. Harris, A. Aiello, F. Marquardt, J.G.E. Harris, “Cavity Optomechanics in a Levitated Helium Droplet” *Phys. Rev. A* **96**, 063842 (2017)
- 2017 A. D. Kashkanova, A. B. Shkarin, C. D. Brown, N. E. Flowers-Jacobs, L. Childress, S. W. Hoch, L. Hohmann, K. Ott, J. Reichel, J. G. E. Harris. “Superfluid Brillouin Optomechanics” *Nature Physics* **13**, 74-79 (2017)
- 2017 A. D. Kashkanova, A. B. Shkarin, C. D. Brown, N. E. Flowers-Jacobs, L. Childress, S. W. Hoch, L. Hohmann, K. Ott, J. Reichel, J. G. E. Harris. “Optomechanics in superfluid helium coupled to a fiber-based cavity” *Journal of Optics* **19**, 034001 (2017)

TECHNICAL PUBLICATIONS

- 2023 C. D. Brown, “Want to Get Students Excited About Physics? Try Using a Glass of Water”, *Education Week* – Nov. 2023
- 2023 C. D. Brown, “Physicists Make Matter out of Light to Find Quantum Singularities” *Scientific American* (June Issue)

NON-TECHNICAL PUBLICATIONS

- 2021 C. D. Brown and E. Gonzales, “Excellence and power in the Black physics community” *Nature Physics* **17**, 3–4 (2021)
- 2020 J. Esquivel and C. D. Brown, “Part of the Revolution: Black Representation in AI and Quantum Information” *Physics Today* DOI:10.1063/PT.6.4.20201030b
- 2020 C. D. Brown, “Disentangling Anti-Blackness from Physics”, *Physics Today* DOI:10.1063/PT.6.3.20200720a

AWARDS AND HONORS

- 2024 DOE QuantISED 2.0 Award
- 2024 NSF CAREER Award
- 2024 AFOSR Young Investigator Program Grant
- 2023 AIP-NSBP Joseph A. Johnson Award for Excellence
- 2023 Yale Public Voices Fellowship
- 2022 University of California, Berkeley Chancellor’s Award for Public Service
- 2021 Quantum Creators Prize
- 2020 National Academies Ford Foundation Postdoctoral Fellowship
- 2020 University of California President’s Postdoctoral Fellowship Finalist
- 2018 National Academies Ford Foundation Dissertation Fellowship
- 2017 Loyde & William C.G. Ortel Fellowship in Physics

2016 D. Allan Bromley Fellowship for Graduate Physics Research
2016 Bouchet Graduate Honor Society Inductee
2014 National Science Foundation Graduate Research Fellowship
2013 Leigh Page Prize
2012 NASA Minnesota Space Grant Consortium Scholarship
2011 The Erwin Marquit and Doris Grieser Marquit Undergraduate Scholarship for Physics

INVITED TALKS

2024 “A 10-Fold Symmetric Quasicrystal Quantum Simulator”
The 28th International Conference on Atomic Physics, London, England

2024 “A 10-Fold Symmetric Quasicrystal Quantum Simulator”
Stanford University, Stanford Q-FARM Seminar

2024 “Decagonal Quasicrystals with Ultracold Atoms”
Duke Quantum Center, Quantum Seminar

2024 Quantum Physics with Trapped Particles Conference
Monte Verita Physics Center, Ascona, Switzerland

2023 “Quantum Simulation of Periodic and Aperiodic Crystals with Ultracold Quantum Gasses”
CCNY, Physics Colloquium

2023 “Geometry and Topology in the Physics of Crystals”
CAARMS2023 Conference, Purdue University

2023 “Transport of a Quantum Gas through band Structure Singularities”
Atomic Physics Gordon Research Conference, Newport, RI

2023 “Transport of a Quantum Gas through band Structure Singularities”
UC San Diego, Physics Colloquium

2023 “Transport of a Quantum Gas through band Structure Singularities”
CUNY, Physics Seminar

2023 “A Probe of Wavefunction Singularities with a Lattice-Trapped Quantum Gas”
Wesleyan University, Physics Colloquium

2023 “A Probe of Wavefunction Singularities with a Lattice-Trapped Quantum Gas”
Ohio State University, Quantum Matter Seminar

2023 “A Probe of Wavefunction Singularities with a Lattice-Trapped Quantum Gas”

University of Toronto, QO/AMO Seminar

- 2022 “Optical, Mechanical, and Thermal Properties of Levitated Superfluid Drops”
Gordon Research Conference – Mechanical Systems in the Quantum Regime,
Ventura, CA
- 2022 “Probe of Band Structure Singularities with a Lattice-Trapped Quantum Gas”
Quantum 2.0, Boston, MA
- 2022 “Optical, Mechanical, and Thermal Properties of Levitated Superfluid Drops”
University of Alberta, Physics Colloquium
- 2022 “Probe of Band Structure Singularities with a Lattice-Trapped Quantum Gas”
APS DAMOP 2022
- 2022 “Probe of Band Structure Singularities with a Lattice-Trapped Quantum Gas”
Corning Technology Center Silicon Valley Tech Klatch, Silicon Valley, CA
- 2022 “Probe of Band Structure Singularities with a Lattice-Trapped Quantum Gas”
Michigan State University, Condensed Matter Seminar
- 2022 “Probe of Band Structure Singularities with a Lattice-Trapped Quantum Gas”
Harvard University, Quantum Materials and Devices Seminar Series
- 2022 “Quantum for the People: Connecting Quantum Information Science and
Society”
AAAS Annual Conference, Quantum Information Science, Culture and Society
Panel
- 2021 “Probe of Band Structure Singularities with a Lattice-Trapped Quantum Gas”
University of Queensland, Quantum Seminar (in-person)
- 2021 “Probe of Band Structure Singularities with a Lattice-Trapped Quantum Gas”
Rice University, Quantum Seminar (in-person)
- 2021 “Probe of Band Structure Singularities with a Lattice-Trapped Quantum Gas”
Dartmouth College, Physics Colloquium (in-person)
- 2021 “Probe of Band Structure Singularities with a Lattice-Trapped Quantum Gas”
Yale University, Physics Colloquium (in-person)
- 2021 “Probe of Band Structure Singularities with a Lattice-Trapped Quantum Gas”
The Ohio State University, Physics Colloquium (in-person)
- 2021 “Probe of Band Structure Singularities with a Lattice-Trapped Quantum Gas”
Pomona College, Physics Colloquium

- 2021 “Disentangling Anti-Blackness from Physics: Perspectives from an AMO Researcher”
APS DAMOP 2021 Annual Conference (virtual)
- 2021 “Non-Equilibrium Phenomena of Ultracold Quantum Gasses Trapped in Optical Lattice Potentials”
University of Oklahoma, Condensed Matter Physics Seminar (virtual)
- 2021 “Non-Equilibrium Phenomena of Ultracold Quantum Gasses Trapped in Optical Lattice Potentials”
Case Western Reserve University, Condensed Matter Physics Seminar (virtual)
- 2021 “Ultracold Atoms in an Optical Kagome Lattice”
Cal Poly Pomona, College of Science Lecture Series (virtual)
- 2021 “Non-Equilibrium Phenomena of Ultracold Quantum Gasses Trapped in Optical Lattice Potentials”
Ohio State University, Condensed Matter Physics Seminar (virtual)
- 2021 “Non-Equilibrium Phenomena of Ultracold Quantum Gasses Trapped in Optical Lattice Potentials”
Pennsylvania State University, Condensed Matter Physics Seminar (virtual)
- 2021 “Non-Equilibrium Phenomena of Ultracold Quantum Gasses Trapped in Optical Lattice Potentials”
Trent University, Department of Physics Colloquium (virtual)
- 2021 “Non-Equilibrium Phenomena of Ultracold Quantum Gasses Trapped in Optical Lattice Potentials”
IBM Qiskit Virtual Seminar Series
- 2020 “Interacting Bosons in the Flat Band of an Optical Kagome Lattice”
National Society of Black Physicists Annual Conference (virtual)
- 2020 “Ultracold atoms in an optical lattice and insights on equity in the physics discipline”
Colgate University, Department of Physics Colloquium (virtual)
- 2020 “Isolated Superfluid Liquid Helium Drops Levitated in a Magneto-Gravitational Trap”
Department of Physics Colloquium (virtual), University of Virginia, Virginia
- 2019 “Optical, Mechanical and Thermal Properties of a Superfluid Helium Drop Magnetically Levitated in Vacuum”
Seminar on Levitated Optomechanics, Bad Honnef, Germany

- 2019 “Optical, Mechanical and Thermal Properties of a Superfluid Helium Drop Magnetically Levitated in Vacuum”
Seminar, University of Vienna, Austria
- 2019 “Optical, Mechanical and Thermal Properties of a Superfluid Helium Drop Magnetically Levitated in Vacuum”
Center for Fundamental Physics Seminar, Northwestern University, Illinois
- 2019 “Optical, Mechanical and Thermal Properties of a Superfluid Helium Drop Magnetically Levitated in Vacuum”
IME Seminar, The University of Chicago, Illinois
- 2019 “Optical, Mechanical and Thermal Properties of a Superfluid Helium Drop Magnetically Levitated in Vacuum”
Seminar, NIST Boulder, Colorado
- 2019 “Optical, Mechanical and Thermal Properties of a Superfluid Helium Drop Magnetically Levitated in Vacuum”
JILA Seminar, JILA, Colorado
- 2019 “Optical, Mechanical and Thermal Properties of a Superfluid Helium Drop Magnetically Levitated in Vacuum”
AMOQI Seminar, UC Berkeley, California
- 2018 “Quantum Acoustics with Superfluid Helium Density Waves”
Quantum Fluids and Solids Conference, University of Tokyo, Tokyo, Japan

CONFERENCE ACTIVITY

Contributed Talks

- 2021 “Wave Function Geometry of Singular Band-Touching Points in a 2D Quantum Simulator”
APS DAMOP 2021 Annual Conference (virtual)
- 2019 “Properties of a Superfluid Helium Drop Magnetically Levitated in Vacuum”
Conference of Ford Fellows, San Juan, Puerto Rico
- 2018 “Cavity Optomechanics in a Levitated Superfluid Helium Drop”
National Society of Black Physicists Annual Conference, Columbus, OH
- 2018 “Stable levitation of superfluid helium: towards quantum optomechanics with drops”
APS March Meeting, Los Angeles, CA

- 2018 “Stable levitation of superfluid helium: towards quantum optomechanics with drops”
Gordon Research Seminar: Mechanical Systems in the Quantum Regime, Venture, CA
- 2017 “Optomechanics in a Levitated Drop of Superfluid Helium”
APS DAMOP Conference, Sacramento, CA

ACADEMIC SERVICE

- 2024 Co-Organizer of Quantum Noir - <https://sites.harvard.edu/quantum-noir/>
- 2024-2027 Director-at-Large, American Institute of Physics
- 2024-2026 Vice-Chair, Venture Grant Advisory Committee of American Institute of Physics
- 2023-2024 Member, Venture Grant Advisory Committee of American Institute of Physics
- 2023 – 2025 A.M.O. Physics Technical Group Chair, National Society of Black Physicists
- 2023 – Faculty Advisor, Yale Chapter of National Society of Black Engineers
- 2023 – Faculty Advisor, Bridging GAPS (Yale graduate student group)
- 2022 Conference Chair, Gordon Research Seminar: Mechanical Systems in the Quantum Regime, Ventura, CA
- 2021 Invited Panelist/Speaker, Expanding Access and Acceptance in Science
UC Berkeley Basic Science Lights the Way Seminar Series
- 2020 Co-author, “Part of the Revolution: Black Representation in AI and Quantum Information”
<https://physicstoday.scitation.org/doi/10.1063/PT.6.4.20201030b/full/>
- 2020 Lead organizer, #BlackinPhysicsWeek
<https://physicstoday.scitation.org/doi/10.1063/PT.6.4.20201026a/full/>
- 2020 Author, “Disentangling anti-Blackness from physics”, Physics Today Magazine
DOI:10.1063/PT.6.3.20200720a
- 2019 Invited Speaker, APS National Mentoring Community Conference
- 2019 Quantum Mechanics Instructor for Physics Department Boot camp

(Instructor for week-long intensive (20 hours) review of quantum mechanics to prepare incoming graduate students for graduate quantum mechanics at Yale)
Department of Physics, Yale University
<https://physics.yale.edu/academics/graduate-studies/bootcamp-physics-fundamentals-2019>

- 2016–2018 National Student Representative, National Society of Black Physicists [NSBP], (selected abstracts for posters and talks at annual conference and workshop, organized conference sections, spearheaded creation of first NSBP institutional chapter – at Hampton University), Arlington, VA
- 2015–2018 Graduate Student Representative, Climate and Diversity Committee
Department of Physics, Yale University
<https://physics.yale.edu/climate-and-diversity-committee>
- 2015–2018 President and Co-Founder, Yale League of Black Scientists
Yale University, New Haven, CT
ylbs.sites.yale.edu
- 2015–2016 Co-Organizer, DiversiTeas Talk Series (speaker series on diversity in STEM)
Yale University, New Haven, CT
<https://poorvucenter.yale.edu/diversiteas>

OUTREACH

Talks

- 2024 Speaker, Yale Pathways to Science - New Student Orientation
- 2020 Invited Speaker, Cal-Bridge Seminar Series: Science by Diverse Scientists
“A Quantum Physicist’s Classical Trajectory”
- 2017–2019 Speaker, Ophthalmology Day
“Optics in Ophthalmology”
Department of Ophthalmology, Yale Medical School, New Haven, CT
- 2016 Speaker, Science in the News Speaker Series
“Quantum Uncertainty”
New Haven Free and Public Library, Milford Library, Branford Library
New Haven, CT & Milford, CT & Branford, CT
- 2016 Speaker, Open Labs Science Café
“Quantum Uncertainty”
Yale University, New Haven, CT
- 2016 Speaker, EVOLUTIONS Afterschool Program
“Life as a Scientist”

Yale Peabody Museum, New Haven, CT

Panel Discussions

- 2024 Yale's STEM PhD Career Pathways Panel Session (Yale Office of Career Strategy)
Yale University, New Haven, CT
- 2023 Upward Bound Math-Science Yale Day Panel Discussion
Yale University, New Haven, CT
- 2022 “The future of STEM in the Black Community” Webinar
Bay Area Urban League
- 2022 “Quantum Opportunities: The Quantum-Material Revolution, Science and Society”
AAAS Annual Meeting
- 2021 “Physics Identity: Empowering African American Undergraduates in Building their Physics Identities”
AIP TEAM-UP Task Force Webinar Series
- 2020 Panelist, Lawrence Berkeley National Laboratory Next – STEM Career Talks
“Keeping up with Quantum”
- 2018–2019 Co-Organizer and Panelist, Yale Pathways to Science Eye Day Panel Discussion
“How to be a Successful College Student in STEM”
Yale University, New Haven, CT
- 2017 Panelist, S.T.A.R.S. Panel Discussion
“Career Paths in Science and Engineering”
Yale University, New Haven, CT
- 2017 Panelist, UConn Learning Community SchOLA²RS Panel Discussion
“Achieving Success as a Graduate Student in STEM”
Yale University, New Haven, CT
- 2017 Organizer and Panelist, P.A.C.E. Panel Discussion with NASA Astronaut Christopher Cassidy
“Life as a Graduate Student in Science and Engineering”
Yale School of Engineering and Applied Science, New Haven, CT
- 2016 Co-Organizer and Panelist, Yale Pathways to Science Eye Day Panel Discussion
“How to Get Into College”
Yale University, New Haven, CT
- 2016 Panelist, Black Arts Festival

“Pursuing Careers in STEM”
Afro-American Cultural Center, Yale University, New Haven, CT

Scientific Demonstrations, Hands-On Activities and Miscellaneous

- 2018 Activity Leader, Yale Pathways to Science – Science Saturdays
 “Discover the Invisible Universe”
 Wright Laboratory, New Haven, CT
- 2018 Activity Leader, Yale Pathways to Science – Eye Day
 “Optics in Ophthalmology”
 Yale University, New Haven, CT
- 2017 Activity Leader, Yale Pathways to Science Summer Scholars – Ophthalmology
 Enrichment Session
 “Optics in Ophthalmology”
 Yale University, New Haven, CT
- 2017 Judge, ESUMS STEM Expo
 New Haven, CT
- 2016 Co-Organizer, City-Wide S.T.E.M. Career fair
 Wilbur Cross High School, New Haven, CT
- 2016 Activity Leader, Yale Pathways to Science – Eye Day
 “Optics in Ophthalmology”
 Yale University, New Haven, CT