Charles Daryl Brown II
Curriculum Vitae

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

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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

TECHNICAL PUBLICATIONS

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)

2021 — C. D. Brown, Y. Wang, M. Namazi, G. I. Harris, M. Uysal, J. G. E. Harris, "Superfluid Helium Drops Levitated in High Vacuum" (submitted to *PRL*) arXiv:2109.05618

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)

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

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 Undergradute Scholarship for Physics

INVITED TALKS

2023	"A Probe of Wavefunction Singularities with a Lattice-Trapped Quantum Gas" Atomic Physics Gordon Research Conference, Newport, RI
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

2022 Chair, Gordon Research Seminar: Mechanical Systems in the Quantum Regime
Hong Kong, China *Rescheduled from 2020 due to SARS-CoV-2 pandemic*

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/do/10.1063/PT.6.4.20201030b/full/

2020 Lead organizer, #BlackinPhysicsWeek
https://physicstoday.scitation.org/do/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

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

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