

Olumakinde Ogunnaike

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MAIN INTERESTS

Physics: Quantum Many-Body Systems and Quantum Dynamics

Non-equilibrium quantum dynamics (operator spreading, measurement, decoherence)
Strongly correlated electronic systems (e.g. bilayer, multi-layer, and twisted graphene)
Topological phases and critical phenomena (e.g. spin liquids, SPT Phases)

EDUCATION

Massachusetts Institute of Technology , Cambridge, MA	2018 - 2024
Ph.D. in Physics Advisors: Leonid Levitov, Jong-Yeon Lee	
Oxford University Merton College, Oxford, UK	2017 - 2018
MSt. in Philosophy of Physics Advisor: Simon Saunders	
Harvard University Cambridge, MA	2013 - 2017
B.S. in Physics and Mathematics (Magna Cum Laude, GPA 3.94/4) Advisor: Cumrun Vafa	

AWARDS and HONORS

MIT Physics Graduate Service Award	2021
– <i>Awarded to 1-3 graduate students for outstanding service for the department</i>	
MIT Lester Wolfe and Kendall Fellowship	2018 - 2021
Harvard Henry Knox Fellowship	2017 - 2018
– <i>Granted to two exceptional graduating seniors for masters study in the UK</i>	
Rhodes Fellowship Finalist	2016
William H. and Mary Lee Bossert Prize	2016
– <i>Three juniors, for "Exceptional academic ability and commitment to a broad range of the sciences"</i>	
Harvard College Summer Research Fellowships	2016
Harvard Program for Research in Science and Engineering	2015
American Physical Society Minority Scholarship	2013 - 2017
– <i>Harvard Representative at National Society of Black Physicists Conference 2015</i>	
American Chemical Society Scholar Scholarship	2013-2015

REFERENCES

Ph.D. Advisor

Leonid Levitov, Massachusetts Institute of Technology
182 Memorial Dr, Cambridge, MA 02139, USA
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Ph.D. Co-Advisor, Collaborator

Jong Yeon Lee, University of Illinois Urbana-Champaign
1110 West Green Street, Champaign, IL 61801, USA
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Collaborator

Soonwon Choi, Massachusetts Institute of Technology
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LEADERSHIP and SERVICE

UC Berkeley Physics Equity & Inclusion Committee- Postdoctoral representative	2024-Present
Quantum Noir Conference at Harvard University- Organizing Committee	2024
Harvard-MIT National Society for Black Physicists Chapter, Founder & Co-President	2020 -2024
MIT PhysREFS (Resources for Easing Friction and Stress)	2019 - 2014
– <i>Offered individual counseling for struggling graduate students</i>	
MIT Summer Research Program, Dept. Committee (2020-21), Application Reviewer	2019 - 2024
– <i>Helped re-structure evaluation and admission to program for underserved undergraduates</i>	
MIT Graduates Advising Graduate Admissions (GAGA), Founding Member	2020 - 2021
MIT Physics Working Group, Founding Member	2020 - 2021
– <i>Surveyed student opinions on DEI, Mentorship, and Advising. Worked with Graduate Student Council to publish a list of recommended changes and departmental scorecard (here)</i>	

TEACHING EXPERIENCE

EDGEEx Summer Lab-Based Projects Course, Head Instructor (MIT)	2023-2024
HSSP S15662, High School Course: General Relativity and Black Holes (MIT)	Summer 2023
Teaching Assistant for 8.06 - Quantum Mechanics III (MIT)	2021
Teaching Assistant for 8.02 - Electricity and Magnetism (MIT)	2020
Harvard Summer School Physics Tutor	2016-2017
Bureau of Study Counsel Physics Tutor (Harvard)	2015-2017
Teaching Assistant for Phys 143a - Quantum Mechanics I (Harvard)	2014-2015

MENTORING EXPERIENCE

Undergraduate Research Mentorship	2019-2024
– Oversaw the research progress of two undergraduate students: Sophie Fisher (2019-2020) – Ultracold Quantum Gases (arXiv:1912.06128) , and Albert Qin (2022-2024) – Quantum Hall Systems	
Harvard College Resident Tutor	2018-2024
– Oversaw undergraduates in a Harvard College dormitory; planned study breaks and outings; academically advised students; provided support on issues of Race, Fellowships, and IM sports.	
MIT Physics Directed Reading Program	2019-2024
– Co-organized and administered program pairing graduate mentors and undergraduate mentees to complete a "reading project" and subsequent presentation over winter term.	
MIT Laureates and Leaders Program	2020-2024
Harvard Physics Polaris Mentor	2020-2022
Harvard College Peer Advising Fellow	2014-2017

PUBLICATIONS [Google Scholar](#) (* is for corresponding author.)

1. **O. Ogunnaike** , J. Feldmeier, J.Y. Lee
Unifying Emergent Hydrodynamics and Lindbladian Low Energy Spectra across Symmetries, Constraints, and Long-Range Interactions , [Phys. Rev. Lett. 131, 220403](#)
2. Z. Dong, **O. Ogunnaike**, L. Levitov
Collective excitations in chiral Stoner magnets, [Phys. Rev. Lett. 130 \(20\), 206701](#), [Editor's Suggestion](#)
3. Z. Dong, M. Davydova, **O. Ogunnaike**, L. Levitov
Isospin-and momentum-polarized orders in bilayer graphene, [Phys. Rev. B 107, 075108](#)
4. Sophie Fisher, **O. Ogunnaike***, L. Levitov
Three-Body Bound States of Quantum Particles: Higher Stability Through Braiding, [Phys. Rev. A 109, 043323](#)

INVITED TALKS

1. National Society for Black Physicists Conference, United States, 11/15/2024
"Measurement-Induced Phase Transitions & Spontaneous Symmetry Breaking"
2. Cambridge Condensed Matter Physics Seminar, United Kingdom, 2/7/2024
"Dynamics from Dispersion: A Versatile Tool"
3. Yale Condensed Matter Physics Seminar, United States, 12/21/2023
"Dynamics from Dispersion: A Versatile Tool"
4. Maryland Quantum-Thermodynamics Hub Seminar, United States, 12/13/2023
"Dynamics from Dispersion: A Versatile Tool"
5. Perimeter Institute Quantum Matter Seminar, Canada, 11/28/2023
"Dynamics from Dispersion: A Versatile Tool"
6. National Society for Black Physicists Conference, United States, 11/10/2023
"Dynamics from Dispersion: A Simple Predictive Tool"