

# Jacob Bringewatt

Theoretical Physicist  
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SUMMARY STATEMENT	I'm a 3rd year PhD candidate in theoretical physics and a Department of Energy Computational Science Graduate fellow. My research interests span many aspects of quantum information and quantum computing. Current areas of focus include adiabatic quantum computation, quantum information geometry in relation to parameter estimation, and quantum algorithms for nuclear theory.		
EDUCATION	<b>Doctoral Candidate</b> , University of Maryland, College Park		2018–Present
	<i>Advisor: Alexey Gorshkov</i>		
	<b>B.S. Physics</b> , University of Maryland, College Park		2014–2018
	<i>Cum laude with high honors in physics.</i>		
FELLOWSHIPS	<b>Department of Energy Computational Science Graduate Fellow</b>		2018-2022
	<b>Lanczos Graduate Fellow</b> , Joint Center for Quantum Information and Computer Science		2018-2020
	<b>Banneker/Key Scholar</b> , University of Maryland, College Park		2014-2018
AWARDS	<b>Communicate Your Science Essay Contest Winner</b> , Department of Energy Computational Science Graduate Fellowship		2019
PUBLICATIONS	<ol style="list-style-type: none"><li>6. T Qian, <i>J Bringewatt</i>, I Boettcher, P Bienias, A V Gorshkov. "Optimal measurement of field properties with quantum sensor networks." Phys. Rev. A (Letter) 103, L030601. (2021) [arXiv:2011.01259]</li><li>5. <i>J Bringewatt</i>, N Sato, W Melnitchouk, J Qiu, F Steffens, M Constantinou. "Confronting lattice parton distributions with global QCD analysis." Phys. Rev. D. 103, 016003 (2021) [arXiv:2010.00548]</li><li>4. <i>J Bringewatt</i>, M Jarret. "Effective gaps are not effective: quasipolynomial classical simulation of obstructed stoquastic Hamiltonians." Phys. Rev. Lett. 125, 170504 (2020), [arXiv:2004.08681]</li><li>3. <i>J Bringewatt</i>, W Dorland, SP Jordan. "Polynomial time algorithms for estimating spectra of adiabatic Hamiltonians." Phys. Rev. A 100 (3), 032336 (2019), [arXiv:1905.07461]. Editors' Suggestion.</li><li>2. <i>J Bringewatt</i>, W Dorland, SP Jordan, A Mink. "Diffusion Monte Carlo approach versus adiabatic computation for local Hamiltonians." Phys. Rev. A 97 (2), 022323 (2018), [arXiv:1709.03971]</li><li>1. K Pushkin, C Akerlof, D Anbajagane, J Armstrong, M Arthurs, <i>J Bringewatt</i>, T Edberg, C Hall, M Lei, R Raymond, M Reh, D Saini, A Sander, J Schaefer, D Seymour, N Swanson, Y Wang, W Lorenzon. "Study of radon reduction in gases for rare event search experiments." Nucl. Instrum. Methods Phys. Res., Sect. A 903, 267-276 (2018), [arXiv:1805.11306]</li></ol>		
SERVICE TO SCIENTIFIC COMMUNITY	<b>Referee</b> for Quantum		
	<b>Organizer</b> of QuICS-JQI-CMTC Friday Seminar		2020–2021
	<b>Panelist</b> at Conference for Undergraduate Underrepresented Minorities in Physics (cu2mip)		Jan. 2021
	<b>Volunteer</b> at University of Maryland Prospective Graduate Student Open Houses		2019-2021

MENTORSHIP	<b>Victoria Adebayo</b> (Howard University) on classical simulation of adiabatic quantum computation. <b>Timothy Qian</b> (Montgomery Blair High School) on quantum sensor networks (Regeneron Science Talent Search 5 <sup>th</sup> place winner).	
TEACHING	<b>Math Tutor</b> , University of Maryland	2016-2018
EXPERIENCE	<b>Teaching Assistant</b> , Philosophy of Quantum Mechanics, University of Maryland	Fall 2016
	<b>Martial arts instructor</b> , Lake Norman Martial Arts Academy	2010-2018
OUTREACH	<b>Participant</b> , Skype a Scientist	2021
	<b>Writing for non-scientific audience</b>	2019-
	Selected writing (see website for more): <ul style="list-style-type: none"> <li>• “Spherical cows: Using barnyard animals to understand quantum computing.” (2019) – won Communicate Your Science Essay Contest, published in Deixis Magazine (magazine on computational science at DoE national labs)</li> </ul>	
OTHER	<b>Physics Education Research Seminar</b> , University of Maryland	Fall 2020
TRAINING	<b>Workshop on Science Communication</b> hosted by Skype a Scientist organization	Aug. 2020
PROFESSIONAL	<b>American Physical Society (APS)</b>	
MEMBERSHIPS	<b>American Association of Physics Teachers (AAPT)</b>	
INVITED TALKS	2. “Lattice data in the JAM framework.” Amherst Center for Fundamental Interactions (ACFI) Workshop on QCD Real-Time Dynamics and Inverse Problems. (Oct. 2020) Invited Talk.  1. “Confronting lattice parton densities with global QCD analysis.” AI for Nuclear Physics Workshop. (Mar. 2020) Invited Talk.	
OTHER	15. “Optimal measurement of field properties with quantum sensor networks.” March Meeting 2021. (Mar. 2021) Talk.  14. “Optimal measurement of field properties with quantum sensor networks.” QuICS Stakeholder Day. (Mar. 2021) Poster.  13. “Estimating multiple functions with quantum sensor networks.” Gorshkov Group Meeting. (Jan. 2021) Talk.  12. “Effective gaps are not effective.” Gorshkov Group Meeting. (April 2020) Talk.  11. “Estimating multiple functions with quantum sensor networks.” QuICS 5 Year Anniversary Symposium. (Jan. 2020) Poster.  10. “Effective gaps are not effective.” FARQC Kickoff Meeting. (Nov. 2019) Poster.  9. “Confronting lattice parton densities with global QCD analysis.” DNP2019. (Oct. 2019) Talk.  8. “Quantum sensor networks and Fisher information.” Gorshkov Group Meeting. (Aug. 2019) Talk.  7. “Confronting lattice parton densities with global QCD analysis.” Jefferson Lab Theory Seminar. (July 2019) Talk.	
PRESENTATIONS		

6. "Polynomial time algorithms for estimating spectra of adiabatic Hamiltonians." DOE Computation Science Graduate Fellowship Annual Program Review. (July 2019) Poster.
5. "Polynomial time algorithms for estimating spectra of adiabatic Hamiltonians." QIP2019. (Jan. 2019) Poster.
4. "Diffusion monte carlo approach versus adiabatic computation for local Hamiltonians." Gorshkov Group Meeting. (Aug. 2018) Talk.
3. "Diffusion monte carlo approach versus adiabatic computation for local Hamiltonians." UMD Undergraduate Research Showcase. (May 2018) Talk.
2. "Diffusion monte carlo approach versus adiabatic computation for local Hamiltonians." Undergraduate Thesis Defense. (May 2018) Talk.
1. "Diffusion monte carlo approach versus adiabatic computation for local Hamiltonians." QIP2018. (Jan. 2018) Poster.