

## Grace E. Chesmore

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<b>EDUCATION</b>	Ph.D. Candidate in Physics <i>University of Chicago</i> Thesis Advisor: Jeff McMahon	2019-
	M.S. Physics <i>University of Michigan</i> Thesis Advisor: Jeff McMahon	2017-2019
	B.A. Physics <i>Santa Clara University</i> Graduation with Honors	2017
<b>SKILLS</b>	<b>Programming Languages:</b> Python, L <sup>A</sup> T <sub>E</sub> X, IDL, HTML, Matlab, C++. <b>Software Languages:</b> SolidWorks, AutoCAD. <b>Languages:</b> Spanish (fluent), English (fluent) and Italian (B1). <b>Instrumentation:</b> Lathe, mill, drill press.	
<b>RESEARCH EXPERIENCE</b>	<b>Graduate Student Researcher</b> 2019 -	University of Chicago Chicago, IL
	Research focuses on the characterization of optical elements and systematics in the Simons Observatory Large Aperture Telescope, a next-generation cosmic microwave background (CMB) experiment. Extending this, I develop software to model the propagation of systematic effects into later analysis of the CMB.	
	<b>Graduate Student Researcher</b> 2017 - 2019	University of Michigan Ann Arbor, MI
	My work included characterization of optical elements and systematics in the Large Aperture Telescope in Simons Observatory, the next-generation cosmic microwave background experiment. This work completed my Master's Degree in Physics, whereupon my advisor, Jeff McMahon, was hired by the University of Chicago. Following the completion of my Master's degree, I transferred to the University of Chicago where I continued onto my PhD candidacy.	
	<b>Committee on SS&amp;T Intern</b> Sept. 2019 - Oct. 2019	United States House of Representatives Washington D.C., VA
	Two month internship in the House of Representatives Committee on Science, Space and Technology. I was tasked with writing scientific reviews of space policy meetings for the Space and Aeronautics subcommittee. I also advised committee staff on the science behind 5G technology.	
	<b>Undergraduate Researcher</b> 2016 - 2017	University of Michigan Ann Arbor, MI
	As a part of the Research Experience for Undergraduates program, funded by the NSF, I assisted in the construction of a Fourier transform spectrometer, which will calibrate the detectors within the Atacama Cosmology Telescope in Chile.	
	<b>Scientific Technical Author</b> 2015 - 2017	Carbon Design Innovations Burlingame, CA
	Reviewed atomic force microscopy technology provided by Carbon Design Innovations, captured publish worthy images and scans, and wrote scientific letters describing new products.	

	<b>Student Researcher</b> 2014 - 2017 Examined the efficiency and lifetime of polymer solar cells by varying a third component in the active layer, study cells under the atomic force microscope, manage projects in machine shop and operate atomic force and scanning electron microscopes.	Department of Physics Santa Clara, CA
<b>HONORS &amp; AWARDS</b>	National Science Foundation: Graduate Research Fellow NASA: Space and Technology Research Fellowship Recipient (declined award) American Physical Society, Society of Physics Students Travel Grant Santa Clara University: Presidential Scholarship Santa Clara University: Hayes Fellowship American Physical Society: Women in Physics Grant Santa Clara University: University Honors Program Santa Clara University: Clare Booth Luce Research Scholar Santa Clara University: Roelandts Grant	2018 - 2021 2018 2016 2016 2016 2016 2015-2017 2015 2014-2015
<b>SERVICE</b>	Optical Publishing Group - Applied Optics: Peer Reviewer The Simons Observatory: Conference Committee Member University of Chicago: Science Policy Group, Vice-President University of Michigan: Association for Women in Science, Co-President of Mentorship University of Michigan: LSA Machine Shop, Machining Instructor Santa Clara University: Women in Physics, Founder and President Santa Clara University: Women in STEM, Leadership Board Member Santa Clara University: Calculus Peer Educator	2022 2021 2020-2021 2019 - 2020 2019 2015-2017 2015-2017 2013-2014
<b>PROFESSIONAL MEMBERSHIP</b>	CMB-S4 Collaboration Science Policy Group at the University of Chicago Simons Observatory Collaboration Atacama Cosmology Telescope Collaboration American Women in Science, University of Michigan Sigma Pi Sigma, The Physics Honor Society Sigma Xi, The Scientific Research Society Society of Physics Students, American Physics Society Women in STEM, Santa Clara University Women in Physics, Santa Clara University	
<b>OUTREACH</b>	<i>NSBP + Simons Obs. Undergraduate Program Coordinator</i> <i>University of Michigan Department of Physics Graduate Mentor</i> <i>University of Michigan Society for Women in Physics Mentor</i> <i>University of Michigan Rackham International Network Mentor</i> <i>Astrobites.com Guest Author</i> <i>After School Physics Instructor, Santa Jose, CA</i> <i>STEM Mentoring Program Educator, Santa Clara University</i> <i>Newport High School Sexual Health Educator, Bellevue, WA</i>	2020 - present 2018 - 2019 2018 - 2019 2018 - 2019 2018 2017 2014-2015 2011-2013

**INVITED TALKS** 69<sup>th</sup> Lindau Nobel Laureate Meeting (2019).

**AND**

**CONFERENCES** “Reflectometry Measurements of the Loss Tangent in Silicon at Millimeter Wavelengths,” ESA Workshop, Noordwijk, Netherlands (2018).

“ACTPol Instrumentation: Fourier Transform Spectrometer,” Physics Department Research Colloquium, Santa Clara, CA (2016).

“Evaluation of 3D carbon nanotube composite AFM probes fabricated with ion flux molding,” APS March Meeting, Baltimore, MD (2016).

“Evaluation of 3D carbon nanotube composite AFM probes fabricated with ion flux molding,” (poster), APS Conference for Undergraduate Women in Physics, Corvallis, OR (2016).

“Polymer Solar Cells with Varied Dye Percentages” APS Conference for Undergraduate Women, Santa Cruz, CA (2015).

**PUBLICATIONS,  
MAIN AUTHOR**

1. “The Simons Observatory: HoloSim-ML: machine learning applied to the efficient analysis of radio holography measurements of complex optical systems”, **G.E. Chesmore**, et al. *Applied Optics*, Volume 60 **29**, pp. 9029-9035 (2021), arXiv:2107.04138.
2. “The Simons Observatory: Metamaterial Microwave Absorber (MMA) and its Cryogenic Applications”, Z. Xu, **G.E. Chesmore**, et al. *Applied Optics*, Volume 60 **4**, pp. 864-874 (2021), arXiv:2010.02233v2.
3. “Reflectometry Measurements of the Loss Tangent in Silicon at Millimeter Wavelengths”, **Grace E. Chesmore**, Tony Mroczkowski, Jeff McMahon, Shreya Sutariya, Alec Josaitis, and Leif Jensen, *Proceedings from the 8th ESA Workshop on Millimetre-Wave Technology and Applications* (2018).
4. “Evaluation of 3D carbon nanotube composite AFM probes fabricated with ion flux molding,” **Grace E. Chesmore** et al., *Journal of Advanced Microscopy Research* (2016).

**PUBLICATIONS,  
COLLABORATION**

1. “The Atacama Cosmology Telescope: Measurement and Analysis of 1D Beams for DR4”, M. Lungu, et al. (in progress).
2. “The Simons Observatory Large Aperture Telescope Receiver”, N. Zhu, et al. *The Astrophysical Journal Supplement Series*, Volume 257 **2**, pp. 71 (2021).
3. “The Simons Observatory: The Large Aperture Telescope (LAT)”, Z. Xu, et al. *Research Notes of the AAS*, Volume 5 **4**, pp. 100 (2021).
4. “The Atacama Cosmology Telescope: Summary of DR4 and DR5 Data Products and Data Access”, M. Mallaby-Kay, et al. *The Astrophysical Journal Supplement Series*, Volume 225 **1** (2021).
5. “The Simons Observatory: modeling optical systematics in the large aperture telescope”, J.E. Gudmundsson, P.A. Gallardo, R. Puddu, S.R. Dicker, et al. *Applied Optics*, Volume 60 **4**, pp. 823-837 (2021), arXiv:2010.02233v2.
6. “The integration and testing program for the Simons Observatory Large Aperture Telescope optics tubes”, K. Harrington, C. Sierra, G.E. Chesmore, et al. *SPIE: Millimeter, Submillimeter, and Far-Infrared Detectors and Instrumentation for Astronomy*, Volume 11453, pp. 1145318 (2020).
7. “The Atacama Cosmology Telescope: A Measurement of the Cosmic Microwave Background Power Spectra at 98 and 150 GHz”, S.K. Choi, M. Hasselfield, S.P.P. Ho, B. Koopman, M. Lungu, M.H. Abitbol, et al. (2020), arXiv:2007.07289.

8. “The Atacama Cosmology Telescope: DR4 Maps and Cosmological Parameters”, S. Aiola, E. Calabrese, L. Maurin, S. Naess, B.L. Schmitt, M.H. Abitbol, et al. (2020), arXiv:2007.07288.
9. “Atacama Cosmology Telescope: Constraints on cosmic birefringence”, T. Namikawa, Y. Guan, O. Darwish, B.D. Sherwin, S. Aiola, N. Battaglia, et al. *Physical Review D*, Volume 101 **8**, (2020).
10. ”Broadband, millimeter-wave antireflection coatings for large-format, cryogenic aluminum oxide optics”, A. Nadolski, J. D. Vieira, J. A. Sobrin, A. M. Kofman, Grace E. Chesmore et al. *Applied Optics*, submitted, in progress (2019).
11. “Wideband 67-116 GHz receiver development for ALMA Band 2”, Pavel Yagoubov, Tony Mroczkowski, Grace E. Chesmore et al. *Astronomy and Astrophysics*, Volume 634, article id A46, 22 pp. (2020).
12. “The Simons Observatory collaboration”, Ade, P., et al. *Journal of Cosmology and Astro-Particle Physics* 056, (2019).
13. “The Simons Observatory: Astro2020 decadal project whitepaper”, The Simons Observatory Collaboration, arXiv:1808.07445.
14. “The Simons Observatory: Science Goals and Forecasts”, The Simons Observatory Collaboration (2018).
15. “The Simons Observatory: Instrument Overview”, The Simons Observatory Collaboration, *Proceedings of SPIE*, Volume 10708 (2018).
16. “Time-dependent efficiency measurements of polymer solar cells with dye additives: unexpected initial increase of efficiency,” K. J. Bandaccari et al., *European Physical Journal Photovoltaics*, (2018).
17. “Structure-function relationships of fullerene esters in polymer solar cells: Unexpected structural effects on lifetime and efficiency” Michael Tro, et al., *International Journal of Energy Research* (2015).
18. “Effect of electron acceptor structure on stability and efficiency in polymer solar cells: a combinatorial approach,” Michael Tro, et al., *International Journal of Energy Research* (2015).