Grace E. Chesmore

The University of Chicago, Department of Astronomy and Astrophysics
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EDUCATION

Ph.D. Candidate in Physics, GPA: 3.7 — 2019-
University of Chicago
Thesis Advisor: Jeff McMahon

M.S. Physics, GPA: 3.5 — 2017-2019
University of Michigan
Thesis Advisor: Jeff McMahon

B.A. Physics, GPA: 3.8 — 2017
Santa Clara University
Graduation with Honors

SKILLS

Programming Languages: Python, LaTeX, IDL, HTML, Matlab, C++.
Software Languages: SolidWorks, AutoCAD.
Languages: Spanish (fluent), English (fluent) and Italian (B1).
Instrumentation: Lathe, mill, drill press.

NOTABLE SERVICE

Simons Observatory Conference Committee	2021
University of Chicago Science Policy Group Vice-President	2020-2021
Association for Women in Science: Co-President of Mentorship	2019 - 2020
University of Michigan LSA Machine Shop: Machining Instructor	2019
Women in Physics at Santa Clara University : Founder and President	2015-2017
Women in STEM at Santa Clara University: Leadership Board Member	2015-2017

HONORS

National Science Foundation Graduate Research Fellow	2018 - present
NASA Space and Technology Research Fellowship Recipient (declined)	2018
American Physical Society, Society of Physics Students Travel Grant	2016
Presidential Scholarship at Santa Clara University	2016
Hayes Fellow at Santa Clara University	2016
American Physical Society Women in Physics Grant	2016
University Honors Program at Santa Clara University	2015-2017
Clare Booth Luce Research Scholar Award at Santa Clara University	2015
Roelandts Grant at Santa Clara University	2014-2015

EXPERIENCE

Graduate Student Researcher — University of Chicago
2019 - — 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 study the propagation of systematic effects into later analysis of the CMB.

AWIS Co-President of Mentorship — Association for Women in Science
2019 - 2020 — Ann Arbor, MI
Organize and schedule the AWIS Mentoring Circles Program, facilitate the application process for this program, train group leaders, and plan all-group events.

Graduate Student Researcher — University of Michigan
2017 - 2019 — 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.

Committee on SS&T Intern United States House of Representatives
Sept. 2019 - Oct. 2019 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.

Undergraduate Researcher University of Michigan
2016 - 2017 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.

Scientific Technical Author Carbon Design Innovations
2015 - 2017 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.

Student Researcher Department of Physics
2014 - 2017 Santa Clara, CA
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.

Calculus Peer Educator Department of Mathematics
2013 - 2014 Santa Clara, CA
Presented guest lectures in Calculus III classes, held weekly office hours and study sessions, and produced study guides for students.

PROFESSIONAL MEMBERSHIP

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

OUTREACH

NSBP + Simons Obs. Undergraduate Program Coordinator	2020 - present
University of Michigan Department of Physics Graduate Mentor	2018 - 2019
University of Michigan Society for Women in Physics Mentor	2018 - 2019
University of Michigan Rackham International Network Mentor	2018 - 2019
Astrobites.com Guest Author	2018
After School Physics Instructor, Santa Jose, CA	2017
STEM Mentoring Program Educator, Santa Clara University	2014-2015
Newport High School Sexual Health Educator, Bellevue, WA	2011-2013

INVITED TALKS AND CONFERENCES

69^{th} Lindau Nobel Laureate Meeting (2019).

"Reflectometry Measurements of the Loss Tangent in Silicon at Millimeter Wave-

lengths," 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: 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.
2. "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).
3. "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 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.
2. "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).
3. "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.
4. "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.
5. "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).
6. "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).
7. "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).
8. "The Simons Observatory: Science Goals and Forecasts", The Simons Observatory Collaboration (2018).
9. "The Simons Observatory: Instrument Overview", The Simons Observatory Collaboration, *Proceedings of SPIE*, Volume 10708 (2018).

10. "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).

11. "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).

12. "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).