Dr. Nicholas Galitzki

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CONTACT INFORMATION

Department of Physics
University of California San Diego
9500 Gilman Dr. #0424
La Jolla, CA, 92093-0424

Phone: +1-(858)-534-6626
E-mail: ngalitzki@ucsd.edu
WWW: www.ngalitzki.com
Twitter: @AstroDrNick

RESEARCH INTERESTS

Experimental cosmology, astrophysical instrumentation, data analysis, polarimetry, cosmic microwave background, interstellar medium, dust, cryogenics, balloon-borne telescopes

EDUCATION

The University of Pennsylvania, Philadelphia, PA
Ph.D., Physics and Astronomy — **May 2016**

- *Magnetic Fields in Molecular Clouds: The BLASTPol[1] and BLAST-TNG[2] Experiments*
- Adviser: Prof. Mark Devlin

California Institute of Technology, Pasadena, CA
B.S., Astrophysics — **June 2008**

RESEARCH EXPERIENCE

University of California San Diego, La Jolla, CA
Simons Observatory Postdoctoral Scholar — **Sept. 2016 - Present**

- Simons Observatory leader for camera design, integration, and testing.
- Simons Observatory systematic studies, data acquisition, and analysis.
- BLAST-TNG flight preparations and Antarctic deployment.
- Simons Array design, field deployment to Chile, and calibration.
- Lead for renovation and setup of new highbay laboratory space at UCSD.

University of Pennsylvania, Philadelphia, PA
Graduate Student — **Sept. 2010 - May 2016**

- BLAST-TNG leader for liquid helium camera design, integration, and testing.
- BLASTPol data reduction and analysis.
- BLASTPol commissioning, testing, and Antarctic launch.

California Institute of Technology, Pasadena, CA
Undergraduate Researcher — **Jun. 2006 - Jun. 2008**

- Developed a radio interferometer for atmospheric characterization.

Jet Propulsion Laboratory, Pasadena, CA
Summer Undergraduate Research Fellowship — **Jun. 2005 - Sept. 2005**

- Developed a lunar based seismometer for the detection of strange quark matter.

FELLOWSHIPS AND AWARDS

Fulbright Scholar Program
Fulbright Postdoctoral Scholar Award — **Selected Feb. 2020**

- Awarded for 2020/2021 grant cycle, scheduled for Dec. 2021 to March 2022.
- Research will focus on developing a drone-based polarized calibration technique for millimeter telescopes with Prof. Rolando Dünner Paella at Pontificia Universidad Católica de Chile.

University of Pennsylvania, Philadelphia, PA
School of Arts and Sciences Dissertation Completion Fellowship — **Sept. 2015 - May 2016**

- Fellowship fully funds student for the final year of their dissertation.
- One student is nominated from the department each year.

American Astronomical Society (AAS)
Astronomy Ambassador — **Jan. 2015 - Present**

- Awarded in partnership with the Astronomical Society of the Pacific (ASP).
- AAS Ambassador status maintained through continued Astronomy outreach work.

[1] BLASTPol: The Balloon-borne Large Aperture Submillimeter Telescope for Polarimetry
[2] BLAST-TNG: The Balloon-borne Large Aperture Submillimeter Telescope - The Next Generation

Recent Professional Talks

2021 Scientific Ballooning Technologies Workshop, Virtual — **May 2021**
The Enabling Technology Instrument

Invited, Cornell University LEPP Seminar, Virtual — **Jan. 2021**
The Simons, BLAST, and CCAT Observatories: Probing the beginning of the Universe with precision polarimetry experiments

237th Meeting of the American Astronomical Society, Virtual — **Jan. 2021**
The Simons Observatory: the Small Aperture Telescopes (SATs)

Invited, San Diego Astronomy Association Monthly Meeting, Virtual — **Aug. 2020**
The Microwave Telescopes of the Simons Observatory

Invited, University of California Riverside Dept. of Physics and Astronomy Seminar, Virtual — **May. 2020**
The Simons Observatory and BLAST-TNG: Probing the beginning of the Universe with precision polarimetry experiments

Invited, University of Iowa Dept. of Physics and Astronomy Colloquium, Iowa City, IA — **Feb. 2020**
The Simons Observatory and BLAST-TNG: Probing the beginning of the Universe with precision polarimetry experiments

Invited, Cardiff University Seminar, Cardiff, UK — **Sept. 2019**
Forethought for foregrounds: Next steps in precision cosmology with the Simons Observatory and BLAST-TNG

Invited, Midwest Magnetic Fields Meeting 2019, Madison, WI — **May 2019**
Dust polarimetry of the interstellar medium with the Simons Observatory and BLAST-TNG

233rd Meeting of the American Astronomical Society, Seattle, WA — **Jan. 2019**
BLAST-TNG: Antarctic pre-flight integration

Invited, University of Southern California Colloquium, Los Angeles, CA — **Sept. 2018**
Forethought for foregrounds: Next steps in precision cosmology

SPIE Astronomical Telescopes + Instrumentation, Austin, TX — **Jun. 2018**
The Simons Observatory: Instrument Overview

Professional Service

Simons Observatory Collaboration

Chilean Engagement program leader.	**Oct. 2020 - Present**
Equity, Diversity, and Inclusion program member.	**May 2020 - Present**
Organizer for the inaugural Simons-NSBP Scholars Program.	**Jun. 2020 - Aug. 2020**
Small aperture telescope, work breakdown structure Level 3 leader.	**Sept. 2017 - Present**
Education and public engagement committee co-leader.	**Sept. 2016 - Oct. 2020**
Local organizing committee member.	**Jun. 2017**
Cryogenics working group co-leader.	**Sept. 2016 - Sept. 2017**

CMB-S4 Collaboration

Education and Public Outreach Committee member.	**Aug. 2020 - Present**
Local organizing committee member.	**Oct. 2019**

UCSD Physics Department

Education and Public Outreach Committee member.	**Aug. 2018 - Present**

NASA

Review panel member.	**Jun. 2017**

Polarbear Collaboration

Remote observer for Polarbear-1 Chilean observations.	**Sept. 2016 - Jun. 2017**
Internal reviewer for a publication.	**Oct. 2016**

Professional Membership

National Society of Black Physicists	**2020 - Present**
CMB-S4 Collaboration	**2018 - Present**
Simons Observatory Collaboration	**2016 - Present**
Polarbear Collaboration	**2016 - Present**
American Astronomical Society	**2015 - Present**

SPIE: The international society for optics and photonics **2014 - Present**

BLAST Collaboration **2012 - Present**

Mentoring Experience

University of California San Diego, La Jolla, CA

Graduate Students

Bryce Bixler, *UCSD* **Jan. 2020 - Present**

Kaiwen Zheng, *Princeton University* **Jan. 2020 - Dec. 2020**

- Mentee within the Simons Observatory Mentorship Program.

Michael Randall, *UCSD* **June 2019 - Present**

Ningfeng Zhu, *University of Pennsylvania* **Jan. 2018 - Present**

- Mentee within the Simons Observatory Mentorship Program.

Jacob Spisak, *UCSD* **June 2018 - Aug. 2021**

Tran Tsan, *UCSD* **Sept. 2017 - Present**

Joseph Seibert, *UCSD* **Sept. 2017 - Present**

Maximiliano Silva-feaver, *UCSD* **Sept. 2016 - Present**

Research Assistants

Wan Tong Fan, *UCSD* **Aug. 2021 - Present**

Joseph Rodriguez, *UCSD* **Nov. 2019 - Mar. 2020**

Christopher Ellis, *UCSD* **June 2019 - June 2020**

- Currently a physics graduate student at University of Nevada, Reno.

Kevin Crowley, *UCSD* **Sept. 2016 - June 2018**

- Currently a physics graduate student at Princeton University.

Undergraduate Researchers

Tanah Bua, *Pomona College* **Aug. 2021 - Present**

- Assumed mentorship to continue research past the NSBP summer program.

Ethan Wadhwa, *UCSD* **Aug. 2021 - Present**

Hakob Abajian, *UCSD* **June 2019 - Dec. 2019**

Tamar Ervin, *University of Southern California* **July 2019 - Sept. 2019**

Logan Foote, *University of California Berkeley* **June 2019 - Aug. 2019**

- Currently a physics graduate student at Caltech.

University of Pennsylvania, Philadelphia, PA

Mark Giovinazzi, *Undergraduate, Drexel University* **Jan. 2015 - May 2016**

- Currently a physics and astronomy graduate student at the University of Pennsylvania.

Timothy McSorley, *Undergraduate, Drexel University* **Jan. 2015 - May 2016**

- Currently a physics and astronomy graduate student at the University of California Irvine.

Teaching Experience

University of California San Diego, La Jolla, CA

PHYS 162 - Cosmology Lecture **May 12, 2021**

- Guest lecture for Prof. Brian Keating on the topic of experimental cosmology.

The Center for Engaged Teaching, La Jolla, CA

Introduction to College Teaching **Oct. 2017 - Dec. 2017**

- Developed expertise in evidence-based teaching practices that support student learning.
- Developed and presented a lesson plan that included active learning components.

The Netter Center, Philadelphia, PA

The Netter Center Astronomy Curriculum Chair **Aug. 2015 - May 2016**

- Developed a 12 Lesson Astronomy Curriculum for an under-served inner-city high school.
- Course included organizing lessons and facilitating demonstrations.
- Mentored undergraduate student volunteers who assisted in teaching the course.

iPraxis, Philadelphia, PA

iPraxis Afterschool Class Mentor **Jan. 2015 - May 2015**

- A reverse engineering class for inner-city middle school students.
- Created activities to help students understand how basic mechanical/electrical devices worked.

University of Pennsylvania, Philadelphia, PA

Teaching Assistant **Jan. 2013 - May 2013**

- Phys 101: General Physics: Mechanics, Heat, and Sound
  - Responsibilities included leading a weekly recitation section, grading, and office hours.
  - Instructor: Prof. Mark Devlin

Teaching Assistant **Aug. 2011 - Dec. 2011, Jan. 2012 - May 2012, Aug. 2012 - Dec. 2012, Aug. 2013 - Dec. 2013**

- Astr 001: Survey of the Universe
  - Undergraduate course in basic astronomy for non-science majors.
  - Responsibilities included grading and office hours.
  - Instructor: Prof. Mark Devlin

Center for Teaching and Learning **Aug. 2012**

- Teaching Assistant Training Workshop Leader
  - Developed lessons on teaching methodology in months prior to workshop.
  - Taught lessons and interactive sessions over one week period prior to start of semester.
  - Responsible for training new teaching assistants for the School of Arts and Sciences.

Teaching Assistant **Aug. 2010 - Dec. 2010**

- Phys 101 and Phys 102 - Laboratory
  - Lab courses in physics, concentrating on mechanics, electricity, and magnetism.
  - Responsibilities included preparing laboratory lectures and demonstrations, supervising student lab groups, and grading lab reports.
  - Lab supervisor: Dr. Robert Johnson

LABORATORY EXPERIENCE

Software:

- *SolidWorks*: Extensive experience with design and simulation.
- *COMSOL Multiphysics*: Experience with mechanical and thermal simulation software.
- *GrabCAD*: Organizational and administrative experience with versioning control software within several collaborations.
- *Microsoft Project*: Significant work constructing and managing project Gantt charts.
- *Jira/Confluence*: Utilized to coordinate the research activities of the graduate students I mentor.
- *Zemax*: Experience with optical design and simulation.
- Experience with Excel, MATLAB, and Mathematica.

Instrumentation, Control, Data Acquisition, Test, and Measurement:

- Extensive cryogenic experience with sub-kelvin systems including dilution refrigerators as well as liquid cryogen handling.
- Experience with FARO Laser Trackers for surface accuracy and alignment measurements.
- Significant experience with Fourier transform spectrometers for bandpass measurements.

Data analysis:

- *Python/Jupyter*: Extensive use for data analysis and observatory control software.
- *TOAST*: Experience with map-making software designed for time-ordered data processing used in both SO and BLASTPol.
- *C++ and Perl*: Implemented for instrument control programs and data reduction.
- *UNIX shell scripting*: General experience for a variety of applications.
- *Jython*: Experience for use with the Herschel ESA instrument data reduction tools.

PUBLIC ENGAGEMENT

University of California San Diego

The Cosmos Show Co-Host **June 2021 - Present**

- Co-Host of new public engagement Youtube channel with biweekly live shows supported by Wyoming Stargazing.
- Provide material for show as well as general discussion and other input.

Astronomy on Tap San Diego Co-Lead **Aug. 2017 - April 2020**

- Co-founder of the San Diego branch of Astronomy on Tap.
- Organize public talks with co-lead, Prof. Lisa Will, at local venues for the general public.

Comicon panel member, "Putting more science in your fiction" **July 2017, 2018, 2019, 2020(Remote)**
- Invited by the STEM advocacy group "The League of Extraordinary Scientists and Engineers."
- Fielded questions from members of the public attending the convention.

San Diego Festival of Science and Engineering - Sponsored Booth **March 2017, 2018, 2019, 2020**
- Primary organizer for our department's booth.
- Physics demonstrations performed by volunteer faculty, graduate students, and undergraduates.

Skype a Scientist **Jan. 2017 - Jan. 2018**
- Classrooms are connected with scientists to ask questions and learn about their research.
- Interacted with over 100 students during active period.

UCSD Cosmology - Lab Tours **Sept. 2016 - Mar. 2020**
- Tours occur on average every other month.
- Groups of 5 to 80 students with an age range from middle school to community college.

Fleet Science Center - #2Scientists **Sept. 2016 - Feb. 2020**
- An event hosted at local bars that occurs once per quarter.
- Members of the public ask participating scientists a wide range of science questions.

San Diego area public talks **Sept. 2016 - Present**
- Occur once per quarter on average.
- Venues have included bars, science festivals, and local astronomy association functions.

San Diego Astronomy Association - Active member **Sept. 2016 - Present**
- Participate in observing nights open to the public.

Simons Observatory

Education and Public Engagement Committee - Social Media **Oct. 2017 - Present**
- Co-manage the social media accounts and website for the observatory.

Fleet Science Center - Cosmology and Cocktails **June 2017**
- Organized a panel event followed by mingling with the public at the Fleet Science Center.
- Event included over 50 members of the collaboration with over 500 attendees.

Popscope

Public Astronomy Nights **March 2015 - Present**
- Sidewalk astronomy program to bring telescope observing to diverse communities.
- Involves transporting telescopes to public spaces and organizing observations of night sky targets.

University of Pennsylvania

Department of Physics and Astronomy - Public Astronomy Nights **Sept. 2011 - May 2016**
- Open night for the public held each semester with demonstrations, a lecture, and observing.

Philadelphia Science Festival - Science Carnival Sponsored Booth **May 2015, May 2016**
- Organized the Department of Physics and Astronomy's demonstration booth.
- Selected for sponsorship by the University of Pennsylvania.
- Booth had multiple activity stations at the carnival which is attended by thousands of people.

Philadelphia Science Festival - Clark Park Discovery Days **April 2015, April 2016**
- Organizer for the Department of Physics and Astronomy's demonstration booth.
- An event held at a Philadelphia park to provide science outreach to the local community.

Pennsylvania Science Olympiad - Urban Schools Initiative
Philadelphia Regional Science Olympiad Competition **March 2015**
- Volunteered with the Science Olympiad competition for urban underserved schools.
- Assisted in organizational and judging responsibilities.

REFEREED PUBLICATIONS

[1] Zhu, N. et al. *The Simons Observatory Large Aperture Telescope Receiver* , 2021, *ApJS*, 256, doi:10.3847/1538-4365/ac0db7

[2] Cheng, Y. et al. *Star Formation in a Strongly Magnetized Cloud*, 2021, *ApJ*, 916 doi:10.3847/1538-4357/ac043c

[3] Tsan, T., **Galitzki**, N. et al. *The effects of inclination on a two stage pulse tube cryocooler for use with a ground based observatory*, 2021, *Cryogenics*, 117, doi:10.1016/j.cryogenics.2021.103323

[4] McCarrick, H. et al. *The Simons Observatory microwave SQUID multiplexing detector module design* , 2021, *Accepted to ApJ*, doi:10.3847/1538-4357/ac2232

[5] Abitbol, M. et al., *Simons Observatory: Bandpass and polarization-angle calibration requirements for B-mode searches*, 2021, *JCAP*, 2021, doi:10.1088/1475-7516/2021/05/032

[6] The CMB-S4 Collaboration et al., *CMB-S4: Forecasting Constraints on Primordial Gravitational Waves*, 2020, *Accepted to ApJ*, arXiv:2008.12619

[7] Gudmundsson, J. et al., *The Simons Observatory: Modeling Optical Systematics in the Large Aperture Telescope*, 2021, *Appl. Opt.*, 60, doi:10.1364/AO.411533

[8] Adachi S. et al., *A Measurement of the CMB E-mode Angular Power Spectrum at Subdegree Scales from 670 Square Degrees of POLARBEAR Data*, 2020, *ApJ*, 904, doi:10.3847/1538-4357/abbacd

[9] The Polarbear Collaboration et al., *A Measurement of the Degree Scale CMB B-mode Angular Power Spectrum with POLARBEAR*, 2020, *ApJ*, 897, doi:10.3847/1538-4357/ab8f24

[10] Ali, A. et al., *Small Aperture Telescopes for the Simons Observatory*, 2020, *JLTP*, 169A, doi:10.1007/s10909-020-02430-5

[11] Gordon, S. et al., *Preflight Detector Characterization of BLAST-TNG*, 2020, *JLTP*, 400G, doi:10.1007/s10909-020-02459-6

[12] Kaneko, S. et al., *Deployment of uc(Polarbear)-2A*, 2020, *JLTP*, 199.1137K, doi:10.1007/s10909-020-02366-w

[13] Sathyanarayana Rao, M. et al., *Simons Observatory Microwave SQUID Multiplexing Readout: Cryogenic RF Amplifier and Coaxial Chain Design*, 2020, *JLTP*, 199.807S, doi:10.1007/s10909-020-02429-y

[14] Chinone, Y. et al., *Results of gravitational lensing and primordial gravitational waves from the POLARBEAR experiment*, 2020, *J.Phys.*, 1468, doi:10.1088/1742-6596/1468/1/012007

[15] Aguilar Faundez, M. et al., *Cross-correlation of POLARBEAR CMB Polarization Lensing with High-z Sub-mm Herschel-ATLAS galaxies*, 2019, *ApJ*, 886, doi:10.3847/1538-4357/ab4a78

[16] Namikawa, T. et al., *Evidence for the Cross-correlation between Cosmic Microwave Background Polarization Lensing from Polarbear and Cosmic Shear from Subaru Hyper Suprime-Cam*, 2019, *ApJ*, 882, doi:10.3847/1538-4357/ab3424

[17] Fissel, L. M. et al., *Relative Alignment Between the Magnetic Field and Molecular Gas Structure in the Vela C Giant Molecular Cloud using Low and High Density Tracers*, 2019, *ApJ*, 878, doi:10.3847/1538-4357/ab1eb0

[18] Shariff, J. A. et al., *Submillimeter Polarization Spectrum of the Carina Nebula*, 2019, *ApJ*, 872, doi:10.3847/1538-4357/aaff5f

[19] The Simons Observatory Collaboration et al., *The Simons Observatory: Science goals and forecasts*, 2019, *JCAP*, Issue 02, ID 056, doi:10.1088/1475-7516/2019/02/056

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[21] Ashton, P. et al., *First Observation of the Submillimeter Polarization Spectrum in a Translucent Molecular Cloud*, 2018, *ApJ*, 857, doi:10.3847/1538-4357/aab3ca

[22] Soler, J. D. et al., *The relation between the column density structures and the magnetic field orientation in the Vela C molecular complex*, 2017, *A&A*, 603, idA64, doi:10.1051/0004-6361/201730608

[23] Takakura, S. et al., *Performance of a continuously rotating half-wave plate on the POLARBEAR telescope*, 2017, *JCAP*, 05, 008, doi:10.1088/1475-7516/2017/05/008

[24] The POLARBEAR Collaboration et al., *A Measurement of the Cosmic Microwave Background B-Mode Polarization Power Spectrum at Sub-Degree Scales from 2 years of POLARBEAR Data*, 2017, *ApJ, 848, doi:10.3847/1538-4357/aa8e9f*

[25] Santos, F. P. et al., *Comparing Submillimeter Polarized Emission with Near-infrared Polarization of Background Stars for the Vela C Molecular Cloud*, 2017, *ApJ, 837*, doi:10.3847/1538-4357/aa62a7

[26] Gandilo, N. N. et al., *Submillimeter Polarization Spectrum in the Vela C Molecular Cloud*, 2016, *ApJ*, 824, 84 doi:10.3847/0004-637X/824/2/84

[27] Fissel, L. M. et al., *Balloon-borne Submillimeter Polarimetry of the Vela C Molecular Cloud: Systematic Dependence of the Polarization Fraction on Column Density and Local Polarization-Angle Dispersion*, 2016, *ApJ*, 824, 134 doi:10.3847/0004-637X/824/2/134

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[29] Chui, T. et al., *Cryogenics for Lunar Exploration*, 2006, *Cryogenics*, Volume 46, Issue 2-3, p. 74-81, doi:10.1016/j.cryogenics.2005.10.006

PUBLICATIONS IN REVIEW

[1] **Galitzki**, N. et al., *The Simons Observatory: Integration and testing of the first small aperture telescope, SAT-MF1*, 2021, *In Simons Observatory internal review*

[2] Crowley, K. et al., *Design and Measured Performance of a Carbon Fiber Strut for a Cryogenic Truss*, 2021, *In Simons Observatory internal review*

[3] Hensley, B. et al., *The Simons Observatory: Galactic Science Goals and Forecasts*, 2021, *In Simons Observatory internal review*

CONFERENCE PROCEEDINGS AND WHITE PAPERS

[1] Lowe, I. et al., *The Balloon-Borne Large Aperture Submillimeter Telescope Observatory*, 2020, *Proc. of SPIE*, 11445, doi:10.1117/12.2576146

[2] Lowe, I. et al., *Characterization, deployment, and in-flight performance of the BLAST-TNG cryogenic receiver*, 2020, *Proc. of SPIE*, arxiv:2012.01372v1

[3] Coppi, G. et al., *In-flight performance of the BLAST-TNG telescope platform*, 2020, *Proc. of SPIE*, 11445, doi:10.1117/12.2560849

[4] Golec, J. E. et al., *Design and fabrication of metamaterial anti-reflection coatings for the Simons Observatory*, 2020, *Proc. of SPIE*, 11451, doi:10.1117/12.2561720

[5] Kiuchi, K. et al., *Simons Observatory Small Aperture Telescope overview*, 2020, *Proc. of SPIE*, 11445, doi:10.1117/12.2562016

[6] Koopman, B. et al., *The Simons Observatory: Overview of data acquisition, control, monitoring, and computer infrastructure*, 2020, *Proc. of SPIE*, arXiv:2012.10345

[7] Xu, Z. et al., *The Simons Observatory: the Large Aperture Telescope Receiver (LATR) Integration and Validation Results*, 2020, *Proc. of SPIE*, arXiv:2012.07862

[8] Harrington, K. et al., *The Integration and Testing Program for the Simons Observatory Large Aperture Telescope Optics Tubes*, 2021, *Proc. of SPIE*, arXiv:2102.02129

[9] Sehgal, N. et al., *CMB-HD: Astro2020 RFI Response*, 2020, arXiv:2002.12714

[10] Abazajian, K. et al., *CMB-S4 Decadal Survey APC White Paper*, 2019, arxiv:1908.01062

[11] The Simons Observatory Collaboration et al., *The Simons Observatory: Astro2020 Decadal Project Whitepaper*, 2019, arxiv:1907.08284

[12] Abazajian, K. et al., *CMB-S4 Science Case, Reference Design, and Project Plan*, 2019, arxiv:1907.04473

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[14] **Galitzki**, N. et al., *BLAST-TNG Antarctic Pre-Flight Integration*, 2019, *AAS*, 233

[15] **Galitzki**, N. et al. *The Simons Observatory: instrument overview*, 2018, *Proc. of SPIE*, 10708, doi:10.1117/12.2312985

[16] **Galitzki**, N. on behalf of the Simons Observatory Collaboration, *The Simons Observatory: Project Overview*, 2018, *Proc. of CIPANP*, arxiv:1810.02465

[17] Salatino, M. et al. *Studies of systematic uncertainties for Simons Observatory: polarization modulator related effects*, 2018, *Proc. of SPIE*, 10708, doi:10.1117/12.2312993

[18] Hill, C. A. et al. *BoloCalc: a sensitivity calculator for the design of Simons Observatory*, 2018, *Proc. of SPIE*, 10708, doi:10.1117/12.2313916

[19] Gallardo, P. A. et al. *Systematic uncertainties in the Simons Observatory: optical effects and sensitivity considerations*, 2018, *Proc. of SPIE*, 10708, doi:10.1117/12.2312971

[20] Orlowski-Scherer, J. L. et al. *Simons Observatory large aperture receiver simulation overview*, 2018, *Proc. of SPIE*, 10708, doi:10.1117/12.2312868

[21] Navaroli, M. F., Teply, G. P., Crowley, K. D., Kaufman, J. P., **Galitzki**, N. B., Arnold, K. S., Keating, B. G., *Design and characterization of a ground-based absolute polarization calibrator for use with polarization sensitive CMB experiments*, 2018, *Proc. of SPIE*, 10708, doi:10.1117/12.2312856

[22] Zhu, N. et al. *Simons Observatory large aperture telescope receiver design overview*, 2018, *Proc. of SPIE*, 10708, doi:10.1117/12.2312871

[23] Coppi, G. et al. *Cooldown strategies and transient thermal simulations for the Simons Observatory*, 2018, *Proc. of SPIE*, 10708, doi:10.1117/12.2312679

[24] Vavagiakis, E. M. et al. *Prime-Cam: a first-light instrument for the CCAT-prime telescope*, 2018, *Proc. of SPIE*, 10708, doi:10.1117/12.2313868

[25] Lourie, N. P. et al. *Preflight characterization of the BLAST-TNG receiver and detector arrays*, 2018, *Proc. of SPIE*, 10708, doi:10.1117/12.2314396

[26] Dicker, S. R. et al. *Cold optical design for the large aperture Simons' Observatory telescope*, 2018, *Proc. of SPIE*, 10700, doi:10.1117/12.2313444

[27] Lourie, N. P. et al. *Design and characterization of a balloon-borne diffraction-limited submillimeter telescope platform for BLAST-TNG*, 2018, *Proc. of SPIE*, 10700, doi:10.1117/12.2314380

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[29] Ashton, P. C. et al. *The First Observation of the Submillimeter Polarization Spectrum in a Low-A_V Molecular Cloud*, 2017, *AAS*, 229

[30] **Galitzki**, N. et al. *Instrumental performance and results from testing of the BLAST-TNG receiver submillimeter optics, and MKID arrays*, 2016, *Proc. of SPIE*, 9914, doi:10.1117/12.2231167

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