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THE SIMONS OBSERVATORY: SCIENCE GOALS AND FORECASTS. AUTHOR SUPPLEMENT.

The Simons Observatory Collaboration

1. AUTHOR CONTRIBUTIONS

We include a list of (optional) sentences from co-authors documenting their contributions.

Simone Aiola estimated the ACT efficiency used in the noise calculation.

Aamir Ali works primarily on the SAT where he has led the design of several key subsystems, and designed the magnetic shielding for both SO telescopes.

David Alonso co-led the B-modes Science Working Group, developed the Fisher, ILC and BFoRe cleaning codes used in Sec. 3 and carried out the associated forecasts, developed the power spectrum code used in Sec. 3, provided input for lensing cross-correlation science cases with LSST.

Marcelo Alvarez contributed simulated temperature maps for patchy reionization forecasts from kSZ power spectrum.

Kam Arnold is a member of the Technical Committee, which created the instrument sensitivity model used in the paper.

Carlo Baccigalupi consolidated and edited Sec. 2.4, describing foreground models for use in both the large and small scale analyses.

Nicholas Battaglia co-led the SZ Science Working Group, provided forecasts for Sec. 7.1 and 7.3, and provided text for Sec. 7.1, 7.3, 7.6 and the introduction to Sec. 7.

Andrew Bazarko is the Simons Observatory project manager.

Rachel Bean contributed to the kinetic SZ growth rate forecasts in Sec. 7.4.

Shawn Beckman is leading lenslet R&D and producion for MF and LF arrays.

Sarah Marie Bruno contributed to the design of the SO sensitivity calculator used for this paper and works on the assembly and validation of detector focal plane modules.

Sean Bryan contributed to the discussion of the impact of tau data on the neutrino mass sensitivity, and the review of upcoming tau measurements.

Erminia Calabrese co-led the High-ell Science Working Group and is a member of the TAC; provided forecast, text and figures for $N_{\rm eff}$ in Sec. 4.1, 4.1.1, 4.1.2; for H_0 in Sec. 4.3; for neutrino mass from the power spectrum in Sec. 4.4.1; for reionization from kSZ in Sec. 7.6; helped develop Planck forecasts, made summary plot of spectra in Fig. 7, and defined the style and polished all figures in the paper.

Victoria Calafut contributed the growth rate forecasts in Sec. 7.4.

Paolo Calisse is the Simons Observatory Site Manager.

Anthony Challinor contributed to Sec. 5, cross-checking lensing and delensing forecasts, and reviewed several sections of the paper.

Grace Chesmore contrubuted to optical systematic studies of the LAT.

Yuji Chinone co-led the Time Domain Science Working Group and developed the SAT atmospheric noise model described in Sec. 2.

Ari Cukierman performs detector and focal-plane design.

Rolando Dünner contributed to the Calibration and Systematics Science Working Group on calibration methods and beam systematics; and contributed to site preparation and working with Chilean authorities.

Tijmen de Haan has worked and is actively working on development of SO-suitable DfMux technology as an alternate readout scheme.

Mark Devlin is the Spokesperson of the Simons Observatory.

Simon Dicker is one of the team who carried out the optical design (initially on the SAT but mostly on the LAT), and works with the cryostat design team.

Matt Dobbs is involved in the organization/development of alternate readout system technologies; serves on the interim Collaboration Council board.

Adri Duivenvoorden developed code for the tensor-scalar-scalar bispectrum forecasts in Table 6.

Jo Dunkley coordinated forecasts as chair of the TAC, wrote parts of Sec. 2 and 9, and edited text.

Josquin Errard co-led the B-modes Science Working Group, forecasting the scientific performance of the SAT with xForecast (after component separation, delensing).

Simone Ferraro co-led the SZ Science Working Group, and contributed text and forecasts to Sec. 7.

Pedro Fluxà is the main developer of the electromagnetic model for the ACT 90 GHz Camera.

Katherine Freese provided infrastructure for Stockholm and Michigan groups, provided text and models for the inflation n_s/r plane, contributed to the final paper review.

Patricio A. Gallardo works on the LAT optics systematics, ground pickup and sidelobes.

Martina Gerbino contributed to the Calibration, Sensitivity and Systematics Working Group, contributed summary plots in Sec. 9.1 (n_s/r and neutrino masses), contributed to the final paper review.

Vera Gluscevic provided code enabling forecasts of sensitivity to DM interactions, built the science case and wrote text of Section 4.4.3.

Neil Goeckner-Wald generated the hits map for the SAT sky coverage.

Joseph Golec contributed to the design of the antireflection coatings of the silicon lenses for the LAT and SAT.

Megan Gralla led the Sources Science Working Group and wrote parts of Sec. 8.

Jon Gudmundsson is one of the team who carried out the optical design (mostly on the LAT).

Matthew Hasselfield co-led the Time Domain science working group and developed the LAT atmospheric noise model described in Sec. 2.
Masashi Hazumi leads the ongoing work for the first receiver for SA, which serves as the basis of SO, and contributed to POLARBEAR polarization modulator and data validation that serve as the basis of the noise model adopted in this paper.
Erin Healy contributed to the development of the focal plane detector/readout modules.
J. Colin Hill helped develop and test the noise calculator in Sec 2.2, constructed the LAT foreground model in Sec 2.4, developed and implemented the LAT component separation, optimization, and foreground-cleaned noise curves in Sec 2.5, and performed the thermal Sunyaev-Zel'dovich power spectrum forecasts in Sec 7.2.
Charles A. Hill developed the noise-equivalent temperature (NET) calculator, BoloCalc, and used it to quantify the instrument confirutations for both the LAT and SAT. He calculated the NET projections for all bands in each telescope.
Renée Hložek developed forecast codes for modelling for the primordial power spectrum P(k), the axion DM constraints and the constraints on patchy reionisation, and contributed both figures and text for those sections; also managed the author list, acknowledgements and contributions as Collaboration Committee chair.
Shuay-Pwu (Patty) Ho leads the development of the focal plane detector/readout modules.
Kevin Huffenberger computed forecasts for source counts, wrote and edited parts of Sec 8, and edited Sec 4.
Margaret Ikape contributed code for the reionization forecasts.
Oliver Jeong involed in consulting for thermal filtering, alumina properties, and AR coating.
Brian Koopman contributed to the study of optical systematics related to the limitations discussed in Sec. 3.5.
Arthur Kosowsky serves on the Science Advisory Board and drafted the introduction and concluding discussion.
Nicoletta Krachmalnicoff produced new models of polarized synchotron emission beyond those included in PySM, accounting for new synchrotron data from the S-PASS survey.
Akito Kusaka contributed to develop the instrumental sensitivity model through the design of the SAT and as a member of the Technical Committee.
Adrian Lee contributed to the conceptual design of the large- and small-aperture telescopes, including optimization of their sensitivity.
Jason Leung contributed code for the primordial power spectrum forecasts.
Antony Lewis provided code for $N_{\rm eff}$ Figure 15, provided code to cross check the P(k) section; multiple edits and paper reviews.
Zack Li performed the dark matter interaction forecasts in Sec. 4.4.3.
Michele Limon contributed to LAT design, LATR design, responsible for WBS 1.1.
Eric Linder developed codes to test for B-modes in modified gravity, and to use the relation between $C^{\phi\phi}$ and C^{BB} as test of new physics.
Thibaut Louis contributed to the power spectrum simulation in Sec. 4.1.2.
Mathew Madhavacheril developed the lensing reconstruction noise and Fisher codes used for lensing 4-point power spectra, iterative delensing, gradient cleaning in cross-correlations, CMB halo lensing mass calibration, co-developed the codes used for tSZ counts and local primordial non-Gaussianity from kSZ tomography, contributed both figures and text for Secs. 5.4, 5.5 and Sec. 7.5.
Frederick Matsuda developed the small aperture telescope optical design, and contributed to the estimation of optical systematics for both the large and small aperture telescopes
Phil Mauskopf contributed to the optical design of the telescopes and receivers and estimation of contributions from the optics to sensitivity and systematics.
Jeff McMahon chairs the Technical Committee, wrote the noise calculator used to produce the noise curves for the LAT and SATs, and assembled Figure 3.
P. Daniel Meerburg wrote Sec. 6 on the bispectrum.
Joel Meyers wrote Sec. 4.4.2 and produced the figures for that section.
Kavilan Moodley computed beam eigenmodes used in Sec. 4 for the LAT beam uncertainty impact on $N_{\rm eff}$; manuscript review.
Federico Nati contributed to the Calibration, Sensitivity and Systematics Technical Working Group; developed the systematics dictionary and artificial calibrator.
Laura Newburgh leads the Data Acquisition Technical Working Group developing acquisition and control for all telescope systems and co-leads the Data Management committee tasked with overseeing data transfer, collection, storage, and TOD pipeline development.
Nam Nguyen contributed to the Lensing Science Working Group, produced the delensing figures for Sec. 5.2, and the neutrino forecasts in Sec. 5.
Mike Niemack is a member of the Technical Committee and contributed to the survey strategy and sensitivity calculation development.
John Orlowski-Scherer works on the design of the Large Aperture Telescope Receiver (LATR).
Lyman Page works on the design of the SAT.
Francesca Perrotta helped in the forecastings for Polarization Point Sources.
Davide Poletti produced the B-modes forcasts based on the cross-spectrum method.
Roberto Puddu produced the characterization of ACT sidelobe shape and level in temperature and polarization, development and characterization of a polarized source model to be used both for ACT detector calibration and ACT sidelobes studies.
Giuseppe Puglisi helped in the forecastings for Polarization Point Sources.
Chris Raum provided information on fabrication feasibility on various detector designs.
Anirban Roy contributed to modeling reionization in Sec. 7.
Emmanuel Schaan produced the shear calibration forecast, text and figure of Sec. 5.3.3, and co-wrote the shear-only CMB lensing estimation paragraph in Sec. 5.5.
Marcel Schmittfull contributed to the forecasts and

text for CMB lensing cross-correlations in Sec. 5.3.
Neelima Sehgal co-led the Lensing Science Working Group, advised the forecasting and provided text for Sec. 5.1 and 5.2, and edited Sec. 5.
Carlos Sierra contributed to detector bandpass filter design and sensitivity study.
Sara M. Simon leads the Sensitivity, Calibration and Systematics Technical Working Group, ran systematic effect and sensitivity studies for feedhorns and lenslets, and leads the design and fabrication of the feedhorn arrays.
David Spergel is part of the Planning Committee and the Theory and Analysis Committee; was involved in identifying science goals for the mission.
Suzanne Staggs contributed to the instrument sensitivity forecasting development.
Aritoki Suzuki gave input into sensitivity forecast as Lead of the Detector Technical Working Group.
Grant Teply was heavily involved with defining and optimizing the SAT instrument concept based on based on back-and-forth iteration on NET predictions and systematics considerations.
Ben Thorne supported the work in Sec. 3, contributing to the BFoRe code, as well as the development of the PySM code used in sky simulations.
Robert Thornton was heavily involved in the design of the LATR.
Carole Tucker is involved in the design, manufacture and test of optical and thermal filtering for LAT and SAT receivers.
Alex van Engelen was involved in the work on gravitatioinal lensing, and wrote Section 5.5 and a portion of Section 5.2.
Ben Westbrook works on the design and fabrication of the detector arrays to meet the sensitivity requirements of the focal plane.
Edward J. Wollack contributes to material characterization, cold optical design, and detector packaging.
Zhilei Xu works in the team to design and fabricate the Large Aperture Telescope Receiver (LATR), leading key subsystems of the instrument.
Ningfeng Zhu works on the design of the Large Aperture Telescope Receiver (LATR).