Emmanuel Schaan

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https://github.com/EmmanuelSchaan

Research Interests

I am a cosmologist working at the intersection of theory and data analysis. My research consists in building innovative analysis techniques to combine large-scale structure and cosmic microwave background (CMB) data, in order to control their systematics and answer fundamental questions in physics such as the nature of dark energy and dark matter and the neutrino masses, and in extragalactic astrophysics such as how galaxies form and how they reionized the Universe.

Education & Academic Appointments

SLAC National Accelerator Laboratory 2022–Present
Staff Scientist

Lawrence Berkeley National Laboratory 2017–2022
Chamberlain post-doctoral fellow

Princeton University
Ph.D. in Astrophysics *with David Spergel* 2017
M.A. in Astrophysics 2014

Ecole Normale Supérieure de Paris
Master's M2 in Theoretical Physics *with Francis Bernardeau* 2012
Master's M1 in Physics *with Steven Balbus & James Stone* 2011
Bachelor's License in Physics *with Nicolas Leroy* 2010

Lycée Louis le Grand, Paris
Classes préparatoires in Mathematics & Physics 2007–2009
Baccalauréat 2007

Grants & Fellowships

Grant writing workshop, Attendee 2022
Three-part training on applying for DOE and NSF grants and awards

NSF Grant, Collaborator 2021
Observations to Constrain the Origins of Hot Gas Between Galaxies and Clusters of Galaxies Across Cosmic Time
PI: Nick Battaglia

NSF Grant, Collaborator 2021
Collaborative Research: Shedding Light on the Complex and Covariant Properties of Massive Halos with Theory and Observations
PIs: Benedikt Diemer, Alexie Leauthaud

France-Berkeley Fund, Co-investigator 2019
Optimally mapping the dark matter in the Universe with the CMB
PIs: Uros Seljak, Ben Wandelt

NASA Jet Propulsion Laboratory, Strategic University Research Partnership 2016
Combining future CMB and weak lensing data to calibrate shear multiplicative biases
PI: Jason Rhodes

Ecole Normale Supérieure, Elève Normalien 2009–2012
Full-ride fellowship for bachelor's and master's degrees in Physics & Theoretical Physics

Honors & Awards

Princeton Emerging Alumni Award, Semifinalist 2016

Ecole Normale Supérieure internal ranking 2012, 2011, 2010
2nd place in M2 Master's, 1st place in M1 Master's, 1st place in Bachelor's

Nationwide Grandes Ecoles entrance exams 2009
Ranked 1st at Ecole Polytechnique (840 candidates), Mines-Ponts (4880), Centrale-Supélec (5000)
Ranked 6th at Ecole Normale Supérieure

French Academy of Sciences, Laureate 2008

International Physics Olympiad, Silver medal, Hanoi, Vietnam 2008

Concours General de Physique, 3rd prize nationwide 2007

Professional Service & Leadership

Collaboration leadership

ACT x DESI, joint projects coordinator 2021–present

Simons Observatory, co-pipeline lead, kinematic Sunyaev-Zel'dovich analysis working group 2020–present

Simons Observatory, co-pipeline lead, CMB lensing cross-correlations analysis working group 2018–2020

Active collaboration membership

ACT, Atacama Cosmology Telescope

SO, Simons Observatory

CMB-S4

DESI, Dark Energy Spectroscopic Instrument

VRO LSST DESC, Vera Rubin Observatory Legacy Survey of Space and Time Dark Energy Science Collaboration

Conferences & seminar organization

Scientific & local organizing committees

Flatiron Institute, *SZ workshop* 2022

CMB-S4 collaboration meeting 2021

Berkeley Center for Cosmological Physics workshop *Accurate lensing in the era of precision cosmology* 2019

Organizer & session chair

CMB lunch, LBNL 2021–2022

Aspen Center for Physics workshop on New Discoveries in the Era of High-Resolution, Low-Noise session on *Novel ideas involving scattering anisotropies* 2021

CMB-S4 virtual collaboration meeting, session on *Synergies of large-scale structure surveys with CMB-S4* 2021

ACT virtual collaboration meeting, kSZ session 2021

SPHEREx community workshop, Center for Computational Astrophysics 2020

Institute for Nuclear and Particle Astrophysics Seminar Series, LBNL 2018–2019

Cosmology journal club, Berkeley Center for Cosmological Physics 2018–2019

Kavli CMB Lensing Workshop, Stanford University, 2017

Leiden Universiteit conference, *A Century of Gravitational Lensing* 2016

Grant Reviewer

NASA, Subject-matter expert reviewer in a NASA peer review 2022
Honorarium donated to the East Bay Astronomical Society's (EAS) Telescope Maker's Workshop

Journal reviewer

ApJ, *JCAP*, *MNRAS*, *MNRAS Letters*, *PRD*, *PRL*, *Proceedings of the Royal Society A*

Mentoring, Teaching & Outreach

Student & Postdoc supervision

I supervised 6 students and junior postdocs, leading to 4 publications and 3 manuscripts in preparation

Teaching

Guest Lecturer, *Advanced Cosmology*, UC Berkeley (video) 2021

Co-organizer, *Weekly Discussions and Tutorials on CMB Lensing* for graduate students, 2018
Lawrence Berkeley National Laboratory

Assistant in Instruction, *Imagining other Earths*, 20k students, Coursera Massive Open Online Course 2014
Princeton University

Assistant in Instruction, *The Universe: Introduction to Astrophysics*, Princeton University 2013

Instructor, *Bachelor's Mathematics*, Oral examiner for weekly "colles", Lycée Louis le Grand, Paris, France 2009–2010

Diversity, Equity & Inclusion

Mount Tamalpais College, San Quentin Prison 2021–Present
Teaching Developmental Math II course for incarcerated individuals. Previously known as the Prison University Project, the mission is to provide intellectually rigorous, inclusive Associate of Arts degree program and College Preparatory Program, free of charge, to people at San Quentin State Prison; to expand access to higher education for incarcerated people; and to foster the values of equity, civic engagement, independence of thought, and freedom of expression. It has been recognized with the 2015 National Humanities Medal. (website)

Científico Latino, Graduate Student Mentorship Initiative 2021–Present
I prepared a student from an underrepresented background to navigate the STEM graduate school application process. The goal of this program is to ensure that everyone, regardless of ethnicity, gender, sexual orientation, disability or immigration status, has equal access to fellowship and scholarship opportunities, and the chance to learn from their peers to become successful STEM professionals. (website)

Compass Project, UC Berkeley 2021–Present
One-on-one mentoring of undergraduate student on career choices and research opportunities. The goal of the COMPASS project is to provide member students with opportunities for professional development, especially those from populations typically underrepresented in the physical sciences. It was recognized by the American Physical Society with the 2012 Award for Improving Undergraduate Education. (website)

Equity Reset Pilot Program, Lawrence Berkeley National Laboratory 2021–Present
I am a participant in monthly lectures and discussions on diversity, inclusion and equity (website)

Resident Graduate Student, Forbes College, Princeton University 2013–2016
For three years I lived in an undergraduate residence hall and provided mentoring and support to first and second-year undergraduate students from all backgrounds and majors, especially first-generation college students. I organized weekly dinners to help students struggling with general adjustment to college life and specific college courses. The goal of the Resident Graduate Student program is to participate in the intellectual and social life of the college.

Outreach

Berkeley Lab Research SLAM
Finalist, *A cosmic shadow theater* https://slam.lbl.gov/link) Sept. 2021

Science at Cal, Midday Science Café
Speaker, *Learning about dark energy with gravitational lensing* (video) Feb. 2021

Bay Area Science Festival
I filmed a virtual tour of Lick Observatory (video) Sep. 2020

Delaware Valley Amateur Astronomers, Delaware
Speaker, *A Cosmic Shadow Theater* (video) Dec. 2020

Amateur Astronomers Inc., New Jersey
Speaker, *A Cosmic Shadow Theater* (video) Oct. 2020

Mount Diablo Astronomical Society, California
Speaker, *Seeing through the gravitational lens* Sep. 2019

Mercer County Science and Engineering Fair
Judge, Rider University, NJ Mar. 2017

Weekly science conversation table
Co-organizer, Forbes College, Princeton University 2017

Near-space balloon project, Forbes College, Princeton University
Supervisor (presentation, video) 2015

Littlebrook Elementary School, 3rd grade class, Princeton, NJ
Presenter, *The Sun* Feb. 2015

Public Observing Program, Dept. of Astrophysical Sciences, Princeton University
Volunteer (link) 2012–2017

Talks & Presentations

Seminars & Colloquia

Colloquia (invited), Bowdoin College (video), Argonne National Laboratory, UT Austin, University of British Columbia, York University, SLAC National Laboratory, University of Toronto, Virginia Tech, Florida State University (video) Nov. 2021-May 2022

Brown bags (invited), University of British Columbia, York University, SLAC National Laboratory, University of Toronto, Virginia Tech Mar.-April 2022

Theory group seminar (invited), Johns Hopkins University Feb. 2022

Astronomy & Astrophysics colloquium (invited), University of California Santa Cruz, Santa Cruz, CA Oct. 2021

Cosmology seminar (invited), Oxford University, Oxford, UK (virtual) May 2021

Center for Astrophysics (invited), Harvard University, Cambridge, MA (virtual) Apr. 2021

Perimeter Institute for Theoretical Physics, Toronto, ON (virtual) Sep. 2020

Princeton University (invited), Princeton, NJ (virtual) Sep. 2020

University of Southern California (invited), Los Angeles, CA (virtual) Sep. 2020

NASA Jet Propulsion Laboratory, Los Angeles, CA Nov. 2019

Cosmology seminar (invited), Kavli Institute for Cosmological Physics, University of Chicago, Chicago, IL Nov. 2019

Journal club, Johns Hopkins University, Baltimore, MD June 2019

Institute d'Astrophysique de Paris, Paris, France May 2018

Argonne National Laboratory, Lemont, IL Jan. 2017

Lawrence Berkeley National Laboratory, Berkeley, CA Nov. 2016

Carnegie Mellon University, Pittsburgh, PA (video) Oct. 2016

University of Pennsylvania, Philadelphia, PA Oct. 2016

Harvard University, Cambridge, MA Oct. 2016

Perimeter Institute, Waterloo, ON Oct. 2016

Canadian Institute for Theoretical Astrophysics, Toronto, ON Oct. 2016

Stanford University, Palo Alto, CA Sept. 2016

University of California at Berkeley, Berkeley, CA Sept. 2016

Astroparticule et Cosmology (APC), Paris, France Dec. 2015

Canadian Institute for Theoretical Astrophysics, Toronto, ON (video) Aug. 2015

Conferences, workshops & webinars

Review of CMB lensing foregrounds, speaker panelist, Key Challenges in Galaxy CMB lensing, Cambridge July 2022

Backlighting the LSS with the CMB, Cosmology from Home (invited, virtual) July 2022
(video)

Multi-line intensity mapping: decorrelation & robust lensing estimation, SUBLIME Workshop Oct. 2021
Study of the Universe by Line Intensity Mapping Experiments (invited, virtual) (video)

Multi-line intensity mapping: decorrelation and intensity mapping vs galaxy detection, KICP Line Intensity July 2021
Mapping Workshop, University of Chicago, Chicago, IL (virtual)

Overview of Simons Observatory, Cosmoglobe Kickoff Meeting, virtual June 2021

Backlighting the missing baryons with the CMB: implications for large-scale structure and galaxy formation, Action Dark Energy Meeting, Paris, France (invited, virtual) Oct. 2020

Astrophysical Evolution with tSZ and kSZ, ACT DR5 Seminar, Simons Foundation (invited) (video) Oct. 2020

Lensing & SPHEREx, SPHEREx community workshop, Center for Computational Astrophysics, Feb. 2020
Flatiron Institute, NYC, NY (invited)

Cross-correlations with missing modes: nonlinear & lensing reconstructions, Lines in the large-scale Jul. 2019
structure conference, Marseille, France

Backlighting the large-scale structure with the CMB, Cosmogold, Institut d'Astrophysique de Paris June 2019
Paris, France

Growth of structure from joint analyses of cosmic microwave background and large-scale structure data, Jan. 2019
special session on CMB, AAS meeting, Seattle, WA (invited)

Foreground-immune CMB lensing with shear-only reconstruction,special session on CMB, AAS meeting Jan. 2019
Seattle, WA (contributed)

Reducing foregrounds in lensing with shear-only reconstruction and lensing bias from lensed foregrounds Dec. 2018
CMB in HD: the low-noise high-resolution frontier, Center for Computational Astrophysics,
Flatiron Institute, NYC, NY (invited speaker and panelist)

Lensing from intensity maps: cosmic infrared background, The Non-linear Universe, Smartno, Slovenia Jul. 2018

WFIRST & CMB S4 lensing: shear calibration, Exploiting Extra-galactic Synergies between WFIRST Feb. 2018
and Future Facilities, California Institute of Technology, Pasadena, CA (invited)

Weak lensing of intensity maps, SPHEREx community workshop, Harvard Center for Astrophysics, Jan. 2018
Cambridge, MA (invited)

Shear calibration with CMB lensing, Kavli CMB Lensing Workshop, Stanford, Palo Alto, CA (invited) Sep. 2017

Detecting the lensing of the cosmic infrared background, Kavli CMB Lensing Workshop, Stanford, Sep. 2017
Palo Alto, CA

Baryon physics from the kinematic Sunyaev-Zel'dovich effect, Advances in theoretical cosmology in light Jul. 2017
of data, Nordita summer school, Stockholm, Sweden

Understanding the large-scale structure from the cosmic microwave background: shear calibration with CMB lensing & gas physics from the kinematic Sunyaev-Zel'dovich effect, April meeting of the American Apr. 2017
Physical Society, Washington, DC

Looking through the same lens: Shear calibration with CMB lensing, A Century of Gravitational Lensing, July 2016
Leiden Universiteit, Leiden, Netherlands

Evidence for the kSZ effect with ACTPol and BOSS: probing baryon physics in galaxy groups and clusters, Dec. 2015
Cosmology and First Light, Institut d'Astrophysique de Paris, France (poster)

Probing cosmic flows through the kinematic Sunyaev Zel'dovich effect, Cosmic Flows and Other Novelties on Aug. 2015
Large Scales, Perimeter Institute, Waterloo, ON (video)

The kSZ effect and the missing baryons problem, Theoretical and observational progress on large-scale structure of the Universe, MPA/ESO/MPE/Excellence Cluster Universe, Garching, Germany (poster) July 2015

Cluster physics from the kSZ effect, Rutgers-Princeton Galaxy Jamboree, Rutgers University, New Brunswick, NJ May. 2014

A stringent test of the EFT for LSS with simulations, Effective field theory for the large-scale structure, Princeton Center for Theoretical Science, Princeton, NJ Feb. 2014

Collaboration talks

Constraining baryonic effects in galaxy-galaxy lensing with SZ, ACT collaboration meeting, invited, July 2021

DESI×ACT: Synergies, ACT collaboration meeting, invited, July 2021

Kinematic Sunyaev-Zel'dovich and Lensing, CMB-S4 collaboration meeting Apr. 2020

ACT×DESI: Synergies, DESI collaboration meeting, invited, June 2021

Kinematic Sunyaev-Zel'dovich and Lensing, CMB-S4 collaboration meeting Apr. 2020

Kinematic Sunyaev-Zel'dovich effect with DESI, DESI collaboration meeting 2020

kSZ and tSZ profiles of BOSS CMASS halos, ACT collaboration meeting, Princeton, NJ 2019

Coordinating pipeline efforts between Simons Observatory & LSST, DESI collaboration meeting, Berkeley, CA 2019

Foreground in T lensing, Maps to other statistics, CMB-S4, San Diego, CA Oct. 2019

Backlighting the baryons: kSZ from DESI & CMB, DESI collaboration meeting, Barcelona, Spain Oct. 2018

Foreground immune CMB lensing with shear-only reconstruction, CMB-S4, Princeton, NJ Sept. 2018

kSZ, CMB-S4 collaboration meeting, Chicago, IL Mar. 2018

Simon's observatory meeting, San Diego, CA Mar. 2017

Shear calibration for LSST with CMB-S4 lensing, DESC meeting, Oxford University, Oxford, UK July 2016

Publications

44 publications, total citations 2843, h-index 24, i10-index 33
17 publications as first or second author
6 publications as supervisor

Lead, Co-lead, or Supervisor

27. Ferraro S, **Schaan E**, Pierpaoli E. Is the Rees-Sciama effect detectable by the next generation of cosmological experiments? 2022. ADS

26. Maniyar A, Ferraro S, **Schaan E**. Doppler boosted dust emission and CIB-galaxy cross-correlations: a new probe of cosmology and astrophysics. 2022. ADS

25. Maniyar A, **Schaan E**, Pullen A. New probe of the high-redshift Universe: Nulling CMB lensing with interloper-free line intensity mapping pair lensing. 2022. ADS

24. Darwish O, Sherwin B, Sailer N, **Schaan E**, Ferraro S. Optimizing foreground mitigation for CMB lensing with combined multifrequency and geometric methods. 2021. ADS

23. Sailer N, **Schaan E**, Ferraro S, Darwish O, Sherwin B. Optimal multi-frequency weighting for CMB lensing. 2021. ADS

22. Fang X, Eifler T, **Schaan E**, Huang H-J, Krause E, Ferraro S. Cosmology from Clustering, Cosmic Shear, CMB Lensing, and Cross Correlations: Combining Rubin Observatory and Simons Observatory. 2021. ADS

21. Maniyar AS, **Schaan E**, Pullen AR. A new probe of the high-redshift Universe: nulling CMB lensing with interloper-free "LIM-pair" lensing. 2021. ADS

20. **Schaan E** & White M. Astrophysics & Cosmology from Line Intensity Mapping vs Galaxy Surveys. 2021. *JCAP* ADS

19. **Schaan E** & White M. Multi-tracer intensity mapping: Cross-correlations, Line noise & Decorrelation. 2021. *JCAP* ADS

18. Moser E, Amodeo S, Battaglia N, Alvarez MA, Ferraro S, **Schaan E**. The Impacts of Modeling Choices on the Inference of the Circumgalactic Medium Properties from Sunyaev-Zeldovich Observations. 2021. ADS

17. **Schaan E**, S Ferraro, S Amodeo, N Battaglia et al. The Atacama Cosmology Telescope: Combined kinematic and thermal Sunyaev-Zel'dovich measurements from BOSS CMASS and LOWZ halos. 2021, *PRD*. ADS
*PRD Editors' Suggestion
*Covered by LBL, Tech Explorist, zephyrnet, EurekAlert! from AAAS

16. Amodeo S, Battaglia N, **Schaan E** et al. The Atacama Cosmology Telescope: Modelling the Gas Thermodynamics in BOSS CMASS galaxies from Kinematic and Thermal Sunyaev-Zel'dovich Measurements. 2021, *PRD*. ADS
* PRD Editors' Suggestion
* Covered by Cornell Chronicle, Science Daily, Nanowerk, Copernical, News Break, Science Springs

15. **Schaan E**, Ferraro S, Seljak U. Photo-z outlier self-calibration in weak lensing surveys. 2020, *JCAP*. ADS

14. Sailer N, **Schaan E**, Ferraro S. Lower bias, lower noise CMB lensing with foreground-hardened estimators. 2020, *PRD*, 102, 6, 063517. ADS

13. Zhu H-M, White M, Ferraro S, **Schaan E**. Reconstruction with velocities. 2019, *MNRAS*, 494, 3, 4244–4254. ADS

12. Mishra N & **Schaan E**. Bias to CMB lensing from lensed foregrounds. 2019, *PRD*, 100, 12, 123504. ADS

11. **Schaan E** & Ferraro S. Foreground-immune CMB lensing with shear-only reconstruction. 2018, *PRL*, 122, 18, 181301. ADS
* Covered by Medium, NERSC, phys.org, Realclearscience, Science Daily, Tech Explorist

10. **Schaan E**, Ferraro S, Spergel D. Weak Lensing of Intensity Mapping: the Cosmic Infrared Background. 2018, *PRD*, 97, 12, 123539. ADS

9. Battaglia N, Ferraro S, **Schaan E**, Spergel D. Future constraints on halo thermodynamics from combined Sunyaev-Zel'dovich measurements. 2017, *JCAP*, 11. ADS

8. **Schaan E**, Krause E, Eifler T, Doré O, Miyatake H, Rhodes J, Spergel D. Looking through the same lens: shear calibration for LSST, Euclid & WFIRST with stage 4 CMB lensing. 2016, *PRD*, 95, 12. ADS

7. Doux C, **Schaan E**, Aubourg E, Ganga K, Lee KG, Spergel D, Tréguer J. First Detection of Cosmic Microwave Background Lensing and Lyman-alpha Forest Bispectrum. 2016, *PRD*, 94, 10. ADS
* PRD Editors' Suggestion

6. **Schaan E**, Ferraro S, Vargas-Magaña M, Smith KM, Ho S et al. Evidence for the kinematic Sunyaev-Zel'dovich effect with the Atacama Cosmology Telescope and velocity reconstruction from the Baryon Oscillation Spectroscopic Survey. 2016, *PRD*, 93, 8. ADS

5. Baldauf T, **Schaan E**, Zaldarriaga M. On the reach of perturbative descriptions for dark matter displacement fields. 2015, *JCAP*, 3. ADS

4. Baldauf T, **Schaan E**, Zaldarriaga M. On the reach of perturbative descriptions for dark matter density fields. 2015, *JCAP*, 3. ADS

3. Hill JC, Battaglia N, Chluba J, Ferraro S, **Schaan E**, Spergel D. Taking the Universe's temperature with spectral distortions of the cosmic microwave background. 2015, *PRL*, 115, 26. ADS

2. **Schaan E**, Takada M, Spergel DN. Joint likelihood of cluster counts and n-point correlation functions: improving their power through including halo sample variance. 2014, *PRD*, 90, 12. ADS

1. Balbus SA & **Schaan E**. The stability of stratified, rotating systems and the generation of vorticity in the Sun. 2012, *MNRAS*, 426, 2. ADS

Other publications

22. Fang X, Eifler T, **Schaan E** et al. Cosmology from clustering, cosmic shear, CMB lensing, and cross correlations: combining Rubin observatory and Simons Observatory. 2022 ADS
21. Abazajian et al. CMB-S4: Forecasting Constraints on Primordial Gravitational Waves. 2022 ADS
20. Li et al. Constraining CMB temperature evolution with Sunyaev-Zel'dovich galaxy clusters from the Atacama Cosmology Telescope. 2021 ADS
19. Guan et al. The Atacama Cosmology Telescope: Microwave Intensity and Polarization Maps of the Galactic Center. 2021 ADS
18. Robertson et al. Strong detection of the CMB lensing $\times$ galaxy weak lensing cross-correlation from ACT-DR4, Planck Legacy, and KiDS-1000. 2021 ADS
17. Naess et al. The Atacama Cosmology Telescope: A search for Planet 9. 2021. ADS
16. Mallaby-Kay et al. The Atacama Cosmology Telescope: Summary of DR4 and DR5 Data Products and Data Access. 2021. ADS
15. Calafut et al. The Atacama Cosmology Telescope: Detection of the Pairwise Kinematic Sunyaev-Zel'dovich Effect with SDSS DR15 Galaxies. 2021. ADS
14. Vavagiakis et al. The Atacama Cosmology Telescope: Probing the Baryon Content of SDSS DR15 Galaxies with the Thermal and Kinematic Sunyaev-Zel'dovich Effects. 2021. ADS
13. Aiola et al. The Atacama Cosmology Telescope: DR4 Maps and Cosmological Parameters. 2020, *JCAP*. ADS
12. Naess et al. The Atacama Cosmology Telescope: arcminute-resolution maps of 18,000 square degrees of the microwave sky from ACT 2008-2018 data combined with Planck. 2020, *JCAP*. ADS
11. Choi et al. The Atacama Cosmology Telescope: A Measurement of the Cosmic Microwave Background Power Spectra at 98 and 150 GHz. 2020, *JCAP*. ADS
10. Madhavacheril et al. The Atacama Cosmology Telescope: Weighing distant clusters with the most ancient light. 2020, *ApJL*. ADS
9. Hilton et al. The Atacama Cosmology Telescope: A Catalog of $>$ 4000 Sunyaev-Zel'dovich Galaxy Clusters. 2020, *ApJS*. ADS
8. Abazajian et al. CMB-S4: Forecasting Constraints on Primordial Gravitational Waves. 2020. ADS
7. Madhavacheril et al. The Atacama Cosmology Telescope: Component-separated maps of CMB temperature and the thermal Sunyaev-Zel'dovich effect. 2019, *PRD*, 102, 2. ADS
6. Ade et al. The Simons Observatory: Science goals and forecasts. *JCAP*. 2019. ADS
5. Doré O, Werner M et al. Science Impacts of the SPHEREx All-Sky Optical to Near-Infrared Spectral Survey II: Report of a Community Workshop on the Scientific Synergies Between the SPHEREx Survey and Other Astronomy Observatories. 2018. ADS
4. Louis et al. The Atacama Cosmology Telescope: Two-Season ACTPol Spectra and Parameters. 2017, *JCAP*, 6. ADS
3. De Bernardis F et al. Detection of the pairwise kinematic Sunyaev-Zel'dovich effect with BOSS DR11 and the Atacama Cosmology Telescope. 2017, *JCAP*, 3. ADS
2. Abazajian et al. CMB-S4 Science Book, First Edition. 2016. ADS
1. Doré O, Werner M et al. Science Impacts of the SPHEREx All-Sky Optical to Near-Infrared Spectral Survey: Report of a Community Workshop Examining Extragalactic, Galactic, Stellar and Planetary Science. 2016. ADS

White papers endorsed

19. Abareshi et al. Overview of the Instrumentation for the Dark Energy Spectroscopic Instrument. 2022. ADS
18. Abazajian et al. Snowmass 2021 CMB-S4 White Paper. 2022. ADS
17. Chang et al. Snowmass2021 Cosmic Frontier: Cosmic Microwave Background Measurements White Paper. 2022. ADS
16. Baxter et al. Snowmass2021: Opportunities from Cross-survey Analyses of Static Probes. 2022. ADS
15. CMB-HD collaboration. Snowmass2021 CMB-HD White Paper. 2022. ADS
14. Abazajian et al. CMB-S4 Decadal Survey APC White Paper. 2019. arxiv
13. Lee et al. Astro2020 APC White Paper: The Simons Observatory. 2019. ADS
12. Slosar et al. Packed Ultra-wideband Mapping Array (PUMA): A Radio Telescope for Cosmology and Transients. 2019. ADS
11. Sehgal et al. CMB-HD: An Ultra-Deep, High-Resolution Millimeter-Wave Survey Over Half the Sky. 2019. ADS
10. Abazajian et al. CMB-S4 Science Case, Reference Design, and Project Plan. 2019. ADS
9. Alvarez et al. Unique Probes of Reionization with the CMB: From the First Stars to Fundamental Physics. 2019. ADS
8. Battaglia et al. Probing Feedback in Galaxy Formation with Millimeter-wave Observations. 2019. ADS
7. Mantz et al. The Future Landscape of High-Redshift Galaxy Cluster Science. 2019. ADS
6. Bechtol et al. Dark Matter Science in the Era of LSST. 2019. ADS
5. Green et al. Messengers from the Early Universe: Cosmic Neutrinos and Other Light Relics. 2019. ADS
4. Erskine et al. Direct Acceleration: Cosmic and Exoplanet Synergies. 2019. ADS
3. Schlegel et al. ASTRO2020 APC White Paper: the MegaMapper: a z>2 spectroscopic instrument for the study of Inflation and Dark Energy. 2019. arxiv
2. Meerburg et al. Primordial Non-Gaussianity. 2019. arxiv
1. Sehgal et al. Science from an Ultra-Deep, High-Resolution Millimeter-Wave Survey. 2019. arxiv

Selected public software

4. `LensQuEst`, CMB Lensing Quadratic Estimator ASCL, github
3. `LaSSI`, Large-Scale Structure Fisher Information ASCL, github
2. `HaloGen`, Modular halo model code for cross-correlations ASCL, github
1. `ThumbStack`, Stacking analysis code github

Languages

French: native
English: fluent
Spanish: conversational