

# Alexandra Amon

Assistant Professor

Trinidadian/British

[alexandra.amon@princeton.edu](mailto:alexandra.amon@princeton.edu)

Department of Astrophysical Sciences

102 Peyton Hall, 4 Ivy Lane,

Princeton University,

Princeton, NJ 08544

RESEARCH	Assistant Professor, Princeton University	2023 – present
	Senior Kavli Fellowship, Cambridge University	2021 – 2023
	Kavli Fellowship, Stanford University	2018 – 2021
EDUCATION	Ph.D. Physics, University of Edinburgh	2018
	‘ <i>Weak lensing with the ESO Kilo-Degree Survey</i> ’ (Profs. C. Heymans & C. Blake)	
	Master of Physics, University of Edinburgh, First Class with Honours	2014
HONOURS & AWARDS	Sloan Research Fellowship	2025
	Vera Rubin Distinguished Visiting Professor, University of California	2025
	<a href="#">British Science Association Physical Sciences &amp; Mathematics Award</a>	2023
	<a href="#">Royal Astronomical Society’s Winton Early-Career Award</a>	2022
	<a href="#">UK Young Academy Emerging Leader</a>	2022
	<a href="#">Caroline Herschel Prize Lectureship</a>	2022
	<a href="#">Fermilab Tollestrup Award</a>	2022
	<a href="#">Rising Star in Physics</a>	2020
	<a href="#">Royal Astronomical Society’s Michael Penston Thesis Prize</a>	2019
	<a href="#">Institute of Physics Jocelyn Bell Burnell Medal and Prize Runner-up</a>	2019
	<a href="#">LSST Data Science Fellowship Programme</a>	2017
	Royal Society Summer Research Fellowship, University of Edinburgh	2012
	National Scholarship from Trinidad and Tobago for Undergraduate Degree	2009
	International Summer School for Young Physicists, Perimeter Institute	2008
	Euler Award, Trinidad and Tobago Mathematics Olympiad	2007
LEADERSHIP	LSST DESC Weak Lensing + Large Scale Structure Co-convener	2024 - present
	DESI - LSST DESC Synergies Co-lead	2023 - present
	DES Weak Lensing Co-coordinator	2021 - present
	DES Team Lead for (i) shear catalog validation, (ii) deep field photometry (iii) cosmic shear cosmology	2018 - 2021

## RESEARCH ACHIEVEMENTS

- Co-lead the Dark Energy Survey weak lensing working group, coordinating >50 members & 10 analysis teams for the Year 6 analysis. Played a pivotal role in the Year 3 cosmology analysis, leading three analysis teams [*DES Collaboration 2021; Amon+2021*].
- Measurements of lowest-mass weak lensing dwarf galaxy mass profiles using a new selection method combining photometric & spectroscopic data [*Thornton+2023*]
- Proposed a potential solution to the  $S_8$  tension and a new approach to analyse data to test the standard cosmological model on non-linear scales [*Amon&Efstathiou 2022, Preston+2023, Preston+2024*]
- Pioneered novel approaches to constrain the effects of galaxy formation on the large scale matter distribution [*Bigwood+2024, McCullough+2024, McCarthy, Amon+2024, Bigwood+2025*]
- Developed and applied leading methods for weak lensing shear systematics and blending [*Amon+2017; Gatti+2020; Jarvis, Bernstein, Amon+2020; MacCrann+2020*] and photometric redshift calibration through the development of custom machine learning architectures [*Myles+2020*]
- Co-led the processing of DES deep imaging fields [*Hartley+2020*] and KiDS bright-time data [*Amon+2017*]
- Worked at the nexus of cross-survey collaboration to test the consistency of weak lensing results [*Amon+2017; Leauthaud & Amon+2021; Amon & Robertson+2022; KiDS & DES Collaboration+2023*]

TEACHING	‘The Universe’, Princeton ( <i>Lecturer</i> )	2024-2025
	Graduate Seminar, Princeton ( <i>Lecturer</i> )	2024
	Weak lensing, Cosmology Schools in Mexico & Corsica ( <i>Lecturer</i> )	2023, 2024
	Office of Life-Long Learning, ‘The Universe’ ( <i>Course Designer &amp; Lecturer</i> )	2015 - 2018
	Fourier Analysis & Statistics; General Relativity, Edinburgh ( <i>TA</i> )	2014 - 2017
ADVISING	<b>Graduate students:</b>	
	<i>Primary Ph.D. advisees</i>	
	Jared Siegl, Princeton	2024 - present
	Leah Bigwood, Cambridge	2022 - present
	Calvin Preston, Cambridge	2022 - present
	<i>Princeton Ph.D. rotation students:</i>	
	Kaitlyn Shavelle, PhD Princeton	2024 - present
	Lena Treiber, PhD Princeton	2024 - present
	James Sunseri, Princeton	2023 - 2024
	<i>Substantial graduate mentorship outside Stanford:</i>	
	Boyan Yin, Princeton	2024 - present
	Jamie McCullough, Stanford	2020 - 2021
	Justin Myles, Stanford	2019 - 2021
	<b>Undergraduates:</b>	
	Daryna Yushchenko, Princeton	2024 - 2025
	Joseph Thornton, Part III Tripos MSci, Cambridge	2022 - 2023
	Elisa Legnani, MSc LMU	2021 - 2022
	Sana Gabriel, BSc University of the West Indies	2018 - 2019
	<b>Postdoctoral Fellows:</b>	
	Masaya Yamamoto, Princeton	2024 - present
Jamie McCullough, Princeton	2024 - present	
Justin Myles, Princeton	2023 - present	
SERVICE:	National Science Foundation & NASA Astrophysics Data Analysis Program	2021-2022
Policy/Panels	<a href="#">Early-career delegate for Astro2020 Decadal Survey</a>	2018
SOC	<a href="#">Cosmic Cartography with Roman</a>	2025
	<a href="#">New Physics from Old Light, CMB Secondaries, KICC</a>	2024
	DES Year 6 Cosmology Meeting, Princeton	2023
	<a href="#">Key Challenges in Galaxy and CMB Lensing, KICC</a> (chair)	2022
Observing	>15 nights at CTIO and AAT	

#### SELECTED SCIENTIFIC PRESENTATIONS:

In the last ~5 years, I’ve presented at ~30 invited colloquia, ~30 conferences, 8 invited reviews at next-generation experiments’ meetings & 3 collaboration results webinars. Highlights include:

#### Invited Colloquia:

<i>Leveraging photometric &amp; spectroscopic data to measure dwarf galaxy mass profiles</i> - Harvard, Yale	2024
<i>Toward a consistent model of galaxy feedback</i> - Harvard, U. Pennsylvania, LMU	2024-2025
<i>Weak lensing with a billion galaxies</i> - CCA, Waterloo, Rutgers	2024-2025

*The  $S_8$  tension: a non-linear solution* - DAMTP, UCL, Durham, Newcastle, SLAC 2022-2023  
*DES Year 3 Lensing + Clustering: Pixels to Cosmology* - [Royal Astronomical Society](#), Imperial College, Berkeley, Stanford, Swinburne, [IAS](#), Arizona, Cambridge, Oxford, Harvard, Fermilab, Princeton 2020-2021  
*Kilo-Degree Survey Cosmology* - Berkeley, NASA JPL, Stanford, UC Santa Cruz 2018

### Invited Conferences:

*Cosmology and galaxy astrophysics with simulations & machine learning* (Simons Institute, NY) 2024  
*New Physics from Old Light - CMB Secondaries* (KICC, Cambridge University)  
*Small Galaxies, Cosmic Questions* (Durham University, UK)  
*Cosmic Signals of Dark Matter Physics* (KITP, USA)  
 50 years of the Institute of Astronomy (Cambridge, UK)  
*Testing the Universe on non-linear scales*; Challenging the cosmological model (Royal Society, UK)  
*Towards a consistent model of galaxy formation*; Baryons in the Universe (IPMU, Japan)  
*Weak lensing & the  $S_8$  tension*; Inconsistencies in the growth of structure (Sesto, Italy) 2022  
*Dark Energy Survey - Pixels to Cosmology*; American Astronomical Society & APS 2021

### Invited reviews at collaboration meetings & Collaboration Result Webinars:

*Lensing & Clustering*; Euclid Consortium 2022  
*Lessons learned from DES: Redshift Calibration*; LSST Dark Energy Science Collaboration 2020  
*Kilo-Degree Survey & Dark Energy Survey Cosmic Shear; Consistent lensing and clustering* 2023  
 Press release: *Dark Energy Survey Year 3 weak lensing and clustering cosmology results* 2021

SCIENCE COMMUNICATION: Highlights from the last  $\sim 5$  years are:

**On camera:** ‘Decoding the Universe: Cosmos’ PBS NOVA Special (2024), [Fermilab Youtube](#) (2022), ‘Ancient Skies’ PBS Documentary Series (2019), ‘The Stream: Dark Matter’, Al Jazeera (2018)

**In print:** 5 articles, inc. BBC Science Focus Cover Story, [Trinity College Magazine](#), & [Caribbean press](#).

**On stage:** >20 talks inc. Museum of Modern Art, British Science Festival, New Scientist Live’, Royal Astronomical Society & [Stanford’s Discover Our Universe](#)

**In schools:** Most enjoyably, I’ve spoken at many high schools, particularly in the Caribbean.

**Social Media:** [@darkenergysurvey](#) SciComm takeover, 300% increase in engagement in 1 month 2020

## Publication List

---

Since the start of my PhD in 2015, I have authored a total of 141 papers in peer-reviewed journals with a total of 9,340 citations (h-index of 47).

Papers led or played a leading role: \* indicates work led by a student I advised

- [1] \***Bigwood, L.**, et al. 2025, submitted to MNRAS. [The case for large-scale AGN feedback in galaxy formation simulations: insights from XFABLE](#)
- [2] \***McCullough, J.**, & **Amon, A.** et al. 2024, submitted to Phys. Rev. Letters. [Dark Energy Survey Year 3: Blue shear](#)
- [3] McCarthy, I., & **Amon, A.** et al. 2024, submitted to MNRAS. [FLAMINGO: combining kinetic SZ effect and galaxy-galaxy lensing measurements to gauge the impact of feedback on large-scale structure](#)

- [4] **\*Bigwood, L., Amon, A.,** & Schneider, A. et al. 2024, MNRAS. [Weak lensing combined with the kinetic Sunyaev Zel'dovich effect: A study of baryonic feedback](#)
- [5] **\*Thornton, J., Amon, A.,** & Wechsler, R. et al. 2024, MNRAS. [The mass profiles of dwarf galaxies from Dark Energy Survey lensing](#)
- [6] **\*Preston, C., Amon, A.,** & Efstathiou, G. 2024, MNRAS. [Reconstructing the matter power spectrum with future cosmic shear surveys](#)
- [7] **\*McCullough, J., Gruen, D., Amon, A.,** et al. 2023, MNRAS. [DESI Complete Calibration of the Color-Redshift Relation \(DC3R2\): Results from early DESI data](#)
- [8] **\*Preston, C., Amon, A.,** & Efstathiou, G. 2023, MNRAS. [A non-linear solution to the S8 tension - II. Analysis of DES Year 3 cosmic shear](#)
- [9] Dark Energy Survey & Kilo-Degree Survey Collaborations, 2023, Open Journal. [DES Y3 + KiDS-1000: Consistent cosmology combining cosmic shear surveys](#)
- [10] **Amon, A.,** & Efstathiou, G. 2022, MNRAS. [A non-linear solution to the  \$S\_8\$  tension?](#)
- [11] **Amon, A.,** Robertson, N. C., Miyatake, H., et al. 2022, MNRAS. [Consistent lensing and clustering in a low- \$S\_8\$  Universe with BOSS, DES Year 3, HSC Year 1 and KiDS-1000](#)
- [12] Dark Energy Survey Collaboration 2022, Phys. Rev. D, 105, 023520. [Dark Energy Survey Year 3 results: Cosmological constraints from galaxy clustering and weak lensing](#)
- [13] **Amon, A.,** Gruen, D., Troxel, M. A., et al. 2022, Phys. Rev. D, 105, 023514. [Dark Energy Survey Year 3 results: Cosmology from cosmic shear and robustness to data calibration](#)
- [14] Leauthaud, A., **Amon, A.,** Singh, S., et al. 2022, MNRAS, 510, 6150. [Lensing without borders - I. A blind comparison of the amplitude of galaxy-galaxy lensing between independent imaging surveys](#)
- [15] Hartley, W. G., Choi, A., **Amon, A.,** et al. 2022, MNRAS, 509, 3547. [Dark Energy Survey Year 3 Results: Deep Field optical + near-infrared images and catalogue](#)
- [16] Jarvis, M., Bernstein, G. M., **Amon, A.,** et al. 2021, MNRAS, 501, 1282. [Dark Energy Survey year 3 results: point spread function modelling](#)
- [17] **\*Myles, J.,** Alarcon, A., **Amon, A.,** et al. 2021, MNRAS, 505, 4249. [Dark Energy Survey Year 3 results: redshift calibration of the weak lensing source galaxies](#)
- [18] Dark Energy Survey Collaboration 2022, VizieR Online Data Catalog, II/371. [VizieR Online Data Catalog: The Dark Energy Survey \(DES\): Data Release 2 \(Abott+, 2021\)](#)
- [19] MacCrann, N., Becker, M. R., **\*McCullough, J., Amon, A.,** et al. 2022, MNRAS, 509, 3371. [Dark Energy Survey Y3 results: blending shear and redshift biases in image simulations](#)
- [20] Gatti, M., Sheldon, E., **Amon, A.,** et al. 2021, MNRAS, 504, 4312. [Dark energy survey year 3 results: weak lensing shape catalogue](#)
- [21] **Amon, A.,** Bechtol, K., Connolly, A. J., et al. 2020, arXiv e-prints, arXiv:2010.15318. [Recommended Target Fields for Commissioning the Vera C. Rubin Observatory](#)
- [22] **Amon, A.,** Blake, C., Heymans, C., et al. 2018, MNRAS, 479, 3422. [KiDS+2dFLenS+GAMA: testing the cosmological model with the  \$E\_G\$  statistic](#)
- [23] **Amon, A.,** Heymans, C., Klaes, D., et al. 2018, MNRAS, 477, 4285. [KiDS-i-800: comparing weak gravitational lensing measurements from same-sky surveys](#)