

Alexandra Amon

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Research

- Sep 2021 – present **Senior Kavli Fellowship, Cambridge University**
Senior Research Fellow, Trinity College, Cambridge
- Sep 2018 – 2021 **Kavli Fellowship, Stanford University / SLAC National Accelerator Laboratory**
- Jun 2013 – Aug 2013 **Summer research scholarship, Imperial College London**
Advisor: Prof. A. Heavens
- Jun 2012 – Aug 2012 **Royal Society Summer Fellowship, University of Edinburgh**
Advisors: Dr T. Kitching, Dr M. Viola

Education

- Sep 2014 – Aug 2018 **Ph.D. Physics, University of Edinburgh**
“Weak lensing with the ESO Kilo-Degree Survey”
Supervisors: Prof. C. Heymans, Prof. C. Blake
- Sep 2009 – Jun 2014 **Master of Physics, University of Edinburgh - First Class with Honours**
“Scalar Field Dark Energy”
Supervisor: Prof. A. Taylor

Honours and Grants

Caroline Herschel Prize Lectureship	2022
Fermilab Tollestrup Award	2022
Cambridge Astronomy Kavli Workshop Funding	2021
Paczynski Visiting Fellowship, Princeton	2021
Kavli Fellowship, Cambridge University	2018
Princeton Rising Star in Physics (*postponed to 2022)	2020
Stanford Innovative Proposal for Program for Astrophysics Visitors Exchange at Stanford*	2019
Royal Astronomical Society’s Michael Penston Thesis Prize	2019
Institute of Physics Jocelyn Bell Burnell Medal and Prize Runner-up	2019
Kavli Fellowship, Stanford University	2018
SUPA Short-Term Travel Grant	2018
LSST Data Science Fellowship Programme	2017
Best Conference Talk, DEX XIII conference	2017
STFC PhD Studentship	2014
Imperial College Summer Scholarship	2013
Royal Society Summer Research Fellowship, University of Edinburgh	2012
National Scholarship from Trinidad and Tobago for Undergraduate Degree	2009
Scholar, International Summer School for Young Physicists, Perimeter Institute	2008
Euler Award, Trinidad and Tobago Mathematics Olympiad	2007

Research Achievements

- Co-lead the Dark Energy Survey weak lensing working group, coordinating >100 members and a ten analysis teams for the Year 6 analysis
- Played a pivotal role in the Dark Energy Survey Year 3 combined lensing and clustering cosmology analysis, leading the weak lensing results and coordinating three analysis teams to the most precise cosmological constraints of its kind [DES Collaboration 2021; Amon+2021a].

- Developed and applied leading methods for weak lensing shear systematics and blending [Amon+2017; Gatti, Sheldon, Amon+2020; Jarvis, Bernstein, Amon+2020; MacCrann, Becker, McCullough, Amon+2020] and the redshift calibration through the development of custom machine learning architectures, based on self-organizing maps [Myles, Alarcon & Amon+2020]
- Experience with image-level data, through co-leading the processing of deep imaging fields for the Dark Energy Survey [Hartley, Choi & Amon+2020] and the single band Kilo-Degree Survey [Amon+2017]
- Pioneered the Lensing Without Borders cross-survey collaboration to test the consistency of weak lensing results [Amon+2017; Leauthaud & Amon+2021; Amon & Robertson+2022]
- Performed a combined probe test of General Relativity (E_G) with weak-lensing and spectroscopic data [Amon+2018]

Selected Talks

(Invited) Colloquium: On weak lensing cosmological tensions, NASA Jet Propulsion Lab/Caltech	11/2022
(Invited) Colloquium: On weak lensing cosmological tensions, LMU, Munich	10/2022
(Invited) Colloquium: Dark Energy Survey - Pixels to Cosmology, ETH	09/2022
(Invited) Colloquium: Dark Energy Survey - Pixels to Cosmology, Zurich	09/2022
Invited Conference: <i>Tensions in Cosmology</i> , Corfu, Greece	09/2022
Invited Conference: <i>IAU Consensus Cosmic Shear in the 2020s</i> , Busan, South Korea	08/2022
Invited Conference: <i>Intriguing inconsistencies in the growth of structure over cosmic time</i> , Sesto, Italy	07/2022
(Invited) Plenary: Dark Energy Survey - Pixels to Cosmology, Advanced Euclid School	06/2022
(Invited) Plenary: Dark Energy Survey - Pixels to Cosmology, Fermilab Annual Meeting	05/2022
(Invited) Plenary: Dark Energy Survey - Pixels to Cosmology, IberiCOS	05/2022
(Invited) Colloquium: On weak lensing cosmological tensions, Durham	05/2022
(Invited) Plenary: Dark Energy Survey - Pixels to Cosmology, Euclid Consortium Annual Meeting	04/2022
(Invited) Colloquium: Dark Energy Survey - Pixels to Cosmology, Newcastle	03/2022
(Invited) Colloquium: Towards Weak Lensing with Rubin, SLAC	03/2022
(Invited) Plenary: Lessons learned from the Dark Energy Survey, Dark Energy Science Collaboration Meeting	03/2022
Invited Conference: <i>Dutch Theoretical Cosmology meeting</i> , Netherlands	01/2022
(Invited) Colloquium: On weak lensing cosmological tensions, Institute for Advanced Study , Princeton	11/2021
(Invited) Royal Astronomical Society: Dark Energy Survey Cosmology Overview , UK	11/2021
(Invited) Colloquium: On weak lensing cosmological tensions, Arizona	09/2021
(Invited) Colloquium: DES: From Pixels to Cosmology, Swinburne, Australia	07/2021
(Invited) Cosmology Seminar: DES: From Pixels to Cosmology, Princeton, NJ	07/2021
(Invited) Particle Astrophysics and Cosmology Seminar: DES Pixels to Cosmology, Imperial College UK	06/2021
(Invited) Cosmology Seminar: DES: From Pixels to Cosmology, Queen Mary University	06/2021
(Invited) Cosmology Seminar: DES: From Pixels to Cosmology, Berkeley, CA	06/2021
(Invited) Colloquium: DES: From Pixels to Cosmology, Stanford, CA	05/2021
Press release: Dark Energy Survey Year 3 weak lensing and clustering cosmology results	05/2021
(Invited) American Physical Society: DES Cosmology Overview, USA	04/2021
(Invited) Cosmology Colloquium: DES: From Pixels to Cosmology, SLAC	03/2021
(Invited) Meeting on Cosmology at the Crossroads : DES Cosmology, Tehran	02/2021
(Invited) American Astronomical Society: DES Cosmology Overview, USA	01/2021
(Invited) Cosmology Seminar: DES: From Pixels to Cosmology, Cambridge, UK	12/2020
(Invited) Latin American Workshop on Observational Cosmology : DES: From Pixels to Cosmology	12/2020
(Invited) Cosmology Seminar: DES: From Pixels to Cosmology, Oxford, UK	11/2020
(Invited) Astrophysics and Cosmology Seminar: Robust Cosmology from DES , Harvard, MA	11/2020
(Invited) Dark Energy Science Collaboration Seminar: Lessons learned from DES Redshifts	10/2020
(Invited) Cosmology Seminar: DES Cosmology Overview, Fermilab, IL	08/2020
Cosmology From Home: DES weak lensing systematics	08/2020
(Invited) Dark Energy Science Collaboration Seminar: Lessons learned from DES Deep Fields	07/2020
KITP Galaxy Halo Connection: Lensing without Borders, USA	01/2020

Texas Symposium, DES Cosmic Shear, Portsmouth, UK	12/2019
Royal Society Ancient Heavens, Lensing without borders, London, UK	03/2019
BCCP Lensing: Lensing without borders, Berkeley, CA	01/2019
(Invited) LSST DESC meeting: KiDS Cosmology Overview, SLAC, CA	03/2018
Dark Universe: Testing gravity with KiDS, Garching, Germany	11/2017
(Invited) Cosmology seminar: KiDS Cosmology Overview, UC Berkeley	10/2017
(Invited) Dark Sector seminar: KiDS Cosmology Overview, NASA JPL	09/2017
(Invited) KIPAC Tea talk: : Testing gravity with KiDS, Stanford	09/2017
Cosmology seminar, UC Santa Cruz	08/2017
Observations in Cosmology: Comparing same-sky lensing data, Benasque, Spain	08/2017
DEX XIII: KiDS Cosmology Overview, Edinburgh, UK	01/2017
GravLens: Comparing same-sky lensing datam Leiden, Netherlands	07/2016
KiDS-GAMA-VIKING: Testing gravity with KiDS, Edinburgh, UK	05/2016
2dFLenS-OzDES Meeting: Testing gravity with KiDS, Swinburne, Australia	03/2015

Leadership positions

[Dark Energy Survey Weak lensing Coordinator](#) (2021 - on-going)

[Dark Energy Survey Builder](#) (2020 - on-going)

[Dark Energy Survey Team Coordinator for 1. Cosmic Shear 2. Deep Fields and 3. Shear Testing](#) (2018 - 2021)

Commissioning co-Liason with Tony Tyson between Rubin, DESC and the Weak Lensing group (2018 - on-going)

Kilo-Degree Survey Analysis Team Coordinator - bright-time data (2014 - 2016)

Teaching and Mentoring

Supervised and co-supervised 8 scientists at the undergraduate to doctoral level:

Calvin Preston, PhD Cambridge (2022 start)

Andresa Campos, PhD CMU, *“Photometric redshift estimation with machine learning”* (2022 - on-going)

Elisa Legnani, MSc LMU, *“Forward modelling intrinsic alignments”* (2021 - 2022)

Theo Schutt, PhD Stanford, *“Salvaging bluer photometric bands for imaging surveys”* (2021 - on-going)

Nisha Grewal, PhD University of Edinburgh, *“Cosmology with new estimators”* (2021 - on-going)

Jamie McCullough, PhD Stanford, *“Understanding blending in crowded images”* (2020 - on-going)

Justin Myles, PhD Stanford, *“Photometric redshift estimation with machine learning”* (2018 - on-going)

Sana Gabriel, BSc University of the West Indies, *“Understanding AGN with weak lensing”* (2019 - 2020)

Tutoring: *Fourier Analysis & Statistics, General Relativity* University of Edinburgh (2014 - 2017)

Science Communication

Instagram SciComm with > 2000 followers, mostly females from the Caribbean [@astroalexamon](#) (2018 - on-going)

Public Frontiers Lecture, American Museum of Natural History (2022)

New Scientist Live, London (2022)

[The Fountain](#), Trinity College Cambridge Alumni Magazine Article (2022)

‘Friends of the Extreme Universe’ Lecture, London Financial Group (2022)

Career Day, From the Caribbean to the Stars, NIHERST, Trinidad (2022)

School Lecture, From the Caribbean to the Stars, Naparima Girls, Trinidad (2022)

School Lecture, From the Caribbean to the Stars, St. Joseph’s Convent, Trinidad (2022)

School Lecture, From the Caribbean to the Stars, International School, Trinidad (2022)

New Scientist Instant Expert Lecture, The Dark Energy Survey, London (2022)

[Youtube with Dr. Becky](#), ‘Dark matter: smooth or clumpy?!’
[Fermilab Youtube](#), ‘Exploring 7 billion light years of space with the Dark Energy Survey’
[Public Lecture, Mt Tam Astronomy Program \(MTAP\) lectures: The Dark Energy Survey](#) (2021)
 Dark Energy Survey SciComm takeover, 300% increase in engagement in one month: [@darkenergysurvey](#) (2020)
 She Can STEM Webinar panelist (2020)
[Public Lecture, Stanford University’s Discover Our Universe Series: The Dark Energy Survey](#) (2020)
 Public Lecture, University of the West Indies: The Dark Energy Survey (2020)
 University of Central Florida COMPASS career-planning panelist (2020)
[Caribbean STEM media article](#) (2020)
 Career and STEM inspiration discussion - with Plumstead Manor Girls High School, London (2020)
 IOP Jocelyn Bell Burnell Prize Finalist Lecture (2019)
 ‘Ancient Skies’ PBS Documentary Series (2019)
 ‘The Stream’, Al Jazeera, Dark Matter edition (2018)
 Fermilab’s ‘Symmetry’ magazine article (2018)
 ‘Space Shed’ event and podcast (Fall 2018)
 Re-designed delivered the Office of Life Long Learning’s Course, “*The Distant Universe*” (2015 - 2018)
 ‘Women Are Boring’ magazine article (2018)
 ‘Shining Light on Dark Matter’ documentary (2018)
 ‘Astronomy on Tap’ speaker, Edinburgh (2018)
 Royal Observatory Edinburgh’s Winter Talk (2017)
 Scotland Girl Guiding science session (2017)
 Organiser for ‘Pint of Science’, Edinburgh (2017)
 Scottish Astronomical Society lecture, Aberdeen (2016)
 ‘What’s Up’ Lecture, Edinburgh (2016)
 ROE Open Day speaker, Edinburgh (2014-2016)
 UoE Physics Undergrads visit high schools (2011-2012)

Diversity and Inclusion

Co-founder, PAVES Program - hosting researchers from under-represented countries at Stanford	2020 - 2021
Advisor for Stanford, KIPAC’s Pilot Programme on STEM coding for high-school students	2020
Mentor, CariScholar	2020 - on-going
Mentor and Board of Directors, Brightest Stars Foundation	2017 - 2019
KIPAC, Co-author of Department Code of Conduct	2020
KIPAC, Stanford Graduate Admissions Review Panel	2020
Science Policy: Early-career delegate for Astro2020 Decadel Survey	2018

Professional Service

Cambridge Cosmology Group Co-organiser (202-on-going)
 NASA Astrophysics Data Analysis Program panel reviewer (2021)
 KIPAC, Stanford Tea Talk organiser (2020 - 2021)
 KIPAC, Stanford Cosmology Seminar organiser (2018 - 2020)
 Lorentz Centre, Leiden Bridging Gaps Between Dynamical Probes of Galaxies SOC co-chair (2020)
[BCCP Accurate lensing in the era of precision Cosmology](#) SOC co-chair (2019)
 >15 nights of telescope observing at CTIO and AAT

Publications

Since the start of my PhD in Sept 2014, I have authored a total of 91 papers in international peer-reviewed journals with a total of 3,885 citations (h-index of 31).

Papers led or played a leading role (first, second or third author papers):

* indicates work led by a student I advised or co-advised

- [1] **Amon, A.** and Efstathiou, G. (2022); submitted to MNRAS;
A non-linear solution to the S_8 tension?
- [2] **Amon, A.** and Robertson, N., et al. (2021); submitted to MNRAS;
Consistent Lensing and Clustering in a Low- S_8 Universe
- [3] Dark Energy Survey Collaboration (2021); Physical Review D.;
Dark Energy Survey Year 3 Results: Cosmology Constraints from Weak Lensing and Clustering Measurements
- [4] **Amon, A.** et al. (2021); Physical Review D.;
Dark Energy Survey Year 3 Results: Robust cosmology from cosmic shear
- [5] Leauthaud, A. and **Amon, A.**, et al (2021); MNRAS;
Lensing Without Borders I. A Blind Comparison of the Amplitude of $\Delta\Sigma$ Across Lensing Surveys
- [6] ***Myles, J.**, Alarcon, A., **Amon, A.** et al (2020); MNRAS;
Phenotypic redshifts with self-organizing maps: A novel method to characterize redshift distributions of source galaxies for weak lensing
- [7] Hartley, W., Choi, A., **Amon, A.** et al. (2020); MNRAS;
Dark Energy Survey Year 3 Results: Deep Field Optical + Near-Infrared Images and Catalogue
- [8] *MacCrann, N., Becker, M., ***MacCullough, J.**, **Amon, A.** et al. (2020); MNRAS;
Dark Energy Survey Year 3: Blending shear and redshift biases in image simulations
- [9] Jarvis, M., Bernstein, G., **Amon, A.** et al. (2020); MNRAS;
Dark Energy Survey Year 3 Results: Point-Spread Function Modeling
- [10] Gatti, M., Sheldon, E., **Amon, A.** et al. (2020); MNRAS
Dark Energy Survey Year 3 Results: Weak lensing shape catalogue
- [11] **Amon, A.** et al (2020) [non-refereed]
Recommended Target Fields for Commissioning the Vera C. Rubin Observatory
- [12] **Amon, A.**; Blake, et al. (2018); MNRAS;
KiDS + 2dFLenS + GAMA: Testing the cosmological model with the E_G statistic
- [13] **Amon, A.**; Heymans, C.; Klaes, D.; Erben, T., et al. (2017); MNRAS;
KiDS-i-800: Comparing weak gravitational lensing measurements in same-sky surveys

Selected papers as part of main science team (with substantial contribution):

- [1] Doux, C. et al. (2022); MNRAS;
Dark Energy Survey Year 3 results: cosmological constraints from the analysis of cosmic shear in harmonic space
- [2] Cordero, J. P. et al. (2021); MNRAS;
Dark Energy Survey Year 3 results: Marginalisation over redshift distribution uncertainties using ranking of discrete realisations