

Alexandra Amon

Senior Kavli Fellow
Trinidadian/British
amonalexandra@gmail.com

Kavli Institute for Cosmology Cambridge
c/o Institute of Astronomy
Madingley Road
Cambridge
CB3 0HA, UK

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

Honours and Grants

Cambridge Astronomy Kavli Workshop Funding	2021
Paczynski Visiting Fellowship, Princeton	2021
Panofsky Fellowship, SLAC (declined)	2021
Henry Norris Russell and Future Faculty Fellowships, Princeton (declined)	2021
Princeton Rising Star in Physics (*postponed due to covid-19)	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 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) Colloquium: On weak lensing cosmological tensions, LMU, Munich	03/2022
(Invited) Colloquium: Dark Energy Survey - Pixels to Cosmology, NASA Jet Propulsion Lab/Caltech	02/2022
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 data 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 6 scientists at the undergraduate to doctoral level:

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)

Angus Cameron, MSc University of Edinburgh, “*Lensing with troughs*” (2017 - 2018)

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)

New Scientist Instant Expert Lecture, London (2022)

Public Frontiers Lecture with the American Museum of Natural History (2022)

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

[Youtube with Dr. Becky](#), ‘Dark matter: smooth or clumpy?!’, 172K views

[Fermilab Youtube](#), ‘Exploring 7 billion light years of space with the Dark Energy Survey’, 55K views

[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

NASA Astrophysics Data Analysis Program panel reviewer	2021
Co-founder, PAVES Program - hosting researchers from under-represented countries at Stanford	2020 - 2021
'We Code' ambassador - Advocating for teaching coding in the Caribbean	2020 - on-going
Advisor for Stanford, KIPAC's Pilot Programme on STEM coding for high-school students	2020 - on-going
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 Decadal Survey	2018

Professional Service

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

References

Prof. G. Efstathiou, Cambridge University gpe@ast.cam.ac.uk
Professor of Astrophysics, FRS

Prof. R. Wechsler, Stanford University rwechsler@stanford.edu
Director of the Kavli Institute of Particle Astrophysics and Cosmology and Professor

Prof. S. Dodelson, Carnegie Mellon University sdodelso@andrew.cmu.edu
Department Head at Carnegie Mellon University and Dark Energy Survey Science Chair

Prof. C. Heymans, University of Edinburgh cech@roe.ac.uk
Astronomer Royal for Scotland, Director of the German Centre for Cosmological Lensing

Prof. M. Troxel, Duke University michael.troxel@duke.edu
Dark Energy Survey Year 3 Project Coordinator.

Publications

Since the start of my PhD in Sept 2014, I have authored a total of 65 papers in international peer-reviewed journals with a total of 2,873 citations (h-index of 26).

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 Robertson, N., et al (in DES internal review)
Consistent Lensing and Clustering in a Low- S_8 Universe
- [2] Dark Energy Survey Collaboration (2021); Physical Review D.;
Dark Energy Survey Year 3 Results: Cosmology Constraints from Weak Lensing and Clustering Measurements
- [3] **Amon, A.** et al. (2021) ; Physical Review D.;
Dark Energy Survey Year 3 Results: Robust cosmology from cosmic shear
- [4] 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
- [5] ***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
- [6] Hartley, W., Choi, A., **Amon, A.** et al. (2020); MNRAS;
Dark Energy Survey Year 3 Results: Deep Field Optical + Near-Infrared Images and Catalogue
- [7] ***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
- [8] Jarvis, M., Bernstein, G., **Amon, A.** et al. (2020); MNRAS;
Dark Energy Survey Year 3 Results: Point-Spread Function Modeling
- [9] Gatti, M., Sheldon, E., **Amon, A.** et al. (2020); MNRAS
Dark Energy Survey Year 3 Results: Weak lensing shape catalogue
- [10] **Amon, A.** et al (2020) [non-refereed]
Recommended Target Fields for Commissioning the Vera C. Rubin Observatory
- [11] **Amon, A.**; Blake, et al. (2018); MNRAS 479, 3422;
KiDS + 2dFLenS + GAMA: Testing the cosmological model with the E_G statistic
- [12] **Amon, A.**; Heymans, C.; Klaes, D.; Erben, T., et al. (2017); MNRAS, 477, 4285;
KiDS-i-800: Comparing weak gravitational lensing measurements in same-sky surveys