ALEX JAMES CAMERON

CURRICULUM VITAE

RESEARCH INTERESTS

Gas-phase metallicity, mass-metallicity relation, ISM properties from emission line spectroscopy, high-redshift galaxies, galaxy evolution, IFU spectroscopy, galactic outflows, outflow metallicity, baryon cycle

EDUCATION

Doctor of Philosophy – Science (Astrophysics)
School of Physics, The University of Melbourne
Feb 2017 – Feb 2021
Conferred on 5 March 2021

Principal supervisor: A/Prof. Michele Trenti
Co-supervisor: Dr. Tiantian Yuan (Swinburne University of Technology)

Thesis: *Observational methods towards constraining the chemical evolution of galaxies* (https://minerva-access.unimelb.edu.au/handle/11343/262682)

Thesis topics: Galaxy evolution, gas-phase metallicity, high-redshift observations, mass-metallicity relation, metallicity gradients

Master of Science (Chemistry)
School of Chemistry, The University of Melbourne
Feb 2014 – Dec 2015
Overall grade: 87.6
Recipient of Ronald Riseborough Award for best thesis in Applied Chemistry

Bachelor of Science
The University of Melbourne
Mar 2011 – Dec 2013
First Class Honours average

PROFESSIONAL APPOINTMENTS

2021 – present	Postdoctoral Research Assistant, Department of Physics, University of Oxford
2017 – 2021	Graduate student researcher, School of Physics, Uni. Melbourne
2018 – 2019	Laboratory coordinator (First year undergraduate astronomy: “From the Solar System to the Cosmos”), Uni. Melbourne
2017 – 2019	Demonstrator (First year undergraduate astronomy: “From the Solar System to the Cosmos”), Uni. Melbourne
2014 – 2015	Graduate student researcher, School of Chemistry, Uni. Melbourne
2015	Undergraduate Tutor, Ormond College, Uni. Melbourne
2014	Demonstrator (Chemistry 1), Uni. Melbourne

DATA & OBSERVING EXPERIENCE

Proposals

VLT/KMOS	Program ID: 0104.B-0566; **PI: Cameron**
	Awarded 2 nights, Visitor Mode
VLT/X-SHOOTER	Program ID: 109.23E3; **PI: Cameron**
	11.9 hours, Service Mode, Priority B

Observing experience

VLT/KMOS	2 nights	Oct 2019	Visitor Mode as PI
Keck/KCWI	2 nights	Jun 2018	Remote; assisting
Keck/ESI	1 half-night	Nov 2018	Remote; assisting
Keck/MOSFIRE	1 half-night	Aug 2019	Remote; assisting

Data reduction & Analysis

Keck/MOSFIRE near-IR slit spectroscopy, **VLT/KMOS** near-IR IFU spectroscopy,
HST/WFC3 optical/near-IR imaging, **SAMI** optical IFU spectroscopy,
Keck/KCWI optical IFU spectroscopy

AWARDS

2020	Faculty of Science Postgraduate Writing-Up Award
2018	Dr Alan Kenneth Head Travelling Scholarship
2017 – 2020	Australian Government Research Training Program (RTP) Scholarship
2015	Ronald Riseborough Prize for best thesis in Applied Chemistry
2011 – 2013	Undergraduate awards: Ormond Scholar, Katie Lush Award

CONFERENCES, WORKSHOPS & VISITS

Dec 2021	BRIDGCE UK Annual Meeting	Online
Nov 2021	SAZERAC: Early Galaxy Formation Near and Far - Preparing for a Long Journey with JWST	Online
Sep 2021	Spatially Resolved Spectroscopy with ELTs (Oxford, UK)	Online via Zoom
Jul 2021	National Astronomy Meeting 2021 (Bath, UK)	Online via Zoom
May 2021	III Workshop Chemical Abundances in Gaseous Nebulae (UniVap, Brazil)	Online via Zoom
Jan 2021	KITP Fundamentals of Gaseous Halos	Online
Dec 2020	1st Australian BlueMUSE Science Workshop	Online via Zoom
Oct 2020	The Rise of Metals and Dust in Galaxies through Cosmic Time (Marseille, FR)	Online via Zoom
Jul 2020	Astronomical Society of Australia ASM	Online via Zoom
Mar 2020	ASTRO 3D Proposal Writing Workshop	Melbourne, AU
Nov 2019	ASTRO 3D Centre Retreat	Melbourne, AU

May 2019	Metals in Galaxies near and far: Looking ahead	Leiden, NL
Feb 2019	ASTRO 3D Galaxy Evolution Busy Week	Melbourne, AU
Nov 2018	SciCoder Workshop	Melbourne, AU
Nov 2018	ASTRO 3D Centre Retreat	Perth, AU
Jun 2018	Department visit hosted by Prof. Tucker Jones	UC Davis, CA, USA
Jun 2018	Summer School in Statistics for Astronomers XIV	Penn. State, PA, USA
Apr 2018	Observational Techniques in Astronomy Workshop	Sydney, AU
Nov 2017	ASTRO 3D Centre Retreat	Sydney, AU
Jul 2017	Astronomical Society of Australia ASM	Canberra, AU
Jul 2017	Harley Wood School of Astronomy	Canberra, AU

TALKS

Dec 2021	**Talk:** *"Unveiling the chemical evolution of galaxies in the early Universe with JWST: the JADES and GA-IFU programs."*	
	BRIDGCE UK Annual Meeting	Online via Zoom
Oct 2021	**Colloquium:** *"Measuring the chemical abundances of galaxies and their outflows"*	
	Oxford Astrophysics Colloquium Series	University of Oxford
Sep 2021	**Talk:** *"Mapping CGM metallicity throughout the haloes of galaxies: Critical constraints on the baryon cycle"*	
	Spatially Resolved Spectroscopy with ELTs	Online via Zoom
Jul 2021	**Talk:** *"Mapping direct method metallicity throughout the baryon cycle in Mrk 1486"*	
	National Astronomy Meeting 2021 (Bath, UK)	Online via HopIn
May 2021	**Talk:** *"Mapping electron temperature along the minor- and major-axes in Mrk 1486"*	
	III Workshop Chemical Abundances in Gaseous Nebulae (UniVap, Brazil)	Online via Zoom
Feb 2021	**Recorded Talk:** *"Mapping extra-planar electron temperature in MRK1486 in the DUVET survey"*	*t*
	Recording: https://youtu.be/GzSWN17WYw0	
	KITP Fundamentals of Gaseous Halos	Online (Slack / YouTube)
Oct 2020	**Talk:** *"Mapping electron temperature in galaxies with [OIII] λ4363"*	
	1st Australian BlueMUSE Science Workshop	Online via Zoom
Nov 2020	**Ph.D. Completion Seminar:** *"Probing the chemical evolution of galaxies with emission lines"*	Uni. Melbourne, Australia
Oct 2020	**Talk:** *"Spatially Resolved Direct Method Metallicities in the SAMI Galaxy Survey"*	

	The Rise of Metals and Dust in Galaxies through Cosmic Time (Marseille, FR)	Online via Zoom
Jul 2020	**Talk:** *"Spatially Resolved Direct Method Metallicities in the SAMI Galaxy Survey"* Astronomical Society of Australia Annual Scientific Meeting	Online via Zoom
Mar 2020	**Invited talk:** *"Leading Proposals as a Student"* Proposal Writing Workshop	Swinburne, Australia
Sep 2018	Geoff Opat Seminar Series	Uni. Melbourne, Australia
Feb 2018	Confirmation Seminar	Uni. Melbourne, Australia

SERVICE & TEACHING

2021 – present	Organiser: Galaxies Journal Club (Department of Physics, Oxford)
2018 – 2019	Laboratory Coordinator – First year undergraduate astronomy (Uni. Melbourne)
2017 – 2019	Laboratory Demonstrator – First year undergraduate astronomy (Uni. Melbourne)
Aug 2019	Guest Lecturer: "Light" – First year undergraduate astronomy (Uni. Melbourne)
Jul 2019	Work Experience Program (Uni. Melbourne) – Volunteer: "Astronomical Imaging with iTelescope"
Jun 2019	Developed work experience activity "Astronomical Imaging with iTelescope"
Jul 2018	Developed content for two undergraduate practical classes: "Understanding the Solar System with Kepler's Laws" "Introduction to Astronomical Imaging"
Mar 2018	Harley Wood School of Astronomy – Scientific Organising Committee Member
Jul 2017	Work Experience Program (Uni. Melbourne) – Volunteer: "Introduction to computer programming"

OUTREACH & PUBLIC TALKS

Dec 2021	YouTube Interview with "Dr. Becky" – *"The first data from the James Webb Space Telescope (ft. Dr Alex Cameron)"* (YouTube: https://www.youtube.com/watch?v=oVkDiQjaNFg)
Jun 2021	"Passport to the Solar System" (University Parks, Oxford, UK) — Station leader
Aug 2020	ASTRO 3D Astro in the Home YouTube Series – "Doppler Redshift with Slinkies" (YouTube: https://youtu.be/dzw5BDyjuy0)
Aug 2019	National Science Week, Public Talk (Coburg Primary School) – "Night sky tour"
Feb 2019	School of Physics Outreach Representative aboard "Antarctica Flights" flight over Cape Adare, Antarctica
Nov 2019	Organiser: Astronomy in the Pub (Melbourne)
Sep 2018	ASTRO 3D Astronomer in Residence at Uluru
May 2018	Stargazing Live World Record Attempt, Public Talk (Gisborne Secondary College)
2017 – 2019	Telescopes in Schools volunteer

PRESS RELEASES

Sep 2021 "Galaxies pump out contaminated exhausts"

Press release based on my first author paper (*"The DUVET Survey: Direct Te-based Metallicity Mapping of Metal-enriched Outflows and Metal-poor Inflows in Markarian 1486"*) resulted in numerous published articles and several radio interviews.

Selected news articles:

"Galaxies expel murkier gas than they take in" (Cosmos Magazine)
https://cosmosmagazine.com/space/galaxies-expel-murkier-gas-than-they-take-in/

"Look: How the explosive death of stars pollutes the galaxy" (Inverse)
https://nc.inverse.com/science/galaxies-release-gas-that-pollutes-their-environment

PUBLICATIONS

Refereed papers – First author

Cameron, Alex J.; Fisher, Deanne B.; McPherson, Daniel; Kacprzak, Glenn G.; Berg, Danielle A.; Bolatto, Alberto; Chisholm, John; Herrera-Camus, Rodrigo; Nielsen, Nikole M.; Reichardt Chu, Bronwyn; Rickards Vaught, Ryan J.; Sandstrom, Karin; Trenti, Michele; *"The DUVET Survey: Direct Te-based metallicity mapping of metal-enriched outflows and metal-poor inflows in Mrk 1486"*; 2021, *ApJ*, 918, 16
(DOI: 10.3847/2041-8213/ac18ca)

Cameron, Alex J.; Yuan, Tiantian; Trenti, Michele; Nicholls, David C.; Kewley, Lisa J.; *"Spatially resolved direct method metallicity in a high-redshift analogue local galaxy: temperature structure impact on metallicity gradients"*; 2021, *MNRAS*, 501, 3695
(DOI: 10.1093/mnras/staa3757)

Cameron, Alex J.; Jones, Tucker; Yuan, Tiantian; Trenti, Michele; Bernard, Stephanie; Henry, Alaina; Hoag, Austin; Vulcani, Benedetta; *"Prospects for Extending the Mass-Metallicity Relation to Low Mass at High Redshift: A Case Study at z~1"*; 2019, *ApJ*, 882, 116
(DOI: 10.3847/1538-4357/ab33fd)

Cameron, Alex J.; Trenti, Michele; Livermore, Rachael C.; van der Velden, C.; *"Observational determination of the galaxy bias from cosmic variance with a random pointing survey: Clustering of z~2 galaxies from Hubble's BoRG survey"*; 2019, *MNRAS*, 483, 1922
(DOI: 10.1093/mnras/sty3069)

Refereed papers – Second author

Metha, Benjamin; **Cameron, Alex J.**; Trenti, Michele; *"A novel approach to investigate chemical inhomogeneities in GRB host galaxies: The Z_{abs}–Z_{emiss} relation"*; 2021, *MNRAS*, 504, 5992
(DOI: 10.1093/mnras/stab892)

Refereed papers (Chemistry; from Masters research)

Cameron, A.; Fisher, B.; Rizzacasa, M. A.; **"***A four step synthesis of violaceic acid"*; Tetrahedron, 2018 (DOI: https://doi.org/10.1016/j.tet.2017.10.071)

Cameron, A.; Fisher, B.; Fisk, N; Hummel, J; White, J. M.; Krenske, E. H.; Rizzacasa, M. A.; *"Towards the Synthesis of Dihydrooxepino[4,3-b]pyrrole Containing Natural Products via Cope Rearrangement of Vinyl Pyrrole Epoxides"*; Organic Letters, 2015
(DOI: https://doi.org/10.1021/acs.orglett.5b02965)