

Denis Erkal

Curriculum Vitae

CONTACT INFORMATION	Department of Physics University of Surrey Guilford GU2 7XH	office: 12 BC 03 phone: (01223) 764612 e-mail: d.erkal@surrey.ac.uk
RESEARCH INTERESTS	Near field cosmology, Galactic dynamics, Galactic archaeology	
CURRENT POSITION	Associate Professor/Reader, University of Surrey	2023-present
PREVIOUS POSITIONS	Senior Lecturer, University of Surrey Lecturer, University of Surrey Postdoctoral Researcher, Institute of Astronomy, Cambridge	2021-2023 2017-2021 2013-2017
EDUCATION	The University of Chicago , Chicago, IL, USA Ph.D. Physics, 2013 Advisors: Nick Gnedin and Andrey Kravtsov <i>Investigating the Physics and Environment of Lyman Limit Systems in Cosmological Simulations</i> M.S. Physics, 2007 Princeton University , Princeton, NJ, USA A.B. Physics (<i>with Honors</i>), 2006	
TECHNICAL EXPERIENCE	GADGET: Galaxy formation simulations and general N-body simulations Programming and Scripting Languages: C, Bash, Python, SQL	
ADVISING EXPERIENCE	Supervising 2 PhD students at Surrey, 2019-present Sophia Lilleengen, <i>The potential of the Milky Way with streams</i> 1 accepted student led publication Tariq Hilmi, <i>Measuring dark substructure with streams</i> Co-supervising PhD student with M. Collins at Surrey, 2021-present Madison Walder, <i>The potential of galaxies with external stellar streams</i> Co-supervising PhD student with N. Noel at Surrey, 2020-present Joanna Sakowska, <i>A search for dwarf galaxies near the LMC</i> Supervising 1 MSc student, <i>Search for substructure in Gaia DR3</i> , 2022 Supervised 13 undergraduate students on Final Year Projects, 2017-present 1 accepted student co-author publication Co-supervised PhD student with N. Noel at Surrey, 2017-2022 Pol Massana, <i>Stellar populations near the LMC</i> 1 accepted student led publication Co-supervised PhD student with V. Belokurov at Cambridge, 2014-2017 Prashin Jethwa, <i>Satellites of the LMC and the MW</i> 3 accepted student led publications Co-supervised visiting PhD student with V. Belokurov at Cambridge, 2016 Giuliano Iorio, <i>Gaia's view of the Milky Way Stellar Halo</i> 2 accepted student led publications Supervised Part III student at University of Cambridge, 2016-2017 Tigran Khachataryants, <i>Effect of the MW bar on tidal streams</i>	

Supervised MPhil in Scientific Computing, 2015

Jake Bauer, *Inserting disks into cosmological N-body simulations*

1 accepted student led publication

Supervised Part III student at University of Cambridge, 2015-2016

James Sharp, *Finding Tidal Streams and Constraining the Shape of the Galactic Potential*

AWARDS

Faculty of Engineering and Physics Sciences Researcher of the Year

University of Surrey, 2020

Vice-Chancellor's Award for Researcher of the Year

University of Surrey, 2020

INVITED TALKS

1. "*Precision modelling of Milky Way streams*"
Astro Seminar, Columbia University, May 2023
2. "*The Waltz of the Milky Way and the LMC*"
CITA Seminar, CITA, Apr. 2023
3. "*The OC stream's evolution in the dark matter haloes of the Milky Way and LMC*"
IAU3S379 - Dynamical Masses of Local Group Galaxies, Mar. 2023
4. "*Measuring the Milky Way's dark matter halo with 6 stellar streams*"
ECOGAL Seminar, MPIA (virtual), Jan. 2023
5. "*Tidal streams: sub-mm/s/year accelerometers*"
Towards Real-Time Galactic Dynamics, Lorentz Center, Jul. 2022
6. "*Measuring the Milky Way's dark matter halo with the OC stream*"
Satellite galaxies and tidal streams in the framework of cosmological models, EAS 2022, Jun. 2022
7. "*Mapping the Milky Way's dark matter with stellar streams*"
Cosmology Seminar, AIP Potsdam (virtual), Jan. 2022
8. "*Mapping out the dark matter in the Milky Way with stellar streams*"
Astrophysical and Cosmological Relativity Seminar, AEI (virtual), Dec. 2021
9. "*Probing the nature of dark matter with stellar streams*"
Astrophysical Windows on Dark Matter, WE-Heraeus-Seminar, Nov. 2021
10. "*Measuring the granularity of dark matter in the Milky Way with streams*"
Barolo Astroparticle Meeting, Sep. 2021 (cancelled due to COVID)
11. "*The dance of the Milky Way and the LMC*"
Galaxies Discussion Group, IoA (virtual), Feb. 2021
12. "*The dance of the Milky Way and the LMC*"
Astro seminar, Texas A&M (virtual), Feb. 2021
13. "*The mass of the LMC and its effect on the Milky Way*"
The Magellanic Clouds in the 2020s: a spectroscopic perspective, EAS 2020 (virtual), Jun. 2020
14. "*The dance of the Milky Way and the LMC*"
Astrophysics talk, INAF OAS Bologna (virtual), Apr. 2020
15. "*Substructure with tidal streams*"
Dark substructure workshop, MPA, Jan. 2020

16. “*The mass of the LMC and its effect on the Milky Way*”
A synoptic view of the Magellanic Clouds, ESO, Sep. 2019
17. “*Hypervelocity Stars and the LMC*”
Stars on the Run II, University of Potsdam, Aug. 2019
18. “*Inferring the nature of dark matter with streams*”
MSSL Seminar, Jul. 2018
19. “*Gaps in tidal streams*”
Stellar halos across the cosmos, MPIA, Jul. 2018
20. “*Effect of substructure on tidal streams*”
Halo Substructure and Dark Matter Searches, IFT Madrid, Jun. 2018
21. “*Local constraints on the nature of dark matter*”
Has Sterile Neutrino Dark Matter been Detected? Lorentz Center
Feb. 2018
22. “*Constraining the nature of dark matter with tidal streams*”
Columbia University, Astro Seminar, Jan. 2018
23. “*Dark matter implications of perturbations detected in tidal streams*”
GRAPPA, University of Amsterdam, Dec. 2017
24. “*Dark matter implications of perturbations detected in tidal streams*”
Theoretical Particle Physics & Cosmology Seminar, King’s College London,
Jan. 2017
25. “*The LMC - A Large and Messy Neighbour*”
Cambridge Astrophysics Colloquium, IoA, Dec. 2016
26. “*Inferring the presence of subhaloes around the Milky Way with tidal streams*”
Galaxies Discussion Group, IoA, Nov. 2016
27. “*Inferring the presence of subhaloes around the Milky Way with tidal streams*”
Durham Astronomy Wednesday Seminar, Nov. 2016
28. “*Modeling the Galactic potential with streams in the presence of the LMC*”
Invited review talk, Dark Matter Distribution in the Era of Gaia, NORDITA,
Oct. 2016
29. “*Detection of perturbations to the Pal 5 stream*”
Chile-UK Workshop, University of Cambridge, Sept. 2016
30. “*Probing the presence of dark subhaloes with gaps in tidal streams*”
Cosmological Probes of Fundamental Physics Workshop, Weizmann Insti-
tute, Jun. 2016
31. “*Probing the presence of dark subhaloes with gaps in tidal streams*”
Dark Matter on the Smallest Scales Workshop, Lorentz Center, Apr. 2016
32. “*Properties of Dark Subhaloes from Gaps in Tidal Streams*”
University of Cambridge, Galaxies Discussion Seminar, Nov. 2015
33. “*Properties of Dark Subhaloes from Gaps in Tidal Streams*”
Stellar Streams in the Local Universe, Ringberg Castle, Jul. 2015
34. “*Constraining Dark Subhaloes with Gaps in Tidal Streams*”
University of Edinburgh, Coffee Talk, Jun. 2015
35. “*Constraining Stellar Feedback in the High-Redshift Universe*”
University of Surrey, Astronomy Colloquium, Feb. 2014

36. “*The Physics and Environment of Lyman Limit and Damped Lyman Alpha Systems*”
MPIA Heidelberg, Honorarium, Jan. 2013

CONTRIBUTED
TALKS

1. “*The OC stream’s evolution in the dark matter haloes of the Milky Way and the LMC*”
54th Annual DDA, Michigan State University, May 2023
2. “*The Milky Way’s deforming dark matter halo*”
Astro Lunch Talk, University of Surrey (virtual), Oct. 2021
3. “*Fitting noisy data with noisy models*”
Bayesian Optimization Workshop, University of Surrey (virtual), Jul. 2021
4. “*Sagittarius, the wrecking ball*”
Streams 21 - Constraints on Dark Matter, CCA (virtual), Feb. 2021
5. “*The dance of the Milky Way and the LMC*”
Astro Lunch Talk, University of Surrey (virtual), Jun. 2020
6. “*Measuring the mass of the Milky Way in the presence of the LMC*”
Gaia Treasure Hunt, Cambridge, Sept. 2019
7. “*Morphology of the GD-1 stream*”
Small Galaxies, Cosmic Questions, Durham, July 2019
8. “*Perturbed streams in the Milky Way - GD1*”
Week of WEAVE, Universitat de Barcelona, Jul. 2019
9. “*Measuring the mass of the LMC with Milky Way streams*”
EWASS 2018, Liverpool, Apr. 2018
10. “*Constraining the nature of dark matter*”
Astro Lunch Talk, University of Surrey, Oct. 2017
11. “*The effect of the LMC on tidal streams around the Milky Way*”
National Astronomy Meeting, Hull University, Jul. 2017
12. “*Predicting the number of Globular Cluster streams around the Milky Way*”
Globular Cluster Formation and Evolution in the Context of Cosmological Galaxy Assembly Workshop, Chicheley Hall, Apr. 2017
13. “*Inferring the presence of subhaloes around the Milky Way with tidal streams*”
Bright and Dark Universe Conference, INAF, Naples, Jan. 2017
14. “*Detection of perturbations to the Pal 5 stream*”
Dark Matter Distribution in the Era of Gaia, NORDITA, Oct. 2016
15. “*Inferring the shape of a halo with tidal streams*”
Institute of Astronomy, Feb. 2016
16. “*Inferring Subhalo Properties from Gaps in Tidal Streams*”
Satellites and Streams in Santiago Conference, ESO, Apr. 2015
17. “*How Gaps Grow in Tidal Streams*”
The Milky Way and its Stars: Stellar Astrophysics, Galactic Archaeology, and Stellar Populations Conference, KITP, Feb. 2015
18. “*Investigating the Physics and Environment of Lyman Limit Systems in Cosmological Simulations*”
Institute of Astronomy, Nov. 2013

RESEARCH COLLABORATIONS	Core member of ARRAKIHS	2022-present
	LSST Affiliate PI	2022-present
	Member of 4MOST survey	2021-present
	Member and modelling coordinator of S ⁵ survey	2018-present
	Member of DELVE survey	2020-present
	Member of WEAVE survey	2017-present
	Member of Euclid survey	2019-present
	External collaborator - Dark Energy Survey	2017-present
PROPOSALS	CoI on ARC Discovery Grant, <i>Seeing Dark with Light: Revealing the Milky Way with Stellar Streams</i> , (2022-present, £370,000)	
	CoI on STFC IAA grant, (2020, £23,822)	
	PI on proposal (0.9M CPU hours) to simulate streams around the MW	
	CoI on proposal (10M CPU hours) to simulate dwarf galaxies	
	CoI on 15 telescope proposals to study tidal streams/LMC	
	CoI on 1 ALMA proposal to study CII in high-redshift DLAs	
	CoI of S ⁵ survey (45 nights)	
	CoI of DELVE survey (126 nights)	
SERVICE	Chair of the Board of Examiners, University of Surrey	2022-present
	Academic Integrity Officer	2022-present
	Year 2 Coordinator, University of Surrey	2020-2023
	Fellow of the Royal Astronomical Society	2020-present
	Year 3 Coordinator, University of Surrey	2019-2020
	PhD viva examiner for 6 PhD candidates to date	2017-present
	Co-organized RAS meeting on Galactic Disc and Halo Dynamics	2020
	Referee for New Astronomy, MNRAS, Nature Astronomy, ApJ, JCAP, Physics of the Dark Universe	2016-Present
	Reviewer for STFC Ernest Rutherford Fellowships	2018-present
	Reviewer for DiRAC HPC Proposal	2015,2016
	Athena SWAN Committee at IoA, Cambridge	2016-2017
	End of year assessment for PhD students, 6 students	2015-2017
	Postdoc Committee, IoA, Cambridge	2015-2017
	Graduate school admissions committee, University of Chicago	2010
TEACHING EXPERIENCE	Fellow of the Higher Education Academy	2019
	Energy and Entropy, University of Surrey	2019-present
	Scientific Investigation Skills, University of Surrey	2017-present
	The Universe, University of Surrey	2018
	Atoms & Quanta, Properties of Matter Labs, University of Surrey	2017-2018
	Part II, Fluid Mechanics, Institute of Astronomy	2014-2015
	Teaching Assistant, 7 Quarters, University of Chicago (Physics for Poets, E&M, Modern Physics, Quantum Mechanics)	2006-2011
PUBLIC TALKS	1. “ <i>DART - This one’s for the dinosaurs!</i> ” University of Surrey, World Space Week, October 2022	

2. “*How to weigh the Milky Way*”
University of Surrey, Public Astronomy Evening, January 2019
3. “*Why do we need dark matter?*”
University of Surrey, Stargazing Live, February 2018
4. “*The Universe, it’s smaller than you think*”
University of Surrey, Public Astronomy Evening, November 2017
5. “*Constraining the nature of dark matter*”
UK Astro Show, Oct. 2017
6. “*How clumpy is the Dark Matter in the Milky Way?*”
Institute of Astronomy, Nov. 2016
7. “*The Universe, it’s smaller than you think*”
Institute of Astronomy Open Day, March 2016
8. “*Galaxy Formation and Tidal Streams*”
Ely Astronomical Club, Sep. 2015
9. “*Galaxy Formation and the Milky Way*”
Cambridge Astronomical Society, Aug. 2014
10. “*Ancient Greek Astronomy: The Distance to the Moon and the Sun*”
Institute of Astronomy, Jan. 2014

OUTREACH	Host of Pint of Science	2018, 2019
	Bright Club Guildford (4 performances)	2017-2019
	Interviewed for episode of BBC Sky at Night	Jan. 2017
	<i>Creativity and Curiosity; Conversations between Artists and Astronomers</i>	
	Collaborate with artists to create art exhibit	2016-2017
	Yerkes Public Observing Guide, Yerkes Observatory	2011-2013
	Space Explorers Instructor, University of Chicago	Summer/Winter 2011
	Designed and taught one week course on detectors and human vision to high school students	

PRESS	Spectra of 12 streams in the Milky Way (2022)
RELEASES	Population of black holes in the Palomar 5 globular cluster (2021)
	Discovery of the most metal poor globular cluster in the Milky Way (2020)
	Discovery of a hypervelocity star ejected from the Milky Way center (2019)
	Discovery of a 10 billion year old major building block of the Milky Way (2018)
	Discovery of an old stellar bridge between the LMC and SMC (2017)
	Discovery of perturbations to a stream consistent with lumpy dark matter (2016)

PUBLICATIONS	ORCID: 0000-0002-8448-5505
	89 refereed publications with 4700+ citations and an h-index of 41 (ADS link)