

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	Senior Lecturer, University of Surrey	2021-present
PREVIOUS POSITIONS	Lecturer, University of Surrey Postdoctoral Researcher, Institute of Astronomy, Cambridge	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> 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> Co-supervising PhD student with N. Noel at Surrey, 2017-2022 Pol Massana, <i>Stellar populations near the LMC</i> Supervised 13 undergraduate students on Final Year Projects, 2017-present 1 accepted student co-author 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 Part III student at University of Cambridge, 2016-2017 Tigran Khachataryants, <i>Effect of the MW bar on tidal streams</i>	

MPhil in Scientific Computing, 2015

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

1 accepted student led publication

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. "*Mapping the Milky Way's dark matter with stellar streams*"
Cosmology Seminar, AIP Potsdam (virtual), Jan. 2022
2. "*Mapping out the dark matter in the Milky Way with stellar streams*"
Astrophysical and Cosmological Relativity Seminar, AEI (virtual), Dec. 2021
3. "*Probing the nature of dark matter with stellar streams*"
Astrophysical Windows on Dark Matter, WE-Heraeus-Seminar, Nov. 2021
4. "*Measuring the granularity of dark matter in the Milky Way with streams*"
Barolo Astroparticle Meeting, Sep. 2021 (cancelled due to COVID)
5. "*The dance of the Milky Way and the LMC*"
Galaxies Discussion Group, IoA (virtual), Feb. 2021
6. "*The dance of the Milky Way and the LMC*"
Astro seminar, Texas A&M (virtual), Feb. 2021
7. "*The dance of the Milky Way and the LMC*"
Astrophysics talk, INAF OAS Bologna (virtual), Apr. 2020
8. "*Substructure with tidal streams*"
Dark substructure workshop, MPA, Jan. 2020
9. "*The mass of the LMC and its effect on the Milky Way*"
A synoptic view of the Magellanic Clouds, ESO, Sep. 2019
10. "*Hypervelocity Stars and the LMC*"
Stars on the Run II, University of Potsdam, Aug. 2019
11. "*Inferring the nature of dark matter with streams*"
MSSL Seminar, Jul. 2018
12. "*Gaps in tidal streams*"
Stellar halos across the cosmos, MPIA, Jul. 2018
13. "*Effect of substructure on tidal streams*"
Halo Substructure and Dark Matter Searches, IFT Madrid, Jun. 2018
14. "*Local constraints on the nature of dark matter*"
Has Sterile Neutrino Dark Matter been Detected? Lorentz Center
Feb. 2018
15. "*Constraining the nature of dark matter with tidal streams*"
Columbia University, Astro Seminar, Jan. 2018

16. “*Dark matter implications of perturbations detected in tidal streams*”
GRAPPA, University of Amsterdam, Dec. 2017
17. “*Dark matter implications of perturbations detected in tidal streams*”
Theoretical Particle Physics & Cosmology Seminar, King’s College London,
Jan. 2017
18. “*The LMC - A Large and Messy Neighbour*”
Cambridge Astrophysics Colloquium, IoA, Dec. 2016
19. “*Inferring the presence of subhaloes around the Milky Way with tidal streams*”
Galaxies Discussion Group, IoA, Nov. 2016
20. “*Inferring the presence of subhaloes around the Milky Way with tidal streams*”
Durham Astronomy Wednesday Seminar, Nov. 2016
21. “*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
22. “*Detection of perturbations to the Pal 5 stream*”
Chile-UK Workshop, University of Cambridge, Sept. 2016
23. “*Probing the presence of dark subhaloes with gaps in tidal streams*”
Cosmological Probes of Fundamental Physics Workshop, Weizmann Insti-
tute, Jun. 2016
24. “*Probing the presence of dark subhaloes with gaps in tidal streams*”
Dark Matter on the Smallest Scales Workshop, Lorentz Center, Apr. 2016
25. “*Properties of Dark Subhaloes from Gaps in Tidal Streams*”
University of Cambridge, Galaxies Discussion Seminar, Nov. 2015
26. “*Properties of Dark Subhaloes from Gaps in Tidal Streams*”
Stellar Streams in the Local Universe, Ringberg Castle, Jul. 2015
27. “*Constraining Dark Subhaloes with Gaps in Tidal Streams*”
University of Edinburgh, Coffee Talk, Jun. 2015
28. “*Constraining Stellar Feedback in the High-Redshift Universe*”
University of Surrey, Astronomy Colloquium, Feb. 2014
29. “*The Physics and Environment of Lyman Limit and Damped Lyman Alpha
Systems*”
MPIA Heidelberg, Honorarium, Jan. 2013

CONTRIBUTED
TALKS

1. “*The Milky Way’s deforming dark matter halo*”
Astro Lunch Talk, University of Surrey (virtual), Oct. 2021
2. “*Fitting noisy data with noisy models*”
Bayesian Optimization Workshop, University of Surrey (virtual), Jul. 2021
3. “*Sagittarius, the wrecking ball*”
Streams 21 - Constraints on Dark Matter, CCA (virtual), Feb. 2021
4. “*The dance of the Milky Way and the LMC*”
Astro Lunch Talk, University of Surrey (virtual), Jun. 2020
5. “*Measuring the mass of the Milky Way in the presence of the LMC*”
Gaia Treasure Hunt, Cambridge, Sept. 2019

6. “*Morphology of the GD-1 stream*”
Small Galaxies, Cosmic Questions, Durham, July 2019
7. “*Perturbed streams in the Milky Way - GD1*”
Week of WEAVE, Universitat de Barcelona, Jul. 2019
8. “*Measuring the mass of the LMC with Milky Way streams*”
EWASS 2018, Liverpool, Apr. 2018
9. “*Constraining the nature of dark matter*”
Astro Lunch Talk, University of Surrey, Oct. 2017
10. “*The effect of the LMC on tidal streams around the Milky Way*”
National Astronomy Meeting, Hull University, Jul. 2017
11. “*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
12. “*Inferring the presence of subhaloes around the Milky Way with tidal streams*”
Bright and Dark Universe Conference, INAF, Naples, Jan. 2017
13. “*Detection of perturbations to the Pal 5 stream*”
Dark Matter Distribution in the Era of Gaia, NORDITA, Oct. 2016
14. “*Inferring the shape of a halo with tidal streams*”
Institute of Astronomy, Feb. 2016
15. “*Inferring Subhalo Properties from Gaps in Tidal Streams*”
Satellites and Streams in Santiago Conference, ESO, Apr. 2015
16. “*How Gaps Grow in Tidal Streams*”
The Milky Way and its Stars: Stellar Astrophysics, Galactic Archaeology, and Stellar Populations Conference, KITP, Feb. 2015
17. “*Investigating the Physics and Environment of Lyman Limit Systems in Cosmological Simulations*”
Institute of Astronomy, Nov. 2013

RESEARCH	LSST Affiliate PI	2022-present
COLLABORATIONS	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, (2022, £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	Year 2 Coordinator, University of Surrey	2020-present
	Fellow of the Royal Astronomical Society	2020-present
	Year 3 Coordinator, University of Surrey	2019-2020
	PhD viva examiner for 4 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	Fellow of the Higher Education Academy	2019
EXPERIENCE	Energy and Entropy, University of Surrey	2019-present
	Scientific Investigation Skills, University of Surrey	2017-present
	The University, 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. *“How to weigh the Milky Way”*
University of Surrey, Public Astronomy Evening, January 2019
2. *“Why do we need dark matter?”*
University of Surrey, Stargazing Live, February 2018
3. *“The Universe, it’s smaller than you think”*
University of Surrey, Public Astronomy Evening, November 2017
4. *“Constraining the nature of dark matter”*
UK Astro Show, Oct. 2017
5. *“How clumpy is the Dark Matter in the Milky Way?”*
Institute of Astronomy, Nov. 2016
6. *“The Universe, it’s smaller than you think”*
Institute of Astronomy Open Day, March 2016
7. *“Galaxy Formation and Tidal Streams”*
Ely Astronomical Club, Sep. 2015
8. *“Galaxy Formation and the Milky Way”*
Cambridge Astronomical Society, Aug. 2014
9. *“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

Creativity and Curiosity; Conversations between Artists and Astronomers

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

81 refereed publications with 3400+ citations and h-index of 33 ([ADS link](#))