

Steven Gillman



Postdoctoral Researcher
Cosmic Dawn Center | DTU-Space

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Overview

I am a Postdoctoral Researcher at the Cosmic Dawn Center, National Space Institute (DTU-Space), Denmark. My research focuses on studying galaxy evolution through the analysis of state of the art observations of high-redshift galaxies. I am also a member of the MIRI High-Z Group working on the *JWST* MIRI HUDF Imaging Survey (Proposal ID:[1283](#)).

Employment

- 2020– **Postdoctoral Researcher** | Technical University of Denmark (DTU), Lyngby, Denmark
Research interests: High-redshift, star-forming galaxies, morphology, kinematics, metallicity, integral field spectroscopy, galaxy evolution and formation.

Education

- 2016–2020 **PhD in Astronomy**
Dept. of Physics, Durham University
Thesis: [Resolved Studies of the Dynamics, Star Formation and Chemical Properties of High-Redshift Galaxies](#)
Supervisor: Prof. Ray Sharples and Prof. Mark Swinbank
- 2012–2016 **MPhys (Hons) Physics and Astronomy**, First Class
Dept. of Physics, University of Birmingham
Masters Thesis: Morphology Density Relation in Low Redshift Galaxy Clusters
Supervisor: Dr. Graham Smith and Dr. Felicia Ziparo
- 2015 **Research Internship**
Dept. of Physics, University of Birmingham
Project: Galaxy Cluster Scaling Relations
Supervisor: Dr. Graham Smith and Dr. Sarah Mulroy

Publications [1st, Co-Author] = 11 [4,7], h-index = 7

- 2022 **The resolved chemical abundance properties within the interstellar medium of star-forming galaxies at $z \approx 1.5$**
 MNRAS Accepted, arXiv:2202.21304
 S. Gillman, A. Puglisi, U. Dudzevičiūtė, A. M. Swinbank, A. L. Tiley, C. M. Harrison, J. Molina, R. M. Sharples, R. G. Bower, M. Cirasuolo, Edo Ibar and D. Obreschkow
- 2021 **Multi-resolution angular momentum measurements of $z \approx 1.5 - 2$ star-forming galaxies** **MNRAS 509 2318**
 J. M. E. Salcedo, Karl Glazebrook, Deanne B. Fisher, Sarah M. Sweet, Danail Obreschkow, A. M. Swinbank, **Steven Gillman** and Alfred L. Tiley

 The KMOS Galaxy Evolution Survey (KGES): the angular momentum of star-forming galaxies over the last ≈ 10 Gyr **MNRAS 506 323T**
 A. L. Tiley, **S. Gillman**, L. Cortese, A. M. Swinbank, U. Dudzevičiūtė, C. M. Harrison, I. Smail, D. Obreschkow, S. M. Croom, R. M. Sharples, A. Puglisi
- The Evolution of Gas-Phase Metallicity and Resolved Abundances in Star-Forming Galaxies from $z \approx 0.6 - 1.8$** **MNRAS 500 4229G**
 S. Gillman, A. L. Tiley, A. M. Swinbank, U. Dudzevičiūtė, R. M. Sharples, Ian Smail, C. M. Harrison, Andrew J. Bunker, Martin Bureau, M. Cirasuolo, Georgios E. Magdis, Trevor Mendel and John P. Stott
- 2020 **A kpc-scale resolved study of unobscured and obscured star-formation activity in normal galaxies at $z = 1.5$ and 2.2 from ALMA and HiZELS**
 MNRAS 499 5241C
 Cheng Cheng, Edo Ibar, Ian Smail, Juan Molina, David Sobral, Andrés Escala, Philip Best, Rachel Cochrane, **Steven Gillman**, Mark Swinbank, R. J. Ivison, Jia-Sheng Huang, Thomas M. Hughes, Eric Villard and Michele Cirasuolo

 From Peculiar Morphologies to Hubble-type Spirals: The relation between galaxy dynamics and morphology in star-forming galaxies at $z \sim 1.5$
 MNRAS 492 1492G
 S. Gillman, A. L. Tiley, A. M. Swinbank, C. M. Harrison, Ian Smail, U. Dudzevičiūtė, R. M. Sharples, L. Cortese, D. Obreschkow, R. G. Bower, T. Theuns, M. Cirasuolo, D. Fisher, K. Glazebrook, Edo Ibar, J. Trevor Mendel and Sarah M. Sweet
- 2019 **The Dynamics and Distribution of Angular Momentum in HiZELS Star-Forming Galaxies at $z = 0.8 - 3.3$** **MNRAS 486 175G**
 S. Gillman, A. M. Swinbank, A. L. Tiley, C. M. Harrison, Ian Smail, U. Dudzevičiūtė, R. M. Sharples, P. N. Best, R. G. Bower, R. Cochrane, D. Fisher, J. E. Geach, K. Glazebrook, Edo Ibar, J. Molina, D. Obreschkow, M. Schaller, D. Sobral, S. Sweet, J. W. Trayford, T. Theuns

The Shapes of the Rotation Curves of Star-forming Galaxies Over the Last ~ 10 Gyr [MNRAS 485 934T](#)

Alfred L. Tiley, A. M. Swinbank, C. M. Harrison, Ian Smail, O. J. Turner, M. Schaller, J. P. Stott, D. Sobral, T. Theuns, R. M. Sharples, **S. Gillman**, R. G. Bower, A. J. Bunker, P. Best, J. Richard, Roland Bacon, M. Bureau, M. Cirasuolo, G. Magdis

Angular momentum of z ~ 1.5 galaxies and their local analogues with adaptive optics [MNRAS 485 5700S](#)

Sarah Sweet, Deanne Fisher, Karl Glazebrook, Danail Obreschkow, **Steven Gillman**, Alfred Tiley, Claudia Lagos, Liang Wang, A. Mark Swinbank; Richard Bower, Ray Sharples

- 2018 **The core of the massive cluster merger MACS J0417.5-1154 as seen by VLT/MUSE** [MNRAS 483 3082J](#)
Mathilde Jauzac, Guillaume Mahler, Alastair C. Edge, Keren Sharon, **Steven Gillman**, Harald Ebeling, David Harvey, Johan Richard, Michele Fumagalli, A. Mark Swinbank, Steven L. Hamer, Jena-Paul Kneib, Richard Massey , Philippe Salome

- 2017 **Galaxy cluster luminosities and colours, and their dependence on cluster mass and merger state** [MNRAS 472 3246](#)
Sarah L. Mulroy, Sean L. McGee, **Steven Gillman**, Graham P. Smith, Chris P. Haines, Jessica Démoclès, Nobuhiro Okabe, Eiichi Egami

Conference and Research Talks

- September 2021 **MIRI High-Redshift GTO Program Update**
DAWN Summit, Copenhagen, Denmark, [Programme](#)
- September 2021 **Resolving the ISM at z≈1.5**
DAWN Summit, Copenhagen, Denmark, [Programme](#)
- June 2021 **The Fundamental Properties of z=1–2 Star-Forming Galaxies**
DAWN Cake Talk: [DAWN-IRES](#) Mentor Introduction, Online
- March 2019 **The Angular Momentum Distribution in High Redshift SF Galaxies**
Life and Death of Star-Forming Galaxies, Perth, Australia, [Programme](#), [Slides](#)
- January 2019 **The Angular Momentum Distribution in High Redshift Galaxies**
DEX XV, Royal Observatory of Edinburgh, UK
- December 2018 **The Redistribution of Angular Momentum in High Redshift Star-Forming Galaxies - A KMOS and SINFONI study**
KMOS @ 5, ESO, Garching, Germany, [Programme](#), [Slides](#)
- November 2018 **The Dynamics and Distribution of Angular Momentum in High Redshift Star-Forming Galaxies**

Friday Lunchtime Astronomy Talk, Durham, UK

March 2018 **Integral Field Galaxy Evolution**
 Friday Lunchtime Astronomy Talk, Durham, UK

June 2017 **IFView of Galaxy Evolution**
 Friday Lunchtime Astronomy Talk, Durham, UK

Approved Observing Proposals (PI)

2020 **106.211L, 39h, VLT/HAWK-I**
 Resolving Clumps in High Redshift KMOS GTO Galaxies using HawkI Narrow Band Imaging.

106.211L, 19.8h, VLT/KMOS
 Resolved Metallicity Gradients in Star Forming Main-Sequence Galaxies at $z \approx 1.5$

2019 **0102.B-0690, 3h, VLT/HAWK-I**
 Resolving Clumps in High Redshift KMOS GTO Galaxies across Cosmic Time using High Resolution HawkI Narrow Band Imaging

2018 **0101.B-0923, 15h, VLT/KMOS**
 Resolved Metallicity Gradients in Star Forming Main-Sequence Galaxies at $z \approx 1.5$

Approved Observing Proposals (CoI)

2021 **2021.1.01098.S, Cycle 8, 13,4h, ALMA**
 The clump-scale ISM in gravitationally unstable discs at $z \approx 0.1$

2019 **0103.B-0862(A), 20h, VLT/MUSE**
 Resolved Star-Formation Driven Outflows at $z \approx 1.5$

2019.1.01238.S, Cycle 7, 19.6h, ALMA
 The kpc-scale view to the molecular gas content in ‘typical’ star-forming galaxies at $z \approx 1.5$

2019.1.00102.S, Cycle 7, 7.6h, ALMA
 A survey for the molecular gas content in star-forming galaxies at $z \approx 1.5$: exploiting the VLT/KMOS and ALMA synergy

2018 **1102.B-0232, 200h, VLT/KMOS**
 The KMOS Ultra-deep Rotational Velocity Survey (KURVS): The outer-edges of individual star-forming galaxies at high-redshift

2018.1.00164.S, Cycle 6, 20h, ALMA

A survey for the molecular gas content in star-forming galaxies at $z \approx 1.5$: exploiting the VLT/KMOS and ALMA synergy

0102.B-0365(A), 12h, VLT/SINFONI

Witnessing the formation of the Hubble Sequence with Angular Momentum

2017

099.A-0282(A), 12h, VLT/SINFONI

Mapping the kpc-scale dynamics and triggering of the starburst activity in high-redshift ultraluminous galaxies

Observing Experience

2018

PauCam (WHT 4.2 m), Santa Cruz de La Palma, Spain (*4 nights*)

PI: N. Hatch, Understanding how $z > 1$ galaxy clusters form

2017

OSIRIS (Keck 10 m), W. M. Keck Observatory, Maunakea, Hawaii (*3 nights*)

PI: K. Glazebrook, Resolving the evolution of galaxy angular momentum and metallicity

2017

KMOS (VLT 8 m), Paranal Observatory, Chile (*3 nights*)

PI: R. Sharples, KMOS Galaxy Evolution Survey (KGES): Tracing the Dynamics, Star-Formation and Chemical Properties of Star-Forming Galaxies Across Half the Age of the Universe

Technical Skills

Experience reducing and analysing integral field spectroscopic observations. In particular: VLT-KMOS; VLT-SINFONI and Keck-OSIRIS

Programming knowledge of Python, Unix, L^AT_EX and basic HTML as well as experience using DS9, ESOREX, GALFIT and SExtractor

Responsibilities, Leadership and Teaching activities

2022

BSc Supervision: Søren Staal

Project: *JWST* Mock Observations of the HUDF in FLARES

2021 –

DTU-Space Astrophysics Seminar Organiser

2021

DAWN-IRES Project Mentor: Michael Messere

Project: Searching for star-burst outflows in $z \approx 1.5$ main-sequence galaxies

2019 – 2020

Departmental Galaxy Evolution Meeting (GEM) Organiser

2018 – 2019

Weekly Postgraduate Journal Club Organiser

2017 – 2020

Undergraduate Year 2 Stars and Galaxies Workshop Demonstrator

2017 – 2018

Weekly 1st Year Postgraduate Journal Club Organiser

2016 – 2017

Undergraduate Year 1 Problems Administrator

Awards and Scholarships

2016 – 2020

STFC Postgraduate Studentship

Centre for Extragalactic Astronomy, Durham, UK

June 2015

Gateway Internship Bursary

Dept. of Physics, University of Birmingham

Professional Memberships

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| 2021 – | Junior Member of International Astronomical Union |
| 2019 – 2021 | Fellow of the Royal Astronomical Society |
| 2016 – | Member of Institute of Physics |
| 2013 – 2016 | Student Member of Institute of Physics |