

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

2021

Multi-resolution angular momentum measurements of $z \approx 1.5-2$ star-forming galaxies [MNRAS Accepted](#), [arXiv:2109.10614](#)

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 $z \sim 1.5$ 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 $z \approx 1.5$**
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 (Col)

- 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, \LaTeX and basic HTML as well as experience using DS9, ESOREX, GALFIT and SEXTRACTOR

Responsibilities, Leadership and Teaching activities

- 2021 – Summer 2021 DTU-Space Astrophysics Seminar Organiser
[DAWN-IREs](#) Mentor
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

- 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