

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 a leading member of the MIRI High-Z Group working on the *JWST* MIRI HUDF Imaging Survey.

Employment

- 2020– **Postdoctoral Researcher** | Technical University of Denmark (DTU), Lyngby, Denmark
Research interests: High-redshift, star-forming galaxies, morphology, photometry, 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] = 21 [5,16], h-index = 9

Author Structure: Lead Author, Co-Authors, Associated Authors alphabetical

2023

Two massive, compact, and dust-obscured candidate z=8 galaxies discovered by JWST [ApJ Submitted](#)

Hollis B. Akins, Caitlin M. Casey, Natalie Allen, Micaela B. Bagley, Mark Dickinson, Steven L. Finkelstein, Maximilien Franco, Santosh Harish, Pablo Arrabal Haro, Olivier Ilbert, Jeyhan S. Kartaltepe, Anton M. Koekemoer, Daizhong Liu, Arianna S. Long, Henry Joy McCracken, Louise Paquereau, Casey Papovich, Nor Pirzkal, Jason Rhodes, Brant E. Robertson, Marko Shuntov, Sune Toft, Guang Yang, Guillermo Barro, Laura Bisigello, Véronique Buat, Jaclyn B. Champagne, Olivia Cooper, Luca Costantin, Alexander de la Vega, Nicole E. Drakos, Andreas Faisst, Adriano Fontana, Seiji Fujimoto, **Steven Gillman**, Carlos Gómez-Guijarro, Ghassem Gozaliasl, Nimish P. Hathi, Christopher C. Hayward, Michaela Hirschmann, Benne W. Holwerda, Shuowen Jin, Dale D. Kocevski, Vasily Kokorev, Erini Lambrides, Ray A. Lucas, Georgios E. Magdis, Benjamin Magnelli, Jed McKinney, Bahram Mobasher, Pablo G. Pérez-González, R. Michael Rich, Lise-Marie Seillé, Margherita Talia, C. Megan Urry, Francesco Valentino, Katherine E. Whitaker, L. Y. Aaron Yung, Jorge Zavala

A Near-Infrared Faint, Far-Infrared-Luminous Dusty Galaxy at z=5 in COSMOS-Web [ApJ Submitted](#)

Jed McKinney, Sinclair M. Manning, Olivia R. Cooper, Arianna S. Long, Hollis Akins, Caitlin M. Casey, Andreas L. Faisst, Maximilien Franco, Christopher C. Hayward, Erini Lambrides, Georgios Magdis, Katherine E. Whitaker, Min Yun, Jaclyn B. Champagne, Nicole E. Drakos, Fabrizio Gentile, **Steven Gillman**, Ghassem Gozaliasl, Olivier Ilbert, Shuowen Jin, Anton M. Koekemoer, Vasily Kokorev, Daizhong Liu, R. Michael Rich, Brant E. Robertson, Francesco Valentino, John R. Weaver, Jorge A. Zavala, Natalie Allen, Jeyhan S. Kartaltepe, Henry Joy McCracken, Louise Paquereau, Jason Rhodes, Marko Shuntov and Sune Toft

Uncovering the stellar structure of the Dusty Star-forming Galaxy GN20 at z=4.055 with MIRI/JWST [A&A Submitted](#)

L. Colina, A. Crespo Gómez, J. Álvarez-Márquez, A. Bik, F. Walter, L. Boogaard, A. Labiano, F. Peissker, P. Pérez-González, G. Östlin, T.R. Greve, H.U. Nörgaard-Nielsen, G. Wright, A. Alonso-Herrero, R. Azollini, K. I. Caputi, M. García-Marín, J. Hjorth, O. Ilbert, S. Kendrew, J. P. Pye, T. Tikkanen, P. van der Werf, L. Costantin, E. Iani , **S. Gillman**, I. Jermann, D. Langeroodi, T. Moutard, P. Rinaldi, M. Topinka, E.F. van Dishoeck, M. Güdel, Th. Henning, P.O. Lagage, T. Ray, and B. Vandenbussche

Sub-Millimetre Galaxies with Webb: Near-Infrared Counterparts and Multi-wavelength Morphology [A&A Submitted](#)

S. Gillman, B. Gullberg, G. Brammer, A. Vijayan, M. Lee, D. Blánquez, M. Brinch, T. Greve, I. Jermann, S. Jin, V. Kokorev, L. Liu, G. Magdis, F. Rizzo and, F. Valentino

An Atlas of Color-selected Quiescent Galaxies at $z > 3$ in Public JWST Fields [ApJ Submitted](#)

Valentino, Francesco, Brammer, Gabriel, Gould, Katriona M. L., Kokorev, Vasily, Fujimoto, Seiji, Kragh Jespersen, Christian, Vijayan, Aswin P., Weaver, John R., Ito, Kei, Tanaka, Masayuki, Ilbert, Olivier, Magdis, Georgios E., Whitaker, Katherine E., Faisst, Andreas L., Gallazzi, Anna, **Gillman, Steven**, Gimenez-Arteaga, Clara, Gomez-Guijarro, Carlos, Kubo, Mariko, Heintz, Kasper E., Hirschmann, Michaela, Oesch, Pascal, Onodera, Masato, Rizzo, Francesca, Lee, Minju, Strait, Victoria, Toft, Sune

Life beyond 30: probing the $-20 < \text{MUV} < -17$ luminosity function at $8 < z < 13$ with the NIRCam parallel field of the MIRI Deep Survey [ApJ Submitted](#)

Pérez-González, Pablo G., Costantin, Luca, Langeroodi, Danial, Rinaldi, Pierluigi, Annunziatella, Marianna, Ilbert, Olivier, Colina, Luis, Noorgaard-Nielsen, Hans Ulrik, Greve, Thomas, Ostlin, Göran, Wright, Gillian, Alonso-Herrero, Almudena, Álvarez-Márquez, Javier, Caputi, Karina I., Eckart, Andreas, Le Fèvre, Olivier, Labiano, Álvaro, García-Marín, Macarena, Hjorth, Jens, Kendrew, Sarah, Pye, John P., Tikkanen, Tuomo, van der Werf, Paul, Walter, Fabian, Ward, Martin, Bosman, Sarah E. I., **Gillman, Steven**, García-Argumánez, Ángela, María Mérida, Rosa

KURVS: The outer rotation curve shapes and dark matter fractions of star-forming galaxies at cosmic noon [MNRAS Submitted](#)

A.Puglisi, U. Dudzevičiūtė, Mark Swinbank, **Steven Gillman**, A. L. Tiley, Luca Cortese, Christopher Harrison, Edoardo Ibar, Juan Molina, Kyle Oman, Matthew Schaller and Francesco Shankar

Strong (H β + [OIII]) and H α emitters at redshift $z \approx 7-8$ unveiled with JWST/NIRCam and MIRI imaging in the Hubble eXtreme Deep Field (XDF) [ApJ Submitted](#)

Rinaldi, P., Caputi, K. I., Costantin, L., **Gillman, S.**, Iani, E., Perez Gonzalez, P. G., Oestlin, G., Colina, L., Greve, T. ; Noorgard-Nielsen, H. U., Wright, G. S., Alonso-Herrero, A., Alvarez-Marquez, J., Eckart, A., Garcia-Marín, M., Hjorth, J. ; Ilbert, O., Kendrew, S., Labiano, A., Le Fevre, O. , Pye, J., Tikkanen, T., Walter, F., van der Werf, P., Ward, M. ; Annunziatella, M., Bik, A., Boogard, L., Bosman, S., Crespo, A., Jermann, I., Langeroodi, D., Melinder, J., Meyer, R., Moutard, T. ; Peissker, F., van Dishoeck, E., Guedel, M., Henning, Th., Lagage, P. -O., Ray, T., Vandenbussche, B., Waelkens, C.

The gas and stellar content of a metal-poor galaxy at $z=8.496$ revealed by JWST and ALMA [ApJ 944L 30H](#)

Heintz, K. E., Giménez-Arteaga, C., Fujimoto, S., Brammer, G., Espada, D., **Gillman, S.**, González-López, J., Greve, T. R., Harikane, Y., Hatsukade, B., Knudsen, K. K., Koekemoer, A. M., Kohno, K., Kokorev, V., Lee, M. M. ,Magdis, G. E., Nelson, E. J., Rizzo, F., Sanders, R. L., Schaerer, D. ,Shapley, A. E., Strait, V. B., Sun, F., Toft, S., Valentino, F., Vijayan, A. P. ,Watson, D., Bauer, F. E., Christiansen, C. R., Wilson, S. N.

2022

COSMOS-Web: An Overview of the JWST Cosmic Origins Survey

[ApJ Submitted](#)

Casey, Caitlin M., Kartaltepe, Jeyhan S., Drakos, Nicole E.,Franco, Maximilien, Ilbert, Olivier, Rose, Caitlin , Cox, Isabella G.,Nightingale, James W., Robertson, Brant E., Silverman, John D.,Koekemoer, Anton M., Massey, Richard, McCracken, Henry Joy, Rhodes, Jason, Akins, Hollis B., Amvrosiadis, Aristeidis, Arango-Toro, Rafael C., Bagley, Micaela B., Capak, Peter L., Champagne, Jaclyn B., Chartab, Nima,Chavez Ortiz, Oscar A., Cooke, Kevin C., Cooper, Olivia R., Darvish, Behnam,Ding, Xuheng, Faisst, Andreas L., Finkelstein, Steven L., Fujimoto, Seiji, Gentile, Fabrizio, **Gillman, Steven**, Gould, Katriona M. L.,Gozaliasl, Ghassem, Harish, Santosh, Hayward, Christopher C., He, Qiuhan,Hemmati, Shoubaneh , Hirschmann, Michaela, Jin, Shuowen,Khostovan, Ali Ahmad, Kokorev, Vasily, Lambrides, Erini, Laigle, Clotilde,Leung, Gene C. K., Liu, Daizhong, Liaudat, Tobias, Long, Arianna S., Magdis, Georgios, Mahler, Guillaume, Mainieri, Vincenzo, Manning, Sinclair M.,Maraston, Claudia, Martin, Crystal L., McCleary, Jacqueline E., McKinney, Jed,McPartland, Conor J. R., Mobasher, Bahram, Pattnaik, Rohan, Renzini, Alvio,Rich, R. Michael, Sanders, David B., Sattari, Zahra, Scognamiglio, Diana,Scoville, Nick, Sheth, Kartik, Shuntov, Marko, Sparre, Martin, Suzuki, Tomoko L.,Talia, Margherita, Toft, Sune, Trakhtenbrot, Benny, Urry, C. Megan,Valentino, Francesco, Vanderhoof, Brittany N., Vardoulaki, Eleni, Weaver, John R.,Whitaker, Katherine E., Wilkins, Stephen M., Yang, Lilan, Zavala, Jorge A.

The resolved chemical abundance properties within the interstellar medium of star-forming galaxies at $z \approx 1.5$ [MNRAS 512 3480G](#)

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 2318E](#)

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
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Research Talks [Invited*, Contributed] = 12 [1,11]

January 2023	Sub-mm Galaxies with Webb* IPARCOS Seminar Series , Online, YouTube
July 2022	The Early Universe JWST First Images Reception, Copenhagen, Denmark,
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)

2022	110.248Z 20h, VLT/KMOS Resolved Interstellar Medium Properties in $z \approx 1.5$ Star-Forming Galaxies.
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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 (e.g. VLT-KMOS, VLT-SINFONI, Keck-OSIRIS) and as well as reduction and analysis of observations from *HST* - WFC3, *HST* - ACS and *JWST* - MIRI

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

Student Supervision

- PhD Supervision:**
2022 – Iris Jermann: ‘Cosmic Evolution of High- z Merger Fraction’
- BSc Supervision:**
2022 Maria Madsen, Andreas Rasmussen: ‘SED fitting with *JWST* and *HST* galaxies’
Søren Staal: ‘*JWST* Mock Observations of the HUDF in FLARES’
- Summer Students:**
2021 **DAWN-IRES** Project Mentor
Michael Messere: ‘Searching for outflows in $z \approx 1.5$ main-sequence galaxies’

Responsibilities, Leadership and Teaching activities

- 2021 – [DTU-Space Astronomy & Atmospheric Physics Seminar](#) Coordinator
- 2020 – Referee for MNRAS, ApJ and A&A journals.
- 2019–2020 Departmental Galaxy Evolution Meeting 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, UK |
| 2016 – 2021 | Member of Institute of Physics, UK |
| 2013 – 2016 | Student Member of Institute of Physics |