

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] = 23 [5,18], h-index = 12

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

2023

Size - Stellar Mass Relation and Morphology of Quiescent Galaxies at $z \geq 3$ in Public JWST Fields [ApJ Submitted](#)

Kei Ito, Francesco Valentino, Gabriel Brammer, Andreas L. Faisst, **Steven Gillman**, Carlos Gomez-Guijarro, Katriona M. L. Gould, Kasper E. Heintz, Olivier Ilbert, Christian Kragh Jespersen, Vasily Kokorev, Mariko Kubo, Georgios E. Magdis, Conor McPartland, Masato Onodera, Francesca Rizzo, Masayuki Tanaka, Sune Toft, Aswin P. Vijayan, John R. Weaver, Katherine E. Whitaker, Lillian Wright

Resolving galactic-scale obscuration of X-ray AGN at $z > 1$ with COSMOS-Web [ApJ Accepted](#)

John D. Silverman, Vincenzo Mainieri, Xuheng Ding, Daizhong Liu, Knud Jahnke, Michaela Hirschmann, Jeyhan Kartaltepe, Erini Lambrides, Masaoka Onoue, Benny Trakhtenbrot, Eleni Vardoulaki, Angela Bongiorno, Caitlin Casey, Francesca Civano, Andreas Faisst, Maximilien Franco, **Steven Gillman**, Ghassem Gozaliasl, Christopher C. Hayward, Anton M. Koekemoer, Vasily Kokorev, Georgios Magdis, Stefano Marchesi, Robert Michael Rich, Martin Sparre, Hyewon Suh, Takumi Tanaka, Francesco Valentino

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

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

Hollis B. Akins, Caitlin M. Casey, Natalie Allen, Michaela 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 673 L6C](#)

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 947 20V](#)

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, Giménez-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 951L 1P](#)

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

MIDIS: 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-Márquez, 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.

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, Khosrovan, Ali Ahmad, Kokorev, Vasily, Lambrides, Erini, Laigle, Clotilde, Leung, Gene C. K., Liu, Daizhong, Liudat, 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	<p>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</p> <p>The Shapes of the Rotation Curves of Star-forming Galaxies Over the Last ~ 10 Gyr MNRAS 485 934T <i>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</i></p> <p>Angular momentum of $z \sim 1.5$ galaxies and their local analogues with adaptive optics MNRAS 485 5700S <i>Sarah Sweet, Deanne Fisher, Karl Glazebrook, Danail Obreschkow, Steven Gillman, Alfred Tiley, Claudia Lagos, Liang Wang, A. Mark Swinbank, Richard Bower, Ray Sharples</i></p>
2018	<p>The core of the massive cluster merger MACS J0417.5-1154 as seen by VLT/MUSE MNRAS 483 3082J <i>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</i></p>
2017	<p>Galaxy cluster luminosities and colours, and their dependence on cluster mass and merger state MNRAS 472 3246 <i>Sarah L. Mulroy, Sean L. McGee, Steven Gillman, Graham P. Smith, Chris P. Haines, Jessica Démoclès, Nobuhiro Okabe, Eiichi Egami</i></p>

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.
- 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 (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 <i>JWST</i> and <i>HST</i> galaxies' Søren Staal: ' <i>JWST</i> 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

2023–	Instrument Center for Danish Astrophysics (IDA) Board Member
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

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