

SOPHIA R FLURY

Curriculum Vitae

University of Edinburgh
Institute for Astronomy, Royal Observatory
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ORCID: 0000-0002-0159-2613
h-index 14, 829 citations

EDUCATION

Ph.D.	Astronomy	2024	University of Massachusetts, Amherst, MA
	advisor: Anne Jaskot		
	dissertation: "Clearing the Path to Cosmic Reionization"		
M.S.	Astronomy	2023	University of Massachusetts, Amherst, MA
	advisor: Anne Jaskot		
	thesis: "New Insights into Lyman Continuum Escape"		
M.A.	Astronomy	2018	Wesleyan University, Middletown, CT
	advisor: Ed Moran		
	thesis: "Unmixing and Diluting Emission-line Cocktails in the Local Universe"		
B.S. (cum laude)	Physics (hons)	2012	Dickinson College, Carlisle, PA
	advisor: Catrina Hamilton, Margaret Trippe (UMD-CP)		
	thesis: "X-ray and Optical Properties of <i>Swift</i> /BAT AGN"		

RESEARCH APPOINTMENTS

University of Edinburgh	PostDoctoral Research Asst	08/2024 - 07/2026 (exp)
UMass Amherst	NASA FINESST award	09/2023 - 08/2024
	<i>HST</i> /COS - LzLCS	01/2020 - 09/2023
Wellesley College	RSS Pipeline Developer	09/2018 - 05/2019

TEACHING APPOINTMENTS

UMass Amherst	ASTR 101: Intro Astronomy	08/2019 - 12/2019
Wesleyan University	ASTR 111: Dark Side of the Universe	01/2017 - 05/2018
	ASTR 211: Observational Astronomy	
	Numerical Methods	05/2018 - 08/2018
Dickinson College	Undergraduate Lab Assistant	08/2009 - 05/2012

FUNDING, PROGRAMS, & AWARDS

<i>JWST</i> GO 5554 (PI Flury)	2024	\$ 250,000
NASA/FINESST Grant (FI Flury)	2023	\$ 100,000
MSGC Fellowships	2023	\$ 8,500

CO-I PROGRAMS

JWST: GO 1869 (PI Schaerer), GO 5545 (PI Barufet)

HST: GO 17069 (PI Hayes), GO 17443 (PI Carr), GO 17220 (PI Heckman)

RESEARCH SPECIALIZATION & INTERESTS

Multiwavelength spectroscopy — rest optical, UV, IR spectroscopic observations of galaxies

Galaxies — ionization, gas geometry, stellar populations, feedback and outflows, active galactic nuclei, chemical abundances, Lyman continuum escape

ISM gas — emission and absorption lines, outflow kinematics, excitation, nebular properties and diagnostics, geometry, ionization structure, BPT-style diagnostics

Stellar populations — ages, feedback, spectroscopic features, ionizing SEDs and ionizing photon budgets, synthetic stellar populations including BPASS and SB99

Extreme ionization sources — shocks, active galactic nuclei, UV excess, high ionization lines

TECHNICAL SKILLS

Programming — python, R, C, C#, SQL, fortran; object-oriented, documentation (sphinx, markdown, HTML, CSS, etc), GitHub (github.com/sflury), PyPI

Science programming and data analysis — numerical methods, statistics (including multivariate methods, treatment of upper limits, faint/weak signals, and non-Gaussian variates), regression (including MCMC, TLS and EIV, proportional hazards, and generalized linear models), time series (including periodograms, FTs, spectrograms, wavelets, autocorrelations, entropy and complexity)

Software packages — OutLines (developer), PyNeb, MAPPINGS, CLOUDY, calcos, FaintCOS, emcee, numpy, scipy, matplotlib, astropy, pandas, survival, lifelines, tidyverse, lightcurve, XSPEC, sherpa, CIAO, vorbin, ppxf

Observing facilities — *HST*/COS, *JWST*/MIRI, WHT/WEAVE, VISTA/4MOST, Gemini/GMOS, Keck/HIRES, *XMM*/EPIC-pn, *Cassini*/RSR, *Voyager*/RSR
— IFU, long slit, echelle, fiber/aperture spectroscopy

PROFESSIONAL ENGAGEMENT

Lyman Continuum Labyrinths	Spring 2025	highlighted talk
Oxford University	Spring 2025	contributing talk
RAS Discussion Meeting	Spring 2025	contributing talk
Durham University	Spring 2025	colloquium
WEAVE/4MOST Conference	Winter 2024	contributing talk
SUPA Cormack Meeting	Winter 2024	contributing talk
St. Andrews University	Fall 2024	lunch talk
IfA - DAWN JWST Workshop	Summer 2024	contributing talk
CAGN IV	Spring 2024	contributing talk
STScI Spring Symposium	Spring 2024	poster
STScI	Fall 2023	journal club
Oxford University	Fall 2023	journal club
University of Hull	Fall 2023	journal club
University of Edinburgh IfA	Fall 2023	coffee talk
IfA - DAWN JWST Workshop	Fall 2023	contributing talk
University of Edinburgh IfA	Fall 2023	journal club

Johns Hopkins University	Fall 2023	coffee talk
University Cidade de São Paulo	Summer 2023	colloquium
UVGalaxies2023	Summer 2023	contributing talk
First Light with JWST	Spring 2023	poster
Lyman Continuum Labyrinths	Spring 2023	contributing talk
AAS Journal Author Series	Summer 2022	interview
Sazerac SIP Early Galaxy Formation	Fall 2021	contributing talk
Sazerac 2.0	Summer 2021	contributing talk
CAGN III	Spring 2021	contributing talk

PROFESSIONAL SERVICE

UEdinburgh SOPA DEI	IfA Representative/Contributor	2024 - present
HWO Working Groups	Contributing Scientist	2024 - present
	iphotons, CGM/IGM, AGN, chemical evolution, stars and stellar pops	
4MOST Working Groups	Contributing Scientist	2024-present
	pipeline dev	
Lyman Continuum Labyrinths	SOC member	2025
WHT TAC	Reviewer	2024
CAGN IV	SOC member	2024
A&A	Referee	2023 - present
ApJ	Referee	2022 - present
Wesleyan University	Bridge program mentor	2021 - 2024
LMT TAC	facilitator	2021
Wesleyan University	Public Observing	2017 - 2018
Macdonough Elem, CT	Planetarium Shows	2017
Wesleyan University	Public outreach talks	2017 - 2018
Dickinson College	Founded and ran public science outreach fair	2010 - 2012

CURRENT / PREVIOUS ADVISEES

Miriam Eleazer	Wesleyan University	Masters thesis, MA
Alaina Einsig	Wesleyan University	Masters thesis, MA
Chase Alvarado-Anderson	Dartmouth College	summer student
Murdo Livingston	University of Edinburgh	senior honors thesis
Thomas Horn	University of Edinburgh	summer student

FIRST-AUTHOR PUBLICATIONS — 308 CITATIONS, * >100 citations, † mentee

- Flury, S. R.**, Jaskot, A. E., Saldana-Lopez, A. et al. 2024. *ApJS* submitted, under review. “The Low-Redshift Lyman Continuum Survey: The Roles of Stellar Feedback and ISM Geometry in LyC Escape” [arXiv:2409.12118](https://arxiv.org/abs/2409.12118)
- Flury, S. R.**, Arellano-Córdova, K. Z., Moran, E. C., & Einsig, A.† 2024. *MNRAS* submitted. “The Shocking Nitrogen Excess at High Redshift” [arXiv:2412.06763](https://arxiv.org/abs/2412.06763)
- Flury, S. R.**, Dors, O. L., & Riffel, R. A. 2024. *MNRAS* under colab review, [available here](#). “Empirical Calibration of AGN Temperature Structure”

- Flury, S. R.**, Bustamante-Gonzalez, S., García Soto, A., & Alvarado-Anderson, C.[†] *ApJ* under colab review, [available here](#). “Activity and Structure of Low Mass Stars: Rossby Number, Mass, and a New Diagnostic”
- Flury, S. R.**, Moran, E. C., & Eleazer, M.[†], 2023, *MNRAS* 525, 4231. “Galactic Outflow Emission Line Profiles: Evidence for Dusty, Radiatively-Driven Ionized Winds in Mrk 462”.
- Flury, S. R.***, Jaskot, A. E., Ferguson, H. C., et al. 2022, *ApJS*, 260, 1. “The Low-redshift Lyman Continuum Survey. I. New, Diverse Local Lyman Continuum Emitters”.
- Flury, S. R.***, Jaskot, A. E., Ferguson, H. C., et al. 2022, *ApJ*, 930, 126. “The Low-redshift Lyman Continuum Survey. II. New Insights into LyC Diagnostics”.
- Flury, S. R.**, & Moran, E. C. 2020, *MNRAS*, 496, 2191. “Chemical abundances in active galaxies”.

CO-AUTHOR PUBLICATIONS — 521 CITATIONS

- French, R. G., Nicholson, P. D., Hedman, M. M., Salo, H., Marouf, E. A. McGhee-French, C. A., Rappaport, N., Colwell, J. Jerousek, R., Afigbo, V. M., **Flury, S. R.**, et al. 2025. *Icarus* 431, 116463. “Further reverberations of the 1983 impact with Saturn’s C ring”
- Heintz, K. E., Brammer, G. B., Watson, D., Oesch, P. A., Keating, L. C., Hayes, M. J., Abdurro'uf, Arellano-Córdova, K. Z., Carnall, A. C., Christiansen, C. R., Cullen, F., Davé, R., Dayal, P., Ferrara, A., Finlator, K., Fynbo, J. P. U., **Flury, S. R.**, et al. *A&A* 693, 60. “The JWST-PRIMAL Legacy Survey. A JWST/NIRSpec reference sample for the physical properties and Lyman- α absorption and emission of ~ 500 galaxies at $z=5.5-13.4$ ”.
- Jennings, R. M., Henry, A., Mauerhofer, V., Gazagnes, S., Heckman, T., Scarlata, C., Carr, C., Xu, X., Jaskot, A. E., Blaizot, J., Verhamme, A., **Flury, S. R.**, et al. 2024. *ApJ* 979, 64. “A Simulated Galaxy Laboratory: Exploring the Observational Effects on UV Spectral Absorption Line Measurements”.
- Mascia, S., Pentericci, L., Llerena, M., Calabrò, A., Matthee, J., **Flury, S. R.**, et al. *A&A* submitted. arXiv:2501.08268. “Little impact of mergers and galaxy morphology on the production and escape of ionizing photons in the early Universe”
- Saldana-Lopez, A., Chisholm, J., Gazagnes, S., Endsley, R., Hayes, M. J., Berg, D. A., Finkelstein, S. L., **Flury, S. R.**, et al. 2025. *MNRAS* submitted. arXiv:2501.17145 “Feedback and dynamical masses in high- z galaxies: the advent of high-resolution NIRSpec spectroscopy”
- Amorín, R. O. , Rodríguez-Henríquez, M., Fernández, V., Vílchez, J. M., Marques-Chaves, R., Schaerer, D., Izotov, Y. I., Firpo, V., Guseva, N., Jaskot, A. E., Komarova, L., Muñoz-Vergara, D., Oey, M. S., Bait, O., Carr, C., Chisholm, J., Ferguson, H., **Flury, S. R.**, et al. 2024. *A&A* 682, 25. “Ubiquitous broad line emission and the relation between ionized gas outflows and Lyman continuum escape in Green Pea galaxies”.
- Bait, O., Borthakur, S., Schaerer, D., Momjian, E., Sebastian, B., Saldana-Lopez, A., **Flury, S. R.**, et al. 2024, *A&A* 688, 198. “The Low-redshift Lyman Continuum Survey: Radio continuum properties of low- z Lyman continuum emitters”.
- Dors, O. L., Cardaci, M. V., Hägele, G. F., Valerdi, M., Ilha, G. S., Oliveira, C. B., Riffel, R. A., **Flury, S. R.**, et al. *MNRAS* 534, 30. “Direct estimates of nitrogen abundance for Seyfert 2 nuclei”
- Dors, O. L., Arellano-Cordova, K. Z., **Flury, S. R.**, et al. 2024. *MNRAS* 533, 1. “Empirical calibration for helium abundance determinations in Active Galactic Nuclei”

- Duncan, K. J., McLeod, D. J., Best, P. N., Pirie, C. A., Clausen, M., Cochrane, R. K., Dunlop, J. S., **Flury, S. R.**, et al. *MNRAS* subm. “The JWST Emission Line Survey (JELS): Extending rest-optical narrow-band emission line selection into the Epoch of Reionization” 2024arXiv241009000D
- Carr, C, Cen, R, Scarlata, C, Marques-Chaves, R, Chave, C, Xu, X, Amorin, R, Schaerer, D, Henry, A, **Flury, S. R.**, et al. 2024. *ApJ* subm. “The Impact of Massive Outflows on Lyman Continuum Escape from Local Starbursts” 2024arXiv240905180C
- Chisholm, J., Berg, D. A., Endsley, R., Gazagnes, S., Richardson, C. T., Lambrides, E., Greene, J., Finkelstein, S., **Flury, S. R.**, et al. 2024. *MNRAS* 534, 26. “[Ne v] emission from a faint epoch of reionization-era galaxy: evidence for a narrow-line intermediate mass black hole”
- Cullen, F., McLeod, D. J., McLure, R. J., Dunlop, J. S., Donnan, C. T., Carnall, A. C., Keating, L. C., Magee, D., Arellano-Cordova, K. Z., Bowler, R. A. A., Begley, R., **Flury, S. R.**, Hamadouche, M. L., and Stanton, T. M. 2024, *MNRAS* 531, 997. “Evidence for the emergence of dust-free stellar populations at $z > 10$ ”.
- Gazagnes, S., Chisholm, J., Endsley, R., Berg, D. A., Leclercq, F., Jurlin, N., Saldana-Lopez, A., Finkelstein, S. L., **Flury, S. R.** et al. *MNRAS* submitted. “A negligible contribution of two luminous $z \sim 7.5$ galaxies to the ionizing photon budget of reionization”.
- Leclercq, F., Chisholm, J., King, W., Zeimann, G., Jaskot, A. E., Henry, A., Hayes, M., **Flury, S. R.**, et al. 2024. *A&A* 678, 73. “Linking Mg ii and [O ii] spatial distribution to ionizing photon escape in confirmed LyC leakers and non-leakers”.
- Jaskot, A. E., Silveyra, A. C., Piantinga, A., **Flury, S. R.**, et al. 2024a. *ApJ* 972, 92. “Multivariate Predictors of LyC Escape I: A Survival Analysis of the Low-redshift Lyman Continuum Survey”
- Jaskot, A. E., Silveyra, A. C., Piantinga, A., **Flury, S. R.**, et al. 2024b. *ApJ* 973, 111. “Multivariate Predictors of LyC Escape II: Predicting LyC Escape Fractions for High-Redshift Galaxies”
- Méndez-Delgado, J. E., Skillman, E. D., Aver, E., Morisset, C., Esteban, C., García-Rojas, J., Kreckel, K., Rogers, N. S. J., Rosales-Ortega, F. F., Arellano-Córdova, K. Z., **Flury, S. R.**, Reyes-Rodríguez, E., and Orte-García, M. *ApJ* under review. “Generalized $T_e([OIII])$ - $T_e(HeI)$ Discrepancies in Ionized Nebulae: Possible Evidence of Case B Deviations and Temperature Inhomogeneities”. 2024arXiv241017381M
- Pirie, C. A., Best, P. N., Duncan, K. J., McLeod, D. J., Cochrane, R. K., Clausen, M., Dunlop, J. S., **Flury, S. R.**, et al. *MNRAS* subm. “The JWST Emission Line Survey (JELS): An untargated search for H α emission line galaxies at $z > 6$ and their physical properties” 2024arXiv241011808P
- Roy, N., Heckman, T., Henry, A., Chisholm, J, **Flury, S. R.**, et al. *ApJ* subm. “Lyman Continuum leakage from massive leaky starbursts: A different class of emitters?” 2024arXiv241013254R
- Dors, O. L. , Valerdi, M., Riffel, R. A., Riffel, R., Cardaci, M. V., Hägele, G. F., Armah, M., Revalski, M., **Flury, S. R.**, Freitas-Lemes, P., Amôres, E. B., Krabbe, A. C., Binette, L., Feltre, A., 2023, *MNRAS*, 521, 1969. “Chemical abundances in Seyfert galaxies – X. Sulfur abundance estimates”.
- French, R. G., Nicholson, P. D., McGhee-French, C. A., Longaretti, P.-Y., Hedman, M. M., Colwell, J., Marouf, E. A., Rappaport, N., **Flury, S. R.**, et al. 2023, *Icarus* 405, 115678. “The complex shape of the outer edge of Saturn's B ring, as observed in Cassini occultation data”.

- Trebitsch, M., Dayal, P., Chisholm, J., Finkelstein, S. L., Jaskot, A., **Flury, S. R.**, et al. 2023, *A&AL* submitted. “Reionization with star-forming galaxies: insights from the Low-z Lyman Continuum Survey”.
- Nicholson, P. D., French, R. G., McGhee-French, C. A., Longaretti, P.-Y., Hedman, M., El Moutamid, M., Colwell, J., Marouf, E. A., Rappaport, N., **Flury, S. R.**, et al. 2023, *Icarus*, 390, 115287. “The seven-lobed shape of the outer edge of Saturn's A ring”.
- Chisholm, J., Saldana-Lopez, A., **Flury, S. R.**, et al. 2022, *MNRAS*, 517, 5104. “The far-ultraviolet continuum slope as a Lyman Continuum escape estimator at high redshift”.
- Marques-Chaves, R., Schaerer, D., Amorin, R. O., Borthakur, S., Chisholm, J., Ferguson, H., **Flury, S. R.**, et al. 2022, *A&A*, 663, L1. “No correlation of the Lyman continuum escape fraction with spectral hardness”.
- Saldana-Lopez, A., Schaerer, D., Chisholm, J., **Flury, S. R.**, et al. 2022, *A&A*, 663, A59. “The Low-Redshift Lyman Continuum Survey. Unveiling the ISM properties of low-z Lyman-continuum emitters”.
- Xu, X., Henry, A., Heckman, T., Chisholm, J., Worseck, G., Gronke, M., Jaskot, A., McCandliss, S. R., **Flury, S. R.**, et al. 2022, *ApJ*, 933, 202. “Tracing Ly α and LyC Escape in Galaxies with Mg II Emission”.
- Wang, B., Heckman, T. M., Amorín, R., Borthakur, S., Chisholm, J., Ferguson, H., **Flury, S. R.**, et al. 2021, *ApJ*, 916, 3. “The Low-redshift Lyman-continuum Survey: [S II] Deficiency and the Leakage of Ionizing Radiation”.