John R. Weaver

Curriculum Vitae

University of Massachusetts – Amherst
Department of Astronomy
Amherst, Massachusetts, USA
✉ *john.weaver.astro@gmail.com*
astroweaver.github.io
Nationality: American

Education

2018–2022 **PhD Astrophysics**, *Cosmic Dawn Center, Univ. of Copenhagen*, Copenhagen, DK.
"COSMOS2020: Insights into galaxy assembly and evolution over the first 10 billion years"
Supervisors: Sune Toft (DAWN); Peter Capak (fmr. IPAC) & Dave Sanders (IfA)

2013–2018 **MPhys (Honours) Astrophysics**, *University of St Andrews*, St Andrews, UK.
"Exploring the origins of bimodality: post-starburst galaxies at $z < 0.1$"
First Class Honours | Supervisor: Vivienne Wild | Prize for best astrophysics thesis

2012–2013 **Astronomy Scholar**, *Connecticut College*, New London, US.
GPA 4.0/4.0 – Non-graduating scholarship program

2009–2013 **High School Diploma**, *The Williams School*, New London, US.

Research Positions

2022–present **Postdoctoral Research Associate**, *University of Massachusetts*, Amherst, US.
UNCOVER | Group Leader: Kate Whitaker, with I. Labbé, R. Bezanson, and J. Leja

Spring 2020 **Visiting Graduate Student**, *Institute for Astronomy*, Honolulu, US.
The Hawaii 2-0 Survey | Supervisor: Dave Sanders

Spring 2019 **Visiting Graduate Student**, *California Institute of Technology*, Pasadena, US.
COSMOS2020 & The Farmer | Supervisor: Peter Capak

Winter 2018 **Visiting Graduate Student**, *Institut d'Astrophysique de Paris*, Paris, FR.
The Spitzer Legacy Survey | Supervisors: Henry McCracken & Andrea Moneti

2016–2019 **Web-app Developer**, *American Assoc. of Variable Star Observers*, Cambridge, US.
Spectroscopy Database; Margaret Mayall Fellow | Supervisor: Stella Kafka

2016–2018 **Research Assistant**, *University of St Andrews*, St Andrews, UK.
Variable Quasar Project | Supervisor: Keith Horne

Summer 2017 **Research Student**, *Max Planck Institute for Astronomy*, Heidelberg, DE.
IFU Spectroscopy of Merger Remnant | Supervisor: Bernd Husemann

Summer 2016 **LEAPS Research Student**, *Leiden Observatory*, Leiden, NL.
Search for $z > 6$ Galaxies in 3D-HST | Supervisor: Michael Maseda

Summer 2015 **REU Research Student**, *Maria Mitchell Observatory*, Nantucket, US.
Star-formation in a local dIrr Galaxy | Supervisors: Michael West and Michael Gregg

---

Collaborations & Survey Teams

- COSMOS: Cosmic Evolution Survey
- DAWN: Cosmic Dawn Survey
- Euclid Consortium
- UNCOVER
- BEASTS: Beasts in the Bubbles (PI)
- BUFFALO

Skills

Data Handling	**spectroscopy** – slit, grism, integral field; SED fitting, kinematics, and line fluxes (pPFX, PyParadise); ionisation diagnostics; Bayesian line ID with own software **photometry** – image processing (Swarp, PSFEx), profile-fitting photometry (The Farmer), aperture photometry (SExtractor, DAOPhot), SED fitting (EAzY, Le Phare) **miscellaneous** – model spectra and SFHs (BC03, FSPS), AGN lightcurve decomposition with own software, Principal Component Analysis of spectra (pyGappy)
Facilities	**CANDIDE HPC** at IAP, Paris - 312 cores; Team Member - 1M+ hours use **Hawaii-2-0 HPC** at IfA, Hawaii - 100 cores; Team Member - 1M+ hours use
Code	Python (numpy/matplotlib/scipy/astropy; expert), FORTRAN (proficient)
Software	The Farmer, pyGappy | Github
Web	Python-Django, MySQL, HTML/CSS

Awards & Scholarships

2021	Teacher of the Year Team; Teacher Assistant *Applied Statistics* | *Faculty of Science, University of Copenhagen*
2018	School Prize for Best Masters Thesis in Astrophysics *University of St Andrews*
2016-2018	Margaret Mayall Fellowship *American Association of Variable Star Observers*
2017	Juno Champion & Athena Swan Equality/Inclusion Awards (application co-author) *Equality & Diversity Committee, University of St Andrews School of Physics*
2013	International Undergraduate Scholarship *University of St Andrews*
Others:	Univ. of St Andrews Deans' List, Society of Physics Students Travel Award, Gunvor Lund Scholarship, New London Scholarship, Mystic Seaport Museum Service Award

Teaching & Supervision

Guest Lecturer, University of Massachusetts Amherst

2023	**A330: Topics in Astrophysics**. Undergraduate Research Course

Teaching Assistant, University of Copenhagen

2021	**Nordic Optical Telescope Summer School**. Postgraduate Level Course | Website
2019, 2020	**Applied Statistics: From Data to Results**. Postgraduate Level Course | 2021 Teacher of the Year Course | Website

Student Supervision (**bold**=primary supervisor)

Graduate	Sam Cutler (UMass), Natalie Allen (DAWN)
Masters	Lukas Zalesky (IfA 2020, project prize), Athansios Anastasiou (DAWN 2019-2020)
Undergradute	Ananya Sreelekha (UMass 2022), Rasmus Damgaard Nielsen (DAWN 2021), Tommy Clark (DAWN-SURF 2021), **Christian Kragh Jespersen & Jonas Vinther** (DAWN 2020), **Julia Tiller** (DAWN-REU 2019), Albert Sneppen (DAWN 2019)

Observations

Operational Experience

Imaging	**Subaru**/HSC
Spectroscopy	**Keck**/DEIMOS/MOSFIRE, **Nordic Optical Telescope**/ALFOSC

Selected Approved Programs (1 PI, 21 CO-I; JWST First)

2021 **PI**, *Beasts in the Bubbles: Characterizing ultra-luminous Galaxies at Cosmic Dawn*.
JWST/NIRSpec IFU | Cycle 1 | 14.4hrs ($260K)

2021 **CO-I**, *Galaxy Protoclusters as Drivers of Cosmic Reionization*.
JWST/NIRCam/NIRSpec | Cycle 1 | 25.2/9.7hrs | PI: C. Martin

2022 **CO-I**, *A joint ALMA and JWST public Legacy Field - Abell 2744*.
ALMA | 37.2h | PI: S. Fujimoto

2022 **CO-I**, *A comprehensive study of the most massive proto-cluster in COSMOS*.
ALMA | 23.3h | PI: J. Zavala

2022 **CO-I**, *Dust in galaxies at* $z = 8 - 11$.
ALMA | 22.1h | PI: S. Fujimoto

2022-2024 **CO-I**, *WERLS: Webb Epoch of Reionization Lyman-alpha Survey*.
NASA Key Strategic Mission Support
Keck/MOSFIRE+LRIS | 29N | PI: C. Casey & J. Kartaltepe

2022 **CO-I**, *Identifying protoclusters at* $z \sim 4$ *in the Euclid Deep Field North*.
NOEMA | 10.0h | PI: M. Shuntov

2022 **CO-I**, *Deep spectroscopy of bright red massive quiescent galaxies at* $z \sim 2.5 - 3$.
VLT/X-Shooter | 56.0h | PI: F. Valentino

2022 **CO-I**, *Beasts in the Bubbles: Remarkably UV-bright Galaxies at* $z = 9 - 10$.
Keck/MOSFIRE | 2N | PI: C. Casey

See website for full listing.

Recent Presentations (33 Talks, 10 Posters)

Jun., 2023 **First Light**, Boston, MA, contributed poster.
Perspectives on precision photometry to explore the early red universe with JWST

Jul., 2022 **COSMOS Collaboration Meeting**, Paris, FR, contributed talk.
COSMOS2020: Catalogs and the evolution of the Galaxy Stellar Mass Function

Mar., 2022 **St Andrews Galaxy Group**, St Andrews, UK, invited talk.
What can quasar variability teach us about the physics of accretion discs?

Mar., 2022 **Pan-SED Fitting Forum**, virtual, invited review talk.
The status of photometric redshifts and their use in COSMOS2020

Jan., 2022 **Quasars and Galaxies Through Cosmic Time**, virtual, contributed talk.
COSMOS2020: Insights into galaxy formation and growth in the first 10 billion years

Jan., 2022 **Leiden Observatory Lunch Talk**, Leiden, NL, invited talk.
COSMOS2020: Insights into galaxy formation and growth in the first 10 billion years

See website for full listing.

Outreach

2019-2022 **Co-founder**, *Astronomy on Tap*, Copenhagen, DK | Website.

2019-2021 **Rotation Writer**, *Astrobites*, Graduate Astrophysics Column | Articles.

2014–2018 **Associate Observer**, *Frosty Drew Observatory*, Ninigrit Park, US.

2013–2018 **Observing Director**, *Univ. of St Andrews Astronomical Society*, St Andrews, UK.

2013–2014 **Writer Supervisor**, *SciNote*, Undergraduate science magazine | Articles.

See website for a list of outreach talks.

Service & Membership

Referee for Academic Journals

ApJ(S), MNRAS, A&A.

University of Massachusetts Amherst

2022–present **Postdoc Representative, Five College Colloquium Coordinator**.

University of St Andrews Student Union

2014–2018 **Science Faculty President, Physics School President, Class Representative**.
School of Physics: Physics Equality & Diversity Committee, Student-Staff Council (chair)
University-wide: Education Committee (co-chair), and the University Academic Council

University of St Andrews Astronomical Society

2014–2017 **President, Observing Director ($\times 2$), First Year Representative**.

University of St Andrews Physics Society

2014–2016 **Academic Lecture Convenor, Publicity Officer**.

Professional Memberships

- American Astronomical Society
- UK Institute of Physics
- Astronomers Without Borders
- UK Royal Astronomical Society
- European Astronomical Society
- The Planetary Society

Press

Feb. 2023 **Boston Globe**, *Interview*.
New image from Webb Telescope, processed by UMass astronomers | Article

Feb. 2022 **SYFY Wire**, *Interview*.
Black Holes Lurk in Literal Rings of Fire | Article

Dec. 2021 **Weekendavisen**, *Interview with Danish magazine*.
Discussion of JWST Beasts Program in "A Golden Guiding Star" | Article

Apr., 2018 **BBC Sky at Night Magazine**, *Cutting-Edge Section*.
"NGC 7252: capturing a cosmic car crash" | Available in print

Mar., 2018 **Sci-News**, *Astronomy Section*.
"ESO's Very Large Telescope Observes Galaxy-Galaxy Merger Remnant" | Article

Feb., 2018 **European Southern Observatory**, *Picture of the Week*.
"Mapping a Merger" | Article

Publications (51 total, 6 as first author, h-index: 15)

Online manuscripts are linked to their respective titles. Click to view.

Link to this listing on the Astrophysical Data Service (ADS):
https://ui.adsabs.harvard.edu/public-libraries/ZLE6-g9VSRK43Gm-HPLh2A

1. Jin, S.,...**Weaver, J.**, et al. 2023, A&A, 670, L11, *Massive galaxy formation caught in action at $z \sim 5$ with JWST*
2. Leung, G., Finkelstein, S., **Weaver, J.**, et al. ApJ, in press, on arxiv, *The Spitzer-HETDEX Exploratory Large Area Survey. IV. Model-Based Multi-wavelength Photometric Catalog*
3. Chávez Ortiz, O. A., ..., **Weaver, J.**, et al. ApJ, in press, Introducing the Texas Euclid Survey for Lyman Alpha (TESLA) Survey: Initial Study Correlating Galaxy Properties to Lyman-Alpha Emission
4. Gould, K. M. L.,... **Weaver, J.**, et al. ApJ, in press, on arxiv, *COSMOS2020: Exploring the dawn of quenching for massive galaxies at $3 < z < 5$ with a new colour selection method*
5. Valentino, F.,... **Weaver, J.**, et al. ApJ, in press, on arxiv, *An Atlas of Color-selected Quiescent Galaxies at $z > 3$ in Public JWST Fields*

6. **Weaver, J.**, Cutler, S., et al. ApJ, submitted, on arxiv, *The UNCOVER Survey: An infrared-selected catalog of a thousand galaxies to $z \sim 15$ near the Abell 2744 lensing cluster*
7. Wang, B.,...**Weaver, J.**, et al. ApJ, submitted, on arxiv, *Inferring More from Less: Prospector as a Photometric Redshift Engine in the era of JWST*
8. Casey, C. & Kartaltepe, J.,...**Weaver, J.**, et al. ApJ, submitted, on arxiv, *The COSMOS-Web Survey: An Overview of the JWST Cosmic Origins Survey*
9. Furtak, L.,... **Weaver, J.**, et al. MNRAS, submitted, on arxiv, *JWST UNCOVER: A triply imaged extremely red and compact object at $z \sim 7.7$*
10. Scoville, N., Faisst, A., **Weaver, J.**, et al. ApJ, in press, on arxiv, *Evolution of Gas, and Star Formation from $z = 0$ to 5*
11. Furtak, L., Zitrin, A., **Weaver, J.**, et al. MNRAS, submitted, on arxiv, *UNCOVERing the extended strong lensing structures of Abell 2744 with the deepest JWST imaging*
12. Bezanson, R.,...**Weaver, J.**, et al. ApJ, submitted, on arxiv, *The JWST UNCOVER Treasury survey: Ultradeep NIRSpec and NIRCam ObserVations before the Epoch of Reionization*
13. Ito, K.,...**Weaver, J.**, et al. 2023, ApJ, 945L, 9I, *Discovery of an overdense structure of massive quiescent galaxies at $z \approx 2.77$*
14. **Weaver, J.**, Davidzon, I., et al. A&A, submitted, on arxiv, *COSMOS2020: The Galaxy Stellar Mass Function: On the assembly and star formation cessation of galaxies at $0.2 < z \leq 7.5$*
15. **Weaver, J.**, Zalesky, L., et al. ApJ, submitted, *The Farmer: A reproducible, profile-fitting photometry pipeline for the next-generation of ultra-deep galaxy surveys using the Tractor*
16. Otter, J.,...**Weaver, J.**, et al. 2022, ApJ, 941, 93O, *Resolved Molecular Gas Observations of MaNGA Post-starbursts Reveal a Tumultuous Past*
17. Miller, T. B.,...**Weaver, J.**, et al. 2022, ApJL, 941L, 37M, *Early JWST imaging reveals strong optical and NIR color gradients in galaxies at $z \sim 2$ driven mostly by dust*
18. Bretonnière, H.,...**Weaver, J.**, et al. 2022, A&A, 671A, 102E ,*Euclid preparation XXVI: The Euclid Morphology Challenge. Towards structural parameters for billions of galaxies*
19. Merlin, E..,...**Weaver, J.**, et al. 2022, A&A, 671A, 101E, *Euclid preparation. XXV. The Euclid Morphology Challenge – Towards model-fitting photometry for billions of galaxies*
20. Nelson, E.,...**Weaver, J.**, et al. 2022, ApJL, submitted, on arxiv, *JWST reveals a population of ultra-red, flattened disk galaxies at $2 < z < 6$ previously missed by HST*
21. Naidu, R.,...**Weaver, J.**, et al. 2022, ApJL, submitted, on arxiv, *Schrodinger's Galaxy Candidate: Puzzlingly Luminous at $z \approx 17$, or Dusty/Quenched at $z \approx 5$?*
22. Chartab, N.,...**Weaver, J.**, et al. ApJ, 942, 91C, *A Machine Learning Approach to Predict Missing Flux Densities in Multi-band Galaxy Surveys*
23. Barrufet, L.,...**Weaver, J.**, et al. 2022, MNRAS, submitted, on arxiv, *Unveiling the Nature of Infrared Bright, Optically Dark Galaxies with Early JWST Data*
24. Naidu, R.,...**Weaver, J.**, et al. 2022, ApJL, 940L, 14N, *Two Remarkably Luminous Galaxy Candidates at $z \approx 11 - 13$ Revealed by JWST*
25. Kaufmann, O., Ilbert, O., **Weaver, J.**, et al. 2022, A&A, 667, A65, on arxiv, *COSMOS2020: The UV Luminosity Function at $z > 7.5$*
26. Brinch, M., Greve, T., **Weaver, J.**, et al. 2022, ApJ, 943, 153B, *COSMOS2020: High-z Protocluster Candidates Discovered in COSMOS*
27. van Mierlo, S. E.,...**Weaver, J.**, et al. 2022, A&A, 666A, 200V, *Euclid preparation: XXI. Intermediate-redshift contaminants in the search for $z > 6$ galaxies within the Euclid Deep Survey*
28. Kokorev, V.,...**Weaver, J.**, et al. 2022, ApJS, 263, 38K, *ALMA Lensing Cluster Survey: HST and $Spitzer$ Photometry of 33 Lensed Fields Built with CHArGE*
29. Suess, K..,...**Weaver, J.**, et al. 2022, ApJL, 937, L33, *Rest-frame near-infrared sizes of galaxies at cosmic noon: objects in JWST's mirror are smaller than they appeared*
30. Sillanssen, N.,...**Weaver, J.**, et al. 2022, A&A, 665, 7S, *A galaxy group candidate at $z \approx 3.7$ in the COSMOS field*
31. Davidzon, I.,...**Weaver, J.**, et al. 2022, A&A, 665, A34, *COSMOS2020: manifold learning to estimate stellar masses and star formation rates in large galaxy surveys*
32. Desprez, G.,...**Weaver, J.**, et al. A&A, 670, A82, *Combining the CLAUDS and HSC-SSP surveys. U + grizy(+YJHKs) photometry and photometric redshifts for 18M galaxies in the 20 deg^2 of the HSC-SSP Deep and ultraDeep fields*

33. Jin, S.,...**Weaver, J.**, et al. 2022, A&A, 665, A3, *Diagnosing deceivingly cold dusty galaxies at $3.5 < z < 6$: a substantial population of compact starbursts with high infrared optical depths*
34. Shuntov, M.,...**Weaver, J.**, et al. 2022, A&A, 664, A61, *COSMOS2020: The cosmic evolution of the stellar-to-halo mass relation for central and satellite galaxies up to $z \sim 5$*
35. Lagattuta, D.,...**Weaver, J.**, et al. 2022, MNRAS, 514, 497L, *Pilot-WINGS: An extended MUSE view of the structure of Abell 370*
36. Steinhardt, C.,...**Weaver, J.**, et al. 2022, ApJ, 934, 22S, *Implications of a Temperature Dependent IMF III: Mass Growth and Quiescence*
37. **Weaver, J.** & Horne, K., 2022, MNRAS, 512, 1, *Measuring the AGN accretion disc light: Hints of finite stress at the innermost stable circular orbit*
38. Steinhardt, C.,...**Weaver, J.**, et al. 2022, ApJ, 931, 58S, *Implications of a Temperature Dependent IMF II: An Updated View of the Star-Forming Main Sequence*
39. Sneppen, A.,...**Weaver, J.**, et al. 2022, ApJ, 931, 57S, *Implications of a Temperature Dependent IMF I: Photometric Template Fitting*
40. Valentino, F.,...**Weaver, J.**, et al. 2022, ApJL, 929, 9V, *Archival discovery of a strong $z = 7.677$ Lyman-α and [C II] emitter*
41. Faisst, A.,...**Weaver, J.**, et al. 2022, ApJ, 929, 66, *Joint Survey Processing I: Compact oddballs in the COSMOS field – low-luminosity Quasars at z > 6?*
42. Ito, K.,...**Weaver, J.**, et al. 2022, ApJ, 929, 531, *COSMOS2020: Ubiquitous AGN activity of Massive Quiescent Galaxies at $0 < z < 5$ Revealed by X-ray and Radio Stacking*
43. Moneti, A.,...**Weaver, J.**, et al. 2022, A&A, 658, A126, *Euclid preparation XVII: Cosmic Dawn Survey: Spitzer Space Telescope observations of the Euclid deep fields and calibration fields*
44. **Weaver, J.**, Kauffmann, O., et al., 2022, ApJS, 258, 11, *COSMOS2020: A panchromatic view of the Universe to $z \sim 10$ from two complementary catalogs*
45. Casey, C.,...**Weaver, J.**, et al. 2021, ApJ, 923, 215, *Mapping Obscuration to Reionization with ALMA (MORA): 2 mm Efficiently Selects the Highest-Redshift Obscured Galaxies*
46. Sun, F.,...**Weaver, J.**, et al. 2021, ApJ, 922, 114, *Extensive Lensing Survey of Optical and Near-Infrared Dark Objects (El Sonido): HST H-Faint Galaxies behind 101 Lensing Clusters*
47. Kokorev, V.,...**Weaver, J.**, et al. 2021, ApJ, 921, 40, *The Evolving Interstellar Medium of Star-Forming Galaxies, as traced by Stardust*
48. Zheng, Y.,...**Weaver, J.**, et al. 2020, MNRAS, 498, 1, *Comparison of stellar populations in simulated and real post-starburst galaxies in MaNGA*
49. Steinhardt, C.,...**Weaver, J.**, et al. 2020, ApJS, 247, 2, 64, *The BUFFALO HST Survey*
50. Steinhardt, C.,**Weaver, J.**, et al. 2019, ApJ, 891, 136S, *A Method to Distinguish Quiescent and Dusty Star-forming Galaxies with Machine Learning*
51. **Weaver, J.**, Husemann, B., et al. 2018, A&A, 614, A32, *Revealing the history and destiny of an emerging early-type galaxy*