

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 (Swrap, PSFEx), profile-fitting photometry ([The Farmer](#)), aperture photometry (SExtractor, DAOPhot), SED fitting (EA_zY, 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

[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 \(**bold**=primary supervisor\)](#)

Undergraduate **Julia Tiller** (DAWN-REU 2019), **Albert Sneppen** (DAWN 2019), **Christian Kragh Jespersen & Jonas Vinther** (DAWN 2020), Rasmus Damgaard Nielsen (DAWN BSc 2021), Tommy Clark (DAWN-SURF 2021), Ananya Sreelekha (UMass)

Masters Athansios Anastasiou (DAWN 2019-2020), Lukas Zalesky (IfA 2020, project prize)

Graduate Sam Cutler (UMass), Natalie Allen (DAWN)

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 the COSMOS field*.
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.

Selected Talks (33 Talks, 9 Posters)

- 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
- Oct., 2021 **Debating the Potential of ML in Astro. Surveys**, IAP, FR, contributed talk.
Selecting Quiescent Galaxies with t-SNE
- Jul., 2021 **UK National Astronomy Meeting**, UK, virtual, contributed talk.
Beasts in the Bubbles: Measurement of the Massive End of $z > 8$ UV Luminosity Function
- Jul., 2021 **SAZERAC2.0**, virtual, contributed talk.
Beasts in the Bubbles: Measurement of the Massive End of $z > 8$ UV Luminosity Function
- Apr., 2021 **Caltech Tea Talk**, virtual, invited talk.
COSMOS2020: A panchromatic view of the Universe to $z \sim 10$
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. 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*.
"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 (38 total, 5 as first author, h-index: 10)

1. **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*
2. **Weaver, J.**, Davidzon, I., et al. A&A, submitted, *COSMOS2020: The Galaxy Stellar Mass Function: On the assembly and star formation cessation of galaxies at $0.2 < z \leq 7.5$*
3. Otter, J. ..., **Weaver, J.**, et al. 2022, ApJ, in press, on arxiv, [Resolved Molecular Gas Observations of MaNGA Post-starbursts Reveal a Tumultuous Past](#)
4. Miller, T. B. ..., **Weaver, J.**, et al. 2022, ApJL, submitted, on arxiv, [Early JWST imaging reveals strong optical and NIR color gradients in galaxies at \$z \sim 2\$ driven mostly by dust](#)
5. Bretonnière, H. ..., **Weaver, J.**, et al. 2022, A&A, in press, on arxiv, [Euclid preparation XXVI: The Euclid Morphology Challenge. Towards structural parameters for billions of galaxies](#)
6. Merlin, E. ..., **Weaver, J.**, et al. 2022, A&A, in press, on arxiv, [Euclid preparation. XXV. The Euclid Morphology Challenge – Towards model-fitting photometry for billions of galaxies](#)
7. 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](#)
8. 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\$?](#)
9. Chartab, N. ..., **Weaver, J.**, et al. ApJ, in press, [A Machine Learning Approach to Predict Missing](#)

Flux Densities in Multi-band Galaxy Surveys

10. Barrufet, L.,...**Weaver, J.**, et al. 2022, MNRAS, submitted, on arxiv, *Unveiling the Nature of Infrared Bright, Optically Dark Galaxies with Early JWST Data*
11. Naidu, R.,...**Weaver, J.**, et al. 2022, ApJL, submitted, on arxiv, *Two Remarkably Luminous Galaxy Candidates at $z \approx 11 - 13$ Revealed by JWST*
12. Kaufmann, O., Ilbert, O., **Weaver, J.**, et al. 2022, A&A, in press, on arxiv, *COSMOS2020: The UV Luminosity Function at $z > 7.5$*
13. Brinch, M.,... **Weaver, J.**, et al. 2022, ApJ, submitted, *COSMOS2020: High- z Protocluster Candidates Discovered in COSMOS*
14. van Mierlo, S. E., ...**Weaver, J.**, et al. 2022, A&A, in press, on arxiv, *Euclid preparation: XXI. Intermediate-redshift contaminants in the search for $z > 6$ galaxies within the Euclid Deep Survey*
15. Kokorev, V.,...**Weaver, J.**, et al. 2022, ApJ, in press, on arxiv, *ALMA Lensing Cluster Survey: HST and Spitzer Photometry of 33 Lensed Fields Built with CHARGE*
16. 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*
17. Sillanssen, N.,...**Weaver, J.**, et al. 2022, A&A, in press, *A galaxy group candidate at $z \approx 3.7$ in the COSMOS field*
18. 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*
19. Desprez, G.,...**Weaver, J.**, et al. A&A, submitted, *The CFHT Large Area U-band Deep Survey (CLAUDS): Data release of combined photometry and photometric redshifts*
20. Jin, S.,...**Weaver, J.**, et al. 2022, A&A, 665, A3, *Diagnosing deceptively cold dusty galaxies at $3.5 < z < 6$: a substantial population of compact starbursts with high infrared optical depths*
21. 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 $z \sim 5$*
22. Lagattuta, D.,...**Weaver, J.**, et al. 2022, MNRAS, 514, 497L, *Pilot-WINGS: An extended MUSE view of the structure of Abell 370*
23. Steinhardt, C.,...**Weaver, J.**, et al. 2022, ApJ, 934, 22S, *Implications of a Temperature Dependent IMF III: Mass Growth and Quiescence*
24. **Weaver, J.** & Horne, K., 2022, MNRAS, 512, 1, *Measuring the AGN accretion disc light: Hints of finite stress at the innermost stable circular orbit*
25. 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*
26. Sneppen, A.,...**Weaver, J.**, et al. 2022, ApJ, 931, 57S, *Implications of a Temperature Dependent IMF I: Photometric Template Fitting*
27. Valentino, F.,...**Weaver, J.**, et al. 2022, ApJL, 929, 9V, *Archival discovery of a strong $z = 7.677$ Lyman- α and [C II] emitter*
28. Faisst, A.,...**Weaver, J.**, et al. 2022, ApJ, 929, 66, *Joint Survey Processing I: Compact oddballs in the COSMOS field – low-luminosity Quasars at $z > 6$?*
29. 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*
30. 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*
31. **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*
32. 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*
33. 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*
34. Kokorev, V.,...**Weaver, J.**, et al. 2021, ApJ, 921, 40, *The Evolving Interstellar Medium of Star-Forming Galaxies, as traced by Stardust*
35. Zheng, Y.,...**Weaver, J.**, et al. 2020, MNRAS, 498, 1, *Comparison of stellar populations in simulated and real post-starburst galaxies in MaNGA*
36. Steinhardt, C.,...**Weaver, J.**, et al. 2020, ApJS, 247, 2, 64, *The BUFFALO HST Survey*
37. Steinhardt, C.,**Weaver, J.**, et al. 2019, ApJ, 891, 136S, *A Method to Distinguish Quiescent and*

38. **Weaver, J.**, Husemann, B., et al. 2018, A&A, 614, A32, *Revealing the history and destiny of an emerging early-type galaxy*