

# John R. Weaver

## Curriculum Vitae

University of Massachusetts Amherst  
Department of Astronomy  
Amherst, Massachusetts, USA  
✉ [john.weaver.astro@gmail.com](mailto:john.weaver.astro@gmail.com)  
📄 [astroweaver.github.io](https://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

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## 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<sub>z</sub>Y, 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

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## 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

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## 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)

Undergraduate 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)

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## 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.

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## 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.

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## 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.

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## Service & Membership

Review Panel Service

**NASA Astrophysics (2023).**

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.**

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### Professional Memberships

o American Astronomical Society

o UK Royal Astronomical Society

o UK Institute of Physics

o European Astronomical Society

o Astronomers Without Borders

o The Planetary Society

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## 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](#)

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## Publications (51, 6 as first author, h-index: 16, citations: 439)

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, on arxiv, *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 NIRSpect 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, accepted, 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<sup>2</sup> of the HSC-SSP Deep and ultraDeep fields*
33. 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*
  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- $\alpha$  and [C II] emitter*
  41. Faist, 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*