

# John R. Weaver

## Publication List

Cosmic Dawn Center  
University of Copenhagen  
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📄 [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 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  $z < 0.1$ "  
Supervisor: Vivienne Wild | School prize for best astrophysics thesis  
GPA 3.8/4.0 – First Class Honours
- 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

- Spring 2020 **Visiting Graduate Student**, *Institute for Astronomy*, Honolulu, US.  
*Profile-fitting photometry for The Hawaii-2-0 Survey and the Cosmic Dawn Survey*  
Supervisor: Dave Sanders
- Spring 2019 **Visiting Graduate Student**, *California Institute of Technology*, Pasadena, US.  
*The Farmer: Profile-fitting photometry for the next generation of galaxy surveys*  
Supervisor: Peter Capak
- Winter 2018 **Visiting Graduate Student**, *Institut d'Astrophysique de Paris*, Paris, FR.  
*The COSMOS2020 Galaxy Catalog and the Spitzer Legacy Survey*  
Supervisor: Henry McCracken & Andrea Moneti
- 2016–2019 **Web-app Director**, *American Assoc. of Variable Star Observers*, Cambridge, US.  
*SpecDB: A public repository for spectra of variable stars*  
Supervisor: Stella Kafka
- 2016–2018 **Research Student**, *University of St Andrews*, St Andrews, UK.  
*Extracting quasar accretion light from SDSS lightcurves*  
Supervisor: Keith Horne
- Summer 2017 **Research Student**, *Max Planck Institute for Astronomy*, Heidelberg, DE.  
*Integral field spectroscopy of the recent merger remnant NGC 7252*  
Supervisor: Bernd Husemann
- Summer 2016 **LEAPS Research Student**, *Leiden Observatory*, Leiden, NL.  
*Searching for extreme high-redshift galaxies with 3D-HST*  
Supervisor: Michael Maseda
- Summer 2015 **REU Research Student**, *Maria Mitchell Observatory*, Nantucket, US.  
*A survey of localized super star clusters in NGC 1427A*  
Supervisors: Michael West and Michael Gregg

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## Skills

Data Handling	<i>multi-object/fibre spectroscopy</i> – kinematics and line fluxes (e.g. pPFX, PyParadise), velocity modelling, ionisation diagnostics, multi-band SED fitting <i>photometry</i> – image reduction (e.g. DS9, IRAF), profile-fitting photometry with own software ( <a href="#">The Farmer</a> ), aperture photometry (e.g. SExtractor, DAOPhot) <i>miscellaneous</i> – photometric redshifts (e.g. EAZY), AGN lightcurve decomposition with own software, Principal Component Analysis of spectra ( <a href="#">pyGappy</a> )
Facilities	<b>CANDIDE HPC</b> at IAP, Paris - 312 cores; Team Member - 1M+ hours use <b>Hawaii-2-0 HPC</b> at IfA, Hawaii - 100 cores; Team Member - 1M+ hours use
Code	Python (numpy/matplotlib/scipy/astropy; expert), FORTRAN (proficient)
Software	<a href="#">The Farmer</a> , <a href="#">pyGappy</a>   <a href="#">Github</a>
Web	Python-Django, MySQL, HTML/CSS

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## Awards & Scholarships

2021	Teacher of the Year; Teacher Assistant <i>Applied Statistics</i> / <i>Faculty of Science, University of Copenhagen</i>
2021	France DIM ACAV+ Computing Infrastructure Proposal (CO-I, €60K) <i>Expand HPC at Institut d'Astrophysique de Paris with 336 CPU + 400TB</i>
2018	Astrophysics Thesis Prize (\$150) <i>University of St Andrews</i>
2016-2018	Margaret Mayall Fellowship (\$6000) <i>American Association of Variable Star Observers</i>
2017	Juno Champion & Athena Swan Equality/Inclusion Awards (co-author) <a href="#">Equality &amp; Diversity Committee</a> , <i>University of St Andrews School of Physics</i>
2013	International Undergraduate Scholarship (\$6000) <i>University of St Andrews</i>
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

### Teaching Assistant, University of Copenhagen

2021	<b>Nordic Optical Telescope Summer School.</b> Postgraduate Level Course   <a href="#">Website</a>
2019, 2020	<b>Applied Statistics: From Data to Results.</b> Postgraduate Level Course   2021 Teacher of the Year Course   <a href="#">Website</a>
	<b>Student Supervision (<b>bold</b>=primary supervisor)</b>
Undergraduate	<b>Julia Tiller</b> (DAWN-REU 2019), <b>Albert Sneppen</b> (DAWN 2019), <b>Christian Kragh Jespersen &amp; Jonas Vinther</b> (DAWN 2020), Rasmus Damgaard Nielsen (DAWN BSc 2021), Tommy Clark (DAWN-SURF 2021)
Masters	Athansios Anastasiou (DAWN 2019-2020), Lukas Zalesky (IfA 2020, project prize)

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## Observations

### Operational Experience

Imaging	<b>Subaru/HSC</b>
Spectroscopy	<b>Keck/DEIMOS</b> , <b>Nordic Optical Telescope/ALFOSC</b>

### Selected Approved Programs (1 PI, 16 CO-I; JWST First)

2021	<b>PI</b> , <i>Beasts in the Bubbles: Characterizing ultra-luminous Galaxies at Cosmic Dawn.</i> JWST/NIRSpec IFU   Cycle 1   14.4hrs (\$260K)
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- 2021 **CO-I**, *Galaxy Protoclusters as Drivers of Cosmic Reionization*.  
JWST/NIRCam/NIRSpec | Cycle 1 | 25.2/9.7hrs | PI: C. Martin
- 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**, *Exploring UV-bright galaxies at  $z \sim 9 - 10$* .  
Keck/MOSFIRE | 2N | PI: B. Mobasher
- 2022 **CO-I**, *First accurate constraint of cold dust and gas properties in the EoR*.  
NOEMA | 20.0hrs | PI: D. Liu
- 2022 **CO-I**, *Deep [OIII] 88um and dust cont. of two luminous galaxies at  $z \sim 10$* .  
ALMA | Cycle 8 | 17.8hrs | PI: T. Hashimoto
- 2022 **CO-I**, *Beasts in the Bubbles: Remarkably UV-bright Galaxies at  $z = 9 - 10$* .  
Keck/MOSFIRE | 2N | PI: C. Casey
- 2022 **CO-I**, *Deep Subaru HSC z-band imaging of the Euclid/JWST/Roman Deep Field*.  
Subaru/HSC | 2N | PI: N. Suzuki
- 2021 **CO-I**, *Chasing big bubbles: the confirmation of a bright  $z = 9.8$  galaxy*.  
NOEMA | 30.0hrs | PI: F. Valentino
- See [website](#) for full listing.

## Selected Talks (29 Talks, 8 Posters)

- 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  $z \sim 10$
- May, 2021 **U. Hawaii Institute for Astronomy Coffee Talks**, virtual, invited talk.  
COSMOS2020: A panchromatic view of the Universe to  $z \sim 10$
- Mar, 2021 **Institut d'Astrophysique de Paris Galaxy Colloquium**, virtual, invited talk.  
COSMOS2020: A panchromatic view of the Universe to  $z \sim 10$
- Oct., 2020 **Galaxy Evolution in the Era of *Roman***, *abbr.*, STSCI, virtual, contributed talk.  
COSMOS2020 as a stepping stone for the next generation of galaxy surveys
- See [website](#) for full listing.

## Outreach

- 2019-present **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.
- 2014-2018 **Student Assistant**, *University Observatory*, St Andrews, UK.
- 2014-2016 **Columnist**, *Sci@StAnd*, Undergraduate science magazine.
- 2013-2018 **Observing Director**, *University 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

### Referee for Academic Journals

2020–present **Monthly Notices of the Royal Astronomical Society.**

2018–present **Astronomy & Astrophysics.**

### 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 (×2), First Year Representative.**

### University of St Andrews Physics Society

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

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## Professional Memberships

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

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## Press

- 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](#)
- Jan., 2015 **The Independent**, *Mention in regional newspaper*.  
"Geeking out at Frosty Drew" | [Article](#)

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## Publications (10 total, 2 as first-author)

*Refereed manuscripts, in reverse chronological order:*

1. **Weaver, J.**, Kauffmann, O., et al., ApJS, in press, [COSMOS2020: A panchromatic view of the Universe to  \$z \sim 10\$  from two complementary catalogs](#)
2. Moneti, A.,...**Weaver, J.**, et al. A&A, in press, [Euclid preparation: Cosmic Dawn Survey Spitzer observations of the Euclid deep fields and calibration fields](#)
3. Casey, C.,...**Weaver, J.**, et al. 2021, ApJ, in press, [Mapping Obscuration to Reionization with ALMA \(MORA\): 2 mm Efficiently Selects the Highest-Redshift Obscured Galaxies](#)
4. Sun, F.,...**Weaver, J.**, et al. 2021, ApJ, in press, [Extensive Lensing Survey of Optical and Near-Infrared Dark Objects \(El Sonido\): HST H-Faint Galaxies behind 101 Lensing Clusters](#)
5. Ito, K.,...**Weaver, J.**, et al. 2021, ApJ, in press, [COSMOS2020: Ubiquitous AGN activity of Massive Quiescent Galaxies at  \$0 < z < 5\$  Revealed by X-ray and Radio Stacking](#)
6. Kokorev, V.,...**Weaver, J.**, et al. 2021, ApJ, in press, [The Evolving Interstellar Medium of Star-Forming Galaxies, as traced by Stardust](#)
7. Yirui, Z.,...**Weaver, J.**, et al. 2020, MNRAS, Volume 498, Issue 1, [Comparison of stellar populations in simulated and real post-starburst galaxies in MaNGA](#)
8. Steinhardt, C.,...**Weaver, J.**, et al. 2020, ApJS, 247, 2, 64, [The BUFFALO HST Survey](#)
9. Steinhardt, C.,**Weaver, J.**, et al. 2019, ApJ, 891, 136S, [A Method to Distinguish Quiescent and Dusty Star-forming Galaxies with Machine Learning](#)
10. **Weaver, J.**, Husemann, B., et al. 2018, A&A, 614, A32, [Revealing the history and destiny of an emerging early-type galaxy](#)

*Submitted Manuscripts:*

1. **Weaver, J.** & Horne, K. MNRAS, submitted, *Measuring the AGN accretion disc light: Hints of finite stress at the innermost stable circular orbit*
2. Lagattuta, D.,...**Weaver, J.**, et al. MNRAS, submitted, *Pilot-WINGS: An extended MUSE view of the structure of Abell 370*
3. Sneppen, A.,...**Weaver, J.**, et al. ApJ, submitted, *Implications of a Temperature Dependent IMF I: Photometric Template Fitting*
4. Steinhardt, C.,...**Weaver, J.**, et al. ApJ, submitted, *Implications of a Temperature Dependent IMF II: An Updated View of the Star-Forming Main Sequence*
5. Steinhardt, C.,...**Weaver, J.**, et al. ApJ, submitted, *Implications of a Temperature Dependent IMF III: Mass Growth and Quiescence*
6. Faisst, A.,...**Weaver, J.**, et al. ApJ, submitted, on arXiv [Joint Survey Processing I: Compact oddballs in the COSMOS field – low-luminosity Quasars at  \$z > 6\$ ?](#)

*Manuscripts to be submitted in the next 6 months:*

1. **Weaver, J.**, Zalesky, L., et al. ApJ, to be submitted, *The Farmer: A reproducible, profile-fitting photometry pipeline for the next-generation of ultra-deep galaxy surveys using the Tractor*
2. **Weaver, J.**, Toft, S., et al. ApJ, to be submitted, *COSMOS2020: The Galaxy Stellar Mass Function, new constraints on mass assembly since  $z \sim 7$*
3. van Mierlo, S.,...**Weaver, J.**, et al. A&A, to be submitted, *Euclid Preparation: Intermediate-redshift contaminants in the search for  $z > 6$  galaxies within the Euclid Deep Survey*
4. Kaufmann, O.,...**Weaver, J.**, et al. A&A, to be submitted, *COSMOS2020: The UV Luminosity Function at  $z > 7.5$*
5. Shuntov, M.,...**Weaver, J.**, et al. A&A, to be submitted, *COSMOS2020: The cosmic evolution of the stellar-to-halo mass relation for central and satellite galaxies up to  $z \sim 5$*
6. Zalesky, L.,...**Weaver, J.**, et al. ApJ, to be submitted, *Source Detection Optimization Using Realistic Simulations of Ultra-deep Ground-based Imaging*
7. McPartland, C.,...**Weaver, J.**, et al. A&A, to be submitted, *Euclid Preparation: Cosmic Dawn Survey: The Hawaii 20 deg<sup>2</sup> Survey (H20) Overview*
8. Chartab, N.,...**Weaver, J.**, et al. ApJ, to be submitted, *A machine learning approach to predict missing wave-band photometry*

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## References

**Prof. Sune Toft**

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**Prof. Keith Horne**

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**Prof. David Sanders**

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