

John R. Weaver

Curriculum Vitae

Cosmic Dawn Center
University of Copenhagen
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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

Skills

Data Handling *slit/spatially-resolved spectroscopy* – kinematics and line fluxes (e.g. pPFX, PyParadise), velocity modelling, ionisation diagnostics, SED fitting (EA_zY, Le Phare)
photometry – image reduction (e.g. DS9, IRAF), profile-fitting photometry with own software ([The Farmer](#)), aperture photometry (e.g. SExtractor, DAOPhot)
miscellaneous – photometric redshifts, 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; Teacher Assistant
Applied Statistics | Faculty of Science, University of Copenhagen

2021 France DIM ACAV+ Computing Infrastructure Proposal (CO-I, €60K)
Expand HPC at Institut d'Astrophysique de Paris with 336 CPU + 400TB

2018 Astrophysics Thesis Prize (\$150)
University of St Andrews

2016-2018 Margaret Mayall Fellowship (\$6000)
American Association of Variable Star Observers

2017 Juno Champion & Athena Swan Equality/Inclusion Awards (co-author)
Equality & Diversity Committee, University of St Andrews School of Physics

2013 International Undergraduate Scholarship (\$6000)
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)

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

Observations

[Operational Experience](#)

Imaging **Subaru/HSC**

Spectroscopy **Keck/DEIMOS/MOSFIRE, Nordic Optical Telescope/ALFOSC**

[Selected Approved Programs \(1 PI, 17 CO-I; JWST First\)](#)

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
- 2022-2024 **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**, *Deep spectroscopy of bright red massive quiescent galaxies at $z \sim 2.5 - 3$* .
VLT/X-Shooter | 56.0hrs | PI: F. Valentino
- 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
- See [website](#) for full listing.

Selected Talks (30 Talks, 8 Posters)

- 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 $z \sim 10$
- 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.

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.**

Professional Memberships

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

Press

- 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 (10 total, 3 as first-author)

Refereed manuscripts, in reverse chronological order:

1. **Weaver, J.** & Horne, K. MNRAS, in press, *Measuring the AGN accretion disc light: Hints of finite stress at the innermost stable circular orbit*
2. **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*
3. Moneti, A.,...**Weaver, J.**, et al. 2022, A&A, in press, *Euclid preparation: Cosmic Dawn Survey Spitzer observations of the Euclid deep fields and calibration fields*
4. 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*
5. 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*
6. Kokorev, V.,...**Weaver, J.**, et al. 2021, ApJ, 921, 40, *The Evolving Interstellar Medium of Star-Forming Galaxies, as traced by Stardust*
7. Yirui, Z.,...**Weaver, J.**, et al. 2020, MNRAS, 498, 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. Kaufmann, O., Ilbert, O., **Weaver, J.**, et al. A&A, submitted, *COSMOS2020: The UV Luminosity Function at $z > 7.5$*
2. Shuntov, M., **Weaver, J.**, et al. A&A, submitted, *COSMOS2020: The cosmic evolution of the stellar-to-halo mass relation for central and satellite galaxies up to $z \sim 5$*
3. Ito, K.,...**Weaver, J.**, et al. ApJ, submitted, *COSMOS2020: Ubiquitous AGN activity of Massive Quiescent Galaxies at $0 < z < 5$ Revealed by X-ray and Radio Stacking*
4. Chartab, N.,...**Weaver, J.**, et al. ApJ, to be submitted, *A machine learning approach to predict missing wave-band photometry*
5. Lagattuta, D.,...**Weaver, J.**, et al. MNRAS, submitted, *Pilot-WINGS: An extended MUSE view of the structure of Abell 370*
6. Sneppen, A.,...**Weaver, J.**, et al. ApJ, submitted, *Implications of a Temperature Dependent IMF I: Photometric Template Fitting*
7. Steinhardt, C.,...**Weaver, J.**, et al. ApJ, submitted, *Implications of a Temperature Dependent IMF II: An Updated View of the Star-Forming Main Sequence*
8. Steinhardt, C.,...**Weaver, J.**, et al. ApJ, submitted, *Implications of a Temperature Dependent IMF III: Mass Growth and Quiescence*
9. Faist, 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 3 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. Brinch, M.,...**Weaver, J.**, et al. ApJ, to be submitted, *COSMOS2020: High- z Protocluster Candidates Discovered in COSMOS*
4. Davidzon, I.,...**Weaver, J.**, et al. A&A, to be submitted, *COSMOS2020: manifold learning to estimate stellar masses and star formation rates in large galaxy surveys*
5. 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*
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 deg² Survey (H20) Overview*
8. Jin, S.,...**Weaver, J.**, et al. A&A, to be submitted, *Diagnosing deceptively cold dusty galaxies at $3.5 < z < 6$: a substantial population of compact starbursts with high infrared optical depths*
9. Desprez, G.,...**Weaver, J.**, et al. A&A, to be submitted, *The CFHT Large Area U-band Deep Survey (CLAUDS): Data release of CLAUDS–HSC–SSP–VIRCAM combined photometry and photometric redshifts*
10. Valentino, F.,...**Weaver, J.**, et al. ApJL, to be submitted, *Archival discovery of a strong $z = 7.677$ Lyman- α and [C II] emitter*