

John R. Weaver

Curriculum Vitae

Cosmic Dawn Center
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Education

- 2018–present **PhD Astrophysics**, *Cosmic Dawn Center, Univ. of Copenhagen*, Copenhagen, DK.
"COSMOS2020: new insights into galaxy assembly and evolution in the first 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 *multi-object/fibre spectroscopy* – kinematics and line fluxes (e.g. pPFX, PyParadise), velocity modelling, ionisation diagnostics, multi-band SED fitting
photometry – image reduction (e.g. DS9, IRAF), profile-fitting photometry with own software ([The Farmer](#)), aperture photometry (e.g. SExtractor, DAOPhot)
miscellaneous – photometric redshifts (e.g. EAZY), 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

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

[Experience](#)

Imaging **Subaru/HSC**

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

[Selected Programs \(1 PI, 9 CO-I\)](#)

2021 **PI**, *Beasts in the Bubbles: Characterizing ultra-luminous Galaxies at Cosmic Dawn.*
JWST/NIRSPEC IFU | Cycle 1 | 13.6hrs

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

- 2022 **CO-I**, *Deep [OIII] 88 um and dust continuum observations of two remarkably 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**, *Beasts in the Bubbles: Remarkably UV-bright Galaxies at $z = 9 - 10$* .
Subaru/SWIMS | 1.5N | PI: S. Fujimoto
- 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**, *Beasts in the Bubbles: Remarkably UV-bright Galaxies at $z = 9 - 10$* .
VLT/XSHOOTER | 25.7hrs | PI: S. Fujimoto
- 2021 **CO-I**, *Chasing big bubbles: the confirmation of a bright $z = 9.8$ galaxy*.
NOEMA | 30.0hrs | PI: F. Valentino
- 2019 **CO-I**, *Resolving the rapid quenching of star formation in the local Universe*.
ALMA | Cycle 7 | 10.7hrs | PI: K. Rowlands
- See [website](#) for full listing.

Selected Talks (26 Talks, 8 Posters)

- 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
- Mar., 2020 **Where Star Formation Ends**, *CANCELLED*, Leiden, NL, invited talk.
Exploring the Origins of Bimodality: Post-starburst Galaxies at $z < 0.1$
- 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](#).

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.**

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

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|---------------------------------|---------------------------------|
| ○ American Astronomical Society | ○ UK Royal Astronomical Society |
| ○ American Physical Society | ○ European Astronomical Society |
| ○ Society of Physics Students | ○ UK Institute of Physics |
| ○ Astronomers Without Borders | ○ The Planetary Society |

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](#)

Publications (10 total, 2 as first-author)

Published 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. 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](#)
3. 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](#)
4. 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](#)
5. Kokorev, V.,...**Weaver, J.**, et al. 2021, ApJ, in press, [The Evolving Interstellar Medium of Star-Forming Galaxies, as traced by Stardust](#)
6. 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](#)
7. Steinhardt, C.,...**Weaver, J.**, et al. 2020, ApJS, 247, 2, 64, [The BUFFALO HST Survey](#)
8. Steinhardt, C.,**Weaver, J.**, et al. 2019, ApJ, 891, 136S, [A Method to Distinguish Quiescent and Dusty Star-forming Galaxies with Machine Learning](#)
9. **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. Moneti, A.,...**Weaver, J.**, et al. 2021, A&A, submitted, *Euclid preparation: Cosmic Dawn Survey Spitzer observations of the Euclid deep fields and calibration fields*
3. Sneppen, A.,...**Weaver, J.**, et al. 2021, ApJ, submitted, *Implications of a Temperature Dependent IMF I: Photometric Template Fitting*
4. Steinhardt, C.,...**Weaver, J.**, et al. 2021, 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. 2021, ApJ, submitted, *Implications of a Temperature Dependent IMF III: Mass Growth and Quiescence*
6. Faisst, A.,...**Weaver, J.**, et al. 2021, ApJ, submitted, on arXiv *Joint Survey Processing I: Compact oddballs in the COSMOS field – low-luminosity Quasars at $z > 6$?*

Manuscripts to be submitted this year:

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. Kaufmann, O.,...**Weaver, J.**, et al. A&A, to be submitted, *COSMOS2020: The UV Luminosity Function at $z > 7.5$*
4. 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 $z \sim 5$*
5. Zalesky, L.,...**Weaver, J.**, et al. ApJ, to be submitted, *Source Detection Optimization Using Realistic Simulations of Ultra-deep Ground-based Imaging*
6. McPartland, C.,...**Weaver, J.**, et al. A&A, to be submitted, *Euclid Preparation: Cosmic Dawn Survey: The Hawaii 20 deg² Survey (H20) Overview*