John R. Weaver

Curriculum Vitae

Cosmic Dawn Center
University of Copenhagen
Copenhagen N, 2200 Denmark
✉ *john.weaver.astro@gmail.com*
🖰 *astroweaver.github.io*

Education

2018–present   **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	*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)

Undergradute	**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, **Nordic Optical Telescope**/ALFOSC

Selected Programs (1 PI, 11 CO-I; JWST First)

2021	**PI**, *Beasts in the Bubbles: Characterizing ultra-luminous Galaxies at Cosmic Dawn*. JWST/NIRSPEC IFU | Cycle 1 | 14.4hrs
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**, *First accurate constraint of cold dust and gas properties in the EoR*.
NOEMA | 20.0hrs | PI: D. Liu

2022   **CO-I**, *Uncovering a unique population of gas giants at <z>=1.2*.
NOEMA | 8.0hrs | PI: V. Kokorev

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 ($\times 2$), First Year Representative**.

University of St Andrews Physics Society

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

Professional Memberships

○ American Astronomical Society
○ American Physical Society
○ Society of Physics Students
○ Astronomers Without Borders

○ UK Royal Astronomical Society
○ European Astronomical Society
○ UK Institute of Physics
○ 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 (9 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.**, ApJ, submitted, *Implications of a Temperature Dependent IMF I: Photometric Template Fitting*
4. Steinhardt, C.,...**Weaver, J.**, ApJ, submitted, *Implications of a Temperature Dependent IMF II: An Updated View of the Star-Forming Main Sequence*
5. Steinhardt, C.,...**Weaver, J.**, ApJ, submitted, *Implications of a Temperature Dependent IMF III: Mass Growth and Quiescence*
6. Faisst, A.,...**Weaver, J.**, 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 $20\,deg^2$ Survey (H20) Overview*
7. Chartab, N.,...**Weaver, J.**, et al. ApJ, to be submitted, *A machine learning approach to predict missing wave-band photometry*