# CHRISTIAN KRAGH JESPERSEN

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## EDUCATION

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|---|---|---|
| **MA/PhD** | Astrophysical Sciences, Princeton University | 2021 – 2026 (expected) |
| **BSc** | Physics, University of Copenhagen | 2018 - 2021 |

## PROFESSIONAL EXPERIENCE

**Undergraduate Researcher and Outreach Assistant** Nov. 2018 – Feb. 2021
Institution: Cosmic Dawn Center (DAWN)
Advisor: Ass. Prof. Charles L. Steinhardt/Prof. Sune Toft

**Caltech Summer Undergraduate Research Fellow** June 2019 – Sept. 2019
Institution: California Institute of Technology
Advisor: Marvin L. Goldberger Professor of Planetary Science David John Stevenson

## PUBLICATIONS

### ***Journal Publications***

Vujeva, L., Steinhardt, C. L., **Jespersen, C. K.**, …, Sneppen, A (2023), Efficient survey design for finding high-redshift galaxies with *JWST*, *The Astrophysical Journal*

Weaver, J. R., Davidzon, I., … **Jespersen, C. K.** … Zamorani, G. (2023), COSMOS2020: The galaxy stellar mass function. The assembly and star formation cessation of galaxies at $0.2< z \leq 7.5$**,** *Astronomy & Astrophysics, Volume 677*.

Ito, K., Valentino, F., … **Jespersen, C. K.**, … Wright, L. (2023), Size - Stellar Mass Relation and Morphology of Quiescent Galaxies at $z\geq3$ in Public *JWST* Fields, *The Astrophysical Journal*

Wu, J. F. & **Jespersen, C. K.** (2023), "Learning the galaxy-environment connection with graph neural networks", ICML.

Hassan, S., Lovell, C. C., … **Jespersen, C. K.**, … Bera, A. (2023), JWST constraints on the UV luminosity density at cosmic dawn: implications for 21-cm cosmology, *The Astrophysical Journal Letters*

Steinhardt, C. L., Mann, W. J., Rusakov, V., & **Jespersen, C. K.** (2023), Classification of BATSE, Swift, and Fermi Gamma-Ray Bursts from Prompt Emission Alone. *The Astrophysical Journal, vol. 945, no. 1*

Valentino, F., Brammer, G., … **Jespersen, C. K.**, … Toft, S. (2023), An Atlas of Color-selected Quiescent Galaxies at z>3 in Public JWST Fields. *The Astrophysical Journal*

**Jespersen, C. K.**, Cranmer, M., Melchior, P., Ho, S., Somerville, R. S., & Gabrielpillai, A. (2022). Mangrove: Learning Galaxy Properties from Merger Trees. T*he Astrophysical Journal Vol. 941, no. 1*.

Weaver, J. R., Kauffmann, O. B., … **Jespersen, C. K.** … Zamorani, G. (2022). COSMOS2020: A Panchromatic View of the Universe to z = 10 from Two Complementary Catalogs**.** *The Astrophysical Journal Supplement Series, Vol 258, Issue 1*.

Lesniewska, A., Michalowski, M. J., … **Jespersen, C. K**., … Watson, D. (2022). **The Interstellar Medium in the Environment of the Supernova-Less Long-Duration GRB111005A.** *The Astrophysical Journal Supplement Series.*

Steinhardt, C. L., **Jespersen, C. K**., Linzer, N. B., (2021). Finding High-Redshift Galaxies with JWST. *The Astrophysical Journal Vol. 923, no 1.*

**Jespersen, C. K**., Severin, J. B., Steinhardt, C. L., Vinther, J., Fynbo, J. P. U., Selsing, J., & Watson, D. (2020). An Unambiguous Separation of Gamma-Ray Bursts into Two Classes from Prompt Emission Alone**.** *The Astrophysical Journal*, 896(2), L20.

**Jespersen, C. K**. & Stevenson, D. J. (2019). Investigating Radius Increases in Hot Exoplanets. *Bulletin of the American Astronomical Society, Vol. 52.*

### ***Other Publications***

Textbook: Hansen, C, Bruun, S. H., Robl, J. B., **Jespersen, C. K**., Larsen, J. Ø., Jensen, R. B., Ditlefsen, E. S., Thomsen, J. S. (2019). **Kompendium for Fysik Camp 2019 (*Compendium for Physics Camp*).** *UNF Print*.

Textbook: Hansen, C, Bruun, S. H., Robl, J. B., **Jespersen, C. K**., Osman, J. O., Jensen, R. B., Ditlefsen, E. S., Thomsen, J. S. (2018). **Kompendium for Fysik Camp 2018 (*Compendium for Physics Camp*).** *UNF Print*.

## TALKS

"Mangrove: Learning Galaxy Properties from Merger Trees", John Hopkins/Space Telescope Science Institute Galaxy Evolution Group, 2023

"Mangrove: Learning Galaxy Properties from Merger Trees", Kavli Institute of Theoretical Physics Data-Driven Galaxy Evolution Workshop, 2023

"The Unreasonable Efficiency of Graph Neural Networks in Physics", Kavli Institute of Theoretical Physics Data-Driven Galaxy Evolution Workshop, 2023

"An Atlas of Color-Selected Quiescent Galaxies", Princeton University Astrocoffee, 2023

"The Unreasonable Efficiency of Graph Neural Networks in Physics", Flatiron Institute, 2023

"Classification of BATSE, Swift, and Fermi Gamma-Ray Bursts from Prompt Emission Alone", Princeton University Astrocoffee, 2023

"Mangrove: Learning Galaxy Properties from Merger Trees", Princeton University Astrocoffee, 2022

"Learning Galaxy Properties from Merger Trees with Mangrove", Euclid Consortium Meeting, 2022

"Learning Galaxy Properties from Merger Trees with Graph Neural Networks", Brown University Machine Leaning Seminar, 2022

"Learning Galaxy Properties from Merger Trees", Flatiron Institute MLxAstro Group, 2021

"Finding High-Redshift Galaxies with JWST", Princeton University Astrocoffee, 2021.

"Optimizing Reconstruction and Error Estimation of IceCube Events Using Graph Neural Networks," University of Toronto, 2021.

"An Unambiguous Separation of Gamma-Ray Bursts into Two Classes from Prompt Emission Alone," University of Toronto, 2021.

"Optimizing Reconstruction and Error Estimation of IceCube Events Using Graph Neural Networks," IceCube Collaboration, 2021.

"Optimizing Reconstruction and Error Estimation of IceCube Events Using Graph Neural Networks," NBI and Technical University of Munich IceCube Groups, 2021.

"Physics, Science, and How to Become an Astrophysicist," Guest Lecturer, Fredensborg Skole and Frederiksborg Gymnasium og HF, 2020.

"Gradient Boosted Reweighting: A tool for improving models trained in Monte Carlo Simulation," Niels Bohr Institute, IceCube Neutrino Group Workshop, 2020.

"An Unambiguous Separation of Gamma-Ray Bursts into Two Classes from Prompt Emission Alone," DAWN Summit, Cosmic Dawn Center, 2020.

"PSF Deconvolution in the COSMOS2020 Field," NBI Astronomy Cake Talk, Cosmic Dawn Center, DARK, and AstroNu Groups, 2020.

"Investigating Radius Increases in Hot Exoplanets," Chambliss Poster Presentation, 235$^{th}$ AAS Meeting, 2019.

"Possibilities for Undergraduate Research – in Denmark and Overseas," University of Copenhagen STEM Council, 2019.

"Investigating Radius Increases in Hot Exoplanets," Caltech Summer Seminar, 2019.

"A Possible Unambiguous Separation of Gamma-Ray Bursts from Prompt Emission Alone," NBI Astronomy Cake Talk, Cosmic Dawn Center, DARK, and AstroNu Groups, 2019.

## MEDIA APPEARANCES

"Solved astronomy mystery after just one year at university," University of Copenhagen University Post, print and online article.

"Tre danske studerende har løst astronomisk mysterium - folk ringer fra hele verden (*Three Danish students have solved an astronomical mystery – people are calling from all over the world*)," TV2, online article.

"Tre danske studerende har løst astronomisk mysterium - folk ringer fra hele verden (*Three Danish students have solved an astronomical mystery – people are calling from all over the world*)," TV2, Go'morgen Danmark (*Good Morning Denmark*), national cable.

## COLLABORATION MEMBERSHIPS

**COSMOS**

**James Webb Space Telescope – Beasts In The Bubbles**

**Learning the Universe (LtU)**

**Prime Focus Spectrograph (PFS)**

**Legacy Survey of Space and Time Dark Energy Science Collaboration (LSST-DESC)**

## ADVISING

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| Adi Varshney (Graduate Student, Cambridge University) | Oct. 2023 – |
| Suvan Shah (Graduate Student, Cambridge University) | Oct. 2023 – |
| Chen-Yu Chuang (Graduate Student, ASIAA) | May 2022 – |
| W. J. Mann (Undergraduate, U of Massachusetts, Amherst) | Sep. 2021 – Jan. 2023 |

## COMMUNITY

**Outreach Speak** August 2023 –
Astronomy on Tap Trenton

**High School Research Advisor** August 2023 –

**Graduate Student Mentor** September 2022 –
Princeton University, Department of Astrophysical Sciences

**Organizer/Observer** September 2022 –
Princeton University Public Observing Nights

**Graduate Student Committee Member** September 2021 –
Princeton University Department of Astrophysical Sciences

**Head Organizer** May 2019 – July 2021
Physics* – Inspirational Talks (University of Copenhagen)

**Co-Founder and Co-Organizer** Sept. 2018 – July 2021
Project Eøler Coding Club (University of Copenhagen)

**Lecturer and Curriculum Co-Author** June 2018 – Aug. 2019
Danish Youth Association of Science

## CODING LANGUAGES & SOFTWARE

Python – Expert
Linux – Advanced
Git – Intermediate
IDL – Intermediate
HTML – Intermediate
C – Introductory
SExtractor
PSFEx
SAO DS9

## SPOKEN/WRITTEN LANGUAGES

Danish – Native
English – Bilingual Proficiency
Portuguese – Bilingual Proficiency
Spanish – Advanced (O)/Advanced (W)
Norwegian – Advanced (O)/Advanced (W)
Swedish – Advanced (O)/Advanced (W)
German – Intermediate (O)/Intermediate (W)
Italian – Intermediate (O)/Advanced (W)
French – Intermediate (O)/Advanced (W)

## HONOURS AND AWARDS

**PLANCKS National Qualification (2nd/19 Competing Teams)** 2023
Team Qualified for PLANCKS Milano 2023 Final

**PLANCKS National Qualification (2nd/27 Competing Teams)** 2020
Team Qualified for PLANCKS London 2020 Final

**National Team Honours** 2018
Danish Physics Olympiad

**National Team Honours** 2018
Danish Chemistry Olympiad

**Youngest Finalist** 2017
Danish Physics Olympiad

**Certificate of Excellence for Outstanding Performance in Physics** 2016
Oxford Royale Academy

**Certificate of Excellence for Outstanding Learning in Mathematics** 2016
Oxford Royale Academy

**National Certificate of Excellence** 2016
Juvenes Translatores, European Commission