CHRISTIAN KRAGH JESPERSEN

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EDUCATION

PhD   Astrophysical Sciences, Princeton University   2021 – 2026 (expected)
Committee: P. Melchior (co-chair), D. N. Spergel (co-chair), R. S. Somerville, S. Ho, J. E. Greene

MA   Astrophysical Sciences, Princeton University   2021– 2023
BSc   Physics, University of Copenhagen   2018 - 2021

PROFESSIONAL EXPERIENCE

Guest Researcher   Aug. 2021 –
Institution: Center for Computational Astrophysics (Flatiron Institute)
Hosts: Prof. Shirley Ho/Prof. David N. Spergel

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   Jun. 2019 – Sep. 2019
Institution: California Institute of Technology
Advisor: Marvin L. Goldberger Professor of Planetary Science, David John Stevenson

PUBLICATIONS

Papers:

Jespersen, C. K., P. Melchior, D. N. Spergel, A. D. Goulding, C. Hahn, K. G. Iyer, "The optical and infrared are connected", 2025, arXiv

F. Valentino, K. E. Heintz, G. Brammer..., **Jespersen, C. K.,** ..., et al., "Gas outflows in two recently quenched galaxies at z = 4 and 7", 2025, arXiv

K. Ito, F. Valentino, M. Farcy..., **Jespersen, C. K.,** ..., et al., "A merging pair of massive quiescent galaxies at z=3.44 in the Cosmic Vine", 2025, arXiv

M. Shuntov, O. Ilbert, S. Toft..., **Jespersen, C. K.,** ..., et al., "COSMOS-Web: Stellar mass assembly in relation to dark matter halos across 0.2 < z < 12 of cosmic history", 2025, A&A

L. Paquereau, C. Laigle, H. J. McCracken..., **Jespersen, C. K.,** ..., et al., "Tracing the galaxy-halo connection with galaxy clustering in COSMOS-Web from z = 0.1 to z ~ 12", 2025, arXiv

J. F. Wu, **Jespersen, C. K.,** R. H. Wechsler, "How the Galaxy–Halo Connection Depends on Large-scale Environment", 2024, ApJ

L. Vujeva, C. L. Steinhardt, **Jespersen, C. K.,** et al., "Efficient Survey Design for Finding High-redshift Galaxies with JWST", 2024, ApJ

Jespersen, C. K., R. H. Lupton, J. E. Gunn, et al., "Airglow and the Subaru Night Sky Spectrograph (SuNSS)", 2024, SPIE

N. Tamura, K. Yabe, S. Koshida..., **Jespersen, C. K.,** ..., et al., "Prime Focus Spectrograph (PFS) for Subaru Telescope: progressing final steps to science operation", 2024, SPIE

C. Chuang, **Jespersen, C. K.,** Y. Lin, S. Ho, S. Genel, "Leaving No Branches Behind: Predicting Baryonic Properties of Galaxies from Merger Trees", 2024, ApJ

K. Ito, F. Valentino, G. Brammer..., **Jespersen, C. K.,** ..., et al., "Size–Stellar Mass Relation and Morphology of Quiescent Galaxies at $z \geq 3$ in Public JWST Fields", 2024, ApJ

Jespersen, C. K., C. L. Steinhardt, R. S. Somerville, C. C. Lovell, "On the Significance of Rare Objects at High Redshift: The Impact of Cosmic Variance", 2024, arXiv

S. Hassan, C. C. Lovell, P. Madau..., **Jespersen, C. K.,** ..., et al., "JWST Constraints on the UV Luminosity Density at Cosmic Dawn: Implications for 21 cm Cosmology", 2023, ApJ

J. R. Weaver, I. Davidzon, S. Toft..., **Jespersen, C. K.,** ..., et al., "COSMOS2020: The galaxy stellar mass function. The assembly and star formation cessation of galaxies at $0.2 < z \leq 7.5$", 2023, A&A

J. F. Wu, **Jespersen, C. K.,** "Learning the galaxy-environment connection with graph neural networks", 2023, Machine Learning for Astrophysics

Jespersen, C. K., M. Cranmer, P. Melchior, S. Ho, R. S. Somerville, A. Gabrielpillai, "Mangrove: Infer galaxy properties using dark matter merger trees", 2023, ASCL

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

F. Valentino, G. Brammer, K. M. L. Gould..., **Jespersen, C. K.,** ..., et al., "An Atlas of Color-selected Quiescent Galaxies at $z > 3$ in Public JWST Fields", 2023, ApJ

C. L. Steinhardt, W. J. Mann, V. Rusakov, **Jespersen, C. K.,** "Classification of BATSE, Swift, and Fermi Gamma-Ray Bursts from Prompt Emission Alone", 2023, ApJ

Jespersen, C. K., M. Cranmer, P. Melchior, S. Ho, R. S. Somerville, A. Gabrielpillai, "Mangrove: Learning Galaxy Properties from Merger Trees", 2022, ApJ

Jespersen, C. K., M. Cranmer, P. M. Melchior, S. Ho, R. Somerville, A. Gabrielpillai, "Learning Galaxy Properties from Merger Trees", 2022, Machine Learning for Astrophysics

A. Leśniewska, M. J. Michałowski, P. Kamphuis..., **Jespersen, C. K.,** ..., et al., "The Interstellar Medium in the Environment of the Supernova-less Long-duration GRB 111005A", 2022, ApJS

J. R. Weaver, O. B. Kauffmann, O. Ilbert..., **Jespersen, C. K.,** ..., et al., "COSMOS2020: A Panchromatic View of the Universe to $z \sim 10$ from Two Complementary Catalogs", 2022, ApJS

C. L. Steinhardt, **Jespersen, C. K.,** N. B. Linzer, "Finding High-redshift Galaxies with JWST", 2021, ApJ

Jespersen, C. K., J. B. Severin, C. L. Steinhardt, et al., "An Unambiguous Separation of Gamma-Ray Bursts into Two Classes from Prompt Emission Alone", 2020, ApJ

Books:
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

"Everything is connected", Stockholm, 2025

"The optical and infrared are connected", Bristol SBI workshop, 2025

"The optical and infrared are connected", CCA Cosmology x ML, 2025

"Everything is connected: galaxy properties couple internally, environmentally, and historically", DAWN Copenhagen, 2024

"Everything is connected: galaxy properties couple internally, environmentally, and historically", Cambridge, 2024

"The most massive galaxy we will find with JWST", IAP, Paris, 2024

"Everything is connected: galaxy properties couple internally, environmentally, and historically", CosmoStat, Saclay, 2024

"Everything is connected: galaxy properties couple internally, environmentally, and historically", IAP, Paris, 2024

"Galaxies, their dark matter environments, formation histories, and couplings", Perimeter Institute, 2024

"Challenging modelling assumptions by connecting the optical and IR", CCA, 2024

"New perspectives in galaxy formation", CU Boulder, 2024

"Challenging modelling assumptions by connecting the optical and IR", Princeton, 2024

"Challenging modelling assumptions by connecting the optical and IR", UCSC, 2024

"Airglow and The Subaru Night Sky Spectrograph (SuNSS)", Hilo, Hawaii, 2024

"Galaxies, their dark matter environments, and formation histories", Ciela Institute, 2024

"The most massive galaxy we will find with JWST", CCA, 2024

"Airglow and The Subaru Night Sky Spectrograph (SuNSS)", AAS Winter Meeting, 2024

"Galaxies and Graphs", Hammers & Nails Conference, 2023

"Galaxies and Graphs", Center for Computational Astrophysics Cosmic Connections Meeting, 2023

"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

"The Unreasonable Efficiency of Graph Neural Networks in Physics", Instituto de Astrofísica de Canarias, 2023

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

"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", CCA, 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," Cosmic Dawn Center, DARK, and AstroNu Groups, 2020.

"Investigating Radius Increases in Hot Exoplanets," Chambliss Poster Presentation, 235th 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

"Connaissez-vous l'airglow, la lueur de l'atmosphère?" Québec Science Magazine, print and online article.

"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, Go'morgen Danmark (*Good Morning Denmark*), national cable.

COLLABORATION MEMBERSHIPS

Learning the Universe (LtU)
Prime Focus Spectrograph (PFS)
Legacy Survey of Space and Time
Dark Energy Science Collaboration (LSST-DESC)
COSMOS Survey
James Webb Space Telescope – The Beasts in The Bubbles

TEACHING

Lecturer, Machine Leaning for the Physical Sciences, Princeton University Wintersession, 2025
Lecturer, Centre for Research in Astrophysics of Quebec Summer School, Montréal, 2024
Assistant Instructor, "The Universe", AST204, Princeton University, 2023
Assistant Instructor, "Modern Statistics", SML505, Princeton University, 2025

ADVISING

Veena Krishnaraj (Undergraduate Student, Princeton University)	Jun. 2024 –
Adi Varshney (Graduate Student, Cambridge University)	Oct. 2023 – Jun. 2024
Suvan Shah (Graduate Student, Cambridge University)	Oct. 2023 – Jun. 2024
Chen-Yu Chuang (Graduate Student, ASIAA/University of Arizona)	May 2022 –
W. J. Mann (Undergraduate, U of Massachusetts, Amherst)	Sep. 2021 – Jan. 2023
A. Mullan (High School Student)	Jul. 2023 – Nov. 2023

COMMUNITY

Community Garden Coordinator — Oct. 2023 –
Lakeside Graduate Apartments Committee

Outreach Speaker — Aug. 2023 –
Astronomy on Tap Trenton

Invited Reviewer — Dec 2022 –
ApJ, AJ, MNRAS, OJA

Graduate Student Peer Mentor — Sep. 2022 –
Princeton University, Department of Astrophysical Sciences

Organizer/Observer — Sep. 2022 –
Princeton University Public Observing Nights

Graduate Student Committee — Sep. 2021 –
Princeton University, Department of Astrophysical Sciences

Head Organizer — May 2019 – Jul. 2021
Physics* – Inspirational Talks, University of Copenhagen

Co-Founder and Co-Organizer — Sep. 2018 – Jul. 2021
Project Eøler Coding Club, University of Copenhagen

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

CONFERENCES/WORKSHOPS ORGANIZED

Learning the Universe Collaboration meeting

Member of the Local Organizing Committee, Princeton University   Mar. 2025

Simulation-Based Inference for Galaxy Formation
Member of the Scientific Organizing Committee, Bristol University   Apr. 2024

HONOURS AND AWARDS

Laura Bassi Scholarship   2025
Laura Bassi Foundation

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   2018
Danish Physics Olympiad

National Team   2018
Danish Chemistry Olympiad

Youngest Finalist   2017
Danish Physics Olympiad

CODING LANGUAGES & SOFTWARE   SPOKEN/WRITTEN LANGUAGES

Coding Languages & Software	Spoken/Written Languages
Python – Expert	Danish – Native
Linux – Advanced	English – Bilingual Proficiency
Git – Intermediate	Portuguese – Bilingual Proficiency
IDL – Intermediate	Spanish – Advanced (O)/Advanced (W)
HTML – Intermediate	Norwegian – Advanced (O)/Advanced (W)
	Swedish – Advanced (O)/Advanced (W)
	French – Advanced (O)/Advanced(W)