

## Kevin N. Hainline

---

### CONTACT

#### INFORMATION

Steward Observatory  
University of Arizona  
Room 256  
933 North Cherry Avenue  
Tucson, AZ 85721

*Email:* kevinhainline@arizona.edu  
*Website:* www.kevinhainline.com

### CURRENT POSITION

Associate Research Professor, James Webb Space Telescope NIRCam Science Team,  
JWST Advanced Deep Extragalactic Survey Team

### RESEARCH INTERESTS

Galaxy Evolution, Active Galactic Nuclei, High-Redshift Galaxies, Science and Astronomy Education, Planetarium Education

### EDUCATION

**University of California, Los Angeles**, Los Angeles, CA USA

Ph.D., Astronomy, September 2006 - July 2012

- PhD Thesis Title: *Understanding Star Formation and AGN Activity at  $z \sim 2-3$*
- Advisor: Professor Alice E. Shapley

M.S., Astronomy, May 2008

- Master's Thesis Title: *Mid-Infrared Line Diagnostics Of Seyfert Galaxies from the 12  $\mu\text{m}$  Sample*
- Advisor: Professor Matt A. Malkan

**Harvey Mudd College**, Claremont, CA, USA

B.S., Physics, June 2006

- With High Honors in Humanities
- Astronomy specialization (emphasis on observational astronomy)

### EMPLOYMENT

**Steward Observatory, University of Arizona**, Tucson, AZ, USA

Career-Track Associate Research Professor, 07/2024 - Present

Career-Track Assistant Research Professor, 03/2020 - 07/2024

Senior Research Associate, 11/2017 - 03/2020

Postdoctoral Research Associate, 09/2015 - 11/2017

**Department of Physics & Astronomy, Dartmouth College**, Hanover, NH, USA

Postdoctoral Researcher 05/2012 - 09/2015

### TEACHING

**University of Arizona, Tucson, AZ**

*Osher Lifelong Learning Institute (OLLI)*

**Fall 2018 - Present**

- Speaking with senior (50+) learners about astronomy, including creating a semester class on the history of space exploration and discovery in the Spring of 2020.
- <https://olli.arizona.edu/>

## Dartmouth College

### *The Solar System*

**Summer 2015**

- I designed and taught an astronomy course for sophomores about the Solar System, including the lectures, classroom activities, homework, and tests. The materials for this course were used well after I left Dartmouth.

GRADUATE AND  
UNDERGRADUATE  
RESEARCH  
MENTORING

## University of Arizona, Tucson, AZ

### *Jakob Helton*

**Spring 2022 - Present**

- Graduate student Jakob Helton started working with me on photometric redshift estimation during his first year at the University of Arizona. He's been an integral member of the JADES team, and has served as a first author on multiple papers studying galaxy overdensities in the early universe, while also assisting in crucial ways in other works from JADES members.

### *Sophie Lebowitz*

**Fall 2020 - Present**

- I co-mentor graduate student Sophie Lebowitz along with Dr. Stephanie Juneau at NOIRLab. She works on images of AGN resolved narrow-line regions with JWST NIRCcam.

### *Raphael Hviding*

**Fall 2018 - Spring 2023**

- I mentored Raphael during his entire time at the University of Arizona, and helped with his growth as a scientist and a science communicator. Raphael Hviding successfully defended his thesis "Seeing Red: The Present and Future of Mid-IR AGN Selection with Optical Spectroscopy" in the spring of 2023, before moving on to the Max Planck Institute in Heidelberg to start a postdoc with Ivelina Momcheva.

### *Tristen Shields*

**Summer 2023 - Present**

- Tristen is a University of Arizona undergraduate who has started working on exploring JADES low-surface-brightness galaxies for his undergraduate thesis.

### *Jacob Magnussen*

**Summer 2021**

- Jacob was a NASA Space Grant intern and undergraduate who, in the run-up to the launch of JWST, worked with me and Dr. Eiichi Egami at the University of Arizona to explore simulating NIRCcam images of distant galaxies with the software *Phosim*.

TELESCOPE  
PROPOSALS

### *JWST*

**Fall 2023**

- I am a key member of the team behind successful Cycle 2 GO proposal ID 3215 "Unveiling the Redshift Frontier with JWST," which has recently taken its observations.

### *MMT Hectospec/Binospec/MMIRS* **Fall 2020, Spring 2021, Fall/Spring 2022**

- Alongside UA graduate student Raphael Hviding, I used multiple instruments to observe photometrically-selected AGN candidates that served as a portion of his thesis.

### *MMT Blue Channel Spectrograph*

**Fall 2016**

- I used the blue channel spectrograph to explore resolved narrow-line regions for a sample of obscured quasars, following-up research done at Dartmouth.

CONTRIBUTED  
SOFTWARE

*JADESView* **Summer 2022**

- JADESView is a GUI for exploring high-redshift galaxy fits made with multiple photometric redshift codes, alongside thumbnails for selecting follow-up candidates. It has been successfully used by the JADES team for targeting the NIRSpec Multi-Shutter Array in multiple observational campaigns.
- <https://github.com/kevinhainline/JADESView>

*NIRCPPrepareMock* **Spring 2019**

- NIRCPPrepareMock is a series of python scripts for converting JAGUAR into catalogs with simulated noise for use in preparing JWST proposals and exploring galaxy color spaces and photometric redshifts.
- <https://github.com/kevinhainline/NIRCPPrepareMock>

*JAGUAR* **Fall 2018**

- JAGUAR, The JAdes extraGalactic Ultradeep Artificial Realizations (Williams, KH et al. 2018) is a full suite of mock galaxy realizations designed to help prepare the scientific community for observations with JWST.
- <https://fenrir.as.arizona.edu/jwstmock/>

OUTREACH

**University of Arizona, Tucson, AZ**

*Pima-UA STEM Bridge Program* **Fall 2020 - Present**

- Mentoring 8 Pima Community College STEM students during and after their transfer to the UA.
- <https://asems.arizona.edu/programs/pima-uaz-stem-bridge-program>

*AAS CSMA Micro Grant Application Review* **Fall 2021 - Present**

- Reviewing American Astronomical Society (AAS) Committee on the Status of Minorities in Astronomy (CSMA) Micro-Grant applications for black, indigenous, people of color and other students suffering the effects of financial scarcity.
- <https://aas.org/posts/news/2021/03/aas-csma-launches-micro-grants-program>

*Steward Department Climate and Mentoring Task Forces* **Summer 2020 - Present**

- These task forces bring undergraduates, graduate students, postdoctoral researchers, and faculty together to explore issues relating to diversity, equity, and inclusion within Steward Observatory.

*Skype A Scientist Program* **Spring 2020 - Present**

- This service pairs research scientists with global classrooms of students to discuss their work, as well as answer questions and lead discussions.
- <https://www.skypeascientist.com/>

*Arizona Science Teachers Association (ASTA)* **Fall 2018 - Present**

- I have served as an annual speaker at the Arizona Science Teacher Association (ASTA) annual meetings, both in person and virtually, since 2018. I have also, through this connection, spoken with many school groups across Arizona about astronomy.
- <https://azsta.org/>

*Referee Service*

- *Astrophysical Journal*
- *Monthly Notices of the Royal Astronomical Society*
- *Astronomy & Astrophysics*
- *Publications of the Astronomical Society of the Pacific*

*Telescope Time Allocation Committees*

- *Chandra X-Ray Observatory*
- *NuSTAR X-Ray Observatory*
- *NASA Research Opportunities in Space and Earth Sciences (ROSES) Program*

**Dartmouth College**

*Montshire Museum of Science*

**Fall 2013 - Summer 20115**

- I worked as a weekly volunteer at the Montshire Museum of Science, designing and leading educational programs for guests of all ages and working directly with the museum to guide the guest experience.
- <https://www.montshire.org/>

OTHER  
SCHOLARSHIP

*STEM to Story: Enthralling and Effective Lesson Plans for Grades 5-8* **2015**

- I created and contributed a science writing workshop “The Science of Saving Daylight” to a book of lesson plans for teaching science through creative writing activities, published in 2015.

CONFERENCES/  
SCHOLARLY  
PRESENTATIONS

**Hainline, K.N.**, and the JADES Collaboration. JADES: Our First Year Capturing Light from the Dawn of Time In: *Texas A&M Colloquium*, (2023).

**Hainline, K.N.**, Robertson, B., Tacchella, S., Rieke, M., Eisenstein, D., Helton, J., Whitler, L., Topping, M., Fengwu, S., Hviding, R., and the JADES Collaboration. Unraveling the Origins of the Cosmos: A Large Population of JADES Candidate Galaxies at  $z > 8$  In: *American Astronomical Society, AAS Meeting #242*, (2023).

**Hainline, K.N.**, and the JADES Collaboration. The Furthest: Exploring the Early Universe with JWST/JADES In: *Northwestern CIERA Colloquium*, (2023).

**Hainline, K.N.**, and the JADES Collaboration. The First Years of JWST: Discovering and Understanding Distant Galaxies In: *University of Kansas Colloquium*, (2022).

**Hainline, K.N.**, Williams, C.C., Curtis-Lake, E., Chevallard, J. and the JADES Collaboration. The Farthest Galaxies: Preparing for Observations of the Early Universe with JWST In: *US Naval Observatory Colloquium*, (2019).

**Hainline, K.N.**, Hickox, R.C., Hviding, R.E., Carroll, C.M, Myers, A.D., Trouille, L., DiPompeo, M.A. Hunting for Infrared Signatures of Supermassive Black Hole Activity in Dwarf Galaxies In: *AGN’s What’s in a Name, Garching ESO Workshop*, (2016).

**Hainline, K.N.**, Hickox, R.C., Hviding, R.E., Carroll, C.M, Myers, A.D., Trouille, L., DiPompeo, M.A. Hunting For Monsters: Selecting and Understanding Active Galactic Nuclei in the Infrared In: *Steward Observatory / NOAO Joint Colloquium*, (2016).

**Hainline, K.N.**, Hickox, R.C., Carroll, C.M, Myers, A.D., Trouille, L., DiPompeo, M.A. Searching for Obscured Quasars with WISE and the Southern African Large Telescope In: *American Astronomical Society, AAS Meeting #224*, (2014).

**Hainline, K.N.**, Hickox, R. C., Greene, J. E., Myers, A. D., Zakamska, N. L., Liu, G. The NLR Size - IR Luminosity Relationship: An Upper Limit on the Size of the Narrow-Line Region? In: *Multiwavelength-surveys: Galaxy Formation and Evolution from the early universe to today, Dubrovnik Croatia*, (2014)., *American Astronomical Society, AAS Meeting #223*, (2014).

- Hainline, K.N.**, Hickox, R.C., Greene, J.E., Myers, A.D., Zakamska, N.L., Shapley, A.E., Greene, J.E., Steidel, C.C. The Relationship Between AGNs and their Host Galaxies At Low And High Redshift In: *University of Durham, Seminar*, (2013). In: *University of Manchester, Seminar*, (2013). In: *University of Sheffield, Seminar*, (2013).
- Hainline, K.N.**, Hickox, R.C., Greene, J.E. SALT Longslit Spectroscopy of Luminous Obscured Quasars In: *American Astronomical Society, AAS Meeting #221; Bulletin of the American Astronomical Society, Vol. 45*, (2012).
- Hainline, K.N.**, Shapley, A.E., Greene, J.E., Steidel, C.C. UV selected AGN at  $z \sim 2 - 3$  In: *Columbia University, Invited Talk*, (2012).
- Hainline, K.N.**, Shapley, A.E., Greene, J.E., Steidel, C.C. The Host Galaxies Of UV-selected AGNs at  $z \sim 2 - 3$  In: *Black Hole Feedback 2012, Dartmouth College*, (2012).
- Hainline, K.N.**, Shapley, A.E., Greene, J.E., Steidel, C.C. The Host Galaxies of UV-selected AGNs at  $z \sim 2 - 3$ . In: *American Astronomical Society, AAS Meeting #219; Bulletin of the American Astronomical Society, Vol. 44*, (2012).
- Hainline, K.N.**, Shapley, A.E., Greene, J.E., Steidel, C. The Host Galaxies of Active Galactic Nuclei at  $z \sim 2 - 3$ . *University of California, Santa Barbara, Invited Talk*, (2011).

SELECTED TALKS,  
PODCASTS, AND  
VIDEOS

This Is A Film About the James Webb Space Telescope  
*Youtube Video*, (2021).  
<https://youtu.be/lrY04VPDg8I>

Keynote Talk

*Voyageurs National Park Conservancy Spring Thaw Event*, (2021).  
<https://youtu.be/gpImQRESQQw>

How to Start Stargazing

*Youtube Live Video Series*, (2020 - present).  
<https://www.youtube.com/playlist?list=PLuqSh9S5HIXpIYXWLVacfPifZCtvKUhb>

Astronomy as a Lens to Understand Yourself

*Curious Humans Podcast with Johnny Miller*, (2019).  
<https://podcast.curioushumans.com/episodes/007-astronomy-as-a-lens-to-understand-yourself-with-kevin-hainline>

REFERENCES  
AVAILABLE TO  
CONTACT

**Dr. Marcia Rieke** (e-mail: [mrieke@as.arizona.edu](mailto:mrieke@as.arizona.edu); phone: +1-520-621-2731; WWW: <https://www.as.arizona.edu/people/faculty/marcia-j-rieke>)

- Regents' Professor of Astronomy , Steward Observatory, University of Arizona
- ◊ 933 North Cherry Avenue, Tucson, AZ 85719
- ★ *Dr. Rieke is the PI of the NIRC*am* project.*

**Dr. Brant E. Robertson** (e-mail: [brant@ucsc.edu](mailto:brant@ucsc.edu); phone: +1-831-459-4903; WWW: <http://www.astro.ucsc.edu/faculty/index.php?uid=brant>)

- Professor, Astronomy and Astrophysics Department, University of California, Santa Cruz
- ◊ 1156 High Street, Santa Cruz, CA 95064
- ★ *Dr. Robertson is a colleague on the JADES collaboration.*

**Dr. Jenny E. Greene** (e-mail: [jgreene@astro.princeton.edu](mailto:jgreene@astro.princeton.edu); phone: +1-609-258-0764; WWW: <http://www.princeton.edu/astro/people/faculty/jenny-greene/>)

- Assistant Professor, Department of Astrophysical Sciences, Princeton University,  
Princeton
- ◇ 4 Ivy Lane, Princeton, NJ 08544

Below, I list my bibliography, separated into three sections, each organized by year. In the first section are my own first author papers. In the second section are papers for which I made a significant contribution, either as a mentor or as a key member of the collaboration, and the position of my name in the author list reflects that. The third section is the remaining papers for which I played a role.

FIRST AUTHOR  
PUBLICATIONS

- Hainline, K.N.**, D'Eugenio, F., Sun, F., Helton, J.M., Miles, B., et al. JADES: Spectroscopic Confirmation and Proper Motion for a T-Dwarf at 2 Kiloparsecs *arXiv:2407.08781*, (2024).
- Hainline, K.N.**, D'Eugenio, F., Jakobsen, P., Chevallard, J., Carniani, S., et al. Searching for Emission Lines at  $z > 11$ : The Role of Damped Lyman- $\alpha$  and Hints About the Escape of Ionizing Photons *arXiv:2404.04325*, (2024).
- Hainline, K.N.**, Johnson, B.D., Robertson, B.E., Tacchella, S., Helton, J.M., Sun, F., et al. The Cosmos in its Infancy: JADES Galaxy Candidates at  $z > 8$  in GOODS-S and GOODS-N. *The Astrophysical Journal*, v.964, Issue 1, article id. 71 (2024).
- Hainline, K.N.**, Helton, J.M., Johnson, B.D., Sun, F., Topping, M.W., Leisenring, J.M., et al. Brown Dwarf Candidates in the JADES and CEERS Extragalactic Surveys. *The Astrophysical Journal*, v.964, Issue 1, article id. 66 (2024).
- Hainline, K.N.**, Hviding, R.E., Rieke, M., Shivaiei, I., Endsley, R., Curtis-Lake, E., Smit, R., Williams, C.C., Alberts, S., et al. Simulating JWST/NIRCam Color Selection of High-redshift Galaxies. *The Astrophysical Journal*, v.892, Issue 2, article id. 125 (2020).
- Hainline, K.N.**, Reines, A.E., Greene, J.E., Stern, D. Mid-infrared Colors of Dwarf Galaxies: Young Starbursts Mimicking Active Galactic Nuclei. *The Astrophysical Journal*, v.832, Issue 2, article id. 119 (2016).
- Hainline, K.N.**, Hickox, R.C., Chen, C.T., Carroll, C.M., Jones, M.L., Zervos, A.S., Goulding, A.D. A Tale of Two Narrow-line Regions: Ionization, Kinematics, and Spectral Energy Distributions for a Local Pair of Merging Obscured Active Galaxies. *The Astrophysical Journal*, v.823, Issue 1, article id. 42 (2016).
- Hainline, K.N.**, Hickox, R.C., Carroll, C.M., Myers, DiPompeo, M.A., Trouille, L. A Spectroscopic Survey of WISE-selected Obscured Quasars with the Southern African Large Telescope. *The Astrophysical Journal*, v.795, Issue 2, article id. 124 (2014).
- Hainline, K.N.**, Hickox, R.C., Greene, J.E., Myers, A.C., Zakamska, N. L., Liu, G., Liu, X. Gemini Long-slit Observations of Luminous Obscured Quasars: Further Evidence for an Upper Limit on the Size of the Narrow-line Region. *The Astrophysical Journal*. v.787, Issue 1, article id. 65 (2014).
- Hainline, K.N.**, Hickox, R.C., Greene, J.E., Myers, A.C., Zakamska, N. L. SALT Long-slit Spectroscopy of Luminous Obscured Quasars: An Upper Limit on the Size of the Narrow-line Region? *The Astrophysical Journal*. v.774, Issue 4, article id. 145 (2013).
- Hainline, K.N.**, Shapley, A.E., Greene, J.E., Steidel, C.C., Reddy, N. A., Erb, D.K. Stellar Populations of Ultraviolet-selected Active Galactic Nuclei Host Galaxies at  $z \sim 2 - 3$ . *The Astrophysical Journal*. v.760, Issue 1, article id. 74 (2012).
- Hainline, K.N.**, Shapley, A.E., Greene, J.E., Steidel, C.C. The Rest Frame Ultraviolet Spectra of UV-Selected Active Galactic Nuclei at  $z \sim 2 - 3$ . *The Astrophysical Journal*. v.733, Issue 1, article id. 31 (2011).

PUBLICATIONS  
WITH A  
SIGNIFICANT  
CONTRIBUTION

- Hainline, K.N.**, Shapley, A.E., Kornei, K.A., Pettini, M., Buckley-Geer, E., Allam, S.S.; Tucker, D.L. Rest-Frame Optical Spectra of Three Strongly Lensed Galaxies at  $z \sim 2$ . *The Astrophysical Journal*. v.701, Issue 1, pp.52-65 (2009).
- Carniani, S., **Hainline, K.N.**, D'Eugenio, F., Eisenstein, D.J., Jakobsen, P., Witsok, J., et al. Spectroscopic confirmation of two luminous galaxies at a redshift of 14 *Nature*, (2024).
- Helton, J.M., Rieke, G.H., Alberts, S., Wu, Z., Eisenstein, D.J., **Hainline, K.N.** et al. JWST/MIRI photometric detection at  $7.7 \mu\text{m}$  of the stellar continuum and nebular emission in a galaxy at  $z > 14$  *arXiv: 2405.18462*, (2024).
- Hviding, R.E., **Hainline, K.N.**, Goulding, A.D., and Greene, J.E. Spectroscopic Confirmation of Obscured AGN Populations from Unsupervised Machine Learning *The Astronomical Journal*. v.167, Issue 4, article id. 169 (2024).
- Robertson, B., Johnson, B.D., Tacchella, Sandro, Eisenstein, D.J., **Hainline, K.N.** et al. Earliest Galaxies in the JADES Origins Field: Luminosity Function and Cosmic Star-Formation Rate Density 300 Myr after the Big Bang *The Astrophysical Journal*. v.970, Issue 1, article id. 31 (2024).
- DeCoursey, C., Egami E., Pierel J.D.R., Sun, F., Rest A. ...**Hainline, K.N.** et al. The JADES Transient Survey: Discovery and Classification of Supernovae in the JADES Deep Field *arXiv: 2406:05060*, (2024).
- Williams, C., Alberts, S., Ji, Zhiyuan, **Hainline, K.N.** et al. The galaxies missed by Hubble and ALMA: the contribution of extremely red galaxies to the cosmic census at  $3 < z < 8$  *The Astrophysical Journal*. v.968, Issue 1, article id. 34 (2024).
- Helton, J.M., Sun, F., Woodrum, C., **Hainline, K.N.**, Willmer, C.N.A., Rieke, M.J., Rieke, G., Alberts, S. et al. Identification of High-Redshift Galaxy Overdensities in GOODS-N and GOODS-S *arXiv: 2311.04270*, (2023).
- Ygouf, M., Beichman C., Llop-Sayson, J., Bryden G., Leisenring J., Gaspar, A., ... **Hainline, K.N.** et al. Searching for Planets Orbiting Fomalhaut with JWST/NIRCam *The Astronomical Journal*. v.167, Issue 1, article id. 26 (2024).
- Eisenstein, D.J., Johnson, B.D., Robertson, B, Tacchella, S., **Hainline, K.N.** et al. The JADES Origins Field: A New JWST Deep Field in the JADES Second NIRCam Data Release *arXiv: 2310.12340*, (2023).
- Lyu, J., Alberts, S., Rieke, G.H., Shivaiei, I., Perez-Gonzalez, P.G., Sun, F., **Hainline, K.N.** et al. Active Galactic Nuclei Selection and Demographics: A New Age with JWST/MIRI *The Astrophysical Journal*. v.966, Issue 2, article id. 229 (2024).
- Simmonds, C., Tacchella, S., **Hainline, K.N.**, Johnson, B. D., McClymont, W., Robertson, B. et al. Low-mass bursty galaxies in JADES efficiently produce ionising photons and could represent the main drivers of reionisation *Monthly Notices of the Royal Astronomical Society*, v.527, Issue 3, (2024).
- Rieke, M., Robertson, B.E., Tacchella, S., **Hainline, K.N.**, Johnson, B.D., and the JADES Collaboration JADES Initial Data Release for the Hubble Ultra Deep Field: Revealing the Faint Infrared Sky with Deep JWST NIRCam Imaging. *The Astrophysical Journal Supplement Series*. v.269, Issue 1, article id. 16 (2023).
- Sun, F., Helton, J.M., Egami, E., **Hainline, K.N.**, Rieke, G.H., Willmer, C.N.A. et al. JADES: Resolving the Stellar Component and Filamentary Overdense Environment of HST-Dark Submillimeter Galaxy HDF850.1 at  $z=5.18$  *The Astrophysical Journal*. v.961, Issue 1, article id. 69 (2024).



- Hviding, R.E., Hickox, R.C., Väisänen, P., Ramphul, R., **Hainline, K.N.** The Kiloparsec-scale Influence of the AGN in NGC 1068 with SALT RSS Fabry-Pérot Spectroscopy *The Astronomical Journal*. v.166, Issue 3, article id. 111 (2023).
- Topping, M.W., Stark, D.P., Endsley, R., Whitler, L., **Hainline, K.N.**, Johnson, B.D., Robertson, B., et al. The UV Continuum Slopes of Early Star-Forming Galaxies in JADES *Monthly Notices of the Royal Astronomical Society*, v.529, Issue 4, (2024).
- Sandles, L., D'Eugenio, F., Helton, J.M., Maiolino, R., **Hainline, K.N.**, Baker, W.M., Williams, C.C. et al. JADES: deep spectroscopy of a low-mass galaxy at redshift 2.3 quenched by environment *arXiv:2307.08633*, (2023).
- Bunker, A.J., Cameron, A. J., Curtis-Lake, E., Jakobsen, P., Carniani, S., Curti, M., Witstok, J., ... **Hainline, K.N.**, et al. JADES NIRSpec Initial Data Release for the Hubble Ultra Deep Field: Redshifts and Line Fluxes of Distant Galaxies from the Deepest JWST Cycle 1 NIRSpec Multi-Object Spectroscopy *arXiv:2306.02467*, (2023).
- Eisenstein, D.J., Willott, C., Alberts, S., Arribas, S., Bonaventura, N., Bunker, A.J., Cameron, A.J., Carniani, S., ... **Hainline, K.N.**, et al. Overview of the JWST Advanced Deep Extragalactic Survey (JADES) *arXiv:2306.02465*, (2023).
- Tacchella, S., Eisenstein, D.J., **Hainline, K.N.**, Johnson, B.D., Baker, W.M., Helton, J.M., et al. JADES Imaging of : Revealing the Morphology and Environment of a Luminous Galaxy 430 Myr After the Big Bang. *The Astrophysical Journal*. v.952, Issue 1, article id. 74 (2023).
- Gardner, J.P., Mather, J.C., Abbott, R., Abell, J.S., Abernathy, M., ... **Hainline, K.N.**, et al. The James Webb Space Telescope Mission *Publications of the Astronomical Society of the Pacific*, v.135, Issue 1048, article id. 068001 (2023).
- Rigby, J., Perrin, M., McElwain, M., Kimble, R., Friedman, S., Lallo, M., ... **Hainline, K.N.**, et al. The Science Performance of JWST as Characterized in Commissioning *Publications of the Astronomical Society of the Pacific*, v.135, Issue 1046, article id. 048001 (2023).
- Rieke, M.J., Kelly, D.M., Misselt, K., Stansberry, J., Boyer, M., Beatty, T., Egami, E., Florian, M., ... **Hainline, K.N.**, et al. Performance of NIRCcam on JWST in Flight *Publications of the Astronomical Society of the Pacific*, v.135, Issue 1044, article id. 028001 (2023).
- Helton, J.M., Sun, F., Woodrum, C., **Hainline, K.N.**, et al. The JWST Advanced Deep Extragalactic Survey: Discovery of an Extreme Galaxy Overdensity at  $z = 5.4$  with JWST/NIRCcam in GOODS-S, *The Astrophysical Journal*. v.962, Issue 2, article id. 124 (2023).
- Robertson, B.E., Tacchella, S., Johnson, B.D., **Hainline, K.N.**, Whitler, L., Eisenstein, D.J., Endsley, R., Rieke, M. et al. Identification and properties of intense star-forming galaxies at redshifts  $z > 10$ . *Nature Astronomy*, v. 7, (2023).
- Curtis-Lake, E., Carniani, S., Cameron, A., Charlot, S. ... **Hainline, K.N.**, et al. Spectroscopic confirmation of four metal-poor galaxies at  $z = 10.3 - 13.2$ . *Nature Astronomy*, v. 7, (2023).
- Hviding, R.E., **Hainline, K.N.**, Rieke, M., Juneau, S., Lyu, J, & Pucha R. A New Infrared Criterion for Selecting Active Galactic Nuclei to Lower Luminosities. *The Astronomical Journal*, v.163, Issue 5, article id. 224 (2022).

Latimer, L.J., Reines, A.E., **Hainline, K.N.**, Greene, J.E., Stern, D. A Chandra and HST View of WISE-selected AGN Candidates in Dwarf Galaxies *The Astrophysical Journal*, v.914, Issue 2, article id. 133 (2021).

Yan, W., Hickox, R.C., **Hainline, K.N.**, Stern, D., Lansbury, G., Alexander, D.M., Hviding, R.E., et al. NuSTAR and Keck Observations of Heavily Obscured Quasars Selected by WISE *The Astrophysical Journal*, v.870, Issue 1, article id. 33 (2019).

Williams, C.C., Curtis-Lake, E., **Hainline, K.N.**, Chevallard, J., et al. The JWST Extragalactic Mock Catalog: Modeling Galaxy Populations from the UV through the Near-IR over 13 Billion Years of Cosmic History *The Astrophysical Journal Supplement Series*. v.236, Issue 2, article id. 33 (2018).

Hviding, R.E., Hickox, R.C., **Hainline, K.N.**, Carroll, C.M., DiPompeo, M.A., Yan, W. Jones, M.L. Characterizing the WISE-selected heavily obscured quasar population with optical spectroscopy from the Southern African Large Telescope *Monthly Notices of the Royal Astronomical Society*, v.474, Issue 2, (2018).

Hickox, R.C., Myers, A.D., Greene, J. E., **Hainline, K.N.**, Zakamska, N.L., DiPompeo, M.A. Composite Spectral Energy Distributions and Infrared-Optical Colors of Type 1 and Type 2 Quasars *The Astrophysical Journal*, v.849, Issue 1, article id. 53 (2017).

Baldassare, V.F., Reines, A.E., Gallo, E., Greene, J.E., Graur, O., Geha, M, **Hainline, K.N.**, Carroll, C.M., Hickox, R.C. Multi-epoch Spectroscopy of Dwarf Galaxies with AGN Signatures: Identifying Sources with Persistent Broad H $\alpha$  Emission *The Astrophysical Journal*, v.829, Issue 1, article id. 57 (2016).

Jones, M.L., Hickox, R.C., Black, C.S., **Hainline, K.N.**, DiPompeo, M.A., Goulding, A.D. The Intrinsic Eddington Ratio Distribution of Active Galactic Nuclei in Star-forming Galaxies from the Sloan Digital Sky Survey *The Astrophysical Journal*, v.826, Issue 1, article id. 12 (2016).

Hickox, R.C., Mullaney, J.R., Alexander, D.M., Chen, C-T.J., Civano, F.M., Goulding, A.D., **Hainline, K.N.** Black Hole Variability and the Star Formation-Active Galactic Nucleus Connection: Do All Star-forming Galaxies Host an Active Galactic Nucleus? *The Astrophysical Journal*, v.782, Issue 1, article id. 9 (2014).

Kulas, K.R., Shapley, A.E., Kollmeier, J.A., Zheng, Z., Steidel, C.C., **Hainline, K.N.** The Kinematics of Multiple-peaked Ly $\alpha$  Emission in Star-forming Galaxies at  $z \sim 2-3$  *The Astrophysical Journal*, v.745, Issue 1, article id. 33 (2012).

OTHER  
PUBLICATIONS

Woodrum, C., Rieke, M., Ji, Zhiyuan., ... **Hainline, K.N.** et al. JADES: Using NIRCcam Photometry to Investigate the Dependence of Stellar Mass Inferences on the IMF in the Early Universe *arXiv: 2310.18464*, (2023).

Stone, M.A., Lyu, J., Rieke, G.H., Alberts, S., **Hainline, K.N.**, Undermassive Host Galaxies of Five  $z \sim 6$  Luminous Quasars Detected with JWST *arXiv: 2310.18395*, (2023).

Li, Z., Cai, Z., Sun, F., Richard, J., Trebitsch, M., ... **Hainline, K.N.** et al. MAGNIF: A Tentative Lensed Rotating Disk at  $z=8.34$  detected by JWST NIRCcam WFSS with Dynamical Forward Modeling *arXiv:2310.09327*, (2023).

Williams, C.C., Tacchella, S., Maseda, M.V., Robertson, B.E., Johnson, B.D., ... **Hainline, K.N.** et al. JEMS: A Deep Medium-band Imaging Survey in the Hubble Ultra Deep Field with JWST NIRCcam and NIRISS *The Astrophysical Journal Supplement Series*. v.268, Issue 2, article id. 64 (2023).

- Suess, K.A., Williams, C.C., Robertson, B., Ji, Z., Johnson, B.D., Nelson, E., Alberts, S., **Hainline, K.N.** et al. Minor Merger Growth in Action: JWST Detects Faint Blue Companions around Massive Quiescent Galaxies at  $0.5 \leq z \leq 3.0$  *The Astrophysical Journal Letters*. v.956, Issue 2, article id. L42 (2023).
- Vayner, A., Zakamska, N.L., Ishikawa, Y., Sankar, S. ... **Hainline, K.N.** et al. First Results from the JWST Early Release Science Program Q3D: Ionization Cone, Clumpy Star Formation, and Shocks in a  $z = 3$  Extremely Red Quasar Host *The Astrophysical Journal*. v.955, Issue 2, id 92 (2023).
- Saxena, A., Robertson, B.E., Bunker, A.J., Endsley, R., Cameron, A.J., Charlot, A., ... **Hainline, K.N.** et al. JADES: Discovery of extremely high equivalent width Lyman- $\alpha$  emission from a faint galaxy within an ionized bubble at  $z = 7.3$  *Astronomy & Astrophysics*. v.678, id A68 (2023).
- Witstok, J., Shivaiei, I., Smit, R., Maiolino, R., Carniani, S., Curtis-Lake, E., Ferruit, P., ... **Hainline, K.N.** et al. Carbonaceous dust grains seen in the first billion years of cosmic time *Nature*. v.621, Issue 7978 (2023).
- Cameron, A.J., Saxena A., Bunker A.J., D'Eugenio F., Carniani, S., Maiolino, R., Curtis-Lake, E., ... **Hainline, K.N.** et al. JADES: Probing interstellar medium conditions at  $z \sim 5.5 - 9.5$  with ultra-deep JWST/NIRSpec spectroscopy *Astronomy & Astrophysics* v.677, id A115 (2023).
- Bunker, A.J., Saxena, A., Cameron, A.J., Willott, C.J., Curtis-Lake, E., Jakobsen, P., ... **Hainline, K.N.** et al. JADES NIRSpec Spectroscopy of : Lyman- $\alpha$  emission and possible enhanced nitrogen abundance in a  $z = 10.60$  luminous galaxy *Astronomy & Astrophysics* v.677, id A88 (2023).
- de Graaff, A., Rix, H-W., Carniani, S., Suess, K.A., Charlot, S., Curtis-Lake, E., ... **Hainline, K.N.** et al. Ionised gas kinematics and dynamical masses of  $z > 6$  galaxies from JADES/NIRSpec high-resolution spectroscopy *arXiv:2308.09742* (2023).
- Rupke, D.S.N., Wylezalek, D., Zakamska, N.L., Veilleux, S., Bertemes, C., ... **Hainline, K.N.** et al. First Results from the JWST Early Release Science Program Q3D: Benchmark Comparison of Optical and Mid-infrared Tracers of a Dusty, Ionized Red Quasar Wind at  $z = 0.435$  *The Astrophysical Journal Letters*. v.953, Issue 2, article id. L26 (2023).
- Veilleux, S., Liu, W., Vayner, A., Wylezalek, D., Rupke, D.S.N., ... **Hainline, K.N.** et al. First Results from the JWST Early Release Science Program Q3D: The Warm Ionized Gas Outflow in  $z 1.6$  Quasar XID 2028 and Its Impact on the Host Galaxy *The Astrophysical Journal Letters*. v.953, Issue 1, article id. L56 (2023).
- Vayner, A., Zakamska, N.L., Ishikawa, Y., Sankar, S., Wylezalek, D., ... **Hainline, K.N.** et al. First results from the JWST Early Release Science Program Q3D: Powerful quasar-driven galactic scale outflow at  $z = 3$  *arXiv:2307.13751*, (2023).
- Tacchella, S., Johnson, B.D., Robertson, B.E., Carniani, S., D'Eugenio, F., Kumari, N., ... **Hainline, K.N.** et al. JWST NIRCам + NIRSpec: interstellar medium and stellar populations of young galaxies with rising star formation and evolving gas reservoirs *Monthly Notices of the Royal Astronomical Society*, v.522, Issue 4, (2023).
- Endsley, R., Stark, D.P., Whitler, L., Topping, M.W., Johnson, B.D., Robertson, B., ... **Hainline, K.N.** et al. The Star-forming and Ionizing Properties of Dwarf  $z 6-9$  Galaxies in JADES: Insights on Bursty Star Formation and Ionized Bubble Growth *arXiv:2306.05295*, (2023).

- Witstok, J., Smit, R., Saxena, A., Jones, G.C., Helton, J.M. ... **Hainline, K.N.** et al. Inside the bubble: exploring the environments of reionisation-era Lyman- $\alpha$  emitting galaxies with JADES and FRESCO *arXiv:2306.04627*, (2023).
- Saxena, A., Bunker, A.J., Jones, G.C., Stark, D.P., Cameron, A.J., Witstok, J., ... **Hainline, K.N.** et al. JADES: The production and escape of ionizing photons from faint Lyman-alpha emitters in the epoch of reionization *arXiv:2306.04536*, (2023).
- Sandles, L., D'Eugenio, F., Maiolino, R., Looser, T.J., Arribas, S., ... **Hainline, K.N.** et al. JADES: Balmer Decrement Measurements at redshifts  $4 < z < 7$  *arXiv:2306.03931*, (2023).
- Laseter, I.H., Maseda, M.V., Curti, M., Maiolino, R., D'Eugenio, F., ... **Hainline, K.N.** et al. JADES: Detecting [OIII]  $\lambda$ 4363 Emitters and Testing Strong Line Calibrations in the High- $z$  Universe with Ultra-deep JWST/NIRSpec Spectroscopy up to  $z \sim 9.5$  *arXiv:2306.03120*, (2023).
- Jones, G.C, Bunker, A.J., Saxena, A., Witstok, J., Stark, D.P., Arribas, S., ... **Hainline, K.N.** et al. JADES: The emergence and evolution of Ly-alpha emission & constraints on the IGM neutral fraction *arXiv:2306.02471*, (2023).
- Looser, T.J., D'Eugenio, F., Maiolino, R., Tacchella, S., Curti, M., Arribas, S., Baker, W.M., ... **Hainline, K.N.** et al. JADES: Differing assembly histories of galaxies – Observational evidence for bursty SFHs and (mini-)quenching in the first billion years of the Universe *arXiv:2306.02470*, (2023).
- Ji, Z., Williams, C.C., Tacchella, S., Suess, K.A., Baker, W.M., ... **Hainline, K.N.** et al. JADES + JEMS: A Detailed Look at the Buildup of Central Stellar Cores and Suppression of Star Formation in Galaxies at Redshifts  $3 \leq z \leq 4.5$  *arXiv:2305.18518*, (2023).
- Maiolino, R., Scholtz, J., Witstok, J., Carniani, S., D'Eugenio, F., de Graaff, A., ... **Hainline, K.N.** et al. A small and vigorous black hole in the early Universe *arXiv:2305.12492*, (2023).
- Endsley, R., Stark, D.P., Lyu, J., Wang, F., Yang, J., ... **Hainline, K.N.** et al. ALMA confirmation of an obscured hyperluminous radio-loud AGN at  $z = 6.853$  associated with a dusty starburst in the 1.5 deg<sup>2</sup> COSMOS field *Monthly Notices of the Royal Astronomical Society*, v.520, Issue 3, (2023).
- Robertson, B.E., Tacchella, S., Johnson, B.D., Hausen, R., Alabi, A.B., Boyett, K. ... **Hainline, K.N.** et al. Morpheus Reveals Distant Disk Galaxy Morphologies with JWST: The First AI/ML Analysis of JWST Images *The Astrophysical Journal Letters*. v.942, Issue 2, article id. L42 (2023).
- Wylezalek, D., Vayner, A., Rupke, D.S.N., Zakamska, N.L., Veilleux, S., ... **Hainline, K.N.** et al. First Results from the JWST Early Release Science Program Q3D: Turbulent Times in the Life of a  $z \sim 3$  Extremely Red Quasar Revealed by NIRSpec IFU *The Astrophysical Journal Letters*. v.940, Issue 1, article id. L7 (2022).
- Girard, J.H., Leisenring, J., Kammerer, J., Gennaro, M., Rieke, M., Stansberry, J., ... **Hainline, K.N.** et al. JWST/NIRCam coronagraphy: commissioning and first on-sky results *Proceedings of the SPIE*, v.12180, article id.121803Q (2022).
- Endsley, R., Stark, D.P., Fan, X., Smit, R., Wang, F., Yang, J., **Hainline, K.N.** et al. Radio and far-IR emission associated with a massive star-forming galaxy candidate at  $z \sim 6.8$ : a radio-loud AGN in the reionization era? *Monthly Notices of the Royal Astronomical Society*, v.512, Issue 3, (2022).

- Masini, A., Hickox, R.C., Carroll, C.M., Aird, J., Alexander, D.M., Assef, R.J., ... **Hainline, K.N.** et al. The Chandra Deep Wide-field Survey: A New Chandra Legacy Survey in the Boötes Field. I. X-Ray Point Source Catalog, Number Counts, and Multiwavelength Counterparts *The Astrophysical Journal Supplement Series*. v.251, Issue 1, article id. 2 (2020).
- Chen, C-T.J., Hickox, R.C., Goulding, A.D., Stern, D., Assef, R., Kochanek, C.S., ... **Hainline, K.N.** et al. The X-Ray and Mid-infrared Luminosities in Luminous Type 1 Quasars *The Astrophysical Journal*. v.837, Issue 2, article id. 145 (2017).
- Chen, C-T.J., Hickox, R.C., Alberts, S., Harrison, C.M., Alexander, D.M., ... **Hainline, K.N.** et al. A Connection between Obscuration and Star Formation in Luminous Quasars *The Astrophysical Journal*. v.802, Issue 1, article id. 50 (2015).
- Marsan, Z.C., Marchesini, D., Brammer, G.B., Stefanon, M., Muzzin, A., Fernández-Soto, A., ... **Hainline, K.N.** et al. Spectroscopic Confirmation of an Ultra Massive and Compact Galaxy at  $z = 3.35$ : a Detailed Look at an Early Progenitor of Local Giant Ellipticals *The Astrophysical Journal*. v.801, Issue 2, article id. 133 (2015).
- DiPompeo, M.A., Myers, A.D., Hickox, R.C., Geach, J.E., Holder, G., **Hainline, K.N.**, Hall, S.W. Weighing obscured and unobscured quasar hosts with the cosmic microwave background *Monthly Notices of the Royal Astronomical Society*, v.446, Issue 4, (2015).
- DiPompeo, M.A., Myers, A.D., Hickox, R.C., Geach, J.E., **Hainline, K.N.** The angular clustering of infrared-selected obscured and unobscured quasars *Monthly Notices of the Royal Astronomical Society*, v.442, Issue 4, (2014).
- Geach, J. E., Hickox, R.C., Bleem, L.E., Brodwin, M., Holder, G.P., Aird, K.A., Benson, B.A., ... **Hainline, K.N.** et al. A Direct Measurement of the Linear Bias of Mid-infrared-selected Quasars at  $z \sim 1$  Using Cosmic Microwave Background Lensing *The Astrophysical Journal Letters*. v.776, Issue 2, article id. L41 (2013).
- Milisavljevic, D., Soderberg, A.M., Margutti, R. Drout, M.R., Howie M.G., ... **Hainline, K.N.** et al. SN 2012au: A Golden Link between Superluminous Supernovae and Their Lower-luminosity Counterparts *The Astrophysical Journal Letters*. v.770, Issue 2, article id. L38 (2013).