Taylor Alexandra Hutchison

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Research Interests

Reionization, high-z universe, near-infrared spectroscopy, high-z spectroscopic tracers, galaxy formation & evolution, Lyman-α emitters, intergalactic medium, photoionization modeling, high-z analogs

Education

Ph.D. in Astronomy (in progress) — (expected) June 2022
M.S. in Astronomy — May 2019
Texas A&M University (TAMU)
Department of Physics and Astronomy
College Station, TX 77843-4242
Advisor: Dr. Casey Papovich

B.S. in Physics, *Minor in Mathematics* — May 2016
Southwestern University
1001 E. University Ave.
Georgetown, TX 78626
Advisor: Dr. Mark Bottorff

Appointments

Graduate Student (under Dr. C. Papovich)	Texas A&M, 2016 – present
Keck Visiting Scholar (under Dr. J. Walawender)	Keck Observatory, Fall 2019
Research Assistant (under Dr. M. Bottorff)	Southwestern, 2014 – 2016
King Creativity Scholar (under O.L. Fellows)	Southwestern, 2014 – 2015
King Creativity Scholar (under Dr. S. Alexander)	Southwestern, 2013 – 2014
Research Assistant (under Dr. S. Alexander)	Southwestern, Summer 2013

Honors & Awards

SOME FUNDED

NSF Graduate Research Fellowship	2018 – 2022
Texas A&M Prestigious Fellowship Scholar	2019 – 2022
Dr. Joseph Newton Graduate Service Award	Fall 2019
W. M. Keck Observatory Visiting Scholar	Fall 2019
Leadership in Equity and Diversity (LEAD) Award	Spring 2018
Texas A&M Graduate Diversity Excellence Fellowship	2016 – 2020
Ruter Scholar Award	2012 – 2016
Distinction Award	2012 – 2016
King Creativity Award	Spring 2014
King Creativity Scholar	2014, 2015

NOTE: any activities that were affected by COVID-19 & occurred virtually are marked by **[COVID-19]**

Awards & Grants

FY21	NASA-Awarded Keck Principal Investigator Data Award	\$17.2K
FY20	NASA-Awarded Keck Principal Investigator Data Award	\$17.2K
FY20	Dr. Joseph Newton Graduate Service Award	\$1K
FY20–22	Texas A&M University Prestigious Fellowship Scholar	\$1K / yr
FY20	Mitchell Institute EPO: *Astronomy on Tap*	\$1.2K
FY20	Mitchell Institute EPO: *Conferences for Undergraduate Women in Physics*	\$30K
FY19	Office of Graduate and Professional Studies Travel Award	\$750
FY19	Leadership in Equity and Diversity (LEAD) Award	\$500
FY19	Mitchell Institute EPO: *Astronomy on Tap*	\$600
FY19–22	**NSF Graduate Research Fellowship**	\$138K
FY17+	Dept. of Physics & Astronomy Diversity Grant	\$1.5K / yr
	The Society for the Under-represented in Physics & Astronomy	
FY17–20	**Graduate Diversity Excellence Fellowship**	\$127.7K
FY13–16	Ruter Scholar Award	\$94K
FY13–16	Distinction Award	\$40K
FY14	King Creativity Award	\$1.5K
FY14,15	King Creativity Scholar	\$2K x 2

Observing Programs / General Experience

PROGRAMS

W. M. Keck Observatory, HI – Keck I, 10-meter telescope
— **MOSFIRE, NIR Spectrograph** ..... **17 nights**
- primary or secondary science lead ..... 14 nights
- engineering time ..... 3 nights

Cierro Tololo Inter-American Observatory, Chile – Blanco 4-meter telescope
— **DECam, Wide-Field CCD Imager** ..... **8 nights**
- contributing scientist ..... 3 nights
- Began Dark Energy Survey Year 6 Observations ..... 5 nights

Madrona Peak Observatory, TX – Robotic 0.6-meter telescope
— Silicon Digital CCD, primary science lead ..... 10+ nights

Fountainwood Observatory, TX – 0.4-meter telescope
— Silicon Digital CCD, primary science co-lead ..... 40+ nights

GENERAL EXPERIENCE

W. M. Keck Observatory, HI – Keck I & II, 10-meter telescopes
— During W. M. Keck Visting Scholar appointment:
- MOSFIRE, NIR Spectrograph, shadowed E. Manjavacas ..... 1 night
- LRIS, Optical Spectrometer, shadowed J. Walawender ..... 1 night
- KCWI, Optical Integral Field Spectrograph, shadowed L. Rizzi ..... 1 night

McDonald Observatory, TX – 0.8-meter telescope
— **Silicon Digital CCD**, mentored TAMU REU students ..... **11 nights**
- as only graduate student ..... 6 nights
- supporting fellow graduate student ..... 5 nights

Whipple Observatory, AZ – 1.5-meter telescope
— **FAST, Optical Spectrograph**, assisted L. Macri ..... **3 nights**

Publications (link to my ads)

Refereed Publications

First Author

Near-Infrared Spectroscopy of Galaxies During Reionization: Measuring C III] in a Galaxy at $z = 7.5$ // arXiv:1905.08812 **(24 citations)**
The Astrophysical Journal, Volume 879, Issue 2, article id. 70, 16 pg. (2019)
T. Hutchison, C. Papovich, S. Finkelstein, M. Dickinson, I. Jung, A. Zitrin, R. Ellis, S. Malhotra, J. Rhoads, G. Roberts-Borsani, M. Song, V. Tilvi

Co-Author

A Census of the Bright $z = 8.5$–11 Universe with the Hubble and Spitzer Space Telescopes in the CANDELS Fields // arXiv:2106.13813 **(3 citations)**
Submitted to The Astrophysical Journal
S. Finkelstein, M. Bagley, M. Song, R. Larson, C. Papovich, M. Dickinson, K. Finkelstein, and 17 additional authors, including **T. Hutchison**

Texas Spectroscopic Search for Lyα Emission at the End of Reionization III. The Lyα Equivalent-width Distribution and Ionized Structures at $z > 7$ // arXiv:2009.10092 **(24 citations)**
The Astrophysical Journal, Volume 904, Issue 2, article id. 144, 27 pg. (2020)
I. Jung, S. Finkelstein, M. Dickinson, **T. Hutchison**, R. Larson, C. Papovich, L. Pentericci, A. Straughn, Y. Guo, S. Malhotra, J. Rhoads, M. Song, V. Tilvi, I. Wold

The properties of He II 1640 emitters at $z \sim 2.5$-5 from the VANDELS survey // arXiv:1911.09999
The Astronomy & Astrophysics Journal, Volume 636, eid. A47, 21 pg. (2020) **(26 citations)**
A. Saxena, L. Pentericci, M. Mirabelli, D. Schaerer, R. Schneider, F. Cullen, R. Amorin, A. Bolzonella, A. C. Bongiorno, and 17 additional authors, including **T. Hutchison**

Texas Spectroscopic Search for Lyα Emission at the End of Reionization II. The Deepest Near-Infrared Spectroscopic Observation at $z > 7$ // arXiv:1901.05967 **(9 citations)**
The Astrophysical Journal, Volume 877, Issue 2, article id. 146, 9 pg. (2019)
I. Jung, S. Finkelstein, M. Dickinson, **T. Hutchison**, R. Larson, C. Papovich, L. Pentericci, M. Song, H. Ferguson, Y. Guo, S. Malhotra, B. Mobasher, J. Rhoads, V. Tilvi, I. Wold

Contributing Scientist

Space Telescope and Optical Reverberation Mapping Project. IX. Velocity-Delay Maps for Broad Emission Lines in NGC 5548
The Astrophysical Journal, Volume 907, Issue 2, article id. 76, 19 pp. (2021)
K. Horne, G. De Rosa, B. M. Peterson, A. J. Barth, B. M. Peterson, and 153 additional authors, including **T. Hutchison**.

Space Telescope and Optical Reverberation Mapping Project. XII. Broad-Line Region Modeling of NGC 5548
The Astrophysical Journal, Volume 902, Issue 1, article id. 74, 26 pg. (2020)
P. R. Williams, A. Pancoast, T. Treu, B. J. Brewer, B. M. Peterson, A. J. Barth, and 153 additional authors, including **T. Hutchison**.

Space Telescope and Optical Reverberation Mapping Project. VIII. Time Variability of Emission and Absorption in NGC 5548 Based on Modeling the Ultraviolet Spectrum
The Astrophysical Journal, Volume 881, Issue 2, article id. 153, 36 pg. (2019)
G. A. Kriss, G. De Rosa, J. Ely, B. M. Peterson, J. Kaastra, and 163 additional authors, including **T. Hutchison**.

Continuum Reverberation Mapping of the Accretion Disks in Two Seyfert 1 Galaxies
The Astrophysical Journal, Volume 854, Issue 2, article id. 107, 24 pg. (2018)
M. Fausnaugh, D. Starkey, K. Horne, C. Kochanek, B. Peterson, and 67 additional authors, including **T. Hutchison**.

Space Telescope and Optical Reverberation Mapping Project. VII. Understanding the Ultraviolet Anomaly in NGC 5548 with X-Ray Spectroscopy
The Astrophysical Journal, Volume 846, Issue 1, article id. 55, 24 pg. (2017)
S. Mathur, A. Gupta, K. Page, R. Pogge, Y. Krongold, M. Goad, and 144 additional authors, including **T. Hutchison**.

Reverberation Mapping of Optical Emission Lines in Five Active Galaxies
The Astrophysical Journal, Volume 840, Issue 2, article id. 97, 27 pg. (2017)
M. Fausnaugh, C. Grier, M. Bentz, K. Denney, G. De Rosa, B. Peterson, and 65 additional authors, including **T. Hutchison**.

Space Telescope and Optical Reverberation Mapping Project. IV. Anomalous Behavior of the Broad Ultraviolet Emission Lines in NGC 5548
The Astrophysical Journal, Volume 824, Issue 1, article id. 11, 10 pg. (2016)
M. Goad, T. Korista, G. De Rosa, A. Kriss, and 96 additional authors, including **T. Hutchison**.

Space Telescope and Optical Reverberation Mapping Project. III. Optical Continuum Emission and Broadband Time Delays in NGC 5548
The Astrophysical Journal, Volume 821, Issue 1, article id. 56, 25 pg. (2016)
M. Fausnaugh, K. Denney, A. Barth, M. Bentz, M. Bottorff, and 92 additional authors, including **T. Hutchison**.

SPIE Conference Proceedings

First Author

Flexure updates to MOSFIRE on the Keck I telescope // arXiv:2012.09308
Proc. SPIE 11447, Ground-based and Airborne Instrumentation for Astronomy VIII, 114476A
T. Hutchison, J. Walawender, S. H. Kwok // Paper No. 11447-114

White Papers

Contributing Scientist

UV Diagnostics of Galaxies from the Peak of Star-Formation to the Epoch of Reionization
C. Papovich, D. Stark, S. Finkelstein, S. Ravindranath, D. Berg, M. Bradac, and 16 additional authors, including **T. Hutchison**. // arXiv:1903.04524

Spatially-resolved studies of star-forming galaxies in the reionization epoch
S. Ravindranath, C. Papovich, B. James, G. Snyder, A. Jaskot, H. Ferguson, and 12 additional authors, including **T. Hutchison**. // article link

Unveiling the Phase Transition of the Universe During the Reionization Epoch with Lyman-alpha
S. Finkelstein, M. Bradac, C. Casey, M. Dickinson, R. Endsley, and 13 additional authors, including **T. Hutchison**. // arXiv:1903.04518

Service & Outreach

International Level

#UniqueScientists, Editing Director	since May 2019

National Level

JWST Subject Matter Expert	since Summer 2021
Warrior Scholar Project*: STEM Week TA	TAMU, since Summer 2018
Letters to a Pre-Scientist	Pen Pal, 2018 – 2019

State Level

Texas Section APS Executive Committee	APS, since Spring 2021

University Level

APS CUWiP 2020 Organizing Committee (for TAMU) ▷	TAMU, 2019 – 2020
RetainU Undergraduate Mentoring Program	TAMU, 2017 – 2018
March for Science, *Meet a Scientist*	TAMU, April 2017
King Creativity Grant Allocation Committee	Southwestern, Fall 2014

Department Level

Departmental Graduate Records Committee	TAMU, since Spring 2020
Mentoring & Advising Graduates in an Inclusive Community ⊙	TAMU, since Fall 2019
Co-founder, current co-coordinator	
Astronomy Graduate Student Representative (for Faculty)	TAMU, 2018 – 2021
Departmental Climate and Diversity Committee	TAMU, 2018 – 2020
Society for the Under-represented in Physics & Astronomy ◇	TAMU, since 2016
Co-founder, grant-funded	
TAMU Physics & Engineering Festival (annual event)	TAMU, since Spring 2017
Dept. Moving Transition Team Member	Southwestern, 2015 – 2016

Local Community Level

Astronomy Outreach, *Astronomy on Tap* (monthly event)	TAMU, since Spring 2018
Astronomy Outreach, *Camp For All* (annual event)	TAMU, 2017 – 2019
TAMU Star Parties (occasional volunteer)	TAMU, Fall 2016
Fountainwood Observatory Public Nights	Southwestern, 2012 – 2016
Physics Outreach, Williamson County Middle Schools	Southwestern, 2013 – 2016
Seaperch Program Mentor	Southwestern, 2014 – 2015

* warrior-scholar.org ▷ TAMU CUWiP – cuwip.tamu.edu
⊙ MAGIC – tamu-magic.github.io ◇ SUPA – tx.ag/supa

Panels

(invited) Graduate Students, APS April Meeting	[COVID-19], 18 April 2020
Activism & Outreach, TAMU CUWiP 2020	TAMU, 18 January 2020
Undergraduate Advice, Intro. to Physics Seminar	TAMU, 26 April 2017

Awarded Telescope Time // Archival Funding

Principal Investigator

- NASA Keck Observatory/MOSFIRE 2020B – *Using Nebular UV Metal Lines to Probe Redshifts and Physical Conditions in Galaxies During Reionization*; 2 nights, Oct/Dec 2020 **[COVID-19]**
- NASA Keck Observatory/MOSFIRE 2020A – *Using Nebular UV Metal Lines to Probe Redshifts and Physical Conditions in Galaxies During Reionization*; 2 nights, Feb 2020
- (Co-PI) IRAM/NOEMA – *A Physical Study of the Galaxy z7_GND_42912 at the End of Reionization (z=7.51)*; 30 hours, 2019 (not observed)

Co-Investigator

- JWST Cy1 – *Probing the Interstellar Medium of Galaxies in the Early Universe*; archival
- JWST Cy1 – *Spectroscopic Confirmation and Characterization of Bright Galaxies at z∼9*; 18.1 hours prime
- JWST Cy1 – *Leveraging Early Public JWST Data to Measure Luminosity Functions and Rest-UV Slopes from 6<z<12*; archival
- JWST Cy1 – *Confirming a Potential Ultra-Massive Galaxy at z=10.57*; 2.6 hours prime
- JWST Cy1 – *The Webb Deep Extragalactic Exploratory Public (WDEEP) Survey: Feedback in Low-Mass Galaxies from Cosmic Dawn to Dusk*; 121.7 hours prime, 96.4 hours parallel
- JWST Cy1 – *The First Observations of the Ionizing Luminosity of Galaxies within the Epoch of Reionization*; 22.2 hours prime
- NASA Keck Observatory/MOSFIRE 2021A – *CEERS proposal to target z>7 Lyα (z∼4-5 rest-UV) in the EGS field*; 2 nights, Apr 2021
- NSF NOIRLab Gemini/GNIRS 2021A – *Near-Infrared Spectroscopy of an Extremely-Large Equivalent-width Lyman-alpha Emitter at z=7.608*; 5 hours, 2021 (not observed, **[COVID-19]**)
- LBT/LUCI 2020A – *Detection of CIII] and Lyα at high redshifts through near-infrared spectroscopy*; 15 hours, Jan 2020
- NASA Keck Observatory/MOSFIRE 2019B – *Islands of Reionization*; 2 nights, Dec 2019
- NASA Keck Observatory/MOSFIRE 2019A – *Islands of Reionization*; 2 nights, Mar 2019
- NASA Keck Observatory/MOSFIRE 2018B – *Islands of Reionization*; 2 nights, Nov 2018
- NASA Keck Observatory/MOSFIRE 2018A – *Islands of Reionization*; 2 nights, Apr 2018
- JWST Early Release Science – *The Cosmic Evolution Early Release Science (CEERS)*, 2017

Conferences & Presentations

Science Presentations

Talk: UCLA Virtual Seminar	19 October 2021
Poster: Keck Science Meeting (interactive)	9-10 September 2021
Talk: TAMU Astrosymposium (college station, tx)	27 August 2021
Talk: SAZERAC 2.0 Virtual Conference (recording)	15 July 2021
Invited Talk: EURECA Virtual Seminar, UofA	16 April 2021
Poster: SPIE Telescopes & Instrumentation (interactive) **[COVID-19]**	14 December 2020
Invited Talk: TAMU Nuclear+Astro Seminar **[COVID-19]**	25 September 2020
Poster: Keck Science Meeting (interactive) **[COVID-19]**	24-25 September 2020
Talk: TAMU Astrosymposium **[COVID-19]**	17 August 2020
Talk: SAZERAC Virtual Conference (recording)	6 July 2020
Invited Talk: Lancaster XGAL Seminar (uk) **[COVID-19]**	14 April 2020
Invited Talk: Gemini Headquarters (hilo, hi)	24 February 2020
Talk: American Astronomical Society #235 (honolulu, hi)	5 January 2020
Talk: Keck Summit Talk (maunakea)	9 December 2019
Talk: Keck Visiting Scholar: Exit Talk (waimea, hi)	24 October 2019
Talk: Keck Visiting Scholar: Entrance Talk (waimea, hi)	2 October 2019
Talk: Keck Science Meeting, UCLA (los angeles, ca)	20 September 2019
Talk: TAMU Astrosymposium (college station, tx)	23 August 2019
Talk: Barefoot in the EoR (fitzroy island, qld, au)	17 July 2019
Talk: Extremely Large Telescopes Conf., UCLA (los angeles, ca)	29 January 2019
Talk: TAMU Astrosymposium (college station, tx)	24 August 2018
Talk: 2-min; DES Collaboration Meeting (college station, tx)	17 May 2018
Talk: CEERS Team Meeting (magnolia, tx)	1 February 2018
Talk: Star Formation in Era of JWST (college station, tx) *Led by D. Calzetti & R. Kennicutt*	1 November 2017
Poster: Frank N. Bash Symposium (austin, tx)	24–25 October 2017
Talk: 1-min; Frank N. Bash Symposium (austin, tx)	24 October 2017
Talk: TAMU Astrosymposium (college station, tx)	25 August 2017
Talk: ZFOURGE Team Meeting (magnolia, tx)	24-28 October 2016
Talk: TAMU Astrosymposium (college station, tx)	26 August 2016

Professional Development Presentations

Talk: Telescope Proposals, a "How To" Guide (recording)	5 March 2021
Talk: GLASS, `matplotlib` & Effective Plotting (recording)	9 October 2020
Talk: MAGIC+GLASS, Grants & Opportunities (& Finding Them)	14 August 2020
Talk: MAGIC, Conferences & Presentations (Making a Good One)	10 July 2020
Talk: MAGIC+GLASS, Crafting Your CV/Resume (recording)	24 June 2020
Talk: MAGIC, Building Your Professional Website (recording)	3 April 2020

Outreach Presentations

Talk: § SPS Distinguished Public Lecture, TLU (seguin, tx)	4 November 2021
Invited: *Semana Mundial del Espacio*, ITESM Virtual Masterclass	6 October 2021
Talk: *Astronomy on Tap* (bryan, tx)	22 September 2021
Invited: W. M. Keck Observatory Virtual Public Talk (recording)	9 December 2020
Talk: *Astronomy on Tap* (bryan, tx) **[COVID-19]** (recording)	16 September 2020
Invited: *The Earth is Flat on Planet Pluto*, David Sobral (recording)	1 July 2020

Talk: Warrior Scholar Project (COLLEGE STATION, TX) **[COVID-19]**	26 June 2020
Talk: *Astronomy on Tap* (BRYAN, TX) **[COVID-19]** (recording)	24 June 2020
Talk: *Astronomy on Tap* (AUSTIN, TX) **[COVID-19]** (recording)	31 March 2020
Talk: Society for Physics Students (COLLEGE STATION, TX) **[COVID-19]**	24 March 2020
Talk: *Astronomy on Tap* (BRYAN, TX)	14 August 2019
Talk: Warrior Scholar Project (COLLEGE STATION, TX)	27 June 2019
Talk: Warrior Scholar Project (COLLEGE STATION, TX)	28 June 2019
Talk: *Astronomy on Tap* (BRYAN, TX)	11 October 2018
Talk: Warrior Scholar Project (COLLEGE STATION, TX)	29 June 2018
Talk: Warrior Scholar Project (COLLEGE STATION, TX)	28 June 2018
Talk: *Camp For All* (BURTON, TX)	21 April 2018

Undergraduate Presentations

Talk: Creative Works Symposium, Senior Capstone (GEORGETOWN, TX)	12 April 2016
Poster: ⋆ Creative Works Symposium (GEORGETOWN, TX)	April 2015
Poster: ⋆ King Creativity Symposium (GEORGETOWN, TX)	April 2015
Poster: APS March Meeting (SAN ANTONIO, TX)	March 2015
Poster: CUWiP ◇ (BROWNSVILLE, TX)	January 2015
Poster: APS Meeting; Texas Section (COLLEGE STATION, TX)	October 2014
Poster: ⋆ Creative Works Symposium (GEORGETOWN, TX)	April 2014
Poster: ⋆ King Creativity Symposium (GEORGETOWN, TX)	April 2014

§ *JWST* Subject Matter Expert speaking event
⋆ Poster paired with Display Table

Supervision / Mentoring

High School Students (2)
Independent Study & Mentorship Program, Frisco ISD
—— N. Sathishkumar (Fall 2020 – present)
—— A. Kothuri (Spring 2021)

Mentoring Under-represented Students for Grad School
—— (3) Recent grads of Talented & Gifted Magnet (2016–2018)
—— (4) Recent grads of Southwestern University (2016–2018)

Teaching Experience

Workshops

Pitt-TAMU Python Camp, instructor	(virtual) 24–26 May 2021
Co-organizer of local JWST proposal planning workshops; STScI JWST master scholars	UT Austin & Texas A&M Spring 2020

Assistant

Warrior Scholar Project: STEM Week	TAMU, Summer 2018, 2019, **[COVID-19]** 2020, 2021
Teaching Assistant, Astronomy	TAMU, 2016–2018
Advisor, Independent Study	Southwestern, 2016
Undergraduate Astronomy	Southwestern, Fall 2014

Programming

Fluent:	`Python`, Tex, html
Experience with:	`C++`, bash, `IDL`, `R`, CSS

Website Architect
Personal website: aibhleog.github.io, created starting websites for (5) colleagues
TAMU Astronomy website (with other grads): tamu-astro.github.io
GLASS, Astronomy Graduate Professional Development Program: tamu-glass.github.io
JWST Texas Master Scholars (with Dr. M. Bagley): jwst-texas-master-scholars.github.io
Mentoring & Advising Graduates in an Inclusive Community (MAGIC): tamu-magic.github.io
Conference for Undergraduate Women in Physics (CUWiP) at TAMU: cuwip.tamu.edu
Society for the Under-represented in Physics & Astronomy (SUPA): tx.ag/supa

Certificates

CIRTL Associate Certificate – Evidenced-Based Teaching Practices	April 2021
OGAPS Intermediate Leadership Development Certificate	4 May 2017
OGAPS Basic Leadership Development Certificate	4 May 2017

Circulars & Telegrams

ASASSN-17bq: Discovery of A Supernova in GALEXASC J072538.14+590010.5
L. Macri, **T. Hutchison**, R. A. Koff et al. 2017, ATel. 10027, 1

Press Coverage

Constellations with host Sarafina Nance, Seeker, "How Space-Time Works When You Look at the Stars" – Episode 3, 29 January 2021

The STEM Squad, *Making Space* Award Nominee, September 2019

Texas A&M Today, "Stargazing", 1 July 2019
Texas A&M University: Science, "Texas A&M NSF Graduate Research Fellow Taylor Hutchison Finds Focus in Studying Universe's Earliest Stars and Sharing Passion for Science", 28 June 2019

Professional Societies

SPIE: The International Society for Optics & Photonics	2020 – present
American Astronomical Society	2019 – present
Sigma Xi, The Scientific Research Honor Society	2018 – present
American Physical Society	2014 – present
Alpha Delta Pi (academic sorority)	2015 – present