

# Thomas Connor

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## CURRENT POSITION

### **NASA JET PROPULSION LABORATORY | NPP FELLOW**

Oct 2019 – Present | Pasadena, CA

## PREVIOUS POSITIONS

### **CARNEGIE OBSERVATORIES | POSTDOCTORAL FELLOW**

Sept 2016 – Sept 2019 | Pasadena, CA

## EDUCATION

### **PHD | MICHIGAN STATE UNIVERSITY**

2013 – 2016 | Michigan, USA

Dissertation: Multi-wavelength observations of galaxy clusters: Population evolution and scaling relations for intermediate-redshift clusters

Advisor: Megan Donahue

### **MS | MICHIGAN STATE UNIVERSITY**

2011 – 2013 | Michigan, USA

Advisor: Megan Donahue

### **BS | CASE WESTERN RESERVE UNIVERSITY**

2007 – 2011 | Ohio, USA

Major in Astronomy with Minors in Physics and Classics. Graduated cum laude

Senior Thesis Supervisor: J. Chris Mihos

## RESEARCH

### **PRIMARY INTERESTS**

Galaxies in Galaxy Clusters, particularly Brightest Cluster Galaxies

The Intersection of the Cosmic Web and Galaxy Clusters

Star Formation near AGN in Massive Galaxies

The Earliest Quasars

### **TECHNIQUES**

Synergies from Multi-Wavelength Analysis

Multi-Object Spectroscopy

Precision Photometry

## HONORS & AWARDS

### **GRANTS & FELLOWSHIPS**

Hubble Space Telescope (HST) Cycle 25 (2017)

UV Observation of a QSO Sightline Intersecting an X-ray Identified Filament of the Cosmic Web

GO Program 15198, P.I.: T. Connor, allocated 5 Orbits and \$61,543 USD

Dissertation Completion Fellowship (2016)

Michigan State University College of Natural Science

Awarded to T. Connor. Allocated \$6,000 USD

Physics Fellowship (2016)

Michigan State University Department of Physics & Astronomy

Awarded to T. Connor. Allocated \$1,702 USD

## AWARDS

NASA NPP Fellowship (2019-)

Kaplan Award (2016)

Awarded for the best presentation of the year at the MSU Physics Grad Organization lunch talks

Best Graduate TA Award (2012)

Awarded for the best graduate teaching assistant of the year in the MSU Department of Physics and Astronomy

Peter Witt Scholarship (2009)

CWRU scholarship honoring students who have shown a dedication to community involvement

Case Alumni Association Scholarship (2009)

Awarded to CWRU students majoring in STEM based on merit, need, and skills

## VOLUNTEER & LEADERSHIP

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### COMMITTEES & ORGANIZATIONS

Carnegie Institution Postdoctoral Association | Representative (2017 - 2019)

PGO Inclusivity Task Force | Founding Member (2016)

AAS Early Career Advisory Board | Founding Member (2015 - Dissolution)

### SERVICE

NuSTAR Time Allocation Committee

Gemini FT Proposal Reviewer

Hubble Space Telescope Proposal Reviewer (2017, 2018)

Chambliss Award Judge – AAS Meeting (2016, 2019)

Graduate Student Mentor (2012 - 2015)

REU Graduate Mentor (2013)

## TEACHING EXPERIENCE

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Guest Instructor | Michigan State University (2015)

AST 308: Galaxies & Cosmology

Instructor | MST@MSU Camp (2013)

Instructor | Michigan State University (2011-2013)

ISP 205L: Visions of the Universe Lab

Teaching Assistant | Case Western Reserve University (2009 - 2011)

ASTR 201: Stars and Planets

ASTR 202: Galaxies and the Universe

ASTR 204: Einstein's Universe

ASTR 206: Life in the Universe

## OBSERVING EXPERIENCE

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### FACILITIES OPERATED

Magellan Telescopes (6.5 m)

IMACS, IMACS-GISMO, LDSS3, MagE, FIRE, FourStar

SOAR Telescope (4.1 m)

Goodman, SOI, Spartan

Irénée du Pont Telescope (2.5 m)

Direct CCD, Echelle, WFCCD

CWRU Burrell-Schmidt Telescope (0.61 m)

### DATA REDUCED & ANALYZED

Hubble Space Telescope

WFC3, ACS: Imaging Data

Chandra X-ray Observatory

ACIS: Quasar spectra

XMM-Newton

EPIC: Galaxy Clusters

Magellan Telescopes

IMACS, IMACS-GISMO, LDSS3

Keck Telescopes

MOSFIRE

Gemini Telescopes

GMOS

SOAR Telescope (4.1 m)

Goodman, SOI

Irénée du Pont Telescope (2.5 m)

Direct CCD

## PUBLICATIONS

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### PRIMARY PUBLICATIONS FIRST OR SECOND AUTHOR

11 Total

1. Connor, Thomas; Eduardo Bañados, Chiara Mazzucchelli, Daniel Stern, Roberto Decarli, Xiaohui Fan, Emanuele Paolo Farina, Elisabeta Lusso, Marcel Neeleman, Fabian Walter.  
"X-ray Observations of a [C II]-bright,  $z=6.59$  Quasar/Companion System." 2020, ApJ, 900, 189
2. Connor, Thomas; Eduardo Bañados, Daniel Stern, Roberto Decarli, Jan-Torge Schindler, Xiaohui Fan, Emanuele Paolo Farina, Chiara Mazzucchelli, John S. Mulchaey, Fabian Walter.  
"X-ray Observations of a  $z \sim 6.2$  Quasar/Galaxy Merger." 2019d, ApJ, 887, 171
3. Connor, Thomas; Fakhri S. Zahedy, Hsiao-Wen Chen, Thomas J. Cooper, John Mulchaey, Alexey Vikhlinin.  
"COS Observations of the Cosmic Web: A Search for the Cooler Components of a Hot, X-ray Identified Filament." 2019c, ApJL, 884, 20
4. Connor, Thomas; Kelson, Daniel D.; Blanc, Guillermo A.; Boutsia, Konstantina.  
"Assembling a RELIC at Redshift 1: Spectroscopic Observations of Galaxies in the RELICS Cluster SPT-CLJ0615–5746." 2019b, ApJ, 878, 66
5. Connor, Thomas; Kelson, Daniel D.; Donahue, Megan; Moustakas, John.  
"On the Origin of the Scatter in the Red Sequence: An Analysis of Four CLASH Clusters." 2019a, ApJ, 875, 16
6. Connor, Thomas; Kelson, Daniel D.; Mulchaey, John; Vikhlinin, Alexey; Patel, Shannon G.; Balogh, Michael L.; Joshi, Gandhali; Kraft, Ralph; Nagai, Daisuke; & Starikova, Svetlana.  
"Wide-Field Optical Spectroscopy of Abell 133: A Search for Filaments Reported in X-ray Observations." 2018, ApJ, 867, 25
7. Bañados, Eduardo; Connor, Thomas; Stern, Daniel; Mulchaey, John; Fan, Xiaohui; Decarli, Roberto; Farina, Emanuele P.; Mazzucchelli, Chiara; Venemans, Bram P.; Walter, Fabian; Wang, Feige; & Yang, Jinyi  
"Chandra X-Rays from the Redshift 7.54 Quasar ULAS J1342+0928." 2018, ApJL, 856, 25
8. Connor, Thomas; Donahue, Megan; Kelson, Daniel D.; Moustakas, John; Coe, Dan; Postman, Marc; Bradley, Larry D.; Koekemoer, Anton M.; Melchior, Peter; Umetsu, Keiichi; & Voit, G. Mark  
"Crowded Field Galaxy Photometry: Precision Colors in the CLASH Clusters." 2017, ApJ, 848, 37
9. Donahue, M; Connor, Thomas; Voit, G. Mark; & Postman, Marc  
"Observations of  $\text{Ly}\alpha$  and O VI: Signatures of Cooling and Star Formation in a Massive Central Cluster Galaxy." 2017, ApJ, 835, 216
10. Donahue, M; Connor, Thomas; Fogarty, Kevin; Li, Yuan; Voit, G. Mark; Postman, Marc; Koekemoer, Anton; Moustakas, John; Bradley, Larry; & Ford, Holland  
"Ultraviolet Morphology and Unobscured UV Star Formation Rates of CLASH Brightest Cluster Galaxies." 2015, ApJ, 805, 177
11. Connor, Thomas; Donahue, Megan; Sun, Ming; Hoekstra, Henk; Mahdavi, Andisheh; Conselice, Christopher J.; & McNamara, Brian  
"Scaling Relations and X-Ray Properties of Moderate-luminosity Galaxy Clusters from  $0.3 < z < 0.6$  with XMM-Newton." 2014, ApJ, 794, 48

### SECONDARY PAPERS Co-AUTHORED PAPERS, PUBLISHED

18 Total

12. Frisbie, R.L.S. et al. (Connor, T: 4/9)  
"Properties of the Hot Ambient Medium of Early-type Galaxies Hosting Powerful Radio Sources." 2020, ApJ, 899, 159
13. Holoien, T. et al. (Connor, T: 18/33)  
"The Rise and Fall of ASASSN-18pg: Following a TDE from Early to Late Times." 2020, ApJ, 898, 161
14. Moravec, E. et al. (Connor, T: 7/21)  
"The Massive and Distant Clusters of WISE Survey. IX. High Radio Activity in a Merging Cluster." 2020, ApJ, 898, 145

15. Steinhardt, C.L. et al. (Connor, T: 35/95)  
"The BUFFALO HST Survey." 2020, ApJS, 247, 64
16. Gonzalez, E.J. et al. (Connor, T: 11/14)  
"Setting the scene for BUFFALO: a study of the matter distribution in the HFF galaxy cluster MACS J0416.1-2403 and its parallel field." 2020, MNRAS, 494, 349
17. Starikova, S. et al (Connor, T: 5/7)  
"Stellar-mass Measurements in A133 with Magellan/IMACS." 2020, ApJ, 892, 34
18. Chen, P., et al. (Connor, T: 17/24)  
"The Most Rapidly-Declining Type I Supernova 2019bkc/ATLAS19dqr." 2020, ApJL, 889, L6
19. DeMaio, T., et al. (Connor, T: 7/12)  
"The growth of brightest cluster galaxies and intracluster light over the past 10 billion years." 2020, MNRAS, 491, 3751
20. Johnson, S.D., et al. (Connor, T: 5/14)  
"The Physical Origins of the Identified and Still Missing Components of the Warm-Hot Intergalactic Medium: Insights from Deep Surveys in the Field of Blazar 1ES1553+113." 2019, ApJL, 884, L31
21. Holoien, T.W.S., et al. (Connor, T: 19/24)  
"Discovery and Early Evolution of ASASSN-19bt, the First TDE Detected by TESS." 2019, ApJ, 883, 111
22. Grossova, R., et al. (Connor, T: 11/16)  
"Powerful AGN jets and unbalanced cooling in the hot atmosphere of IC 4296." 2019, MNRAS, 488, 1917
23. Husemann, B., et al. (Connor, T: 11/18)  
"The Close AGN Reference Survey (CARS). A massive multi-phase outflow impacting the edge-on galaxy HE1353-1917." 2019, A&A, 627, 53
24. Juráňová, A., et al. (Connor, T: 11/12)  
"Cooling in the X-ray halo of the rotating, massive early-type galaxy NGC 7049." 2019, MNRAS, 484, 2886
25. Lakhchaura, K., et al. (Connor, T: 7/9)  
"Thermodynamic properties, multiphase gas and AGN feedback in a large sample of giant ellipticals." 2018, MNRAS, 481, 4472
26. DeMaio, T., et al. (Connor, T: 5/7)  
"Lost but not forgotten: intracluster light in galaxy groups and clusters." 2018, MNRAS, 474, 3009
27. Morrison, H.L., et al. (Connor, T: 5/13)  
"Globular and Open Clusters Observed by SDSS/SEGUE: The Giant Stars." 2016, AJ, 151, 7
28. Fogarty, K., et al. (Connor, T: 3/5)  
"Star Formation Activity in CLASH Brightest Cluster Galaxies." 2015, ApJ, 813, 117
29. Werner, N., et al. (Connor, T: 9/15)  
"The origin of cold gas in giant elliptical galaxies and its role in fuelling radio-mode AGN feedback." 2014, MNRAS, 439, 2291

## OUTREACH HIGHLIGHTS

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### **Mt. Wilson STEM Program (2018 - Present)**

Taught middle and high school students at Mt. Wilson Observatory

### **Carnegie Observatories Open House (2016 - Present)**

Planned, organized, and ran spectroscopy activity at yearly open house

### **Astronomy on Tap – Lansing (2015-2016)**

Gave public talk, coordinated social media during events

### **Public Nights - MSU Campus Observatory (2011-2014)**

Operated telescopes and engaged with members of the public

### **Science Olympiad – CWRU (2010 - 2011) and MSU (2012)**

Wrote, proctored, and graded exams

### **Very Large Array tour guide (2010)**

Gave tours of the Very Large Array facilities to visitors

## TELESCOPE ALLOTMENT

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### **Hubble Space Telescope**

PI: #15198 – 5 orbits with the Cosmic Origins Spectrograph (2017)

Co-I: #15308 – 6 orbits with ACS / WFC3 (2017)

### **Chandra X-ray Observatory**

Co-I: #20700106 – 277 ks to study a radio-bright quasar (2018)

Co-I: #21700027 – 120 ks to study an obscured quasar (2019)  
Co-I: #22800459 – 271 ks to study a high-redshift galaxy clusters (2020)  
Co-I: #22700552 – 710 ks to survey quasars in the epoch of reionization (2020)

#### **XMM-Newton Observatory**

Co-I: #084274 – 146 ks to study a high-z quasar companions (2018)  
PI: #086378 – 186 ks to study a high-z radio-bright quasar (2019)

#### **Magellan Telescopes**

PI: 33.5 Nights Awarded (2017-2020)

#### **Gemini Telescopes**

PI: 1 hour (2020)  
Co-I: 9.2 hours (2019)

#### **Palomar 200 Inch**

PI: 4 Nights Awarded (2020)

#### **Irénée du Pont Telescope**

PI: 15 Nights Awarded (2017-2020)

## PRESENTATIONS

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### **TALKS**

**The Current Status of X-ray Observations of High-z Quasars (March 2020)**  
Black Holes and Galaxies at the Edge of the Universe, Ringberg Castle, Germany

**X-rays from the Cosmic Web: The Case of Abell 133 (Sept 2019)**  
X-ray Astronomy 2019, Bologna, Italy

**Observing the Cosmic Web at the Cluster Boundary (Jan 2019)**  
Winter AAS Meeting, Washington, USA

**Building a Galaxy Cluster (Oct 2018)**  
University of Alabama at Huntsville Physics Seminar, Huntsville, Alabama, USA

**Cosmic Filaments & AXIS (Aug 2018)**  
AXIS Summer Workshop, Washington, D.C., USA

**Optical Observations of Cluster Filaments (June 2018)**  
Alabama WHIM 2018, Alabama, USA

**Tying Clusters Onto the Cosmic Web with X-rays (March 2018)**  
SnowCluster 2018, Utah, USA

**Observations of Infall into Abell 133 (December 2016)**  
4th Magellan Science Symposium, Washington, D.C., USA

**Multi-Wavelength Observations of Galaxy Clusters: Population Evolution and Scaling Relations for Intermediate-Redshift Clusters (July 2016)**  
Thesis Defense, Michigan, USA

**Inclusive Astronomy, Inclusive Physics: Working Toward a Better Future in our Fields (February 2016)**  
MSU PGO Lunch Talk, Michigan, USA

**Crowded Field Photometry in the CLASH Clusters: Measuring the Red Sequence of Cluster Galaxies with Robust Photometry (January 2016)**  
Winter AAS Meeting, Florida, USA

**Seeing the Trees for the Forest: An Optimized Census of Galaxy Clusters (September 2015)**  
MSU PGO Lunch Talk, Michigan, USA

**A Beginner's Guide to Galaxy Clusters (October 2014)**  
MSU PGO Lunch Talk, Michigan, USA

**Optimal Photometric Measurements for Determining the Stellar Masses of BCGs and Galaxy Clusters (September 2013)**  
CLASH Team Science Meeting, London, UK

### **POSTERS**

**X-ray Observations of Quasars in the First Billion Years of the Universe: Searching for AGN Activity in Companions (January 2020)**  
AAS Winter Meeting, Honolulu, Italy

**Taking the Red Sequence Offline (July 2019)**  
Tracing Cosmic Evolution With Clusters of Galaxies 2019, Sexten, Italy

Photometry of CLASH Cluster Galaxies (March 2015)

SnowCluster 2015, Utah, USA

Optical Morphology of Faint Radio Sources in the GOODS-N Field (January 2011)

AAS Winter Meeting, Washington, USA

## OTHER INFORMATION

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**CITIZENSHIP:** UNITED STATES OF AMERICA

### LANGUAGES

English: Native

Spanish: Basic

### PROFESSIONAL MEMBERSHIPS

American Astronomical Society | Full Member

High Energy Astrophysics Division, American Astronomical Society | Member

### REFERENCES

**Dr. John Mulchaey**

Crawford H. Greenewalt Chair and Director of The Observatories of the Carnegie Institution for Science

**Prof. Megan Donahue**

University Distinguished Professor, Michigan State University

Past President, American Astronomical Society

**Dr. Daniel D. Kelson**

Staff Associate, The Observatories of the Carnegie Institution for Science