

Courtney B. Watson

Astrophysicist

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Education

- 2019–2025 **PhD , Astrophysics** Boston University
Advisor: Dr. Elizabeth Blanton
Thesis: “Galaxy Cluster Dynamics: Insights from Bent, Double-Lobed Radio Sources and Multi-wavelength Observations”
- May 2022 **Master of Arts , Astrophysics** Boston University
- May 2018 **Bachelor of Science, Physics** Texas A&M University
Minor in Astrophysics
Undergraduate Thesis: “Identifying Galaxy Mergers in High Redshift Clusters Using the Hubble Space Telescope”
Advisor: Dr. Kim-Vy Tran

Experience

Research

- 2025–now **Postdoctoral Researcher** Harvard-Smithsonian CfA, OIR Division
PI: Dr. Kim-Vy Tran
Compiling and maintaining the lensing systems library and creating visualizations to provide insights into the systems in the benchmark AGEL survey.
- 2020–2025 **Graduate Research Assistant** Boston University
Advisor: Prof. Elizabeth Blanton
Employing space-based observations to study the thermodynamic properties of galaxy clusters and investigate the interplay between active galactic nuclei and their surrounding cluster environments
- 2024–2025 **Predocctoral Fellow** Harvard-Smithsonian CfA, Chandra X-ray Center, HEA Division
Advisor: Dr. Scott Randall
Using X-ray observations of ICM to study thermodynamics of one of the longest, continuous sloshing spirals ever observed.
- Sum. 2020, 2024 **Visiting Student Fellow** Harvard-Smithsonian CfA, Chandra X-ray Center, HEA Division
Advisor: Dr. Scott Randall
Using X-ray observations of the ICM of radio source host clusters to map its thermodynamic properties and morphology
- 2018–2019 **Post-Baccalaureate Researcher** Yale University, Department of Astronomy
Advisors: Dr. Pieter van Dokkum and Dr. Sarbani Basu
Near-infrared spectroscopy of high redshift galaxy-galaxy mergers; Asteroseismic analysis of solar-cycle related changes in the sun
- 2015–2018 **Undergraduate Research Assistant** Texas A&M University, Department of Physics and Astronomy
Advisor: Prof. Kim-Vy Tran
Combined Hubble Space Telescope photometry with 3D-HST observations to present a complete survey of potentially merging objects in two high redshift clusters; Identification of galaxy-galaxy mergers in high redshift galaxy clusters.

Teaching

Spring 2024	Teaching Fellow Instructor: Prof. Thomas Bania TF for the undergraduate course AS 107 Life Beyond Earth again	Boston University, Department of Astronomy
Fall 2023	Teaching Fellow Instructor: Prof. Paul Withers TF for undergraduate course AS 101 The Solar System	Boston University, Department of Astronomy
Spring 2021	Teaching Fellow Instructor: Prof. Elizabeth Blanton TF for undergraduate course AS 203 Principles of Astronomy II	Boston University, Department of Astronomy
Fall 2020	Teaching Fellow Instructor: Prof. Thomas Bania TF for the undergraduate course AS 107 Life Beyond Earth	Boston University, Department of Astronomy
Spring 2020	Teaching Fellow Instructor: Prof. Elizabeth Blanton TF for the undergraduate course AS 109 Cosmology	Boston University, Department of Astronomy
Spring 2017	Undergraduate Teaching Assistant Instructor: Prof. Kim-Vy Tran Undergraduate TA for the undergraduate course AS 101 Basic Astronomy	Texas A&M University, Department of Physics and Astronomy

Awards and Honors

2023-2024	Graduate School of Arts and Sciences Outstanding Teaching Fellow, Astronomy Department	Boston University
2021-2023	Massachusetts Space Grant Consortium Graduate Fellowship	NASA
Fall 2019	Dean's Fellowship Graduate Fellowship	Boston University
2017	Undergraduate Research Scholar Honors distinction awarded after the completion of my undergraduate thesis: "Identifying Galaxy Mergers in High Redshift Clusters Using the Hubble Space Telescope"	Texas A&M University
2016-2017	Louis Stokes Alliance for Minority Participation Scholarship Undergraduate research scholarship	Texas A&M University

Academic and Conference Talks

2024	25 Years of Science with Chandra Showed preliminary results of deepest Chandra observations of longest, continuous sloshing spiral in galaxy cluster	Poster talk
2023	241st Meeting Of The American Astronomical Society Showed results presented in my paper "Chandra X-Ray Observations of Abell 119: Cold Fronts and a Shock in an Evolved Off-Axis Merger"	Poster talk
2019	Yale Post-Baccalaureate Research Education Program Symposium, Yale University Presented the results of the focus of my research during the Yale PREP program.	Oral Presentation
2017	Student Research Week, Texas A&M University Presented the preliminary analysis from my Undergraduate Research Scholars Thesis.	Poster talk
2016	Astrosymposium, Texas A&M University Presented the findings of my first year of research conducted under the supervision of Prof. Kim-Vy Tran.	Oral Presentation

Professional Associations

- 2020–now **American Astronomical Society**
- 2020–now **High Energy Astrophysics Division, AAS**
- 2012–now **American Indian Science and Engineering Society**

Publications

6. “*Deep Chandra X-ray Observations of Abell 2029: the Merger History of a Relaxed, Strong Cool Core Cluster*”, **Watson, Courtney B.**, Blanton, E.L., Randall, S.W., Clarke, T.E., ZuHone, J.A., 2025, *ApJ*, 996, 1
5. “*HST Grism Observations of a $z \sim 1.8$ Cluster Candidate from the Clusters Occupied by Bent Radio AGN (COBRA) Survey*”, **Watson, Courtney B.**, Blanton, E.L., Golden-Marx, E., Ashby, M.L.N., Randall, S.W., Wing, J.D., Douglass, E.M., 2025, *ApJ*, 984, 57
4. “*CHANDRA X-Ray Observations of Abell 119: Cold Fronts and a Shock in an Evolved Off-axis Merger*”, **Watson, Courtney B.**, Blanton, E.L., Randall, S.W., Sarazin, C.L., Sarkar, A., ZuHone, J.A., Douglass, E.M., 2023, *ApJ*, 955, 103
3. “*Solar-cycle-related Changes in the Helium Ionization Zones of the Sun*”, **Watson, Courtney B.**, Basu, Sarbani, 2020, *ApJL*, 903, L29
2. “*Galaxy Merger Fractions in Two Clusters at $z \sim 2$ Using the Hubble Space Telescope*”, **Watson, C.**, Tran, K.V., Tomczak, A., Alcorn, L., Salazar, I.V., Gupta, A., Momcheva, I., Papovich, C., van Dokkum, P., Brammer, G., Lotz, J., & Willmer, C.N.A., 2019, *ApJ*, 874, 63
1. “*Identifying Galaxy Mergers in High Redshift Clusters Using the Hubble Space Telescope*”, **Watson, Courtney** and Tran, Kim-Vy, 2017, *Texas A&M OAKTrust Repository*

In the Press

- 2023 “**Complex galaxy cluster Abell 119 explored by researchers**” Phys.org
<https://phys.org/news/2023-08-complex-galaxy-cluster-abell-explored.html>

Research Interests

Clusters of galaxies and their environments; Interactions of galaxies and surrounding cluster environments; Large-scale structure formation & evolution

Skills

</> Python, SQL, pandas, SciPy, NumPy, Jupyter, Matplotlib, IRAF, Anaconda, EAZY, FAST, SExtractor, CIAO, \LaTeX , git