

Julia Falcone

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EDUCATION

Georgia State University, Atlanta, GA

Expected Ph.D., Astronomy

Fall 2020 - Present

M.S., Physics with Astronomy Concentration

Summer 2022

Case Western Reserve University, Cleveland, OH

Bachelor of Science, Astronomy

Fall 2016 - Spring 2020

Secondary Major, Physics

Fall 2016 - Spring 2020

RESEARCH EXPERIENCE

Georgia State University, Atlanta, GA

Fall 2020 - Present

Graduate Research Assistant under Professor Mike Crenshaw

- Reduce and calibrate data from several spectrographic instruments.
- Utilized and improved a Gaussian fitting routine to analyze gas kinematics in the galaxy NGC 3227.
- Conceptualized and programmed an algorithm to produce and statistically analyze over half a million models.
- Calculated trajectories of radiatively driven gas to characterize the observed gas outflows and contribute to the credibility of radiative driving as a means of gas acceleration for a low-luminosity active galactic nucleus.

American Museum of Natural History, New York City, NY

Summer 2020 - Present

Volunteer researcher and mentor in the Y/Dim Collaboration under Professor Charles Liu

- Developed a Python program to automate full width at half max (FWHM) measurements and calculations for thousands of galaxies.
- Developed a method to easily classify the morphologies of thousands of Sloan Digital Sky Survey (SDSS) galaxies so we could isolate a specific type called E+A galaxies.
- Mentor several other undergraduate and high school volunteers in conducting research, Python coding, and explaining relevant concepts.

Case Western Reserve University, Cleveland, OH

Spring 2019 - May 2020

Research under Professor Stacy McGaugh

- Analyzed the impact of tidal forces on dwarf spheroidal galaxies.

- Quantified the effect of dark matter on the Baryonic Tully-Fisher relation through statistical analysis and graphing.
- Developed a relationship between a galaxy's stellar mass and its dark matter halo mass by utilizing dynamical properties independent of abundance matching.

REFEREED PUBLICATIONS



- **Falcone, J.**, Crenshaw, D. M., Fischer, T.C., Meena, B., Revalski, M., Shea, M., Davis, M., and Riffel, R. “*An Analysis of AGN-Driven Outflows in the Seyfert 1 Galaxy NGC 3227*”. Accepted to ApJ.
- Revalski, M., Crenshaw, D. M., Rafelski, M., Kraemer, S., [...] **Falcone, J.**, et al. “*Quantifying Feedback from Narrow Line Region Outflows in Nearby Active Galaxies. IV. The Effects of Different Density Estimates on the Ionized Gas Masses and Outflow Rates*”, 2022, ApJ, 930, 14.
- Meena, B., Crenshaw, D. M., Schmitt, H. R., Revalski, M., [...] **Falcone, J.**, et al. “*Investigating the Narrow Line Region Dynamics in Nearby Active Galaxies*”, 2023, ApJ, 943, 98.
- Bentz, M. C., Duffee, M., Erfani, D., **Falcone, J.**, et al. “*Broad-band Photometric Monitoring of 1226 Golia and 6349 Acapulco*”, 2022, The Minor Planet Bulletin, 49, 4.

OTHER PUBLICATIONS

- Ludwig, E., **Falcone, J.**, et al. “*The Relation between Gas-phase Metallicity and Stellar Mass Surface Density in Post-starburst E+A and E+A+ Galaxies within the Coma Cluster Observed by the SDSS-IV MaNGA Survey*”, 2022, RNAAS, 6, 12, 259.
- Quayum, R., **Falcone, J.**, Greenfield, S., and Liu, C. “*E+A Galaxy Candidates in and around the Leo Cluster*”, 2021, RNAAS, 5, 3, 53.
- **Falcone, J.**, Wurmser, S., Kerrison, N., et al. “*E+A Galaxies in and Around Nearby Rich Clusters of Galaxies*”, 2021, RNAAS, 5, 3, 67.

CONFERENCE TALKS

- **Falcone, J.**, Crenshaw, D.M., Fischer, T.C., et al. “*Multiwavelength Analysis of the Outflows and Rotation in the Seyfert 1 Galaxy NGC 3227*”. Talk presented at the 243rd Meeting of the American Astronomical Society, New Orleans, LA, January 2024.
- **Falcone, J.**, Crenshaw, D.M., Revalski, M., [...]. “*Disentangling Outflows and Rotation in the Star-Forming Seyfert 1 Galaxy NGC 3227*”. Talk presented at AGN Winds on the Chesapeake, Easton, MD, June 2023.
- Revalski, M., Crenshaw, D. M., [...], **Falcone, J.**, et al. “*The Effects of Different Density Profiles on Spatially Resolved Outflow Energetics*”. Talk presented at AGN Winds on the Chesapeake, Easton, MD, June 2023.

- Meena, B., Crenshaw, D. M., Schmitt, H., Revalski, M., Fischer, [...] **Falcone, J.**, et al. “*The Origins and Driving Mechanisms of Narrow-Line Regions Outflows*”. Talk presented at AGN Winds on the Chesapeake, Easton, MD, June 2023.
- Fischer, T. J., Johnson, M., Secrest, N., [...] **Falcone, J.**, et al. “*Let’s Talk About Jets: Analyzing Extranuclear Radio Sources in NGC 1068 and Friends*”. Talk presented at AGN Winds on the Chesapeake, Easton, MD, June 2023.
- Ferree, N., Crenshaw, D.M., **Falcone, J.**, et al. “*Gas Outflow Kinematics in NGC 3516*”. Talk presented at AGN Winds on the Chesapeake, Easton, MD, June 2023.

CONFERENCE POSTERS

- **Falcone, J.**, Crenshaw, D. M., Fischer, T., Meena, B., Revalski, M., Shea, M., Chapman, Z., Polack, G. “*Disentangling Outflows and Rotation in the Star-Forming Seyfert 1 Galaxy NGC 3227*”. 241st Meeting of the American Astronomical Society, Seattle, WA, January 2023.
 - The virtual poster is available to see [here](#).
- Ferree, N., Crenshaw, D. M., **Falcone, J.**, et al. “*Gas Outflow Kinematics in NGC 3516*”. 241st Meeting of the American Astronomical Society, Seattle, WA, January 2023.
- Shea, M., Crenshaw, D., **Falcone, J.**, et al. “*Ionized Gas Flows in the Compact Galaxy Group Stephan's Quintet and its Active Galaxy NGC 7319*”. 241st Meeting of the American Astronomical Society, Seattle, WA, January 2023.
- Chapman, Z., Crenshaw, D., **Falcone, J.**, et al. “*NGC 4395: The Little AGN That Could*”. 241st Meeting of the American Astronomical Society, Seattle, WA, January 2023.
- Greene, O., **Falcone, J.**, Marinelli, M., et al. “*Investigating Quenching in a Spatially Resolved Catalog of E+A Galaxies from SDSS-IV MaNGA*”. 241st Meeting of the American Astronomical Society, Seattle, WA, January 2023.
- Ludwig, E., **Falcone, J.**, Marinelli, M., et al. “*The Effects of Star Formation Rates on the Mass-Metallicity Relation in E+A Galaxies within the Coma Cluster Observed with the SDSS-IV MaNGA Survey*”. 241st Meeting of the American Astronomical Society, Seattle, WA, January 2023.
- **Falcone, J.**, Crenshaw, D. M., Fischer, T., Meena, B., Revalski, M., Polack, G., Shea, M., Chapman, Z. “*An Analysis of AGN-Driven Outflows in the Seyfert 1 Galaxy NGC 3227*”. 240th Meeting of the American Astronomical Society, Pasadena, CA, June 2022.
 - The virtual poster is available to see [here](#).
- **Falcone, J.**, Greenfield, S., Joyce, M., et al. “*E+A Galaxies In and Around Nearby Rich Clusters of Galaxies*”, 237th Meeting of the American Astronomical Society, January 2021.
 - The virtual poster is available to see [here](#).
- Joyce, M. L., Greenfield, S., **Falcone, J.**, et al. “*E+A Galaxies With Companions In The Field And In Nearby Rich Clusters Of Galaxies*”, 237th Meeting of the American Astronomical Society, January 2021.

- Williams, R. H., **Falcone, J.**, Greenfield, S., et al. “*E+A Galaxies And Candidates In And Around The Hercules Supercluster*”, 237th Meeting of the American Astronomical Society, January 2021.
- Liu, A. G., Kerrison, N., Wurmser, S., **Falcone, J.**, et al. “*Virtual Reality Mapping of E+A Galaxies and Candidates in the Coma Cluster and Other Nearby Rich Clusters of Galaxies*”, 237th Meeting of the American Astronomical Society, January 2021.
- Marinelli, M., Kerrison, N., Wurmser, S., **Falcone, J.**, et al. “*SDSS-MaNGA: Spatially Resolved Spectroscopy of E+A Galaxy Candidates in the Coma Cluster*”, 237th Meeting of the American Astronomical Society, January 2021.
- Quayum, R., Greenfield, S., Wurmser, S., **Falcone, J.**, et al. “*E+A Galaxies And Candidates In And Around The Leo Cluster (Abell 1367)*”, 237th Meeting of the American Astronomical Society, January 2021.
- Wurmser, S., **Falcone, J.**, Greenfield, S., et al. “*E+A Galaxies And Candidates In And Around The Virgo Cluster*”, 237th Meeting of the American Astronomical Society, January 2021.
- Ostling, W. B., Kerrison, N., Wurmser, S., **Falcone, J.**, et al. “*Eight E+A Galaxies Located Inside A Large-Scale Filament In The Coma Cluster*”, 237th Meeting of the American Astronomical Society, January 2021.
- **Falcone, J.**, Corbitt, T., and Cripe, J. “*Improving Thermal Noise Measurements in Crystalline AlGaAs Mirrors*”. 23rd Annual Summer Undergraduate Research Forum, Baton Rouge, Louisiana, July 2017.
- Wally, M., Weaver, O., Anderson, M., Liu, A., **Falcone, J.**, Wallack, N., James, O., and Liu, C. “*A Study of E+A Galaxies Through SDSS-MaNGA Integral Field Spectroscopy*”. 229th Meeting of the American Astronomical Society, Grapevine, Texas, January 2017.
- Weaver, O., Anderson, M., Wally, M., James, O., **Falcone, J.**, Liu, A., Wallack, N., and Liu, C. “*Spectral Analysis, Synthesis, & Energy Distributions of Nearby E+A Galaxies Using SDSS-IV MaNGA*”. 229th Meeting of the American Astronomical Society, Grapevine, Texas, January 2017.

MISCELLANEOUS TALKS AND PRESENTATIONS

- “*AGN Feedback and Outflows*”. Talk presented at “From Galaxies to Gluons” lunch talk series, Atlanta, Georgia, June 2024.
- “*Supermassive Black Holes and Their Feedback Processes: Understanding the Universe’s Rowdiest Partiers*”. Public outreach talk given at Three Taverns Brewery, Atlanta, Georgia, May 2024.
- “*Georgia Outreach Team for Space*”. Talk presented at the Georgia Space Grant Affiliates meeting, Atlanta, Georgia, April 2024.
- “*Star of Our World*”. Talk presented to elementary school students at Usher-Collier Elementary School, Atlanta, Georgia, September 2023.
- “*From Cosmic Rays to Food: How Does Nuclear Physics Affect My Life?*” Volunteer at the nuclear physics booth at the Atlanta Science Festival, Atlanta, Georgia, April 2023.

- “*What Aliens Might Exist in Our Solar System?*” Talk presented to elementary school students at M. Agnes Jones Elementary School, Atlanta, Georgia, September 2022.
- “*From Cosmic Rays to Food: How Does Nuclear Physics Affect My Life?*” Volunteer at the nuclear physics booth at the Atlanta Science Festival, Atlanta, Georgia, April 2022.
- “*How Do Galaxies Change Over Time?*” Virtual talk presented to elementary school students at the International School of Brooklyn, December 2021.
- “*Fly to Planets and Build a Solar System with GOT Space!*” Volunteer and coordinator of GOT Space’s booth for Space Day Atlanta, Atlanta, Georgia, September 2021.

MENTORING

- Kesha Patel - REU Student, Georgia State University Summer 2024
- Jacob Tutterow - Masters Student, Georgia State University Spring 2024 - Present
- Madeline Davis - REU Student, Georgia State University Summer 2023
- Nicolas Ferree - REU Student, Georgia State University Summer 2022
- Eric Ludwig - Undergraduate Student, CUNY College of Staten Island Summer 2021- Summer 2023

AWARDS AND SCHOLARSHIPS

- Career Development Fellowship**, Out to Innovate Spring 2024
- Travel Support Award**, AGN Winds on the Chesapeake Conference Summer 2023
- Rod Nave Educator Award for Outstanding Teaching Assistantship**, GSU Spring 2023
- Georgia Space Grant Consortium Fellowship**, NASA Fall 2022 - Summer 2023
- Chambliss Astronomy Achievement Student Award, Honorable Mention**, AAS Summer 2022
- Jason J. Nassau Prize**, Case Western Reserve University Spring 2020
- Richard L. Garwin Award**, Case Western Reserve University Spring 2020
- University Scholarship**, Case Western Reserve University Fall 2016 - Spring 2020

OBSERVING EXPERIENCE

- Astrophysical Research Consortium (ARC) 3.5-meter Telescope** Summer 2021 - Present
- Apache Point Observatory, Sunspot, NM* Total: 230 hours (180 remote, 50 in-person)
 - Took optical imaging using the ARC Telescope Imaging Camera (ARCTIC)
 - Took spectroscopy using the KOSMOS instrument
 - Performed telescope operations such as tracking guide stars and taking spectroscopy of internal and truss lamps for wavelength calibration.
 - Assisted in the planning of observations
- Hard Labor Creek Observatory** Spring 2021
- Georgia State University-owned telescope located in Rutledge, GA* Total: 30 hours

- Observed the photometric movements of two asteroids
- Calibrated and analyzed the raw data using IRAF

TECHNICAL SKILLS

Programming Languages

- Expert proficiency in Python
- Intermediate proficiency in IDL, IRAF
- Basic proficiency in Julia, Fortran, MATLAB, SQL

Astronomical Observations & Software

- Significant experience using astronomy-related Python packages such as AstroPy, NumPy
- Experienced in performing data analysis using DS9, TOPCAT, IRAF, IDL
- Experienced in using GSU's high-performance computing (HPC) facilities for data analysis
- Experienced in LaTeX formatting

TEACHING EXPERIENCE

Graduate Teaching Assistant

Fall 2020 - Spring 2024

Georgia State University, Atlanta, GA

- Lab instructor for ASTR1010 (Astronomy of the Solar System): 3 classes
- Lab instructor for ASTR1020 (Stellar and Extragalactic Astronomy): 10 classes
- Lab instructor for PHYS 2211 (Physics I): 1 class
- Lab instructor for PHYS 112K (Physics II): 1 class

ACTIVITIES

Faculty Search Committee for Associate Professor in Astronomy

Fall 2023 - Spring 2024

Member

- Read through all applications and helped compile a shortlist of candidates to interview.
- Helped conduct interviews with several candidates.
- Assisted in coordinating campus visits and talks for four candidates.

GSU Graduate Council for the College of Arts and Sciences

Fall 2022 - present

Graduate Representative

- Provide a graduate student perspective on issues related to topics such as graduate stipends and graduate student benefits.
- Advocate for better conditions for graduate students by dialoguing with the graduate directors and deans about the hardships that many graduate students face at GSU.

GSU Physics and Astronomy Department Publicity & Outreach Committee

Fall 2021 - present

Co-representative

- Coordinate outreach requests received through faculty or the university.
- Contribute updates on outreach initiatives to the yearly department newsletter.

Georgia Outreach Team for Space (GOT Space), Atlanta, GA

Summer 2021 - present

Graduate Outreach Lead

- Coordinate and participate in astronomy-based outreach events with educators in the Atlanta area.
- Collaborate with graduate students and educators at Georgia Institute of Technology to develop presentations and activities for outreach events.

CWRU Women in Physics and Astronomy Club

Fall 2018 - May 2020

Cofounder and President

- Organize events such as workshops and lectures by female professors centering around women interested in careers in physics and astronomy.
- Encourage participation in physics and astronomy among undergraduate students by attending off-campus lectures and events by women in physics and astronomy.
- Foster an environment of support for women studying physics and astronomy to help overcome the challenges of working in a male-dominated field.

Cleveland Museum of Natural History, Cleveland, OH

Fall 2016 - Spring 2019

Volunteer at the Educator Resource Center

- Organized and stored the various educational kits being sent to and from Cleveland's schools.
- Collaborated with the museum's astronomers to improve outdated astronomy kits by designing supplemental activities.