

SHERELYN ALEJANDRO MERCHAN

Curriculum Vitae

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EDUCATION

THE GRADUATE CENTER, CITY UNIVERSITY OF NEW YORK 2024 – Present
Ph.D. in Physics
Advisors: Dr. Jacqueline Faherty (American Museum of Natural History),
Prof. Kelle Cruz (Hunter College)
New York, New York, USA

HUNTER COLLEGE, CITY UNIVERSITY OF NEW YORK 2020 – 2024
B.A in Physics - Minors: Mathematics and Philosophy
New York, New York, USA

OBSERVING TIME

JWST Cycle 5: Program GO 11448 (113.0hrs), Co-Investigator 2026
JWST Cycle 4: Program GO 7793, (40.3hrs), Co-Investigator 2025
JWST Cycle 4: Program GO 8441, (174.6hrs), Co-Investigator 2025
JWST Cycle 3: Program GO 6084, (4.09hrs), Co-Investigator 2024

GRANTS & FELLOWSHIPS

Charting Substellar Worlds Conference Travel Grant 2026
CUNY Science Scholarship (\$21,785) 2024 – 2026
Women and Girls in Astronomy Program Grant (\$2000) 2024
BDNYC Summer Fellow (\$6000) 2024
The Joseph A. Gillett Memorial Prize (\$1000) 2024
Maria Mitchell Observatory Astronomy REU (\$6000) 2023
Hunter Undergraduate STEM Research Conference Award 2023
John P. McNulty Scholars Program (\$12,000) 2022 – 2024
CUNY AstroCom Fellowship (\$16,500) 2021 – 2024
Athena Honors Scholarship (\$12,000) 2020 – 2024
Peter V. Fallone Scholarship (\$2,000) 2020 – 2024
SACNAS NDiSTEm Conference 2022 Travel Scholarship 2022

FIRST-AUTHOR PUBLICATIONS

1. DIVERSITY OF COLD WORLDS: A NEAR COMPLETE SPECTRAL ENERGY DISTRIBUTION FOR 2MASS J04151954-0935066 USING JWST
Alejandro Merchan, S., Faherty, J. K., Suárez, G., Cruz, K. L., Burgasser, A. J., Gagné, J., Hood, C. E., Gonzales, E. C., Bardalez Gagliuffi, D. C., L'Heureux, J., Vos, J. M., Schneider, A. C., Meisner, A. M., Morley, C., Kirkpatrick, J. D., Marocco, F., Kiman, R., Beichman, C. A., Burningham, B., Caselden, D., Eisenhardt, P. R., Gelino, C. R., Gharib-Nezhad, E., Kuchner, M. J., Lacy, B., Rothermich, A., Rowland, M. J., & Whiteford, N. (2025), *The Astrophysical Journal*, 989, 80.

CO-AUTHOR PUBLICATIONS

1. SILICATE PRECURSOR SILANE DETECTED IN COLD LOW-METALLICITY BROWN DWARF

Faherty, J. K., Meisner, A. M., Burningham, B., Visscher, C., Line, M., Suárez, G., Gagné, J., **Alejandro Merchan, S.**, Rothermich, A. J., Burgasser, A. J., Schneider, A. C., Caselden, D., Kirkpatrick, J. D., Kuchner, M. J., Bardalez Gagliuffi, D. C., Eisenhardt, P., Gelino, C. R., Gonzales, E. C., Marocco, F., Leggett, S., Lodieu, N., Casewell, S. L., Tremblin, P., Cushing, M., Zapatero Osorio, M. R., Béjar, V. J. S., Gauza, B., Wright, E., Phillips, M. W., Zhang, J.-Y., & Martin, E. L. (2025), *Nature*, 645, 62.

2. DISCOVERY OF THE SECOND Y+ Y DWARF BINARY SYSTEM: CWISEP J193518.59-154620.3

De Furio, M., Faherty, J. K., Bardalez Gagliuffi, D. C., Gagné, J., Gonzales, E. C., Kiman, R., Kuchner, M., Marocco, F., **Alejandro Merchan, S.**, Rowland, M., Schneider, A. C., Suárez, G., & Vos, J. M. (2025), *The Astrophysical Journal Letters*, 990, L63.

3. THE DIVERSITY OF COLD WORLDS: A BLENDED-LIGHT BINARY STRADDLING THE T/Y TRANSITION IN BROWN DWARFS

Bardalez Gagliuffi, D. C., Faherty, J. K., Suárez, G., **Alejandro Merchan, S.**, Lacy, B., Burningham, B., Matuszewska, K., Kiman, R., Vos, J. M., Rothermich, A., Gagné, J., Morley, C., Rowland, M. J., Caselden, D., Meisner, A., Schneider, A. C., Kuchner, M. J., Beichman, C. A., Eisenhardt, P. R., Gelino, C. R., Gharib-Nezhad, E., Gonzales, E. C., Marocco, F., Whiteford, N., & Kirkpatrick, J. D. (2025), *The Astrophysical Journal*, 984, 74.

4. PROTOSOLAR D-TO-H ABUNDANCE AND ONE PART PER BILLION PH₃ IN THE COLDEST BROWN DWARF

Rowland, M. J., Morley, C. V., Miles, B. E., Suarez, G., Faherty, J. K., Skemer, A. J., Beiler, S. A., Line, M. R., Bjorkaker, G. L., Fortney, J. J., Vos, J. M., **Alejandro Merchan, S.**, Marley, M., Burningham, B., Freedman, R., Gharib-Nezhad, E., Batalha, N., Lupu, R., Visscher, C., Schneider, A. C., Geballe, T. R., Carter, A., Allers, K., Mang, J., Apai, D., Limbach, M. A., & Wilson, M. J. (2024), *The Astrophysical Journal Letters*, 977, L49.

5. RETRIEVING YOUNG CLOUDY L-DWARFS: A NEARBY PLANETARY-MASS COMPANION BD+60 1417B AND ITS ISOLATED RED TWIN W0047

Phillips, C. L., Faherty, J. K., Burningham, B., Vos, J. M., Gonzales, E. C., Griffith, E. J., **Alejandro Merchan, S.**, Calamari, E., Visscher, C., Morley, C. V., Whiteford, N., Gaarn, J., Ilyin, I., Strassmeier, K., & Wang, J. (2024), *The Astrophysical Journal*, 972, 172.

6. METHANE EMISSION FROM A COOL BROWN DWARF

Faherty, J. K., Burningham, B., Gagné, J., Suárez, G., Vos, J. M., **Alejandro Merchan, S.**, Morley, C. V., Rowland, M., Lacy, B., Kiman, R., Caselden, D., Kirkpatrick, J. D., Meisner, A., Schneider, A. C., Kuchner, M. J., Bardalez Gagliuffi, D. C., Beichman, C., Eisenhardt, P., Gelino, C. R., Gharib-Nezhad, E., Gonzales, E., Marocco, F., Rothermich, A. J., & Whiteford, N. (2024), *Nature*, 628, 511.

7. HIGH-PRECISION ATMOSPHERIC CONSTRAINTS FOR A COOL T DWARF FROM JWST SPECTROSCOPY

Hood, C. E., Mukherjee, S., Fortney, J. J., Line, M. R., Faherty, J. K., **Alejandro Merchan, S.**, Burningham, B., Suárez, G., Kiman, R., Gagné, J., Beichman, C. A., Vos, J. M., Bardalez Gagliuffi, D., Meisner, A. M., & Gonzales, E. C. (2024), *arXiv e-prints*, arXiv:2402.05345.

8. CWISE J105512.11+544328.3: A NEARBY Y DWARF SPECTROSCOPICALLY CONFIRMED WITH KECK/NIRES

Robbins, G., Meisner, A. M., Schneider, A. C., Burgasser, A. J., Kirkpatrick, J. D., Gagné, J., Hsu, C.-C., Moranta, L., Casewell, S., Marocco, F., Gerasimov, R., Faherty, J. K., Kuchner, M. J., Caselden, D., Cushing, M. C., **Alejandro Merchan, S.**, & Backyard Worlds: Cool Neighbors Collaboration (2023), *The Astrophysical Journal*, 958, 94.

9. PATCHY FORSTERITE CLOUDS IN THE ATMOSPHERES OF TWO EXOPLANET ANALOGS

Vos, J. M., Burningham, B., Faherty, J. K., **Alejandro Merchan, S.**, Gonzales, E., Calamari, E., Bardalez Gagliuffi, D., Visscher, C., Tan, X., Morley, C. V., Marley, M., Gemma, M. E., Whiteford, N., Gaarn, J., & Park, G. (2023), *The Astrophysical Journal*, 944, 138.

PRESENTATIONS

Charting Substellar Worlds Workshop	2026
Cool Stars 23, Cambridge Workshops on Cool Stars, Stellar Systems and the Sun	2026
The Brown Dwarf to Exoplanet Connection conference (BDExocon)	2026
ExoNYC, Center for Computational Astrophysics at the Flatiron Institute	2026
Hunter College's 2024 Undergraduate STEM Research Conference	2024
ExoNYC, Center for Computational Astrophysics at the Flatiron Institute	2024
American Astronomical Association 243 rd Meeting, iPoster Presentation	2024
The First Year of JWST Science Conference, Space Telescope Science Institute	2023
Maria Mitchell Observatory Science Symposium	2023
Hunter College's 2023 Undergraduate STEM Research Conference	2023
Guest Presenter, Colorado College	2023
Gotham Fest Poster Presentation, CCA at the Flatiron Institute	2023
American Astronomical Association 241st Meeting, iPoster Presentation	2023
American Museum of Natural History Summer Research Symposium	2022
Gaia DR3 Fête, Center for Computational Astrophysics at the Flatiron Institute	2022

STUDENTS MENTORED

<i>High-School Students mentored under the co-supervision of Dr. Jackie Faherty</i>	
Elliot Rooney, Montclair Kimberley Academy	2026
William Han, Horace Mann School	2025, 2026
Benjamin Cha, Choate Rosemary Hall	2025, 2026
Jason Kim, The Lawrenceville School	2025
Kay Lee, Choate Rosemary Hall (current undergraduate at Princeton)	2022, 2024
Grace (Yeeun) Park, Palisades Park High School (current undergraduate at Stanford)	2022
Keun Kwak, Avon Old Farms (current undergraduate at U. Chicago)	2022
Daniel Jeon, Phillips Exeter Academy (current undergraduate at M.I.T)	2022
Teawoo Kim, St. Paul's School	2022

TECHNICAL SKILLS

PROJECTS

SEDkit – **Current principle developer** of SEDkit: a collection of pure Python modules for simple spectral energy distribution (SED) construction and analysis.

SIMPLE Archive – **Senior developer** for a collaborative database of low-mass stars, brown dwarfs, and directly imaged exoplanets: a simple archive of complex objects

COMPUTER SKILLS

High Proficiency – PYTHON, SQL, SQLAlchemy, Jupyter Lab, Git, Github, Vizier, Overleaf, LaTeX, Unix

SCIENCE COMMUNICATION

Spanish Translator for the Hayden Planetarium Show “Encounters in the Milky Way at the American Museum of Natural History” – (Summer 2025)

Co-Leader and organizer of the project “Bringing Astronomy Close to Indigenous Women in Rural Communities in Mexico” as part of WGAP by NA-ROAD. – (Summer 2024)

Science Speaker on various episodes of the Star Report on the Nature of Nantucket, Maria Mitchell Association Podcast – (Summer 2023)