Christian Aganze

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Appointments

2023– Stanford Science Fellow, Stanford University

2023– KIPAC Rubin Fellow, Stanford University

Education

2016 – 2023 **PhD** Physics, UC San Diego, CA
Thesis title: *Galactic Archeology with Ultracool Dwarfs*
Advisor: Prof. Adam Burgasser

2012 – 2016 **B.Sc. Physics,** Morehouse College, Atlanta, GA

Publications

30 publications, 509 citations, h-index=14

First-author, Peer-reviewed Articles

1. **Aganze, C.**, Pearson, S., Starkenburg, T., Contardo, G., Johnston, K. V., Tavangar, K., … Burgasser, A. J. (2024, February). *Prospects for Detecting Gaps in Globular Cluster Stellar Streams in External Galaxies with the Nancy Grace Roman Space Telescope*. doi:10.3847/1538-4357/ad159c. arXiv: 2305.12045 [astro-ph.GA]

2. **Aganze, C.**, Burgasser, A. J., Malkan, M., Theissen, C. A., Tejada Arevalo, R. A., Hsu, C.-C., … Holwerda, B. (2022a, July). *Beyond the Local Volume. II. Population Scaleheights and Ages of Ultracool Dwarfs in Deep HST/WFC3 Parallel Fields*. doi:10.3847/1538-4357/ac7053. arXiv: 2204.07621 [astro-ph.GA]

3. **Aganze, C.**, Burgasser, A. J., Malkan, M., Theissen, C. A., Tejada Arevalo, R. A., Hsu, C.-C., … Holwerda, B. (2022b, January). *Beyond the Local Volume. I. Surface Densities of Ultracool Dwarfs in Deep HST/WFC3 Parallel Fields*. doi:10.3847/1538-4357/ac35ea. arXiv: 2110.07672 [astro-ph.SR]

4. **Aganze, C.**, Burgasser, A. J., Faherty, J. K., Choban, C., Escala, I., Lopez, M. A., … Rockward, W. (2016, February). *Characterization of the Very-low-mass Secondary in the GJ 660.1AB System*. doi:10.3847/0004-6256/151/2/46. arXiv: 1512.08659 [astro-ph.SR]

Co-author, Peer-reviewed Articles

1. Barkaoui, K., Schwarz, R. P., Narita, N., Mistry, P., Magliano, C., Hirano, T., … Wohler, B. (2024, July). Three short-period Earth-sized planets around M dwarfs discovered by TESS: TOI-5720 b, TOI-6008 b, and TOI-6086 b. *687*, A264. doi:10.1051/0004-6361/202349127. arXiv: 2405.06350 [astro-ph.EP]

2 Gillon, M., Pedersen, P. P., Rackham, B. V., Dransfield, G., Ducrot, E., Barkaoui, K., … Zong Lang, F. (2024a, July). Detection of an Earth-sized exoplanet orbiting the nearby ultracool dwarf star SPECULOOS-3. *Nature Astronomy*, *8*, 865–878. doi:10.1038/s41550-024-02271-2

3 Timmermans, M., Dransfield, G., Gillon, M., Triaud, A. H. M. J., Rackham, B. V., Aganze, C., … Winn, J. N. (2024, July). TOI-4336 A b: A temperate sub-Neptune ripe for atmospheric characterization in a nearby triple M-dwarf system. *687*, A48. doi:10.1051/0004-6361/202347981. arXiv: 2404.12722 [astro-ph.EP]

4 Marocco, F., Kirkpatrick, J. D., Schneider, A. C., Meisner, A. M., Popinchalk, M., Gelino, C. R., … Backyard Worlds Collaboration. (2024, June). Thirteen New M Dwarf + T Dwarf Pairs Identified with WISE/NEOWISE. *967*(2), 147. doi:10.3847/1538-4357/ad3f1d. arXiv: 2404.14324 [astro-ph.SR]

5 Rothermich, A., Faherty, J. K., Bardalez-Gagliuffi, D., Schneider, A. C., Kirkpatrick, J. D., Meisner, A. M., … Wedracki, Z. (2024, June). 89 New Ultracool Dwarf Comoving Companions Identified with the Backyard Worlds: Planet 9 Citizen Science Project. *167*(6), 253. doi:10.3847/1538-3881/ad324e. arXiv: 2403.04592 [astro-ph.SR]

6 Gillon, M., Pedersen, P. P., Rackham, B. V., Dransfield, G., Ducrot, E., Barkaoui, K., … Zong Lang, F. (2024b, May). Detection of an Earth-sized exoplanet orbiting the nearby ultracool dwarf star SPECULOOS-3. *Nature Astronomy*. doi:10.1038/s41550-024-02271-2. arXiv: 2406.00794 [astro-ph.EP]

7 Holwerda, B. W., Hsu, C.-C., Hathi, N., Bisigello, L., de la Vega, A., Haro, P. A., … Kirkpatrick, A. (2024, April). Cosmic evolution early release science survey (CEERS): multiclassing galactic dwarf stars in the deep JWST/NIRCam. *529*(2), 1067–1081. doi:10.1093/mnras/stae316. arXiv: 2309.05835 [astro-ph.GA]

8 Kirkpatrick, J. D., Marocco, F., Gelino, C. R., Raghu, Y., Faherty, J. K., Bardalez Gagliuffi, D. C., … The Backyard Worlds: Planet 9 Collaboration. (2024, April). The Initial Mass Function Based on the Full-sky 20 pc Census of ∼3600 Stars and Brown Dwarfs. *271*(2), 55. doi:10.3847/1538-4365/ad24e2. arXiv: 2312.03639 [astro-ph.SR]

9 Dransfield, G., Timmermans, M., Triaud, A. H. M. J., Dévora-Pajares, M., **Aganze, C.**, Barkaoui, K., … Zapparata, A. (2024, January). A 1.55 $R_\oplus$ habitable-zone planet hosted by TOI-715, an M4 star near the ecliptic South Pole. *527*(1), 35–52. doi:10.1093/mnras/stad1439. arXiv: 2305.06206 [astro-ph.EP]

10 Ghachoui, M., Soubkiou, A., Wells, R. D., Rackham, B. V., Triaud, A. H. M. J., Sebastian, D., … Schwarz, R. P. (2023, September). TESS discovery of a super-Earth orbiting the M-dwarf star TOI-1680. *677*, A31. doi:10.1051/0004-6361/202347040. arXiv: 2307.05368 [astro-ph.EP]

11 Calissendorff, P., De Furio, M., Meyer, M., Albert, L., **Aganze, C.**, Ali-Dib, M., … Vandal, T. (2023, April). JWST/NIRCam Discovery of the First Y+Y Brown Dwarf Binary: WISE J033605.05-014350.4. *947*(2), L30. doi:10.3847/2041-8213/acc86d. arXiv: 2303.16923 [astro-ph.SR]

12 Pozuelos, F. J., Timmermans, M., Rackham, B. V., Garcia, L. J., Burgasser, A. J., Kane, S. R., … Mancini, L. (2023, April). A super-Earth and a mini-Neptune near the 2:1 MMR straddling the radius valley around the nearby mid-M dwarf TOI-2096. *672*, A70. doi:10.1051/0004-6361/202245440. arXiv: 2303.08174 [astro-ph.EP]

13 Schneider, A. C., Burgasser, A. J., Bruursema, J., Munn, J. A., Vrba, F. J., Caselden, D., … Backyard Worlds: Planet 9 Collaboration. (2023, February). Redder than Red: Discovery of an Exceptionally Red L/T Transition Dwarf. *943*(2), L16. doi:10.3847/2041-8213/acb0cd. arXiv: 2301.02322 [astro-ph.SR]

14 Delrez, L., Murray, C. A., Pozuelos, F. J., Narita, N., Ducrot, E., Timmermans, M., … Gillon, M. (2022, November). Two temperate super-Earths transiting a nearby late-type M dwarf. *667*, A59. doi:10.1051/0004-6361/202244041. arXiv: 2209.02831 [astro-ph.EP]

15 Gan, T., Soubkiou, A., Wang, S. X., Benkhaldoun, Z., Mao, S., Artigau, É., … Jenkins, J. M. (2022, August). TESS discovery of a sub-Neptune orbiting a mid-M dwarf TOI-2136. *514*(3), 4120–4139. doi:10.1093/mnras/stac1448. arXiv: 2202.10024 [astro-ph.EP]

16 Kiwy, F., Faherty, J. K., Meisner, A., Schneider, A. C., Kirkpatrick, J. D., Kuchner, M. J., … Backyard Worlds: Planet 9 Collaboration. (2022, July). Discovery of 34 Low-mass Comoving Systems Using NOIRLab Source Catalog DR2. *164*(1), 3. doi:10.3847/1538-3881/ac68e7. arXiv: 2204.09739 [astro-ph.SR]

17 Ryan, R. E., Thorman, P., Aganze, C., Burgasser, A. J., Cohen, S. H., Hathi, N. P., … Windhorst, R. A. (2022, June). A Self-consistent Model for Brown Dwarf Populations. *932*(2), 96. doi:10.3847/1538-4357/ac6de5

18 Softich, E., Schneider, A. C., Patience, J., Burgasser, A. J., Shkolnik, E., Faherty, J. K., … Backyard Worlds: Planet 9 Collaboration. (2022, February). CWISE J014611.20-050850.0AB: The Widest Known Brown Dwarf Binary in the Field. *926*(2), L12. doi:10.3847/2041-8213/ac51d8. arXiv: 2202.02315 [astro-ph.SR]

19 Gagliano, A., Izzo, L., Kilpatrick, C. D., Mockler, B., Jacobson-Galán, W. V., Terreran, G., … Tinyanont, S. (2022, January). An Early-time Optical and Ultraviolet Excess in the Type-Ic SN 2020oi. *924*(2), 55. doi:10.3847/1538-4357/ac35ec. arXiv: 2105.09963 [astro-ph.HE]

20 Faherty, J. K., Gagné, J., Popinchalk, M., Vos, J. M., Burgasser, A. J., Schümann, J., … Backyard Worlds: Planet 9 Collaboration. (2021, December). A Wide Planetary Mass Companion Discovered through the Citizen Science Project Backyard Worlds: Planet 9. *923*(1), 48. doi:10.3847/1538-4357/ac2499. arXiv: 2112.04678 [astro-ph.SR]

21 Hsu, C.-C., Burgasser, A. J., Theissen, C. A., Gelino, C. R., Birky, J. L., Diamant, S. J. M., … Faherty, J. K. (2021, December). The Brown Dwarf Kinematics Project (BDKP). V. Radial and Rotational Velocities of T Dwarfs from Keck/NIRSPEC High-resolution Spectroscopy. *257*(2), 45. doi:10.3847/1538-4365/ac1c7d. arXiv: 2107.01222 [astro-ph.SR]

22 Schneider, A. C., Meisner, A. M., Gagné, J., Faherty, J. K., Marocco, F., Burgasser, A. J., … Backyard Worlds: Planet 9 Collaboration. (2021, November). Ross 19B: An Extremely Cold Companion Discovered via the Backyard Worlds: Planet 9 Citizen Science Project. *921*(2), 140. doi:10.3847/1538-4357/ac1c75. arXiv: 2108.05321 [astro-ph.EP]

23 Meisner, A. M., Schneider, A. C., Burgasser, A. J., Marocco, F., Line, M. R., Faherty, J. K., … Backyard Worlds: Planet 9 Collaboration. (2021, July). New Candidate Extreme T Subdwarfs from the Backyard Worlds: Planet 9 Citizen Science Project. *915*(2), 120. doi:10.3847/1538-4357/ac013c. arXiv: 2106.01387 [astro-ph.SR]

24 Kirkpatrick, J. D., Gelino, C. R., Faherty, J. K., Meisner, A. M., Caselden, D., Schneider, A. C., … Backyard Worlds: Planet 9 Collaboration. (2021, March). The Field Substellar Mass Function Based on the Full-sky 20 pc Census of 525 L, T, and Y Dwarfs. *253*(1), 7. doi:10.3847/1538-4365/abd107. arXiv: 2011.11616 [astro-ph.SR]

25 Meisner, A. M., Faherty, J. K., Kirkpatrick, J. D., Schneider, A. C., Caselden, D., Gagné, J., … Backyard Worlds: Planet 9 Collaboration. (2020, August). Spitzer Follow-up of Extremely Cold Brown Dwarfs Discovered by the Backyard Worlds: Planet 9 Citizen Science Project. *899*(2), 123. doi:10.3847/1538-4357/aba633. arXiv: 2008.06396 [astro-ph.SR]

26 Burgasser, A. J., Lopez, M. A., Mamajek, E. E., Gagné, J., Faherty, J. K., Tallis, M., … **Aganze, C.** (2016, March). The First Brown Dwarf/Planetary-mass Object in the 32 Orionis Group. *820*(1), 32. doi:10.3847/0004-637X/820/1/32. arXiv: 1602.03022 [astro-ph.SR]

Service

2024–2025
- NSF Panels for the Astronomy Division
- JWST Cycle 4 Proposal Reviewer
- Stanford/KIPAC committees & TACs

2022
- Referee for MNRAS

2016–2022
- UCSD graduate student committees

Mentoring

2024–
- B. Martinez Ramirez (Cal Poly Pomona)

2022–2023
- M. Desai (UCSD: 2022-2023), J. D. Draxl Giannoni (UCSD: 2022-2023), C. Dunning (UCSD: 2022-2023), E. G. Gutierrez (2022), G. Eduardo Gauna (2022), A. M. Maytorena (2022), Z. Gong (2022), C. Verdaguer (2022)

Scientific Presentations

2022
- **LSST Kickstarter Colloqium**
  Counts, Colors, Kinematics and Ages for Ultracool Dwarfs with HST surveys and the Vera Rubin Observatory (*Invited Talk*)
- **Stanford KIPAC Tea Talk**
  Detecting Gaps in Globular Cluster Streams in M31 and Other External Galaxies with the Nancy Grace Roman Telescope
- **University of Michigan Astro Seminar**
  Galactic Archeology with Ultracool Dwarfs (*Invited Talk*)
- **National Society of Black Physicists (NSBP)**
  Galactic Archeology with Ultracool Dwarfs (*Contributed Talk*)
- **NSBP Innovate Seminar**
  Ultracool Dwarfs as Tracers for Galactic Structure and Star Formation History: Prospects with Large-Scale Surveys (*Invited Talk*)
- **Journal Club Talk, STScI**
  Detecting Gaps in Globular Cluster Streams in M31 and Other External Galaxies with the Nancy Grace Roman Telescope (*Invited Talk*)
- **21st Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun (Cool Stars 21)**
  Popsims: A Population Simulation Code for Ultracool Dwarfs throughout the Galaxy (*Poster*)
- **American Astronomical Society Meeting (AAS 240)**
  Probing Gaps in Globular Cluster Streams in External Galaxies with the Nancy Grace Roman Telescope (*poster*)
  Chambliss Poster Award (Honorable Mention)
- **Division of Dynamical Astronomy Meeting**
  Probing Gaps in Globular Cluster Streams in External Galaxies with the Nancy Grace Roman Telescope(*poster*)

2021
- **National Society of Black Physicists (NSBP)**
  Scale heights & Ages of Brown Dwarfs in Deep Fields (*talk*)
  Beth Brown Memorial Award (Honorable Mention)
- **Big Apple Dynamics**
  Streams, Dark Matter: Future Prospects for Galaxies Beyond the Milky Way (*talk*)
- **American Astronomical Society Meeting (AAS 237)**
  Studying Ultracool Dwarfs with the Nancy Grace Roman Space Telescope *Invited Talk*)
- **American Astronomical Society Meeting (AAS 237)**
  Brown Dwarfs in the Galaxy: Predictions for Future Wide-Field Observatories (*Poster*)
- **Journal Club Talk, Princeton**

2020
- **Journal Club Talk, NOIRLAB**

Scientific Presentations (continued)

- **National Society of Black Physicists (NSBP)**
  Searching for Distant Ultracool Dwarfs in Deep HST/WFC3 Surveys (*Poster*)
  Beth Brown Memorial Award

2019
- **Nancy Grace Roman Telescope Meeting**
  Brown Dwarfs Beyond Gaia: A Deep Survey of late-M, L, T Dwarfs with HST-WFC3 Parallel Fields (*Poster*)

2018
- **20th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun (Cool Stars 20)**
  Brown Dwarfs Beyond Gaia: A Deep Survey of late-M, L, T Dwarfs with HST-WFC3 Parallel Fields (*Poster*)

2017
- **American Astronomical Society Meeting (AAS 228, 229)**
  Toward a Comprehensive Sample of VLM Chemical Abundances with APOGEE (*Poster*) **FAMOUS grant award**

2016
- **American Astronomical Society Meeting (227)**
  Identifying Distant Brown Dwarfs in HST/WFC3 Parallel Fields (*Poster*)

2015
- **National Society of Black Physicists (NSBP)**
  Characterization of the M Dwarf Binary System GJ 660.1AB (*Poster*)

2014
- **Society for Advancement of Chicanos/Hispanics and Native Americans in Science conference(SACNAS)**
  Characterization of the M Dwarf Binary System GJ 660.1AB (*Poster*)
  Best Poster Award

Awards

2023
- AAS Rodger Doxsey Travel Award

2022
- AAS Chambliss Poster Award (Honorable Mention)
- Bouchet Honor Society (Honorable Mention)

2021
- Beth Brown Memorial Award (Honorable Mention AAS, NSBP)
- LSST DP0 Delegate

2020
- Beth Brown Memorial Award (AAS, NSBP)
  Recognition by the AAS and the NSBP for the best presentation at the NSBP meeting

2018
- LSSTC Data Science Fellowship

2016
- UC-HBCU Graduate Student Fellowship
  Fellowship that covers 2 years of graduate school funding

2015
- FAMOUS Travel Grant (AAS)

2014
- Poster Award (SACNAS)

Training and Workshops

2021
- Software Carpentries Instructor Training (Virtual)
- Summer School on Galactic Dynamics (The Flatiron Institute, NY, NY)

Training and Workshops (continued)

2020 Big Data and Deep Learning Workshop (Pittsburg Supercomputing Center)
2017 Kraft Observational Astronomy Workshop (Lick Observatory, San Jose, CA)
Scicoder Workshop (Vanderbilt University, Nashville, TN)

Telescope Proposals

2021 *Telescope Proposal*: Radial Velocity Monitoring of A New Peculiar Nearby M Dwarf (APF/Shane Telescope)

Skills

Coding — Python, Github, Parallel Computing
Research — NIR Spectral Analysis, Machine Learning, Archival Data Analysis, Optical & NIR Telescope Observations