

Antonio D. Montero-Dorta, Ph.D.

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I am an astrophysicist working at the interface of galaxy evolution and cosmology. Currently, I serve as an Associate Professor at the Universidad Técnica Federico Santa María in Chile, where I am also the Director of the Astrophysics Undergraduate Program at the San Joaquín Campus in Santiago. I was born in Tenerife, Canary Islands, Spain, but my scientific career has taken me to live in the USA, Brazil, and Chile. In addition to my academic work, I enjoy writing outreach columns on scientific topics.



Contact and biographical information

Birthplace	■ Santa Cruz de Tenerife, Canary Islands, Spain
Birthdate	■ July 14, 1980
Current Affiliation	■ Department of Physics, Universidad Técnica Federico Santa María (UTFSM), Vicuña Mackenna 3939 San Joaquín, Región Metropolitana, Santiago de Chile, Chile
Telephone	■ +56 9 4590 3417/2 2303 7173

Professional Experience

2020 –	■ Professor , Associate since 2024. Universidad Técnica Federico Santa María (USM), Santiago, Chile.
2017 – 2020	■ FAPESP Postdoctoral Fellow . University of Sao Paulo (USP), Sao Paulo, Brazil. Sponsor: Raul W. Abramo.
2016 – 2017	■ Postdoctoral Research Associate . Institute of Astrophysics of Andalusia (IAA-CSIC), Granada, Spain. PI: Francisco Prada.
2012 – 2016	■ Postdoctoral Research Associate (SDSS-III BOSS) . University of Utah, Salt Lake City, USA. PI: Adam Bolton.
2011 – 2012	■ Postdoctoral Research Associate . Institute of Astrophysics of Andalucía (IAA-CSIC), Granada, Spain. PI: Francisco Prada

Education

2006 – 2011	■ Ph.D., Astrophysics, University of Granada (ULL)/ Institute of Astrophysics of Andalusia (IAA-CSIC) in galaxy Evolution. Granada, Spain. Thesis title: <i>Galaxy Evolution with Large-scale Galaxy redshift Surveys</i> . Advisor: Francisco Prada. Grade: Summa Cum Laude.
	■ Research Exchange Programs at University of California at Berkeley (USA, 2006, 4 months) and Stanford University (USA, 2008, 4 months) . Advisors/hosts: Marc David/Darren Croton at UC Berkeley and Risa Wechsler at Stanford.
2004 – 2006	■ M.Sc. Astrophysics, University of La Laguna (ULL)/Institute of Astrophysics of the Canary Islands (IAC) in Large-scale Structure and Cosmology. Tenerife, Spain. Thesis title: <i>New Theoretical Advances on the Cosmic Mass Function</i> . Advisor: Juan Betancort-Rijo.

Education (continued)

- 2004  **M.Sc. Education for Physics, Complutense University of Madrid (UCM).** Madrid, Spain.
Certification: *Certificado de Aptitud Pedagógica (CAP)*.
- 1998 – 2004  **B.Sc. Physics, University of La Laguna (ULL)/Institute of Astrophysics of the Canary Islands (IAC)** in Astrophysics. Tenerife, Spain.

Projects & Grants

- 2022 – 2017  **ICTP Senior External Research Associate.** Funding Agency: International Centre for Theoretical Physics (ICTP), Trieste, Italy.
Title: *Connecting galaxies and halos in the era of multi-tracer cosmology*.
- 2021 – 2025  **Fondecyt Regular 2021 1210612, Principal Investigator.** Funding Agency: ANID, Chile. Amount: 118,730,000 CLP
Title: The halo-galaxy connection in the era of multi-tracer cosmology.
- 2017 – 2020  **FAPESP Postdoctoral Fellowship, Principal Investigator.** Funding Agency: FAPESP, Sao Paulo, Brazil
Title: Unifying galaxy evolution and cosmology with massive dark-energy surveys.
- 2006 – 2010  **FPI PhD Fellowship.** Funding Agency: Ministerio de Educación y Ciencias, Spain.

Production Summary

Totals		71 publications, 1 SDSS Galaxy Product
As main contributor		14 papers as 1st author, 11 as 2nd, 8 as 3rd
Citations		> 9800 (ADS)
Most cited		Coauthor in 6 papers with more than 500 citations, 3 papers with more than 1000 citations (ADS)
H-index		27

Research Publications

Journal Articles

- 1 A. Balaguera-Antolínez and A. D. Montero-Dorta, “Secondary halo bias through cosmic time: II. Reconstructing halo properties using clustering information,” *Astronomy & Astrophysics*, vol. 692, A32, A32, Dec. 2024.  DOI: 10.1051/0004-6361/202451484. arXiv: 2407.09282 [astro-ph.CO].
- 2 A. Balaguera-Antolínez, A. D. Montero-Dorta, and G. Favole, “Secondary halo bias through cosmic time. I. Scaling relations and the connection with the cosmic web,” *Astronomy & Astrophysics*, vol. 685, A61, A61, May 2024.  DOI: 10.1051/0004-6361/202348694. arXiv: 2311.12991 [astro-ph.CO].
- 3 G. Favole, V. Gonzalez-Perez, Y. Ascasibar, *et al.*, “Characterizing the ELG luminosity functions in the nearby Universe,” *Astronomy & Astrophysics*, vol. 683, A46, A46, Mar. 2024.  DOI: 10.1051/0004-6361/202346443. arXiv: 2303.11031 [astro-ph.GA].
- 4 A. D. Montero-Dorta, S. Contreras, M. C. Artale, F. Rodriguez, and G. Favole, “Exploring the physical origins of halo assembly bias from early times,” *arXiv e-prints*, arXiv:2410.18319, arXiv:2410.18319, Oct. 2024.  DOI: 10.48550/arXiv.2410.18319. arXiv: 2410.18319 [astro-ph.CO].
- 5 A. D. Montero-Dorta and F. Rodriguez, “The dependence of assembly bias on the cosmic web,” *Monthly Notice of the Royal Astronomical Society*, vol. 531, no. 1, pp. 290–303, Jun. 2024.  DOI: 10.1093/mnras/stae796. arXiv: 2309.12401 [astro-ph.GA].

- 6 A. D. Montero-Dorta, F. Rodriguez, M. C. Artale, R. Smith, and J. Chaves-Montero, "Tracking the evolution of satellite galaxies: mass stripping and dark-matter deficient galaxies," *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 527, no. 3, pp. 5868–5885, Jan. 2024. [DOI](#): 10.1093/mnras/stad3268. arXiv: 2212.12090 [astro-ph.GA].
- 7 D. Palma, I. Lacerna, M. C. Artale, *et al.*, "The evolution of low-mass central galaxies in the vicinity of massive structures and its impact on the two-halo conformity," *arXiv e-prints*, arXiv:2406.12977, arXiv:2406.12977, Jun. 2024. [DOI](#): 10.48550/arXiv.2406.12977. arXiv: 2406.12977 [astro-ph.GA].
- 8 N. V. N. Rodrigues, N. S. M. de Santi, L. R. Abramo, and A. D. Montero-Dorta, "Exploring the halo-galaxy connection with probabilistic approaches," *arXiv e-prints*, arXiv:2410.17844, arXiv:2410.17844, Oct. 2024. [DOI](#): 10.48550/arXiv.2410.17844. arXiv: 2410.17844 [astro-ph.CO].
- 9 D. Stoppacher, A. D. Montero-Dorta, M. C. Artale, *et al.*, "A semi-analytical perspective on massive red galaxies: I. Assembly history, environment & redshift evolution," *arXiv e-prints*, arXiv:2412.05745, arXiv:2412.05745, Dec. 2024. [DOI](#): 10.48550/arXiv.2412.05745. arXiv: 2412.05745 [astro-ph.GA].
- 10 N. V. N. Rodrigues, N. S. M. de Santi, A. D. Montero-Dorta, and L. R. Abramo, "High-fidelity reproduction of central galaxy joint distributions with neural networks," *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 522, no. 3, pp. 3236–3247, Jul. 2023. [DOI](#): 10.1093/mnras/stad1186. arXiv: 2301.06398 [astro-ph.CO].
- 11 M. C. Artale, M. Haider, A. D. Montero-Dorta, *et al.*, "The large-scale distribution of ionized metals in IllustrisTNG," *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 510, no. 1, pp. 399–412, Feb. 2022. [DOI](#): 10.1093/mnras/stab3281. arXiv: 2102.01092 [astro-ph.GA].
- 12 N. S. M. de Santi, N. V. N. Rodrigues, A. D. Montero-Dorta, L. R. Abramo, B. Tucci, and M. C. Artale, "Mimicking the halo-galaxy connection using machine learning," *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 514, no. 2, pp. 2463–2478, Aug. 2022. [DOI](#): 10.1093/mnras/stac1469. arXiv: 2201.06054 [astro-ph.GA].
- 13 G. Favole, A. D. Montero-Dorta, M. C. Artale, S. Contreras, I. Zehavi, and X. Xu, "Subhalo abundance matching through the lens of a hydrodynamical simulation," *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 509, no. 2, pp. 1614–1625, Jan. 2022. [DOI](#): 10.1093/mnras/stab3006. arXiv: 2101.10733 [astro-ph.GA].
- 14 I. Lacerna, F. Rodriguez, A. D. Montero-Dorta, *et al.*, "On the environmental influence of groups and clusters of galaxies beyond the virial radius: Galactic conformity at few Mpc scales," *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 513, no. 2, pp. 2271–2284, Jun. 2022. [DOI](#): 10.1093/mnras/stac1020. arXiv: 2110.09536 [astro-ph.GA].
- 15 R. M. González Delgado, L. A. Díaz-García, A. de Amorim, *et al.*, "The miniJPAS survey. Identification and characterization of galaxy populations with the J-PAS photometric system," *Astronomy & Astrophysics*, vol. 649, A79, A79, May 2021. [DOI](#): 10.1051/0004-6361/202039849. arXiv: 2102.13121 [astro-ph.GA].
- 16 A. D. Montero-Dorta, "Spin bias: theory and observations," *Boletín de la Asociación Argentina de Astronomía La Plata Argentina*, vol. 62, pp. 159–164, Jul. 2021.
- 17 A. D. Montero-Dorta, M. C. Artale, L. R. Abramo, and B. Tucci, "On the kinetic Sunyaev-Zel'dovich effect as an observational probe for halo spin bias," *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 504, no. 3, pp. 4568–4582, Jul. 2021. [DOI](#): 10.1093/mnras/stab1026. arXiv: 2008.08607 [astro-ph.CO].
- 18 A. D. Montero-Dorta, J. Chaves-Montero, M. C. Artale, and G. Favole, "On the influence of halo mass accretion history on galaxy properties and assembly bias," *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 508, no. 1, pp. 940–949, Nov. 2021. [DOI](#): 10.1093/mnras/stab2556. arXiv: 2105.05274 [astro-ph.GA].

- 19 F. Rodríguez, A. D. Montero-Dorta, R. E. Angulo, M. C. Artale, and M. Merchán, “The galaxy size-halo mass scaling relations and clustering properties of central and satellite galaxies,” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 505, no. 3, pp. 3192–3205, Aug. 2021. [DOI: 10.1093/mnras/stab1571](#). arXiv: 2011.00014 [astro-ph.GA].
- 20 B. Tucci, A. D. Montero-Dorta, L. R. Abramo, G. Sato-Polito, and M. C. Artale, “The physical origins of low-mass spin bias,” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 500, no. 3, pp. 2777–2785, Jan. 2021. [DOI: 10.1093/mnras/staa3319](#). arXiv: 2007.10366 [astro-ph.CO].
- 21 G. Favole, V. Gonzalez-Perez, D. Stoppacher, *et al.*, “[O II] emitters in MultiDark-Galaxies and DEEP2,” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 497, no. 4, pp. 5432–5453, Oct. 2020. [DOI: 10.1093/mnras/staa2292](#). arXiv: 1908.05626 [astro-ph.GA].
- 22 R. Marques-Chaves, I. Pérez-Fournon, Y. Shu, *et al.*, “Rest-frame UV properties of luminous strong gravitationally lensed Ly α emitters from the BELLS GALLERY Survey,” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 492, no. 1, pp. 1257–1278, Feb. 2020. [DOI: 10.1093/mnras/stz3500](#). arXiv: 1912.04033 [astro-ph.GA].
- 23 A. Molino, M. V. Costa-Duarte, L. Sampedro, *et al.*, “Assessing the photometric redshift precision of the S-PLUS survey: the Stripe-82 as a test-case,” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 499, no. 3, pp. 3884–3908, Dec. 2020. [DOI: 10.1093/mnras/staa1586](#). arXiv: 1907.06315 [astro-ph.GA].
- 24 A. D. Montero-Dorta, L. R. Abramo, B. R. Granett, S. de la Torre, and L. Guzzo, “The Multi-Tracer Optimal Estimator applied to VIPERS,” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 493, no. 4, pp. 5257–5272, Apr. 2020. [DOI: 10.1093/mnras/staa405](#). arXiv: 1909.00010 [astro-ph.CO].
- 25 A. D. Montero-Dorta, M. C. Artale, L. R. Abramo, *et al.*, “The manifestation of secondary bias on the galaxy population from IllustrisTNG300,” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 496, no. 2, pp. 1182–1196, Aug. 2020. [DOI: 10.1093/mnras/staa1624](#). arXiv: 2001.01739 [astro-ph.GA].
- 26 B. R. Granett, G. Favole, A. D. Montero-Dorta, E. Branchini, L. Guzzo, and S. de la Torre, “Measuring the growth of structure by matching dark matter haloes to galaxies with VIPERS and SDSS,” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 489, no. 1, pp. 653–662, Oct. 2019. [DOI: 10.1093/mnras/stz2152](#). arXiv: 1905.10375 [astro-ph.CO].
- 27 C. Mendes de Oliveira, T. Ribeiro, W. Schoenell, *et al.*, “The Southern Photometric Local Universe Survey (S-PLUS): improved SEDs, morphologies, and redshifts with 12 optical filters,” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 489, no. 1, pp. 241–267, Oct. 2019. [DOI: 10.1093/mnras/stz1985](#). arXiv: 1907.01567 [astro-ph.GA].
- 28 G. Sato-Polito, A. D. Montero-Dorta, L. R. Abramo, F. Prada, and A. Klypin, “The dependence of halo bias on age, concentration, and spin,” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 487, no. 2, pp. 1570–1579, Aug. 2019. [DOI: 10.1093/mnras/stz1338](#). arXiv: 1810.02375 [astro-ph.GA].
- 29 D. Stoppacher, F. Prada, A. D. Montero-Dorta, *et al.*, “A semi-analytical perspective on massive galaxies at $z \sim 0.55$,” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 486, no. 1, pp. 1316–1331, Jun. 2019. [DOI: 10.1093/mnras/stz797](#). arXiv: 1902.05496 [astro-ph.GA].
- 30 M. A. Cornachione, A. S. Bolton, Y. Shu, *et al.*, “The BOSS Emission-line Lens Survey. V. Morphology and Substructure of Lensed Ly α Emitters at Redshift $Z \approx 2.5$ in the BELLS GALLERY,” *The Astrophysical Journal*, vol. 853, no. 2, 148, p. 148, Feb. 2018. [DOI: 10.3847/1538-4357/aaa412](#). arXiv: 1708.08854 [astro-ph.GA].
- 31 G. Favole, A. D. Montero-Dorta, F. Prada, S. A. Rodríguez-Torres, and D. J. Schlegel, “The mass-size relation of luminous red galaxies from BOSS and DECaLS,” *Monthly Monthly Notice of the Royal*

- Astronomical Society*, vol. 480, no. 1, pp. 1415–1425, Oct. 2018. [DOI: 10.1093/mnras/sty1947](#). arXiv: 1802.01596 [astro-ph.GA].
- 32 A. Niemiec, E. Jullo, A. D. Montero-Dorta, *et al.*, “Probing galaxy assembly bias with LRG weak lensing observations,” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 477, no. 1, pp. L1–L5, Jun. 2018. [DOI: 10.1093/mnrasl/sly041](#). arXiv: 1801.06551 [astro-ph.CO].
- 33 F. D. Albareti, C. Allende Prieto, A. Almeida, *et al.*, “The 13th Data Release of the Sloan Digital Sky Survey: First Spectroscopic Data from the SDSS-IV Survey Mapping Nearby Galaxies at Apache Point Observatory,” *The Astrophysical Journal Supplement Series*, vol. 233, no. 2, 25, p. 25, Dec. 2017. [DOI: 10.3847/1538-4365/aa8992](#). arXiv: 1608.02013 [astro-ph.GA].
- 34 M. Einasto, H. Lietzen, M. Gramann, *et al.*, “BOSS Great Wall: morphology, luminosity, and mass,” *Astronomy & Astrophysics*, vol. 603, A5, A5, Jun. 2017. [DOI: 10.1051/0004-6361/201629105](#). arXiv: 1703.08444 [astro-ph.CO].
- 35 G. Favole, S. A. Rodríguez-Torres, J. Comparat, *et al.*, “Galaxy clustering dependence on the [O II] emission line luminosity in the local Universe,” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 472, no. 1, pp. 550–558, Nov. 2017. [DOI: 10.1093/mnras/stx1980](#). arXiv: 1611.05457 [astro-ph.GA].
- 36 C. López-Sanjuan, E. Tempel, N. Benítez, *et al.*, “The ALHAMBRA survey: B-band luminosity function of quiescent and star-forming galaxies at $0.2 \leq z < 1$ by PDF analysis,” *Astronomy & Astrophysics*, vol. 599, A62, A62, Mar. 2017. [DOI: 10.1051/0004-6361/201629517](#). arXiv: 1611.09231 [astro-ph.GA].
- 37 R. Marques-Chaves, I. Pérez-Fournon, Y. Shu, *et al.*, “Discovery of a Very Bright and Intrinsically Very Luminous, Strongly Lensed Ly α Emitting Galaxy at $z = 2.82$ in the BOSS Emission-Line Lens Survey,” *The Astrophysical Journal Letters*, vol. 834, no. 2, L18, p. L18, Jan. 2017. [DOI: 10.3847/2041-8213/834/2/L18](#). arXiv: 1702.00989 [astro-ph.GA].
- 38 A. D. Montero-Dorta, A. S. Bolton, and Y. Shu, “A direct measurement of the high-mass end of the velocity dispersion function at $z \sim 0.55$ from SDSS-III/BOSS,” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 468, no. 1, pp. 47–58, Jun. 2017. [DOI: 10.1093/mnras/stx321](#). arXiv: 1607.06820 [astro-ph.GA].
- 39 A. D. Montero-Dorta, E. Pérez, F. Prada, *et al.*, “The Dependence of Galaxy Clustering on Stellar-mass Assembly History for LRGs,” *The Astrophysical Journal Letters*, vol. 848, no. 1, L2, p. L2, Oct. 2017. [DOI: 10.3847/2041-8213/aa8cc5](#). arXiv: 1705.00013 [astro-ph.GA].
- 40 Y. Shu, J. R. Brownstein, A. S. Bolton, *et al.*, “The Sloan Lens ACS Survey. XIII. Discovery of 40 New Galaxy-scale Strong Lenses,” *The Astrophysical Journal*, vol. 851, no. 1, 48, p. 48, Dec. 2017. [DOI: 10.3847/1538-4357/aa9794](#). arXiv: 1711.00072 [astro-ph.GA].
- 41 J. L. Tinker, J. R. Brownstein, H. Guo, *et al.*, “The Correlation between Halo Mass and Stellar Mass for the Most Massive Galaxies in the Universe,” *The Astrophysical Journal*, vol. 839, no. 2, 121, p. 121, Apr. 2017. [DOI: 10.3847/1538-4357/aa6845](#). arXiv: 1607.04678 [astro-ph.GA].
- 42 K. S. Dawson, J.-P. Kneib, W. J. Percival, *et al.*, “The SDSS-IV Extended Baryon Oscillation Spectroscopic Survey: Overview and Early Data,” *The Astronomical Journal*, vol. 151, no. 2, 44, p. 44, Feb. 2016. [DOI: 10.3847/0004-6256/151/2/44](#). arXiv: 1508.04473 [astro-ph.CO].
- 43 H. Lietzen, E. Tempel, L. J. Liivamägi, *et al.*, “Discovery of a massive supercluster system at $z \sim 0.47$,” *Astronomy & Astrophysics*, vol. 588, L4, p. L4, Apr. 2016. [DOI: 10.1051/0004-6361/201628261](#). arXiv: 1602.08498 [astro-ph.CO].
- 44 A. D. Montero-Dorta, A. S. Bolton, J. R. Brownstein, *et al.*, “The high-mass end of the red sequence at $z \sim 0.55$ from SDSS-III/BOSS: completeness, bimodality and luminosity function,” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 461, no. 2, pp. 1131–1153, Sep. 2016. [DOI: 10.1093/mnras/stw1352](#). arXiv: 1410.5854 [astro-ph.GA].

- 45 A. D. Montero-Dorta, Y. Shu, A. S. Bolton, J. R. Brownstein, and B. J. Weiner, “A steep slope and small scatter for the high-mass end of the L- σ relation at $z \sim 0.55$,” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 456, no. 3, pp. 3265–3281, Mar. 2016. [DOI: 10.1093/mnras/stv2871](#). arXiv: 1505.03866 [astro-ph.GA].
- 46 S. A. Rodríguez-Torres, C.-H. Chuang, F. Prada, *et al.*, “The clustering of galaxies in the SDSS-III Baryon Oscillation Spectroscopic Survey: modelling the clustering and halo occupation distribution of BOSS CMASS galaxies in the Final Data Release,” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 460, no. 2, pp. 1173–1187, Aug. 2016. [DOI: 10.1093/mnras/stw1014](#). arXiv: 1509.06404 [astro-ph.CO].
- 47 Y. Shu, A. S. Bolton, C. S. Kochanek, *et al.*, “The BOSS Emission-line Lens Survey. III. Strong Lensing of Ly α Emitters by Individual Galaxies,” *The Astrophysical Journal*, vol. 824, no. 2, p. 86, Jun. 2016. [DOI: 10.3847/0004-637X/824/2/86](#). arXiv: 1604.01842 [astro-ph.GA].
- 48 Y. Shu, A. S. Bolton, S. Mao, *et al.*, “The BOSS Emission-line Lens Survey. IV. Smooth Lens Models for the BELLS GALLERY Sample,” *The Astrophysical Journal*, vol. 833, no. 2, p. 264, Dec. 2016. [DOI: 10.3847/1538-4357/833/2/264](#). arXiv: 1608.08707 [astro-ph.GA].
- 49 J. R. Whitbourn and T. Shanks, “The galaxy luminosity function and the Local Hole,” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 459, no. 1, pp. 496–507, Jun. 2016. [DOI: 10.1093/mnras/stw555](#). arXiv: 1603.02322 [astro-ph.CO].
- 50 S. Alam, F. D. Albareti, C. Allende Prieto, *et al.*, “The Eleventh and Twelfth Data Releases of the Sloan Digital Sky Survey: Final Data from SDSS-III,” *The Astrophysical Journal Supplement Series*, vol. 219, no. 1, p. 12, Jul. 2015. [DOI: 10.1088/0067-0049/219/1/12](#). arXiv: 1501.00963 [astro-ph.IM].
- 51 S. Chatterjee, J. A. Newman, T. Jeltema, *et al.*, “X-ray Surface Brightness Profiles of Active Galactic Nuclei in the Extended Groth Strip: Implications for AGN Feedback,” *Publications of the Astronomical Society of the Pacific*, vol. 127, no. 954, p. 716, Aug. 2015. [DOI: 10.1086/682263](#).
- 52 A. Nigoche-Netro, A. Ruelas-Mayorga, P. Lagos, *et al.*, “How much dark matter is there inside early-type galaxies?” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 446, no. 1, pp. 85–103, Jan. 2015. [DOI: 10.1093/mnras/stu2045](#). arXiv: 1410.1469 [astro-ph.GA].
- 53 Y. Shu, A. S. Bolton, J. R. Brownstein, *et al.*, “The Sloan Lens ACS Survey. XII. Extending Strong Lensing to Lower Masses,” *The Astrophysical Journal*, vol. 803, no. 2, p. 71, Apr. 2015. [DOI: 10.1088/0004-637X/803/2/71](#). arXiv: 1407.2240 [astro-ph.GA].
- 54 J. R. Trump, M. Sun, G. R. Zeimann, *et al.*, “The Biases of Optical Line-Ratio Selection for Active Galactic Nuclei and the Intrinsic Relationship between Black Hole Accretion and Galaxy Star Formation,” *The Astrophysical Journal*, vol. 811, no. 1, p. 26, Sep. 2015. [DOI: 10.1088/0004-637X/811/1/26](#). arXiv: 1501.02801 [astro-ph.GA].
- 55 C. P. Ahn, R. Alexandroff, C. Allende Prieto, *et al.*, “The Tenth Data Release of the Sloan Digital Sky Survey: First Spectroscopic Data from the SDSS-III Apache Point Observatory Galactic Evolution Experiment,” *The Astrophysical Journal Supplement Series*, vol. 211, no. 2, p. 17, Apr. 2014. [DOI: 10.1088/0067-0049/211/2/17](#). arXiv: 1307.7735 [astro-ph.IM].
- 56 P. Arnalte-Mur, V. J. Martínez, P. Norberg, *et al.*, “The ALHAMBRA survey: evolution of galaxy clustering since $z \sim 1$,” *Monthly Monthly Notice of the Royal Astronomical Society*, vol. 441, no. 2, pp. 1783–1801, Jun. 2014. [DOI: 10.1093/mnras/stu681](#). arXiv: 1311.3280 [astro-ph.CO].
- 57 M. D. Olmstead, P. J. Brown, M. Sako, *et al.*, “Host Galaxy Spectra and Consequences for Supernova Typing from the SDSS SN Survey,” *The Astronomical Journal*, vol. 147, no. 4, p. 75, Apr. 2014. [DOI: 10.1088/0004-6256/147/4/75](#). arXiv: 1308.6818 [astro-ph.CO].
- 58 S. Chatterjee, J. A. Newman, T. Jeltema, *et al.*, “X-ray Surface Brightness Profiles of Active Galactic Nuclei in the Extended Groth Strip: Implications for AGN Feedback,” *arXiv e-prints*, arXiv:1310.0836, arXiv:1310.0836, Oct. 2013. [DOI: 10.48550/arXiv.1310.0836](#). arXiv: 1310.0836 [astro-ph.CO].

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Conference Proceedings

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- 2 A. Bhattacharjee, S. Chatterjee, A. D. Myers, *et al.*, “Diffuse X-Ray Emission in Active and Normal Galaxies in the Extended Groth Strip,” in *American Astronomical Society Meeting Abstracts #223*, ser. American Astronomical Society Meeting Abstracts, vol. 223, Jan. 2014, 251.28, p. 251.28.
- 3 A. Nigoche, A. Ruelas-Mayorga, P. Lagos, *et al.*, “How much dark matter is there inside early-type galaxies?” In *Probes of Dark Matter on Galaxy Scales*, vol. 1, Jul. 2013, p. 30 301.

Relevant Presentations

Conferences & Meetings

- 2024
- **Contributed talk: Mind the Gap: Galaxies and the Large-Scale Structure**, Córdoba, Argentina. Title: *Connecting bias and the cosmic web*
 - **Invited talk: Mock Barcelona: clustering, lensing, and the galaxy-halo connection**, Autonomous University of Barcelona, Barcelona, Spain. Title: *Exploring the physics of assembly bias*
 - **Invited participation: Miramar Workshop**, Donostia, Spain
- 2023
- **Contributed talk: A journey through galactic environments - From the halo assembly bias to the satellite quenching**, Porto Ercole, Italy. Title: *The dependence of assembly bias on the cosmic web from TNG*
 - **Invited talk: III Workshop on the Halo-Galaxy Connection, Atacama 2023**, University of Atacama, Copipó, Chile. Title: *On the physical origins of assembly bias: The cosmic-web connection*
 - **Invited talk: Mock La Serena: the galaxy-halo connection and its relationship to the environment**, University of La Serena, La Serena, Chile. Title: *On the physical origins of assembly bias: The cosmic-web connection*
 - **Contributed talk: Southern Astrophysics Network (SAN) Meeting**, Buenos Aires Argentina. Title: *The halo-galaxy connection: a multi-angle approach*
 - **Contributed talk: Friends of Friends (FoF) 2023 Meeting**, Córdoba, Argentina. Title: *Assembly bias: when cosmology meets galaxy evolution*
- 2022
- **Invited talk: European Astronomical Society (EAS) Annual Meeting 2022**, Valencia, Spain. Title: *On the influence of halo mass accretion history on galaxy properties and assembly bias*
 - **Invited talk: Friends of Friends (FoF) 2022 Meeting**, Córdoba, Argentina. Title: *The halo-galaxy connection: a multi-angle approach*
 - **Invited talk: CIELO Workshop**, Santiago, Chile. Title: *The effect of mass stripping on the satellite galaxy population from TNG50*
- 2020
- **Invited talk: Webinar Público: Materia Oscura, lo más bonito es lo desconocido, Technical University Federico Santa Maria (UTFSM)**, Santiago, Chile.
 - **Invited talk: 62a Reunión Anual de la Asociación Argentina de Astronomía (AAA)**, Santa Fe, Argentina. Title: *La conexión halo-galaxia en el contexto cosmológico*
 - **Contributed talk: The Galaxy-Halo Connection Across Cosmic Time: Recent Updates**, Santa Barbara, USA. Title: *The manifestation of halo assembly bias on the galaxy population*
 - **Contributed talk: Mock Innsbruck: the connection between galaxies and dark matter haloes**, Innsbruck, Austria. Title: *The manifestation of secondary halo bias on the galaxy population*
 - **Invited Lecturer: IX La Plata International School (LAPIS) on Astronomy and Geophysics**, La Plata, Argentina. Title: *The Connection between Galaxies and Halos in the LSS*
- 2019
- **Contributed talk: S-PLUS Collaboration meeting, Sao Paulo, Brazil**, Sao Paulo, Brazil. Title: *Multi-tracer Cosmology: dissecting the connections between galaxies and halos with upcoming surveys*
 - **Invited talk: Halo and Galaxy Assembly Bias - from Theory to Observation**, Shanghai, China. Title: *Halo and Galaxy Assembly Bias: From N-body numerical simulations to galaxy data*
 - **Contributed talk: Uchuu Collaboration Meeting**, Chiba University, Japan. Title: *The Halo-Galaxy Connection in the Large-Scale Structure of the Universe*
 - **Contributed talk: FAPESP-JSPS workshop on Dark Energy, Dark Matter and Galaxies**, Sao Paulo, Brazil. Title: *The Halo-Galaxy Connection in the Large-Scale Structure of the Universe*
 - **Contributed talk: VI Meeting on Fundamental Cosmology**, Granada, Spain. Title: *The Halo-Galaxy Connection in the Large-Scale Structure of the Universe*

Relevant Presentations (continued)

- **Contributed talk: J-PAS Collaboration Meeting**, Teruel, Spain. Title: *The Halo-Galaxy Connection in the Large-Scale Structure of the Universe*
- **Invited talk: SPANET Workshop on Clusters of Galaxies and the Large-Scale Structure of the Universe**, Sao Paulo, Brazil. Title: *The Halo-Galaxy Connection in the Large-Scale Structure of the Universe*
- 2018
■ **Contributed talk: CosmoAndes 2018**, Santiago, Chile. Title: *A Comprehensive Study of Galaxy Assembly Bias for Massive Galaxies.*
- 2017
■ **Contributed talk: Little Workshop on LSS**, Granada, Spain. Title: *A Comprehensive Study of Galaxy Assembly Bias for Massive Galaxies.*
- 2016
■ **Posters: SnowPAC 2016: The Galaxy-Halo Connection**, Park City, Utah. Title: *The BOSS Great Wall: The Biggest Supercluster Ever Found / The Intrinsic Halo-Galaxy Connection from BOSS: A forward-modeling approach.*
- 2015
■ **Contributed talk: The SDSS-IV Collaboration Meeting**, Madrid, Spain. Title: *A Forward Modeling Approach for the study of the LRG population from $z = 1$. II. The $L-\sigma$ relation.*
- **Poster: Drifting through the Cosmic Web: the Evolution of Galaxies within the Large Scale Structure**, 10th Marseille Cosmology Conference, Aix-en-Provence, France. Title: *Forward-Modeling Approach for the Evolution of the Most Massive Galaxies in the Universe.*
- 2014
■ **Contributed talk: Joint BOSS+eBOSS Collaboration Meeting**, Cloudcroft, USA. Title: *The redshift evolution of the high-mass end of the red sequence LF from the CMASS sample. Application to the computation of the Faber-Jackson relation.*
- **Contributed talk: The SDSS-III and SDSS-IV Collaboration Meetings**, Park City, USA. Title: *Title: The redshift evolution of the high-mass end of the red sequence LF from the CMASS sample. Constraints on the stellar populations of the LRG population.*
- 2013
■ **Contributed talk: 2013 BOSS Collaboration Meeting and eBOSS+TDSS+Spiders review**, Berkeley, USA. Title: *Title: The BOSS LF*
- **Contributed talk: The 2013 SDSS-III Collaboration Meeting**, Baltimore, USA. Title: *Title: The BOSS CMASS Luminosity Function of Galaxies*
- 2012
■ **Contributed talk: 2012 BOSS Collaboration Meeting**, Pittsburgh, USA. Title: *Title: 1) The Granada FSPS Galaxy Product, 2) Completeness in the BOSS CMASS sample*
- **Contributed talk: BOSS 2012 Collaboration Meeting**, New York, USA. Title: *Title: The Granada Galaxy Evolution Catalog*
- 2010
■ **Contributed talk: SDSS-BOSS 2010 Collaboration Meeting**, Paris, France. Title: *Title: Fiber aperture and atmospheric systematics in stellar population studies with BOSS*
- **Poster: 2010 May Symposium: Stellar Populations in the Cosmological Context**, Paris, France. Title: *Title: The ALHAMBRA Survey: Photometric Stellar Masses*
- 2008
■ **Contributed talk: When the Universe Formed Stars, Understanding the Most Active Period of Star Formation in the History of the Universe Down to its Fall**, Martinique, France. Title: *Title: DEEP2 RS: The AGN fraction and its environmental and redshift dependence*
- **Contributed talk: Joel Fest Galaxy Evolution Workshop**, Santa Cruz, USA. Title: *Title: DEEP2 RS: The AGN fraction and its environmental and redshift dependence*

Notable seminars & Colloquia

- 2023
■ **Institute for Fundamental Physics of the Universe (IFPU) at the International Centre for Theoretical Physics (ICTP)**, Trieste, Italy. Invited by Ravis Sheth/Emiliano Sefusatti
- 2022
■ **University of Valparaíso (UV)**, Valparaíso, Chile. Invited by Yara L. Jaffé
- 2021
■ **CGI Seminar, University of California at Santa Cruz (UCSC)**, Santa Cruz, California, USA. Invited by Doris Stoppacher

Relevant Presentations (continued)

- 2020 **IAG Department Seminar, University of Sao Paulo (IAG-USP)**, Sao Paulo, Brazil. Invited by Raul Abramo/Laerte Sodre
- Cosmology Seminar, Max Planck Institute for Astrophysics (MPA)**, Garching, Germany. Invited by Elisa Ferreira.
- Astrophysics Seminar, University of Pennsylvania (UPenn)**, Philadelphia, USA. Invited by Ravi Sheth.
- 2019 **Astrophysics Seminar, Federal University of Rio Grande do Sul (UFRGS)**, Porto Alegre, Brazil. Invited by Cristina Furlanetto
- 2011 **Astronomy Seminar, University of Utah (UoU)**, Salt Lake City, USA. Invited by Adam Bolton
- Astronomy Seminar, University of California at Berkeley (UC Berkeley)**, Berkeley, USA. Invited by David Schlegel
- Astronomy Seminar, Durham University**, Durham, UK. Invited by Carlton Baugh
- 2009 **Astronomy Seminar, Stanford University**, Palo Alto, USA. Invited by Risa Wechsler
- Astronomy Seminar, Oxford University**, Oxford, UK. Invited by Christian Wolf

Teaching and Mentoring

Courses

- 2024 **Astrophysics, Postgraduate Astrophysics Program**, UTFSM, Chile. Topic: *A hands-on course on advance projects*
- 2022-2024 **Advanced Extragalactic Astrophysics, Undergraduate Astrophysics Program Year 4**, UTFSM, Chile. Topic: *A course on large-scale structure and the halo-galaxy connection*
- 2021-2024 **Introduction to Astrophysics, Undergraduate Astrophysics Program Year 1**, UTFSM, Chile. Topic: *A basic introduction to Astrophysics*
- 2021 **General Physics III, Engineering Program Year 1**, UTFSM, Chile. Topic: *Basic course on waves, thermodynamics and fluids*
- General Physics I, Engineering Program Year 1**, UTFSM, Chile. Topic: *Basic course on kinematics and Newtonian mechanics*
- 2020 **Scientific Instrumentation, Undergraduate Astrophysics Program Year 1**, UTFSM, Chile. Topic: *A review on scientific instruments and their physical basis*

Students and postdocs

- 2025- **PhD in progress: Constanza Soto**, UTFSM, Chile. *Main advisor*
- Master in progress: Vicente Izzo**, UTFSM, Chile. *Main advisor*
- PhD in progress: Ignacio Quiroz**, UTFSM, Chile. *Co-advisor, main advisor: Rory Smith*
- 2024- **Postdoc in progress: Ankit Kumar (ALMA)**, UNAB, Chile. *Co-advisor, main advisor: Celeste Artale (UNAB, Chile)*
- Master in progress: David Tobar**, UTFSM, Chile. *Main advisor, co-advisor: Rory Smith*
- Final undergraduate research project in progress: Constanza Soto**, UTFSM, Chile. *Main advisor*
- Final undergraduate research project in progress: Fabián Molina**, UTFSM, Chile. *Main advisor*
- Final undergraduate research project in progress: Vicente Cáceres**, UTFSM, Chile. *Main advisor*

Teaching and Mentoring (continued)

- 2024  **Final undergraduate research project completed: Vicente Izzo**, UTFSM, Chile. *Main advisor*
-  **Final undergraduate research project completed: Isidora Espinoza**, UTFSM, Chile → UC, Chile. *Main advisor*
-  **Final undergraduate research project completed: David Tobar**, UTFSM, Chile. *Main advisor*
- 2023  **Final undergraduate research project completed: Pablo Saavedra**, UTFSM, Chile → UC, Chile. *Main advisor*
- 2020-  **PhD in progress: Beatriz Tucci**, USP, Brazil → MPA, Germany. *Main advisor, co-advisor: Raul Abramo (USP)*
-  **PhD in progress: Natalia Villa Nova**, USP, Brazil. *Co-advisor, main advisor: Raul Abramo (USP)*
- 2019-2024  **PhD completed: Natali de Santi**, USP, Brazil → UC Berkeley/Flatiron Institute, USA. *Main advisor, co-advisor: Raul Abramo (USP)*
- 2018-2020  **Final undergraduate research project completed: Gabriela Sato-Polito**, USP, Brazil → IAS-Princeton, USA, Germany. *Main advisor, co-advisor: Raul Abramo (USP)*
- 2016  **Final undergraduate research project completed: Benjamin Knowlton**, U. of Utah, USA. *Main advisor*

Organization of events

- 2024  **Unveiling the physical origins of assembly bias**, Institute for Fundamental Physics of the Universe (IFPU-ICTP), Trieste, Italy. Role: *Organizer*. Type: *international workshop*
- 2023  **III Workshop on Halo-Galaxy Connection - Atacama'23**, University of Atacama, Copiapó, Chile. Role: *co-organizer, main organizer: Iván Lacerna*. Type: *international workshop*
- 2022  **II Mini Workshop on Assembly Bias for the South American Community**, Universidad Técnica Federico Santa María (UTFSM), Santiago, Chile. Role: *organizer*. Type: *international workshop*
- 2019  **I Mini Workshop on Assembly Bias for the South American Community**, Pontificia Universidad Católica de Chile (OUC), Santiago, Chile. Role: *co-organizer, main organizer: Nelson Padilla*. Type: *international workshop*
- 2018  **SPANET Workshop on Clusters of Galaxies and the Large-Scale Structure of the Universe**, Instituto de Astronomia, Geofísica e Ciências Atmosféricas (IAG), University of Sao Paulo, Sao Paulo, Brazil. Role: *member of SOC/LOC, main organizer: Laerte Sodre*. Type: *international workshop*
- 2008  **Cosmology across cultures**, Granada, Spain. Role: *member of LOC, main organizer: Francisco Prada*. Type: *international conference*

In the media

- 2024  *La danza cósmica de la Tierra y la Luna*. El martutino, Medio Directo, g5 Noticias, and others
-  *Cartografiando el Universo desde el desierto chileno*. El Martutino, Valparaíso Noticias, Bío Bío Chile, La Quinta Emprende, and others

In the media (continued)

- 2022  *La primera fotografía de Sagitario A*: el agujero negro supermasivo en el centro de nuestra galaxia.* USM, Portal Innova, g5 Noticias, PáginaV, La región hoy, El Martutino, El Observador, El Zorro Nortino, and others
-  *Vera Rubin: la astrónoma que miraba al infinito.* USM, El Mercurio de Valparaíso, Diario Concepción, El Mostrador, and others
-  *La materia misteriosa que necesitan las galaxias.* USM, El Martutino, Tierra Amarillano, Página V, g5 Noticias, La Voz en línea, EL Diario de la Araucanía, El Diario de la Costa, El Diario Santiago, Medio Directo, EL Zorro Nortino, and others
- 2021  *El Telescopio espacial James Webb y el nacimiento de las primeras galaxias/¿Dónde nos llevará el telescopio espacial James Webb?.* USM, El Martutino, El Mostrador, g5 Noticias, and others
-  *DART: Cuando la realidad supera la ficción/En marcha la misión de la NASA para desviar asteroides peligrosos para la Tierra.* USM, El Mostrador, El Martutino, and others
-  *Un momento clave para la Astrofísica Chilena.* USM, La Página V, Valparaíso Noticias, g5 Noticias, Radio Bohemia, La Quinta Emprende, Informa Al Minuto, and others
-  *Nuevos hallazgos en los agujeros negros.* USM, El Martutino, La Ligua Noticias, Diario La Quinta, g5 Noticias, Rancagua TV, and others
- 2020  *Eclipse y sus asombros.* USM, El Mercurio de Valparaíso, and others

Research visits

- 2025  **Institute of Astrophysics of the Canary Islands (IAC)**, Tenerife, Spain. Hosted by: *Ginevra Favole*. Duration: 2 months
- 2024  **International Centre for Theoretical Physics (ICTP)**, Trieste, Italy. Hosted by: *ICTP Associates Grant*. Duration: 1 months
-  **Institute of Astrophysics of the Canary Islands (IAC)**, Tenerife, Spain. Hosted by: *Ginevra Favole and Francisco Shu-Kitaura*. Duration: 2 months
- 2023  **International Centre for Theoretical Physics (ICTP)**, Trieste, Italy. Hosted by: *ICTP Associates Grant*. Duration: 1 months
- 2024  **Institute of Astrophysics of the Canary Islands (IAC)**, Tenerife, Spain. Hosted by: *Ginevra Favole and Francisco Shu-Kitaura*. Duration: 2 months
- 2018  **University of Milan**, Milan, Italy. Hosted by: *Luigi Guzzo*. Duration: 4 months
- 2016  **National Optical Astronomy Observatory (NOAO)**, Tucson, USA. Hosted by: *Adam Bolton*. Duration: 1 month
- 2015  **Institute of Astrophysics of Andalusia (IAA-CSIC)**, Granada, Spain. Hosted by: *Carolina Kehrig*. Duration: 1 month
-  **Autonomous University of Madrid (UAM)**, Madrid, Spain. Hosted by: *Francisco Prada*. Duration: 1 month
- 2014  **Institute of Astrophysics of the Canary Islands (IAC)**, Tenerife, Spain. Hosted by: *Carlos Allende-Prieto*. Duration: 1 months
- 2011  **University of Utah (UoU)**, Salt Lake City, USA. Hosted by: *Adam Bolton*. Duration: 1 week
-  **Lawrence Berkeley National Laboratory (LBNL)**, Berkeley, USA. Hosted by: *David Schlegel*. Duration: 1.5 months
-  **Max Planck Institute for Astrophysics (MPA)**, Garching, Germany. Hosted by: *Ariel Sánchez*. Duration: 1 week
- 2010  **Institute for Computational Cosmology (ICC) Durham University**, Durham, UK. Hosted by: *Carlton Baugh*. Duration: 1 week

Research visits (continued)

- 2009  **KAVLI Stanford University**, Palo Alto, USA. Hosted by: *Risa Wechsler*. Duration: *4 months*
- 2008  **University of Oxford**, Oxford, UK. Hosted by: *Chris Wolf*. Duration: *2 weeks*
- 2007  **University of California at Berkeley**, Berkeley, USA. Hosted by: *Darren Croton/Marc Davis*. Duration: *4 months*
- 2006  **Max Planck Institute for Astrophysics (MPA)**, Garching, Germany. Hosted by: *Jeremy Blaizot, Simon White*. Duration: *2 weeks*

Language skills

- Spanish  Native
- English  Proficient in writing and speaking
- Portuguese  Good speaking and comprehension skills
- Italian  Basic speaking, good comprehension skills

References

- Postdoc Advisor @ Utah Adam Bolton, KIPAC Senior Staff Member, Stanford University, USA. US Data Facility Lead, Vera C. Rubin Observatory
- Postdoc Advisor @ USP Raul Abramo, Full Professor, Institute of Physics, University of Sao Paulo, Brazil
- Collaborator 1 Ravi Sheth, Full Professor, University of Pennsylvania, USA
- Collaborator 2 Luigi Guzzo, Full Professor, University of Milan, Italy