TOMÁS ALBERTO CASSANELLI

Astronomer & Assistant Professor of Astronomical Instrumentation

Last update: June 2, 2025

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Spanish (Español Chile) — Native speaker **English** — Professional working proficiency.

EDUCATION

Jan. 2018–Feb. 2022 **PhD Astronomy & Astrophysics**. University of Toronto (U of T), Dunlap Institute, Canada.

Oct. 2015–Oct. 2017 **MSc Astrophysics**. Universität Bonn, Argelander Institut für Astronomie (AIfA) and Max-Planck-Institut für Radioastronomie (MPIfR), Germany.

Mar. 2009–Jan. 2015 **Civil Industrial Engineering with a Major in Mechanics** (*título profesional*). Universidad de La Frontera (UFRO), Chile.

Aug. 2010–Aug. 2014 **Applied Physics Bachelors Degree**. UFRO, Chile.

PROFESSIONAL APPOINTMENTS

Mar. 2022–Present Assistant Professor (Astronomical Instrumentation), Electrical Engineering Department, Universidad de Chile (UChile), Chile.

Nov. 2017–Dec. 2017 Part time scientist: Out-of-focus holography at the Effelsberg telescope. MPIfR, Germany.

EXTERNAL POSITIONS

Sept. 2024–Present Canadian Hydrogen Intensity Mapping Experiment fast radio burst project (CHIME/FRB) Collaboration. Followup committee member.

Apr. 2024–Present Center for Astrophysics and Associated Technologies (CATA) adjunct researcher.

GRANTS AND ALLOCATIONS

Research grants

Jan. 2025 FONDECYT de iniciación 2025, PI. An improved backend for the transient radio array, $90 000. Agencia Nacional de Investigación y Desarrollo (ANID), Chile.

May 2024 PARD2024, co-I. Italian quantum eye (IQUEYE) at Gemini South: the highest sensitivity to look at the fastest variable astronomical objects, $44 000. Università di Padova, Italy.

Dec. 2023 Dunlap Seed Fund 2023, co-I. Canadian-Chilean array for radio transient studies (CHARTS), $255 000. Dunlap Institute, U of T, Canada.

Dec. 2023 QUIMAL Fund 2023, PI. CHARTS, $180 000. ANID, Chile.

June 2023 Faculty research initial stage grant, $15 000. *Vicerectoria de Investigación y Desarrollo* (VID), UChile.

Apr. 2023 Trip to commission CHIME/FRB Outrigger Green Bank Observatory (GBO) telescope, $3000. VID, UChile.

Sept. 2022 Faculty settlement initial grant, $10 000. VID, UChile.

Telescope allocations

2025A IQUEYE at Gemini South: the highest sensitivity to look at the fastest variable astronomical objects, PI, Gemini South, 50 hours (instrument commission and observations). GS-2025A-C-1.

2025A Simultaneous observations of the Crab pulsar with GBT and Gemini South, co-I, Director's Discretionary Time (DDT), Green Bank Telescope (GBT), 2.5 hours in Group A and 5.00 hours in Group B. GBT25A-416.

2024B Can magnetars in complex environments explain the origin of fast radio burst?, co-I, Atacama Large Millimeter Array (ALMA) cycle 11, 5.2 hours. 2024.1.01044.P.

2023B Probing the formation pathway of a fast radio burst: CO 3-2 observations towards FRB190520, PI. ALMA cycle 10, 18 hours. 2023.1.01372.S.

2023B The first large census of fast radio burst host galaxies with Gemini, co-I. GMOS/Gemini North/South. 200 hours (long and large program). GS-LP-110.

2023A CHIME/FRB observed repeaters & followup with the UWL (CORFU), co-I. UWL/Murriyang (Parks Observatory). 200 hours. P1195.

2022B Chemical gradients & heat transport in an Ultra-Hot Jupiter Atmosphere, co-I. MAROON-X/Gemini North. 4 hours (fast turnaround). GN-2022B-FT-103.

2022A Precise Pulsar Positions for CHIME/FRB Outrigger Calibration, co-I. Very Large Baseline Array (VLBA). 42 hours (regular). VLBA/22A-345.

2021A Precise Pulsar Positions for CHIME/FRB Outrigger Calibration, co-I. VLBA. 60 hours. VLBA/21A-314.

THESES

2022 **Astronomy & Astrophysics Doctoral thesis**: Fast radio burst localization with very long baseline interferometry. U of T, Canada. Supervisor: Dr. Keith Vanderlinde.

2017 **Astrophysics MSc thesis**: Systematic measurements of the surface of the 100-m radio telescope using the out-of-focus holography method. MPIfR, Germany. Supervisor: Dr. Karl Menten.

2015 **Civil Engineering thesis**: *Análisis de las vibraciones en instrumentación de observación astronónomica generadas durante operaciones de transporte*. ALMA, Chile. Supervisor: Engineer Armin Silber (European Southern Observatory) and Dr. Juan Möller (UFRO).

AWARDS

2020 "Department of Astronomy & Astrophysics Graduate Program Award". U of T, Canada, $800.

2018, 2019, and 2020 "Faculty of Arts & Science Program-Level Fellowship". U of T, Canada, $1600.

2018 "Verein der Freunde und Förderer des MPIfR e.V." Master of science thesis annual award, Germany, $600. Three referees delivered the judgement: **excellent**.

2017 Becas Chile. ANID. "Becas doctorado en el extranjero 2017" complete funding for up to four years in a foreign PhD program. Government of Chile, $170 000.

2010, 2011, and 2012 Academic Excellence Award. UFRO, Chile, $920.

PUBLICATIONS

Refereed publications (52; 4 first author)

Apr. 2025 Ng, C., A. Pandhi, R. Mckinven, et al. "Polarization Properties of 28 Repeating Fast Radio Burst Sources with CHIME/FRB". In: ApJ 982.2, 154, p. 154. DOI: 10.3847/1538-4357/adb0bc.

Feb. 2025 Eftekhari, T., Y. Dong, W. Fong, et al. "The Massive and Quiescent Elliptical Host Galaxy of the Repeating Fast Radio Burst FRB 20240209A". In: ApJ 979.2, L22, p. L22. DOI: 10.3847/2041-8213/ad9de2.

Feb. 2025 Shah, V., K. Shin, C. Leung, et al. "A Repeating Fast Radio Burst Source in the Outskirts of a Quiescent Galaxy". In: ApJ 979.2, L21, p. L21. DOI: 10.3847/2041-8213/ad9ddc.

Jan. 2025 *Braga, C. A.**, M. Cruces, T. **Cassanelli**, et al. "FRB 20121102A monitoring: Updated periodicity in the L band". In: A&A 693, A40, A40. DOI: 10.1051/0004-6361/202451905.

Jan. 2025 Mckinven, R., M. Bhardwaj, T. Eftekhari, et al. "A pulsar-like polarization angle swing from a nearby fast radio burst". In: Nature 637.8044, pp. 43–47. DOI: 10.1038/s41586-024-08184-4.

Dec. 2024 Hewitt, D. M., M. Bhardwaj, A. C. Gordon, et al. "A Repeating Fast Radio Burst Source in a Low-luminosity Dwarf Galaxy". In: ApJ 977.1, L4, p. L4. DOI: 10.3847/2041-8213/ad8ce1.

Nov. 2024 **Cassanelli**, T., C. Leung, P. Sanghavi, et al. "A fast radio burst localized at detection to an edge-on galaxy using very-long-baseline interferometry". In: *Nature Astronomy* 8, pp. 1429–1442. DOI: 10.1038/s41550-024-02357-x.

Nov. 2024 Lin, H.-H., P. Scholz, C. Ng, et al. "Do All Fast Radio Bursts Repeat? Constraints from CHIME/FRB Far Sidelobe FRBs". In: ApJ 975.1, 75, p. 75. DOI: 10.3847/1538-4357/ad779d.

Oct. 2024 Cook, A. M., P. Scholz, A. B. Pearlman, et al. "Contemporaneous X-Ray Observations of 30 Bright Radio Bursts from the Prolific Fast Radio Burst Source FRB 20220912A". In: ApJ 974.2, 170, p. 170. DOI: 10.3847/1538-4357/ad6a13.

Aug. 2024 Bhardwaj, M., D. Michilli, A. Y. Kirichenko, et al. "Host Galaxies for Four Nearby CHIME/FRB Sources and the Local Universe FRB Host Galaxy Population". In: ApJ 971.2, L51, p. L51. DOI: 10.3847/2041-8213/ad64d1.

Aug. 2024 Lanman, A. E., S. Andrew, M. Lazda, et al. "CHIME/FRB Outriggers: KKO Station System and Commissioning Results". In: AJ 168.2, 87, p. 87. DOI: 10.3847/1538-3881/ad5838.

July 2024 **Cassanelli**, T., U. Bach, B. Winkel, et al. "Out-of-focus holography at the Effelsberg telescope. Systematic measurements of the surface of a 100 m telescope using OOF holography". In: A&A 687, A27, A27. DOI: 10.1051/0004-6361/202142116.

July 2024 CHIME/FRB Collaboration, M. Amiri, B. C. Andersen, et al. "Updating the First CHIME/FRB Catalog of Fast Radio Bursts with Baseband Data". In: ApJ 969.2, 145, p. 145. DOI: 10.3847/1538-4357/ad464b.

June 2024 Pandhi, A., Z. Pleunis, R. Mckinven, et al. "Polarization Properties of 128 Nonrepeating Fast Radio Bursts from the First CHIME/FRB Baseband Catalog". In: ApJ 968.2, 50, p. 50. DOI: 10.3847/1538-4357/ad40aa.

Jan. 2024 Ibik, A. L., M. R. Drout, B. M. Gaensler, et al. "Proposed Host Galaxies of Repeating Fast Radio Burst Sources Detected by CHIME/FRB". In: ApJ 961.1, 99, p. 99. DOI: 10.3847/1538-4357/ad0893.

Jan. 2024 Sanghavi, P., C. Leung, K. Bandura, et al. "TONE: A CHIME/FRB Outrigger Pathfinder for Localizations of Fast Radio Bursts using Very Long Baseline Interferometry". In: *Journal of Astronomical Instrumentation* 13.3, 2450010-589, pp. 2450010–589. DOI: 10.1142/S2251171724500107.

Oct. 2023 Abbott, R., T. D. Abbott, F. Acernese, et al. "Search for Gravitational Waves Associated with Fast Radio Bursts Detected by CHIME/FRB during the LIGO–Virgo Observing Run O3a". In: ApJ 955.2, 155, p. 155. DOI: 10.3847/1538-4357/acd770.

Oct. 2023 Sand, K. R., D. Breitman, D. Michilli, et al. "A CHIME/FRB Study of Burst Rate and Morphological Evolution of the Periodically Repeating FRB 20180916B". In: ApJ 956.1, 23, p. 23. DOI: 10.3847/1538-4357/acf221.

Sept. 2023 Curtin, A. P., S. P. Tendulkar, A. Josephy, et al. "Limits on Fast Radio Burst-like Counterparts to Gamma-Ray Bursts Using CHIME/FRB". In: ApJ 954.2, 154, p. 154. DOI: 10.3847/1538-4357/ace52f.

July 2023 Mckinven, R., B. M. Gaensler, D. Michilli, et al. "Revealing the Dynamic Magnetoionic Environments of Repeating Fast Radio Burst Sources through Multiyear Polarimetric Monitoring with CHIME/FRB". In: ApJ 951.1, 82, p. 82. DOI: 10.3847/1538-4357/acd188.

June 2023 Mckinven, R., B. M. Gaensler, D. Michilli, et al. "A Large-scale Magneto-ionic Fluctuation in the Local Environment of Periodic Fast Radio Burst Source FRB 20180916B". In: ApJ 950.1, 12, p. 12. DOI: 10.3847/1538-4357/acc65f.

June 2023 Michilli, D., M. Bhardwaj, C. Brar, et al. "Subarcminute Localization of 13 Repeating Fast Radio Bursts Detected by CHIME/FRB". In: ApJ 950.2, 134, p. 134. DOI: 10.3847/1538-4357/accf89.

Apr. 2023 CHIME/FRB Collaboration, B. C. Andersen, K. Bandura, et al. "CHIME/FRB Discovery of 25 Repeating Fast Radio Burst Sources". In: ApJ 947.2, 83, p. 83. DOI: 10.3847/1538-4357/acc6c1.

Apr. 2023 Merryfield, M., S. P. Tendulkar, K. Shin, et al. "An Injection System for the CHIME/FRB Experiment". In: AJ 165.4, 152, p. 152. DOI: 10.3847/1538-3881/ac9ab5.

Feb. 2023 Shin, K., K. W. Masui, M. Bhardwaj, et al. "Inferring the Energy and Distance Distributions of Fast Radio Bursts Using the First CHIME/FRB Catalog". In: ApJ 944.1, 105, p. 105. DOI: 10.3847/1538-4357/acaf06.

Aug. 2022 Kader, Z., C. Leung, M. Dobbs, et al. "High-time resolution search for compact objects using fast radio burst gravitational lens interferometry with CHIME/FRB". In: Phys. Rev. D 106.4, 043016, p. 043016. DOI: 10.1103/PhysRevD.106.043016.

Aug. 2022 Leung, C., Z. Kader, K. W. Masui, et al. "Constraining primordial black holes using fast radio burst gravitational-lens interferometry with CHIME/FRB". In: Phys. Rev. D 106.4, 043017, p. 043017. DOI: 10.1103/PhysRevD.106.043017.

July 2022 **Cassanelli**, T., G. Naletto, G. Codogno, et al. "New technique for determining a pulsar period: Waterfall principal component analysis". In: A&A 663, A106, A106. DOI: 10.1051/0004-6361/202243515.

July 2022 CHIME/FRB Collaboration Bridget C., A., K. Bandura, M. Bhardwaj, et al. "Sub-second periodicity in a fast radio burst". In: Nature 607.7918, pp. 256–259. DOI: 10.1038/s41586-022-04841-8.

June 2022 Sand, K. R., J. T. Faber, V. Gajjar, et al. "Multiband Detection of Repeating FRB 20180916B". In: ApJ 932.2, 98, p. 98. DOI: 10.3847/1538-4357/ac6cee.

Mar. 2022 Chawla, P., V. M. Kaspi, S. M. Ransom, et al. "Modeling Fast Radio Burst Dispersion and Scattering Properties in the First CHIME/FRB Catalog". In: ApJ 927.1, 35, p. 35. DOI: 10.3847/1538-4357/ac49e1.

Mar. 2022 Lanman, A. E., B. C. Andersen, P. Chawla, et al. "A Sudden Period of High Activity from Repeating Fast Radio Burst 20201124A". In: ApJ 927.1, 59, p. 59. DOI: 10.3847/1538-4357/ac4bc7.

Feb. 2022 **Cassanelli**, T., C. Leung, M. Rahman, et al. "Localizing FRBs through VLBI with the Algonquin Radio Observatory 10 m Telescope". In: AJ 163.2, 65, p. 65. DOI: 10.3847/1538-3881/ac3d2f.

Feb. 2022 Kirsten, F., B. Marcote, K. Nimmo, et al. "A repeating fast radio burst source in a globular cluster". In: Nature 602.7898, pp. 585–589. DOI: 10.1038/s41586-021-04354-w.

Feb. 2022 Mena-Parra, J., C. Leung, S. Cary, et al. "A Clock Stabilization System for CHIME/FRB Outriggers". In: AJ 163.2, 48, p. 48. DOI: 10.3847/1538-3881/ac397a.

Feb. 2022 Nimmo, K., J. W. T. Hessels, F. Kirsten, et al. "Burst timescales and luminosities as links between young pulsars and fast radio bursts". In: *Nature Astronomy* 6, pp. 393–401. DOI: 10.1038/s41550-021-01569-9.

Dec. 2021 CHIME/FRB Collaboration, M. Amiri, B. C. Andersen, et al. "The First CHIME/FRB Fast Radio Burst Catalog". In: ApJS 257.2, 59, p. 59. DOI: 10.3847/1538-4365/ac33ab.

Dec. 2021 Josephy, A., P. Chawla, A. P. Curtin, et al. "No Evidence for Galactic Latitude Dependence of the Fast Radio Burst Sky Distribution". In: ApJ 923.1, 2, p. 2. DOI: 10.3847/1538-4357/ac33ad.

Dec. 2021 Pleunis, Z., D. C. Good, V. M. Kaspi, et al. "Fast Radio Burst Morphology in the First CHIME/FRB Catalog". In: ApJ 923.1, 1, p. 1. DOI: 10.3847/1538-4357/ac33ac.

Nov. 2021 Rafiei-Ravandi, M., K. M. Smith, D. Li, et al. "CHIME/FRB Catalog 1 Results: Statistical Cross-correlations with Large-scale Structure". In: ApJ 922.1, 42, p. 42. DOI: 10.3847/1538-4357/ac1dab.

Oct. 2021 Mckinven, R., D. Michilli, K. Masui, et al. "Polarization Pipeline for Fast Radio Bursts Detected by CHIME/FRB". In: ApJ 920.2, 138, p. 138. DOI: 10.3847/1538-4357/ac126a.

Apr. 2021 Bhardwaj, M., B. M. Gaensler, V. M. Kaspi, et al. "A Nearby Repeating Fast Radio Burst in the Direction of M81". In: ApJ 910.2, L18, p. L18. DOI: 10.3847/2041-8213/abeaa6.

Apr. 2021 Michilli, D., K. W. Masui, R. Mckinven, et al. "An Analysis Pipeline for CHIME/FRB Full-array Baseband Data". In: ApJ 910.2, 147, p. 147. DOI: 10.3847/1538-4357/abe626.

Apr. 2021 Pleunis, Z., D. Michilli, C. G. Bassa, et al. "LOFAR Detection of 110-188 MHz Emission and Frequency-dependent Activity from FRB 20180916B". In: ApJ 911.1, L3, p. L3. DOI: 10.3847/2041-8213/abec72.

Feb. 2021 Leung, C., J. Mena-Parra, K. Masui, et al. "A Synoptic VLBI Technique for Localizing Nonrepeating Fast Radio Bursts with CHIME/FRB". In: AJ 161.2, 81, p. 81. DOI: 10.3847/1538-3881/abd174.

Nov. 2020 CHIME/FRB Collaboration, B. C. Andersen, K. M. Bandura, et al. "A bright millisecond-duration radio burst from a Galactic magnetar". In: Nature 587.7832, pp. 54–58. DOI: 10.1038/s41586-020-2863-y.

Oct. 2020 Scholz, P., A. Cook, M. Cruces, et al. "Simultaneous X-Ray and Radio Observations of the Repeating Fast Radio Burst FRB $\sim$ 180916.J0158+65". In: ApJ 901.2, 165, p. 165. DOI: 10.3847/1538-4357/abb1a8.

June 2020 Chawla, P., B. C. Andersen, M. Bhardwaj, et al. "Detection of Repeating FRB 180916.J0158+65 Down to Frequencies of 300 MHz". In: ApJ 896.2, L41, p. L41. DOI: 10.3847/2041-8213/ab96bf.

Mar. 2020 Fonseca, E., B. C. Andersen, M. Bhardwaj, et al. "Nine New Repeating Fast Radio Burst Sources from CHIME/FRB". In: ApJ 891.1, L6, p. L6. DOI: 10.3847/2041-8213/ab7208.

Jan. 2020 Marcote, B., K. Nimmo, J. W. T. Hessels, et al. "A repeating fast radio burst source localized to a nearby spiral galaxy". In: Nature 577.7789, pp. 190–194. DOI: 10.1038/s41586-019-1866-z.

Nov. 2019 CHIME/FRB Collaboration, B. C. Andersen, K. Bandura, et al. "CHIME/FRB Discovery of Eight New Repeating Fast Radio Burst Sources". In: ApJ 885.1, L24, p. L24. DOI: 10.3847/2041-8213/ab4a80.

Jan. 2019 CHIME/FRB Collaboration, M. Amiri, K. Bandura, et al. "A second source of repeating fast radio bursts". In: Nature 566.7743, pp. 235–238. DOI: 10.1038/s41586-018-0864-x.

Submitted/accepted publications (2)

Apr. 2025 CHIME/FRB Collaboration, M. Amiri, B. C. Andersen, et al. "CHIME/FRB Outriggers: Design Overview". In: *arXiv e-prints*. DOI: 10.48550/arXiv.2504.05192.

Mar. 2024 Leung, C., S. Andrew, K. W. Masui, et al. "A VLBI Software Correlator for Fast Radio Transients". In: *arXiv e-prints*. DOI: 10.48550/arXiv.2403.05631.

Conference proceedings (2; 2 first author)

Apr. 2025 **Cassanelli**, T., J. Mena-Parra, *S. Manosalva*[*], et al. "Canadian-Chilean Array for Radio Transient Studies (CHARTS): Analog System Developments". In: *2025 19th European Conference on Antennas and Propagation (EuCAP)*. Pp. 1–5. DOI: 10.23919/EuCAP63536.2025.10999353.

Jan. 2016 **Cassanelli**, T. and T. Abbott. "Photometry of the old nova HZ Pup". In: *American Astronomical Society Meeting Abstracts #227*. Vol. 227. American Astronomical Society Meeting Abstracts. 144.04, p. 144.04.

Research notes

Sept. 2021 Cary, S., J. Mena-Parra, C. Leung, et al. "Evaluating and Enhancing Candidate Clocking Systems for CHIME/FRB VLBI Outriggers". In: *Research Notes of the American Astronomical Society* 5.9, 216, p. 216. DOI: 10.3847/2515-5172/ac289d.

Lecture notes & course material

Nov. 2023 **Cassanelli**, T. *Electromagnetismo Aplicado*. Spanish. Version 1.0. DOI: 10.5281/zenodo.10067791.

[*]Supervised students.

TEACHING

Graduate courses taught

Mar. 2025–July 2025 Radio astronomy: applications, tools, & impact (EL7053). Electrical Engineering Department. UChile.

Undegraduate courses taught

Mar. 2025–July 2025 Applied electromagnetism (EL3103). Electrical Engineering Department. UChile.

July 2024–Dec. 2024 Astronomy research project (AS4103). Astronomy Department. UChile.

July 2024–Dec. 2024 Applied electromagnetism (EL3103). Electrical Engineering Department. UChile.

Mar. 2024–July 2024 Applied electromagnetism (EL3103). Electrical Engineering Department. UChile.

Mar. 2024–July 2024 Radio astronomy: applications, tools, and impact (EL6053). Electrical Engineering Department. UChile.

July 2023–Dec. 2023 Applied electromagnetism (EL3103). Electrical Engineering Department. UChile.

Mar. 2023–July 2023 Astronomy research project (AS4103). Astronomy Department. UChile.

Mar. 2023–July 2023 Targeted research (AS4107). Astronomy Department. UChile.

Mar. 2023–July 2023 Applied electromagnetism (EL3103). Electrical Engineering Department. UChile.

Aug. 2022–Dec. 2022 Applied electromagnetism (EL3103). Electrical Engineering Department. UChile.

Apr. 2015–Aug. 2015 Mechanics (ICF328). Physics Department. UFRO.

Apr. 2015–Aug. 2015 Dynamics (IIM366-1). Mechanical Engineering Department. UFRO.

Summer schools taught

26–30 July 2021 Dunlap Instrumentation Summer School. Facilitator for the radio fundamentals laboratory (online format). Dunlap Institute, University of Toronto (U of T).

7–12 July 2019 Dunlap Instrumentation Summer School. Lead lecturer and facilitator in the interferometry laboratory. Dunlap Institute, U of T.

Teaching assistantships

Sept. 2021–Dec. 2021 The Sun and Its Neighbours (AST101) fall term. David A. Dunlap Department of Astronomy & Astrophysics (DADDAA). U of T.

Sept. 2020–Dec. 2020 Practical Astronomy (AST326) fall term. DADDAA. U of T.

Aug. 2020 Practical Astronomy (AST326). Redesign course for online delivery (due to COVID-19 pandemic). DADDAA. U of T.

May 2020–June 2020 Life on Other Worlds (AST251) summer term. DADDAA. U of T.

May 2020–June 2020 Great Moments in Astronomy (ASTB03) summer term. Department of Physical & Environmental Sciences. U of T Scarborough.

Jan. 2020–Apr. 2020 Astrophysics of Planetary Systems (ASTC25) winter term. Department of Physical & Environmental Sciences. U of T Scarborough.

Jan. 2020–Apr. 2020 Advanced Computational Methods in Physics (PHYD57) winter term. Department of Physical & Environmental Sciences. U of T Scarborough.

Jan. 2020–Apr. 2020 Stars and Galaxies (AST201) winter term. DADDAA. U of T.

Sept. 2019–Apr. 2020 Practical Astronomy (AST326) fall and winter terms. DADDAA. U of T.

Sept. 2019–Dec. 2019 Introduction to Practical Astronomy (AST325) fall term. DADDAA. U of T.

May 2019–June 2019 Great Moments in Astronomy (ASTB03) summer term. Department of Physical & Environmental Sciences. U of T Scarborough.

May 2019–June 2019 The Sun and Its Neighbours (AST101) summer term. DADDAA. U of T.

Jan. 2019–Apr. 2019 Stars and Galaxies (AST201) winter term. DADDAA. U of T.

May 2018–June 2018 The Sun and Its Neighbours (AST101) summer term. DADDAA. U of T.

Jan. 2018–Apr. 2018 Stars and Galaxies (AST201) winter term. DADDAA. U of T.

Mar. 2014–July 2014 Mechanics (ICF214). Physics Department. UFRO.

Mar. 2014–July 2014 Calculus II (IME186). Mathematics and Statistics Department. UFRO.

Aug. 2013–Dec. 2013 Calculus II (IME186). Mathematics and Statistics Department. UFRO.

Mar. 2013–July 2013 Calculus II (IME186). Mathematics and Statistics Department. UFRO.

Aug. 2012–Dec. 2012 Modern physics (ICF235). Physics Department. UFRO.

Aug. 2012–Dec. 2012 Mathematics fundamentals (IME020). Mathematics and Statistics Department. UFRO.

Mar. 2012–July 2012 Modern physics (ICF235). Physics Department. UFRO.

Mar. 2012–July 2012 Applied Mathematics (Fourier analysis and complex variable; IME127). Mathematics and Statistics Department. UFRO.

Mar. 2012–July 2012 Physics II (ICF190). Physics Department. UFRO.

Mar. 2012–July 2012 Ordinary differential equations (IME063). Mathematics and Statistics Department. UFRO.

Mar. 2012–July 2012 Calculus II (IME186). Mathematics and Statistics Department. UFRO.

Mar. 2011–July 2011 Calculus II (IME186). Mathematics and Statistics Department. UFRO.

Mar. 2011–July 2011 Mechanics (ICF214). Physics Department. UFRO.

Mar. 2011–Dec. 2011 Calculus (IME005 annual). Mathematics and Statistics Department. UFRO.

Mar. 2011–Dec. 2011 General physics (ICF100 annual). Physics Department. UFRO.

Mar. 2010–Dec. 2010 Calculus (IME005 annual). Mathematics and Statistics Department. UFRO.

Mar. 2010–Dec. 2010 General physics (ICF100 annual). Physics Department. UFRO.

TRAINEE SUPERVISION

Postdoctoral research & laboratory engineering supervision (2)

Mar. 2024–Present Dr. Julián Faúndez. Visiting postdoctoral researcher. Condense matter physics and applications to fast astronomical detectors at optical wavelengths.

Mar. 2023–Present MSc. Physics Gonzalo Burgos. CHARTS project engineer.

Graduate research supervision (3)

Mar. 2025–Present Gonzalo Burgos, astronomy student at UChile. Astronomy & Astrophysics thesis: towards fast radio burst (FRB) detection with CHARTS.

Aug. 2024–Present Daniel Valenzuela, electrical engineering student at UChile. Engineering thesis: Study and development of traveling-wave kinetic inductance parametric amplifiers using artificial coplanar waveguide (CPW) lines, and comparison with CPW and microstrip lines.

Aug. 2022–Present Sebastián Manosalva, electrical engineering student at UChile. Engineering thesis: Design and implementation of a frequency division multiplexer (FDM) circuit board for CHARTS.

Undergraduate thesis students (4; 2 current)

Mar. 2025–Present Oriel Arias, electrical engineering student at UChile. Engineering thesis: Diagnosis and mitigation of radio frequency interference (RFI) to improve the CHARTS experiment's FRB realtime search engine.

Mar. 2024–Present Francisco Muñoz, electrical engineering student at UChile. Engineering thesis: Design and build of a low noise amplification system (CHARTS project).

Mar. 2024–May 2025 Vicente Aitken, electrical engineering student at UChile. Engineering thesis: Implementation of a 3-m radio dish as a pathfinder for the CHARTS project.

Aug. 2022–May 2023 Fabiola Norambuena, physics engineering student at UFRO. Engineering thesis: Data science analyses from Gemini South observations.

Undergraduate research students (10; 5 current)

Aug. 2024–Present Juan Pablo Contreras, electrical engineering student at UChile. Research: microstructure and fast radio burst pulse search in archival datasets.

Dec. 2023–Present Bruno Pollarolo, electrical engineering and astronomy student at UChile. Research: FRB analog pulse simulation and injection with radio frequency system-on-chip (RFSoC) technology (CHARTS).

Dec. 2023–Present Joaquín Díaz, electrical engineering student at UChile. Research: Condense matter physics and applications to fast astronomical detectors at optical wavelengths.

June 2023–Present Pascual Marcone, electrical engineering student at UChile. Research: Pulsar timing analyses from IQUEYE as a visiting instrument at Gemini South.

Mar. 2023–Present Constanza Espinoza, astronomy student at UChile. Targeted research (AS4107), summer research intern, & astronomical research project (AS4103): Modeling & simulating the activity phases of periodic fast radio bursts and exploring their observational bias.

Mar. 2023–Dec. 2024 Cristóbal Braga, astronomy student at UChile. Summer research intern & astronomical research project (AS4103): FRB detection pipeline for the astronomical radio transient experiment (ARTE) project, and transient targeted searches Effelsberg 100-m telescope archived data.

Dec. 2023–July 2024 Erik Sáez, electrical engineering student at UChile. Summer research intern: Antenna design for transient detections in the 300–500 MHz bandpass (CHARTS).

June 2023–Sept. 2023 Rufat Ismayilov, work-study program student at U of T. Research: Testing the very long baseline interferometry (VLBI) localization precision of the Dominium Radio Astropysical Observatory (DRAO)-Algonquin Radio Observatory (ARO) baseline. Co-supervised alongside Dr. Gusinskaia (U of T).

Jan. 2023–Mar. 2023 Marcelo Gatica, electrical engineering student at UChile. Summer research intern: Signal processing for fast photon counters.

Sept. 2020–Apr. 2021 Mitchell Barret, astronomy student at U of T. Research topic in astronomy (AST425Y1): ARO 10-m radio dish, telescope characterization.

CONTRIBUTED PUBLIC SOFTWARE

2022–Present PyWPF: Waterfall Principal Component Analysis Folding, primary author, `pywpf`.

2017–Present PyOOF: Out-of-focus holography, primary author, `pyoof`.

ACADEMIC SERVICE

Institution service

June 2023 Electrical Engineering Department, UChile, faculty search committee.

Meetings service

Nov. 2023 FRB 2023 Chair of the VLBI & Instrumentation session.

Peer review

2025B ALMA Cycle 12.

Oct. 2024 Journal of Cosmology and Astroparticle Physics (JCAP).

2023B ALMA Cycle 10.

May 2023 Elseiver Astronomy & Computing.

Sept. 2022 *Proyectos de exploración*. ANID.

2022B Gemini Fast Turnaround program.

Undergraduate thesis defense as co-supervisor

May 2025 Vicente Aitken, UChile, supervisors: Prof. Ricardo Finger and Prof. T. Cassanelli.

Jan. 2023 Fabiola Norambuena, UFRO, supervisors: Prof. Pablo Díaz and Prof. T. Cassanelli.

Graduate thesis defense as committee member

Aug. 2024 Lucas Bernales, Pontificia Universidad Católica de Valparaíso (PUCV), supervisor: Prof. Nicolás Tejos.

Aug. 2024 Francisca Solís, UChile, supervisor: Prof. Ricardo Finger.

June 2024 Felipe Lucero, UChile, supervisor: Prof. Patricio Mena.

PhD examination committees

Aug. 2024 Luis Rodríguez, Pontificia Universidad Católica de Chile (PUC), supervisors: Prof. Franz Bauer and Prof. Marilyn Cruces.

RESEARCH PRESENTATIONS

Seminars and colloquia

13 Sept. 2024 Physics Department, UFRO, Chile. Colloquium: Canadian-Chilean array for radio transient studies (CHARTS).

20 Aug. 2024 Institute of Astrophysics, PUC, Chile. Colloquium: CHARTS.

6 June 2024 *Seminario de astrofísica, cosmología y gravitación*, PUCV, Chile. Colloquium: Towards detection of fast radio transients in Chile.

13 Feb. 2024 Gemini South, National Optical-Infrared Astronomy Research Laboratory (NOIRLab), Chile. Colloquium: A fast photon counter for Gemini South.

10 Jan. 2024 Astronomy Department, UChile, Chile. Colloquium: A fast photon counter for Gemini South.

17 May 2022 MPIfR, Germany. Colloquium: Out-of-focus holography at the Effelsberg telescope.

14 Feb. 2022 Brown Bag Lunch talk at Massachusetts Institute of Technology (MIT). Online format. Talk: FRB Localization with CHIME/FRB Outriggers.

Panels

9 Nov. 2023 FRB 2023. Online format. Hidden parameter spaces.

Invited conference talks

4 Aug. 2022 Mechanical Engineering Department. UFRO, Chile. *Holografía en el radio telescopio Effelsberg 100-m*.

14–18 Feb. 2022 VLBI in the Square Kilometre Array (SKA) Era. Online format. FRB Localization with CHIME/FRB Outriggers.

Contributed conference talks

9–13 Dec. 2024 Science at Low Frequencie (SALF) X. Hybrid conference hosted in Shanghai, China. CHARTS.

13–16 Mar. 2023 *Sociedad Chilena de Astronomía* (SOCHIAS) meeting, UFRO, Chile. New technique for determine pulsar period: waterfall principal component analysis.

28 July–5 Aug. 2021 FRB 2021. Online format. Breaking news session: First VLBI localization of a single-burst FRB with the CHIME/FRB Outrigger testbed ARO 10-m telescope.

6–9 July 2020 FRB 2020. Online format. Technical developments session: FRB localization efforts with VLBI in collaboration with CHIME/FRB.

9–11 Dec. 2019 SALF VI. Arizona State University, USA. FRB localization with VLBI.

17–20 June 2019 Canadian Astronomical Society (CASCA) Annual Meeting. McGill University, Canada. VLBI efforts in support of CHIME/FRB.

20–21 Feb. 2018 Effelsberg Science Workshop MPIfR, Germany. Systematic measurements of the surface of the 100-m radio telescope using the out-of-focus holography method.

23–24 Jan. 2014 Third Cycle of Cosmology, Gravitation and Quantum Field Theory. UFRO, Chile. Gross-Neveu model.

5–6 Dec. 2013 Magnetism and Statistical Physics. UFRO, Chile. Percolation through silver nano-particles.

Conference posters

26–28 Nov. 2014 *Sociedad Chilena de Física* (SOCHIFI). Universidad de Concepción (UdeC), Chile. Percolation through silver nano-particles.

27–29 Oct. 2013 Chile-Mexico V Workshop on Magnetism, Nanosciences and their applications. Los Ándes, Chile. Percolation through silver nano-particles.

COMPUTING SKILLS

Operating systems Linux, Mac and Windows.

Languages Arduino, bash, C++, CASA, Git, IRAF, OpenMPI, Matlab, and Python (astropy).

Markup languages HTML, LaTeX, TeX, Gnuplot and Ti*k*Z.

Productive tools Abaqus, Ansys, CATIA, LibreOffice and Office.

RESEARCH EXPERIENCE

Sept. 2016–Oct. 2016 Internship: A new method to determine a pulsar period: the PCA Waterfall. Department of Information Engineering, Università di Padova, Italy. Supervisor: Dr. Giampiero Naletto.

July 2016–Aug. 2016 Internship: Angular momenta in dark matter subhalos (simulation). AIfA, Universität Bonn, Germany. Supervisor: Dr. Cristiano Porciani.

Jan. 2015–Mar. 2015 Internship: Photometry of three cataclysmic variables. Cerro Tololo Inter-American Observatory (CTIO), Chile. Supervisor: Dr. Tim Abbott.

Feb. 2014–Mar. 2014 Internship: Amplitude calibration device graphic user interface. ALMA, Chile. Supervisor: Engineer Jaime Guarda.

May 2012–Dec. 2013 Internship: Condensed matter physics and statistical physics: percolation of discrete sites. UFRO, Chile. Supervisor: Dr. Eugenio Vogel.

WORKSHOPS

3–12 July 2017 1st OPTICON Instrumentation School. Københavns Universitet, Denmark.

14–19 Aug. 2016 Dunlap Summer School: Introduction to Astronomical Instrumentation. U of T, Canada.

10–20 May 2016 International Max Planck Research School for Astronomy & Astrophysics. MPIfR, Germany. Statistics and Data Modeling by Dr. Douglas Applegate.

OUTREACH AND PRESS

Public lectures

26 Apr. 2022 UFRO, Chile. *Radio astronomía moderna*.

26 Nov. 2020 UFRO, Chile. *Introducción a la radio astronomía de ráfagas rápidas de radio*.

8 July 2020 UFRO, Chile. *El radio universo desconocido, fundamentos en radio astronomía*.

3 Jan. 2019 UFRO, Chile. *Ráfagas de Radio Rápidas, el último misterio astronómico*.

Jan. 2018–Jan. 2022 Outreach events: Astronomy on Tap, Space Time, Doors Open TO. Toronto, Canada.

Jan. 2018–Jan. 2022 Skype a Scientist. Online format.

Dec. 2012–Dec. 2013 President and founder of ASTROUFRO, a group orientated in promoting public knowledge of astronomy. UFRO, Chile.

Media appearances

Apr. 2025 *Nuevo fotómetro IQUEYE en Chile busca expandir el conocimiento astronómico*. Newspaper: Cooperativa ciencia, Chile.

Apr. 2025 *Nuevo fotómetro liderado por chilenos ve su primera luz en Observatorio Gemini Sur*. CATA.

Apr. 2025 *Nuevo instrumento astronómico liderado por chilenos ve su primera luz en Observatorio Gemini Sur*. Newspaper: El Mostrador, Chile

Apr. 2025 *Científicos chilenos crean sofisticado instrumento astronómico para uno de los observatorios más avanzados del país.* Newspaper: La Tercera, Chile.

Mar. 2025 *IQUEYE va in visita al Gemini South*. Istituto Nazionale di Astrofisica (INAF).

Mar. 2025 IQUEYE on Gemini South Sees First Light. NOIRLab.

Jan. 2025 *Columna de astronomía: Los eventos más rápidos del Universo*. Newspaper: El Mercurio, Chile.

Jan. 2025 *Factultad Ciencias Físicas y Matemáticas (FCFM) lidera investigación científica con siete nuevos proyectos Fondecyt 2025*. Institution web page.

Sept. 2024 Research Communities post: A VLBI-localized FRB probes the ISM at $z \sim 0.2$.

Dec. 2023 *Más de 350 millones de pesos en dos proyecto QUIMAL*. Institution web page.

June 2023 *Universidad de Chile inaugura cámara anecoica para la investigación de antenas, sensores y sistemas de radiofrecuencias*. Institution web page.

Sept. 2022 *La estudiante Fabiola Norambuena gana Beca de Movilidad*. Institution web page.

Sept. 2021 Dunlap Institute Graduate student of the month. Institution web page.

Nov. 2020 *Titulado UFRO forma parte de importante hito astrofísico*. Institution web page.

Nov. 2020 Detection of a radio burst in Milky Way could resolve origins of mysterious phenomenon. Institution web page.

Jan. 2019 Interview Bio-Bio La Radio, Chile. *Científicos detectan por segunda vez misteriosas ondas de radio desde una galaxia lejana*. Radio.

May 2015 A Successful Year for the CTIO Undergraduate Internship Programs in Chile. Institution web page.
