

TOMÁS ALBERTO CASSANELLI

Astronomer & Assistant Professor of Astronomical Instrumentation

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

EDUCATION

- January 2018–February 2022 **PhD Astronomy & Astrophysics**. University of Toronto (U of T), Dunlap Institute, Canada.
- October 2015–October 2017 **MSc Astrophysics**. Universität Bonn, Argelander Institut für Astronomie (AlfA) and Max-Planck-Institut für Radioastronomie (MPIfR), Germany.
- March 2009–January 2015 **Civil Industrial Engineering with a Major in Mechanics** (*título profesional*). Universidad de La Frontera (UFRO), Chile.
- August 2010–August 2014 **Applied Physics Bachelors Degree**. UFRO, Chile.

PROFESSIONAL APPOINTMENTS

- March 2022–Present [Assistant Professor \(Astronomical Instrumentation\), Electrical Engineering Department, Universidad de Chile \(UChile\), Chile.](#)
- November 2017–December 2017 Part time scientist: Out-of-focus holography at the Effelsberg telescope. MPIfR, Germany.

EXTERNAL POSITIONS

- September 2024–Present Canadian Hydrogen Intensity Mapping Experiment fast radio burst (CHIME/FRB) Collaboration. Followup committee member.
- April 2024–Present [Center for Astrophysics and Associated Technologies \(CATA\)](#) adjunct researcher.

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. Agencia Nacional de Investigación y Desarrollo (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.

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 astronómica generadas durante operaciones de transporte](#). Atacama Large Millimeter Array (ALMA), Chile. Supervisor: Engineer Armin Silber (European Southern Observatory) and Dr. Juan Möller (UFRO).

PUBLICATIONS

Refereed publications (45; 4 first author)

- 2024 **Cassanelli, T.**, C. Leung, P. Sanghavi, et al. (Nov. 2024). “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](https://doi.org/10.1038/s41550-024-02357-x).
- 2024 Lin, H.-H., P. Scholz, C. Ng, et al. (Nov. 2024). “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](https://doi.org/10.3847/1538-4357/ad779d).
- 2024 Cook, A. M., P. Scholz, A. B. Pearlman, et al. (Oct. 2024). “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](https://doi.org/10.3847/1538-4357/ad6a13).
- 2024 Bhardwaj, M., D. Michilli, A. Y. Kirichenko, et al. (Aug. 2024). “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](https://doi.org/10.3847/2041-8213/ad64d1).
- 2024 Lanman, A. E., S. Andrew, M. Lazda, et al. (Aug. 2024). “CHIME/FRB Outriggers: KKO Station System and Commissioning Results”. In: *AJ* 168.2, 87, p. 87. DOI: [10.3847/1538-3881/ad5838](https://doi.org/10.3847/1538-3881/ad5838).
- 2024 **Cassanelli, T.**, U. Bach, B. Winkel, et al. (July 2024). “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](https://doi.org/10.1051/0004-6361/202142116).
- 2024 CHIME/FRB Collaboration, M. Amiri, B. C. Andersen, et al. (July 2024). “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](https://doi.org/10.3847/1538-4357/ad464b).
- 2024 Pandhi, A., Z. Pleunis, R. Mckinven, et al. (June 2024). “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](https://doi.org/10.3847/1538-4357/ad40aa).
- 2024 Ibik, A. L., M. R. Drout, B. M. Gaensler, et al. (Jan. 2024). “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](https://doi.org/10.3847/1538-4357/ad0893).
- 2023 Abbott, R., T. D. Abbott, F. Acernese, et al. (Oct. 2023). “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](https://doi.org/10.3847/1538-4357/acd770).
- 2023 Sand, K. R., D. Breitman, D. Michilli, et al. (Oct. 2023). “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](https://doi.org/10.3847/1538-4357/acf221).
- 2023 Curtin, A. P., S. P. Tendulkar, A. Josephy, et al. (Sept. 2023). “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](https://doi.org/10.3847/1538-4357/ace52f).
- 2023 Mckinven, R., B. M. Gaensler, D. Michilli, et al. (July 2023a). “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](https://doi.org/10.3847/1538-4357/acd188).
- 2023 Mckinven, R., B. M. Gaensler, D. Michilli, et al. (June 2023b). “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](https://doi.org/10.3847/1538-4357/acc65f).
- 2023 Michilli, D., M. Bhardwaj, C. Brar, et al. (June 2023). “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](https://doi.org/10.3847/1538-4357/accf89).

- 2023 CHIME/FRB Collaboration, B. C. Andersen, K. Bandura, et al. (Apr. 2023). "CHIME/FRB Discovery of 25 Repeating Fast Radio Burst Sources". In: *ApJ* 947.2, 83, p. 83. DOI: [10.3847/1538-4357/acc6c1](https://doi.org/10.3847/1538-4357/acc6c1).
- 2023 Merryfield, M., S. P. Tendulkar, K. Shin, et al. (Apr. 2023). "An Injection System for the CHIME/FRB Experiment". In: *AJ* 165.4, 152, p. 152. DOI: [10.3847/1538-3881/ac9ab5](https://doi.org/10.3847/1538-3881/ac9ab5).
- 2023 Shin, K., K. W. Masui, M. Bhardwaj, et al. (Feb. 2023). "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](https://doi.org/10.3847/1538-4357/acaf06).
- 2022 Kader, Z., C. Leung, M. Dobbs, et al. (Aug. 2022). "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](https://doi.org/10.1103/PhysRevD.106.043016).
- 2022 Leung, C., Z. Kader, K. W. Masui, et al. (Aug. 2022). "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](https://doi.org/10.1103/PhysRevD.106.043017).
- 2022 **Cassanelli**, T., G. Naletto, G. Codogno, et al. (July 2022a). "New technique for determining a pulsar period: Waterfall principal component analysis". In: *A&A* 663, A106, A106. DOI: [10.1051/0004-6361/202243515](https://doi.org/10.1051/0004-6361/202243515).
- 2022 CHIME/FRB Collaboration Andersen, B. C., K. Bandura, M. Bhardwaj, et al. (July 2022). "Sub-second periodicity in a fast radio burst". In: *Nature* 607.7918, pp. 256–259. DOI: [10.1038/s41586-022-04841-8](https://doi.org/10.1038/s41586-022-04841-8).
- 2022 Sand, K. R., J. T. Faber, V. Gajjar, et al. (June 2022). "Multiband Detection of Repeating FRB 20180916B". In: *ApJ* 932.2, 98, p. 98. DOI: [10.3847/1538-4357/ac6cee](https://doi.org/10.3847/1538-4357/ac6cee).
- 2022 Chawla, P., V. M. Kaspi, S. M. Ransom, et al. (Mar. 2022). "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](https://doi.org/10.3847/1538-4357/ac49e1).
- 2022 Lanman, A. E., B. C. Andersen, P. Chawla, et al. (Mar. 2022). "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](https://doi.org/10.3847/1538-4357/ac4bc7).
- 2022 **Cassanelli**, T., C. Leung, M. Rahman, et al. (Feb. 2022). "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](https://doi.org/10.3847/1538-3881/ac3d2f).
- 2022 Kirsten, F., B. Marcote, K. Nimmo, et al. (Feb. 2022). "A repeating fast radio burst source in a globular cluster". In: *Nature* 602.7898, pp. 585–589. DOI: [10.1038/s41586-021-04354-w](https://doi.org/10.1038/s41586-021-04354-w).
- 2022 Mena-Parra, J., C. Leung, S. Cary, et al. (Feb. 2022). "A Clock Stabilization System for CHIME/FRB Outriggers". In: *AJ* 163.2, 48, p. 48. DOI: [10.3847/1538-3881/ac397a](https://doi.org/10.3847/1538-3881/ac397a).
- 2022 Nimmo, K., J. W. T. Hessels, F. Kirsten, et al. (Feb. 2022). "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](https://doi.org/10.1038/s41550-021-01569-9).
- 2021 CHIME/FRB Collaboration, M. Amiri, B. C. Andersen, et al. (Dec. 2021). "The First CHIME/FRB Fast Radio Burst Catalog". In: *ApJS* 257.2, 59, p. 59. DOI: [10.3847/1538-4365/ac33ab](https://doi.org/10.3847/1538-4365/ac33ab).
- 2021 Josephy, A., P. Chawla, A. P. Curtin, et al. (Dec. 2021). "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](https://doi.org/10.3847/1538-4357/ac33ad).

- 2021 Pleunis, Z., D. C. Good, V. M. Kaspi, et al. (Dec. 2021). "Fast Radio Burst Morphology in the First CHIME/FRB Catalog". In: *ApJ* 923.1, 1, p. 1. DOI: [10.3847/1538-4357/ac33ac](https://doi.org/10.3847/1538-4357/ac33ac).
- 2021 Rafiei-Ravandi, M., K. M. Smith, D. Li, et al. (Nov. 2021). "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](https://doi.org/10.3847/1538-4357/ac1dab).
- 2021 Mckinven, R., D. Michilli, K. Masui, et al. (Oct. 2021). "Polarization Pipeline for Fast Radio Bursts Detected by CHIME/FRB". In: *ApJ* 920.2, 138, p. 138. DOI: [10.3847/1538-4357/ac126a](https://doi.org/10.3847/1538-4357/ac126a).
- 2021 Bhardwaj, M., B. M. Gaensler, V. M. Kaspi, et al. (Apr. 2021). "A Nearby Repeating Fast Radio Burst in the Direction of M81". In: *ApJ* 910.2, L18, p. L18. DOI: [10.3847/2041-8213/abeaa6](https://doi.org/10.3847/2041-8213/abeaa6).
- 2021 Michilli, D., K. W. Masui, R. Mckinven, et al. (Apr. 2021). "An Analysis Pipeline for CHIME/FRB Full-array Baseband Data". In: *ApJ* 910.2, 147, p. 147. DOI: [10.3847/1538-4357/abe626](https://doi.org/10.3847/1538-4357/abe626).
- 2021 Pleunis, Z., D. Michilli, C. G. Bassa, et al. (Apr. 2021). "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](https://doi.org/10.3847/2041-8213/abec72).
- 2021 Leung, C., J. Mena-Parra, K. Masui, et al. (Feb. 2021). "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](https://doi.org/10.3847/1538-3881/abd174).
- 2020 CHIME/FRB Collaboration, B. C. Andersen, K. M. Bandura, et al. (Nov. 2020). "A bright millisecond-duration radio burst from a Galactic magnetar". In: *Nature* 587.7832, pp. 54–58. DOI: [10.1038/s41586-020-2863-y](https://doi.org/10.1038/s41586-020-2863-y).
- 2020 Scholz, P., A. Cook, M. Cruces, et al. (Oct. 2020). "Simultaneous X-Ray and Radio Observations of the Repeating Fast Radio Burst FRB ~ 180916.J0158+65". In: *ApJ* 901.2, 165, p. 165. DOI: [10.3847/1538-4357/abb1a8](https://doi.org/10.3847/1538-4357/abb1a8).
- 2020 Chawla, P., B. C. Andersen, M. Bhardwaj, et al. (June 2020). "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](https://doi.org/10.3847/2041-8213/ab96bf).
- 2020 Fonseca, E., B. C. Andersen, M. Bhardwaj, et al. (Mar. 2020). "Nine New Repeating Fast Radio Burst Sources from CHIME/FRB". In: *ApJ* 891.1, L6, p. L6. DOI: [10.3847/2041-8213/ab7208](https://doi.org/10.3847/2041-8213/ab7208).
- 2020 Marcote, B., K. Nimmo, J. W. T. Hessels, et al. (Jan. 2020). "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](https://doi.org/10.1038/s41586-019-1866-z).
- 2019 CHIME/FRB Collaboration, B. C. Andersen, K. Bandura, et al. (Nov. 2019). "CHIME/FRB Discovery of Eight New Repeating Fast Radio Burst Sources". In: *ApJ* 885.1, L24, p. L24. DOI: [10.3847/2041-8213/ab4a80](https://doi.org/10.3847/2041-8213/ab4a80).
- 2019 CHIME/FRB Collaboration, M. Amiri, K. Bandura, et al. (Jan. 2019). "A second source of repeating fast radio bursts". In: *Nature* 566.7743, pp. 235–238. DOI: [10.1038/s41586-018-0864-x](https://doi.org/10.1038/s41586-018-0864-x).

Submitted/accepted publications (8)

- 2024 Ng, C., A. Pandhi, R. Mckinven, et al. (Nov. 2024). "Polarization properties of 28 repeating fast radio burst sources with CHIME/FRB". In: *arXiv e-prints*, arXiv:2411.09045, arXiv:2411.09045. DOI: [10.48550/arXiv.2411.09045](https://doi.org/10.48550/arXiv.2411.09045).
- 2024 Eftekhari, T., Y. Dong, W. Fong, et al. (Oct. 2024). "The Massive and Quiescent Elliptical Host Galaxy of the Repeating Fast Radio Burst FRB20240209A". In: *arXiv e-prints*, arXiv:2410.23336, arXiv:2410.23336. DOI: [10.48550/arXiv.2410.23336](https://doi.org/10.48550/arXiv.2410.23336).

- 2024 Hewitt, D. M., M. Bhardwaj, A. C. Gordon, et al. (Oct. 2024). "A Repeating Fast Radio Burst Source in a Low-Luminosity Dwarf Galaxy". In: *arXiv e-prints*, arXiv:2410.17044, arXiv:2410.17044. DOI: [10.48550/arXiv.2410.17044](https://doi.org/10.48550/arXiv.2410.17044).
- 2024 Shah, V., K. Shin, C. Leung, et al. (Oct. 2024). "A repeating fast radio burst source in the outskirts of a quiescent galaxy". In: *arXiv e-prints*, arXiv:2410.23374, arXiv:2410.23374. DOI: [10.48550/arXiv.2410.23374](https://doi.org/10.48550/arXiv.2410.23374).
- 2024 *Braga, C. A.**, M. Cruces, T. **Cassanelli**, et al. (Aug. 2024). "FRB 20121102A monitoring: updated periodicity at L-band". In: *arXiv e-prints*, arXiv:2408.12567, arXiv:2408.12567. DOI: [10.48550/arXiv.2408.12567](https://doi.org/10.48550/arXiv.2408.12567).
- 2024 Leung, C., S. Andrew, K. W. Masui, et al. (Mar. 2024). "A VLBI Software Correlator for Fast Radio Transients". In: *arXiv e-prints*, arXiv:2403.05631, arXiv:2403.05631. DOI: [10.48550/arXiv.2403.05631](https://doi.org/10.48550/arXiv.2403.05631).
- 2024 Mckinven, R., M. Bhardwaj, T. Eftekhari, et al. (Feb. 2024). "A pulsar-like swing in the polarisation position angle of a nearby fast radio burst". In: *arXiv e-prints*, arXiv:2402.09304, arXiv:2402.09304. DOI: [10.48550/arXiv.2402.09304](https://doi.org/10.48550/arXiv.2402.09304).
- 2023 Sanghavi, P., C. Leung, K. Bandura, et al. (Apr. 2023). "TONE: A CHIME/FRB Outrigger Pathfinder for localizations of Fast Radio Bursts using Very Long Baseline Interferometry". In: *arXiv e-prints*, arXiv:2304.10534, arXiv:2304.10534. DOI: [10.48550/arXiv.2304.10534](https://doi.org/10.48550/arXiv.2304.10534).

Conference proceedings

- 2016 **Cassanelli**, T. and T. Abbott (Jan. 2016). "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

- 2021 Cary, S., J. Mena-Parra, C. Leung, et al. (Sept. 2021). "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](https://doi.org/10.3847/2515-5172/ac289d).

Lecture notes & course material

- 2023 **Cassanelli**, T. (Nov. 2023). *Electromagnetismo Aplicado*. Spanish. Version 1.0. DOI: [10.5281/zenodo.10067791](https://doi.org/10.5281/zenodo.10067791). URL: <https://doi.org/10.5281/zenodo.10067791>.

TEACHING

Courses taught

- July 2024–December 2024 Astronomy research project (AS4103). Astronomy Department. Universidad de Chile (UChile).
- July 2024–December 2024 Applied electromagnetism (EL3103). Electrical Engineering Department. UChile.
- March 2024–July 2024 Applied electromagnetism (EL3103). Electrical Engineering Department. UChile.
- March 2024–July 2024 Radio astronomy: applications, tools, and impact (EL6053). Electrical Engineering Department. UChile.
- July 2023–December 2023 Applied electromagnetism (EL3103). Electrical Engineering Department. UChile.
- March 2023–July 2023 Astronomy research project (AS4103). Astronomy Department. UChile.
- March 2023–July 2023 Targeted research (AS4107). Astronomy Department. UChile.
- March 2023–July 2023 Applied electromagnetism (EL3103). Electrical Engineering Department. UChile.
- August 2022–December 2022 Applied electromagnetism (EL3103). Electrical Engineering Department. UChile.

*Articles from supervised students.

April 2015–August 2015 Mechanics (ICF328). Physics Department. UFRO.

April 2015–August 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

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

September 2020–December 2020 Practical Astronomy (AST326) fall term. DADDAA. U of T.

August 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.

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

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

January 2020–April 2020 Stars and Galaxies (AST201) winter term. DADDAA. U of T.

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

September 2019–December 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.

January 2019–April 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.

January 2018–April 2018 Stars and Galaxies (AST201) winter term. DADDAA. U of T.

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

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

August 2013–December 2013 Calculus II (IME186). Mathematics and Statistics Department. UFRO.

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

August 2012–December 2012 Modern physics (ICF235). Physics Department. UFRO.

August 2012–December 2012 Mathematics fundamentals (IME020). Mathematics and Statistics Department. UFRO.

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

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

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

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

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

- March 2011–July 2011 Calculus II (IME186). Mathematics and Statistics Department. UFRO.
- March 2011–July 2011 Mechanics (ICF214). Physics Department. UFRO.
- March 2011–December 2011 Calculus (IME005 annual). Mathematics and Statistics Department. UFRO.
- March 2011–December 2011 General physics (ICF100 annual). Physics Department. UFRO.
- March 2010–December 2010 Calculus (IME005 annual). Mathematics and Statistics Department. UFRO.
- March 2010–December 2010 General physics (ICF100 annual). Physics Department. UFRO.

TRAINEE SUPERVISION

Postdoctoral research & laboratory engineering supervision

- March 2023–Present MSc. Physics Gonzalo Burgos. Canadian-Chilean array for radio transient studies (CHARTS) project engineer.

Graduate research supervision

- August 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.
- August 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



- March 2024–Present Vicente Aitken, electrical engineering student at UChile. Engineering thesis: Implementation of a 3-m radio dish as a pathfinder for the CHARTS project.
- March 2024–Present Francisco Muñoz, electrical engineering student at UChile. Engineering thesis: Design and build of a low noise amplification system (CHARTS project).
- August 2022–May 2023 Fabiola Norambuena, physics engineering student at UFRO. Engineering thesis: Data science analyses from Gemini South observations.

Undergraduate research students

- August 2024–Present Juan Pablo Contreras, electrical engineering student at UChile. Research: microstructure and fast radio burst pulse search in archival datasets.
- December 2023–Present Bruno Pollarolo, electrical engineering and astronomy student at UChile. Research: Fast radio burst analog pulse simulation and injection with [RFSoc technology](#) (CHARTS).
- December 2023–Present Joaquín Díaz, electrical engineering student at UChile. Research: Building a 3-m antenna dish and controlling system at Cerro Calán.
- June 2023–Present Pascual Marcone, electrical engineering student at UChile. Research: Pulsar timing analyses from fast photon counters (in preparation of Iqueye as a visitor instrument at Gemini South).
- March 2023–Present Cristóbal Braga, astronomy student at UChile. Summer research intern & astronomical research project (AS4103): Fast radio burst detection pipeline for the [astronomical radio transient experiment \(ARTE\)](#) project, and transient targeted searches Effelsberg 100-m telescope archived data.
- March 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.
- December 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–September 2023 Rufat Ismayilov, work-study program student at U of T. Research: Testing the very long baseline interferometry (VLBI) localization precision of the Dominion Radio Astrophysical Observatory (DRAO)-Algonquin Radio Observatory (ARO) baseline. Co-supervised alongside Dr. Gusinskaia (U of T).
- January 2023–March 2023 Marcelo Gatica, electrical engineering student at UChile. Summer research intern: Signal processing for fast photon counters.
- September 2020–April 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](#).

GRANTS AND ALLOCATIONS

Research grants

- May 2024 PARD2024, co-I. Iqueye at Gemini South: the highest sensitivity to look at the fastest variable astronomical objects, \$44 000. Università di Padova, Italy.
- December 2023 Dunlap Seed Fund 2023, co-I. CHARTS, \$255 000. Dunlap Institute, U of T, Canada.
- December 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.
- April 2023 Trip to commission CHIME/FRB Outrigger Green Bank Observatory (GBO) telescope, \$3000. VID, UChile.
- September 2022 Faculty settlement initial grant, \$10 000. VID, UChile.

Telescope allocations

- 2024B Can magnetars in complex environments explain the origin of fast radio burst?, co-I, ALMA cycle 11, 5.2 hours.
- 2023B Probing the formation pathway of a fast radio burst: CO 3-2 observations towards FRB190520, PI. ALMA cycle 10, 18 hours.
- 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).
- 2023A CHIME/FRB observed repeaters & followup with the UWL (CORFU), co-I. UWL/Murriyang (Parks Observatory). 200 hours.
- 2022B Chemical gradients & heat transport in an Ultra-Hot Jupiter Atmosphere, co-I. MAROON-X/Gemini North. 4 hours (fast turnaround).
- 2021 [Precise Pulsar Positions for CHIME/FRB Outrigger Calibration](#), co-I. Very Large Baseline Array (VLBA). 42 hours (regular).
- 2020 [Precise Pulsar Positions for CHIME/FRB Outrigger Calibration](#), co-I. VLBA. 60 hours (regular).

ACADEMIC SERVICE

- 2024 Referee. *Journal of Cosmology and Astroparticle Physics* (JCAP).
- 2023 FRB2023 Chair of the VLBI & Instrumentation session.
- 2023 Electrical Engineering Department, UChile, faculty search committee.
- 2023B Referee. ALMA Cycle 10.
- 2023 Referee. Elsevier *Astronomy & Computing*.

- 2022 Referee. *Proyectos de exploración*. ANID.
 2022B Referee. Gemini Fast Turnaround program.

Thesis and PhD examination committees

- August 2024 Lucas Bernales, Pontificia Universidad Católica de Valparaíso (PUCV), supervisor: Prof. Nicolás Tejos.
 August 2024 Luis Rodríguez, Pontificia Universidad Católica de Chile (PUC), supervisors: Prof. Franz Bauer and Prof. Marilyn Cruces.
 August 2024 Francisca Solís, UChile, supervisor: Prof. Ricardo Finger.
 June 2024 Felipe Lucero, UChile, supervisor: Prof. Patricio Mena.

RESEARCH PRESENTATIONS

Seminars, Colloquia, and Discussions

- 13 September 2024 UFRO. Colloquium: Canadian-Chilean array for radio transient studies (CHARTS).
 20 August 2024 Pontificia Universidad Católica de Chile. Colloquium: CHARTS.
 6 June 2024 *Seminario de astrofísica, cosmología y gravitación*. PUCV, Chile. Colloquium: Towards detection of fast radio transients in Chile.
 13 February 2024 Gemini South, National Optical-Infrared Astronomy Research Laboratory (NOIRLab). Colloquium: A fast photon counter for Gemini South.
 10 January 2024 Astronomy Department, UChile. Colloquium: A fast photon counter for Gemini South.
 9 November 2023 Fast radio bursts (FRBs) 2023. Online format. **Invited for panel discussion: Hidden parameter spaces.**
 4 August 2022 *Seminario Departamento Ingeniería Mecánica*. UFRO, Chile. **Invited talk: Holografía en el radio telescopio Effelsberg 100-m.**
 17 May 2022 Colloquia at the MPIfR. **Special Colloquium:** Out-of-focus holography at the Effelsberg telescope.
 14 February 2022 Brown Bag Lunch talk at Massachusetts Institute of Technology (MIT). **Invited talk:** FRB Localization with CHIME/FRB Outriggers.
 20–21 February 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 January 2014 Third Cycle of Cosmology, Gravitation and Quantum Field Theory. UFRO, Chile. Presenting Gross-Neveu model.
 5–6 December 2013 Magnetism and Statistical Physics. UFRO, Chile. Presenting percolation through silver nano-particles.

Conference talks

- 13–16 March 2023 *Sociedad Chilena de Astronomía* (SOCHIAS) meeting, UFRO, Chile. New technique for determine pulsar period: waterfall principal component analysis.
 14–18 February 2022 VLBI in the Square Kilometre Array (SKA) Era. Online format. **Invited talk:** FRB Localization with CHIME/FRB Outriggers.
 28 July–5 August 2021 FRBs 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 FRBs 2020. Online format. **Technical developments session:** [FRB localization efforts with VLBI in collaboration with CHIME/FRB.](#)
 9–11 December 2019 Science at Low Frequency (SALF). Arizona State University, Tempe, Arizona, USA. FRB localization with VLBI.
 17–20 June 2019 Canadian Astronomical Society (CASCA) Annual Meeting. McGill University, Montreal, Canada. VLBI efforts in support of CHIME/FRB.

Conference posters

- 26–28 November 2014 *Sociedad Chilena de Física* (SOCHIFI). Universidad de Concepción (UdeC), Chile. Presenting percolation through silver nano-particles.
- 27–29 October 2013 Chile-Mexico V Workshop on Magnetism, Nanosciences and their applications. Los Ándes, Chile. Presenting 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 TikZ.
- Productive tools Abaqus, Ansys, CATIA, LibreOffice and Office.

RESEARCH EXPERIENCE

- September 2016–October 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–August 2016 Internship: Angular momenta in dark matter subhalos (simulation). AlfA, Universität Bonn, Germany. Supervisor: Dr. Cristiano Porciani.
- January 2015–March 2015 Internship: Photometry of three cataclysmic variables. Cerro Tololo Inter-American Observatory (CTIO), Chile. Supervisor: Dr. Tim Abbott.
- February 2014–March 2014 Internship: Amplitude calibration device graphic user interface. ALMA, Chile. Supervisor: Engineer Jaime Guarda.
- May 2012–December 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 (University of Copenhagen), Denmark.
- 14–19 August 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 April 2022 Public talk at UFRO, Temuco, Chile. *Radio astronomía moderna*.
- 26 November 2020 Public talk at UFRO, Temuco, Chile. *Introducción a la radio astronomía de ráfagas rápidas de radio*.
- 8 July 2020 Public talk at UFRO, Temuco, Chile. *El radio universo desconocido, fundamentos en radio astronomía*.
- January 2019 Public Talk at UFRO, Temuco, Chile. *Ráfagas de Radio Rápidas, el último misterio astronómico*.
- 2018–2022 Outreach events: Astronomy on Tap, Space Time, Doors Open TO. Toronto, Canada.
- 2018–2022 [Skype a Scientist](#). Toronto, Canada.
- December 2012–December 2013 President and founder of ASTROUFRO, a group orientated in promoting public knowledge of astronomy. UFRO, Chile.

Media appearances

- September 2024 Research Communities post: [A VLBI-localized FRB probes the ISM at \$z \sim 0.2\$](#) .
- December 2023 [Más de 350 millones de pesos en dos proyectos 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.
- September 2022 [La estudiante Fabiola Norambuena gana Beca de Movilidad](#). Institution web page.
- September 2021 [Dunlap Institute Graduate student of the month](#). Institution web page.
- November 2020 [Titulado UFRO forma parte de importante hito astrofísico](#). Institution web page.
- November 2020 [Detection of a radio burst in Milky Way could resolve origins of mysterious phenomenon](#). Institution web page.
- January 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.