TOMÁS ALBERTO CASSANELLI

Assistant Professor of Electrical Engineering

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

EDUCATION

January 2018 - February 2022 **PhD Astronomy & Astrophysics**. University of Toronto, Canada.

October 2015 - October 2017 **MSc Astrophysics**. Universität Bonn and Max-Planck-Institut für Radioastronomie, Germany.

March 2009 - January 2015 **Civil Industrial Engineering with a Major in Mechanics** (Título Profesional). Universidad de La Frontera, Chile.

August 2010 - August 2014 **Applied Physics Bachelors Degree**. Universidad de La Frontera, Chile.

PROFESSIONAL APPOINTMENTS

March 2022 - Present Assistant Professor, Departamento Ingeniería Eléctrica, Universidad de Chile, Chile.

November 2017 - December 2017 Part time scientist: Out-of-focus holography at the Effelsberg telescope. Max-Planck-Institut für Radioastronomie, Germany.

AWARDS

2020 "Department of Astronomy & Astrophysics Graduate Program Award". University of Toronto, Canada, $800.

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

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

2017 Becas Chile (CONICYT/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. Universidad de La Frontera, Chile, $920.

THESES

2022 **Astronomy & Astrophysics Doctoral thesis**: Fast Radio Burst localization with Very Long Baseline Interferometry. University of Toronto, Canada.
Supervisor: Dr. Keith Vanderlinde.

2017 **Astronomy & Astrophysics MSc thesis**: Systematic measurements of the surface of the 100-m radio telescope using the out-of-focus holography method.
Max-Planck-Institut für Radioastronomie, Germany.
Supervisor: Dr. Karl Menten.

2015 **Civil Engineering thesis**: Análisis de las vibraciones en instrumentación de observación astronónomica generadas durante operaciones de transporte*.
Atacama Large Millimeter/submillimeter Array (ALMA), Chile.
Supervisor: Mechanical Engineer Armin Silber (ESO Cryogenics) and Dr. Juan Möller (Universidad de La Frontera).

*Vibration analysis of astronomical instrumentation related to transport operations.

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). Argelander Institut für Astronomie, 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 — Project: Amplitude calibration device graphic user interface. ALMA, Chile.
Supervisor: Electronic Engineer Jaime Guarda.

May 2012 - December 2013 — Project: Condensed matter physics and statistical physics: percolation of discrete sites. Universidad de La Frontera, Chile.
Supervisor: Dr. Eugenio Vogel.

SUBMITTED/ACCEPTED PUBLICATIONS (5)

2022 The LIGO Scientific Collaboration et al, incl. **Cassanelli, T.** Search for Gravitational Waves Associated with Fast Radio Bursts Detected by CHIME/FRB During the LIGO–Virgo Observing Run O3a, arXiv e-prints.

2021 Sand, Ketan R. et al, incl. **Cassanelli, T.** Multiband Detection of Repeating FRB 20180916B, arXiv e-prints.

2021 **Cassanelli, T.** et al. Out-of-focus holography at the Effelsberg telescope, arXiv e-prints.

2021 The CHIME/FRB Collaboration et al, incl. **Cassanelli, T.** Sub-second periodicity in a fast radio burst, arXiv e-prints.

2021 The CHIME/FRB Collaboration et al, incl. **Cassanelli, T.** The First CHIME/FRB Fast Radio Burst Catalog, arXiv e-prints.

REFEREED PUBLICATIONS (22)

2022 Lanman, Adam E. et al, incl. **Cassanelli, T.** A Sudden Period of High Activity from Repeating Fast Radio Burst 20201124A, The Astrophysical Journal.

2022 Chawla, P. et al, incl. **Cassanelli, T.** Modeling Fast Radio Burst Dispersion and Scattering Properties in the First CHIME/FRB Catalog, The Astrophysical Journal.

2022 Mena-Parra, J. et al, incl. **Cassanelli, T.** A Clock Stabilization System for CHIME/FRB Outriggers, The Astronomical Journal.

2022 **Cassanelli, T.** et al. Localizing FRBs through VLBI with the Algonquin Radio Observatory 10 m Telescope, The Astronomical Journal.

2022 Kirsten, F. et al, incl. **Cassanelli, T.** A repeating fast radio burst source in a globular cluster, Nature.

2022 Nimmo, K. et al, incl. **Cassanelli, T.** Burst timescales and luminosities as links between young pulsars and fast radio bursts, Nature Astronomy.

2021 Pleunis, Ziggy et al, incl. **Cassanelli, T.** Fast Radio Burst Morphology in the First CHIME/FRB Catalog, The Astrophysical Journal.

2021 Josephy, A. et al, incl. **Cassanelli, T.** No Evidence for Galactic Latitude Dependence of the Fast Radio Burst Sky Distribution, The Astrophysical Journal.

2021 CHIME/FRB Collaboration et al, incl. **Cassanelli, T.** The First CHIME/FRB Fast Radio Burst Catalog, The Astrophysical Journal Supplement Series.

2021 Rafiei-Ravandi, Masoud et al, incl. **Cassanelli, T.** CHIME/FRB Catalog 1 Results: Statistical Cross-correlations with Large-scale Structure, The Astrophysical Journal.

2021 Mckinven, R. et al, incl. **Cassanelli, T.** Polarization Pipeline for Fast Radio Bursts Detected by CHIME/FRB, The Astrophysical Journal.

2021 Bhardwaj, M. et al, incl. **Cassanelli, T.** A Nearby Repeating Fast Radio Burst in the Direction of M81, The Astrophysical Journal.

2021 Pleunis, Z. et al, incl. **Cassanelli, T.** LOFAR Detection of 110-188 MHz Emission and Frequency-dependent Activity from FRB 20180916B, The Astrophysical Journal.

2021 Michilli, D. et al, incl. **Cassanelli, T.** An Analysis Pipeline for CHIME/FRB Full-array Baseband Data, The Astrophysical Journal.

2021 Leung, Calvin et al, incl. **Cassanelli, T.** A Synoptic VLBI Technique for Localizing Nonrepeating Fast Radio Bursts with CHIME/FRB, The Astronomical Journal.

2020 CHIME/FRB Collaboration et al, incl. **Cassanelli, T.** A bright millisecond-duration radio burst from a Galactic magnetar, Nature.

2020 Scholz, P. et al, incl. **Cassanelli, T.** Simultaneous X-Ray and Radio Observations of the Repeating Fast Radio Burst FRB 180916.J0158+65, The Astrophysical Journal.

2020 Chawla, P. et al, incl. **Cassanelli, T.** Detection of Repeating FRB 180916.J0158+65 Down to Frequencies of 300 MHz, The Astrophysical Journal.

2020 Fonseca, E. et al, incl. **Cassanelli, T.** Nine New Repeating Fast Radio Burst Sources from CHIME/FRB, The Astrophysical Journal.

2020 Marcote, B. et al, incl. **Cassanelli, T.** A repeating fast radio burst source localized to a nearby spiral galaxy, Nature.

2019 CHIME/FRB Collaboration et al, incl. **Cassanelli, T.** CHIME/FRB Discovery of Eight New Repeating Fast Radio Burst Sources, The Astrophysical Journal.

2019 CHIME/FRB Collaboration et al, incl. **Cassanelli, T.** A second source of repeating fast radio bursts, Nature.

CONFERENCE TALKS

14–18 February 2022 VLBI in the SKA Era. Online format. *Invited talk*: FRB Localization with CHIME/FRB Outriggers.

28 July–5 August 2021 Fast Radio Bursts 2021 (FRB2021). Online format. *Breaking news session*: First VLBI localization of a single-burst FRB with the CHIME/FRB Outrigger testbed ARO 10-m.

6–9 July 2020 Fast Radio Bursts 2020 (FRB2020). Online format. *Technical developments session*: FRB localization efforts with VLBI in collaboration with CHIME/FRB.

9–11 December 2019 Science at Low Frequencies (SALF). Arizona State University, Tempe, Arizona, USA. Fast Radio Burst Localization with VLBI.

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

20–21 February 2018 Effelsberg Science Workshop Max-Planck-Institut für Radioastronomie, 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. Universidad de La Frontera, Chile. Presenting Gross-Neveu model.

5–6 December 2013 Magnetism and Statistical Physics. Universidad de La Frontera, Chile. Presenting percolation through silver nano-particles.

CONFERENCE PROCEEDINGS

2016 **Cassanelli, Tomas** and Abbott, Tim. Photometry of the old nova HZ Pup, American Astronomical Society Meeting Abstracts 227.

CONFERENCE POSTERS

26–28 November 2014 Sociedad Chilena de Física (Chilean Physics Society). Universidad de Concepción, 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.

LECTURING EXPERIENCE

7–12 July 2019	Dunlap Instrumentation Summer School. Lead lecturer and facilitator in the interferometry laboratory. Dunlap Institute, University of Toronto, Canada.
April 2015 - August 2015	Mechanics lecturer at the Departamento de Ciencias Físicas (Physics Department), Universidad de La Frontera, Chile.
April 2015 - August 2015	Dynamics lecturer at the Departamento de Ingeniería Mecánica (Mechanical Engineering Department), Universidad de La Frontera, Chile.

OTHER TEACHING EXPERIENCE

September 2021 - December 2021	Teaching Assistant for The Sun and Its Neighbours (AST101) fall term. University of Toronto, Canada.
26–30 July 2021	Dunlap Instrumentation Summer School. Facilitator for the radio fundamentals laboratory (online format). Dunlap Institute, University of Toronto, Canada.
September 2020 - December 2020	Teaching Assistant for Practical Astronomy (AST326) fall term. University of Toronto, Canada.
August 2020	Teaching Assistant for Practical Astronomy (AST326). Redesign course for online delivery (due to COVID-19 pandemic).
May 2020 - June 2020	Teaching Assistant for Life on Other Worlds (AST251) summer term. University of Toronto, Canada.
May 2020 - June 2020	Teaching Assistant for Great Moments in Astronomy (ASTB03) summer term. University of Toronto Scarborough, Canada.
January 2020 - April 2020	Teaching Assistant for Astrophysics of Planetary Systems (ASTC25) winter term. University of Toronto Scarborough, Canada.
January 2020 - April 2020	Teaching Assistant for Advanced Computational Methods in Physics (PHYD57) winter term. University of Toronto Scarborough, Canada.
January 2020 - April 2020	Teaching Assistant for Stars and Galaxies (AST201) winter term. University of Toronto, Canada.
September 2019 - April 2020	Teaching Assistant for Practical Astronomy (AST326) fall and winter terms. University of Toronto, Canada.
September 2019 - December 2019	Teaching Assistant for Introduction to Practical Astronomy (AST325) fall term. University of Toronto, Canada.
May 2019 - June 2019	Teaching Assistant for Great Moments in Astronomy (ASTB03) summer term. University of Toronto Scarborough, Canada.
May 2019 - June 2019	Teaching Assistant for The Sun and Its Neighbours (AST101) summer term. University of Toronto, Canada.
January 2019 - April 2019	Teaching Assistant for Stars and Galaxies (AST201) winter term. University of Toronto, Canada.
May 2018 - June 2018	Teaching Assistant for The Sun and Its Neighbours (AST101) summer term. University of Toronto, Canada.
January 2018 - April 2018	Teaching Assistant for Stars and Galaxies (AST201) winter term. University of Toronto, Canada.
May 2010 - December 2014	Teaching Assistant for civil engineering students in Calculus I, Calculus II, Calculus III, Differential Equations, General Physics, Physics II, Modern Physics, Fundamental Mathematics, Complex Variable and Mechanics. Universidad de La Frontera, Chile.

COMPUTING SKILLS

Operating systems	Linux, Mac and Windows.

Languages	Arduino, bash, C++, CASA, Git, IRAF, OpenMPI, Matlab, and Python (astropy).
Markup languages	HTML, LaTeX, Gnuplot and Ti*k*Z.
Productive tools	Abaqus, Ansys, CATIA, LibreOffice and Office.

WORKSHOPS

3–12 July 2017	1st OPTICON Instrumentation School. University of Copenhagen, Denmark.
14–19 August 2016	Dunlap Summer School: Introduction to Astronomical Instrumentation. University of Toronto, Canada.
10–20 May 2016	International Max Planck Research School for Astronomy and Astrophysics. Max-Planck-Institut für Radioastronomie, Germany. Statistics and Data Modeling by Dr. Douglas Applegate.

OUTREACH

26 November 2020	Public talk at Universidad de La Frontera, Temuco, Chile. Introducción a la radio astronomía de Fast Radio Bursts*.

*Introduction to the astronomy of Fast Radio Bursts.

8 July 2020	Public talk at Universidad de La Frontera, Temuco, Chile. El radio universo desconocido, fundamentos en radio astronomía*.

*The unknown radio universe, radio astronomy principles.

January 2019	Public Talk at Universidad de La Frontera, Temuco, Chile. Fast Radio Bursts, el último misterio astronómico*.

*Fast Radio Bursts the latest astronomical mystery.

2018 - Present	Outreach events: Astronomy on Tap, Space Time, Doors Open TO, and Skype a Scientist. Toronto, Canada.
December 2012 - December 2013	President and founder of ASTROUFRO, a group orientated in promoting public knowledge of astronomy. Universidad de La Frontera, Chile.

MEDIA APPEARANCES

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.