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Research Positions

- since Oct 2024 📌 **Alexander von Humboldt Fellow**, Max Planck Institute for Astrophysics, Garching - Germany. Host: Prof. Dr. Selma de Mink.
- Mar 2023 - Sep 2024 📌 **Postdoctoral Scientific Staff**, University of Hamburg, Hamburg - Germany. Adviser: Prof. Dr. Stephan Rosswog.
- Oct 2019 - Feb 2023 📌 **Postdoctoral Researcher**, Charles University, Prague - Czech Republic. Adviser: Assoc. Prof. Dr. Ondřej Pejcha.
- Feb – Nov 2018 📌 **Visiting Ph.D. student**, Max Planck Institute for Extraterrestrial Physics, Garching - Germany. Hosts: Prof. Dr. Andreas Burkert & Dr. Marc Schartmann.
- Jan – Mar 2013 📌 **Research Intern**, Cerro Tololo Inter-American Observatory, La Serena - Chile. Adviser: Dr. Percy Gómez.

Education

- Sep 2019 📌 **Ph.D. in Astrophysics**, *summa cum laude*, Pontificia Universidad Católica de Chile. Thesis: *"The Role of Interacting Stellar Winds Feeding Sagittarius A"*. Advisers: Prof. Dr. Jorge Cuadra & Dr. Marc Schartmann.
- Mar 2015 📌 **Master in Astrophysics**, *summa cum laude*, Pontificia Universidad Católica de Chile. Thesis: *"Thin-shell instabilities and clump formation due to colliding stellar winds in the Galactic Centre"*. Adviser: Prof. Dr. Jorge Cuadra.
- Dec 2012 📌 **Bachelor in Astronomy**, *summa cum laude*, Universidad de Concepción, Chile. Ranked 1 out of 35 enrolled at the Astronomy program in 2009.

Honors and Awards

- Jul 2024 📌 **Heraeus Fellowship**, Wilhelm and Else Heraeus Foundation, Germany.
- Sep 2023 📌 **Quantum Universe Postdoctoral Grant**, University of Hamburg, Germany.
- Mar 2023 📌 **Humboldt Research Fellowship**, Alexander von Humboldt Foundation, Germany.
- 2015-2019 📌 **Doctoral Fellowship**, National Agency for Research and Development (ANID), Chile.
- Mar 2015 📌 **Doctoral Excellence Award**, Pontificia Universidad Católica de Chile.
- 2013-2014 📌 **Master Fellowship**, National Agency for Research and Development (ANID), Chile
- 2009-2012 📌 **Undergraduate Scholarship**, Center for Excellence in Astrophysics and Associated Technologies (CATA).

Refereed Publications

Summary: 16 published (+1 submitted, +1 in prep.), 8 first-author papers (+1 in prep.).
NASA ADS (Nov 2025): 195 citations. Papers with students are shown in bold italic.

- 1 Gillessen, S., Eisenhauer, F., Cuadra, J., Genzel, R., **Calderón, D.**, Joharle, S., Piran, T., Ribeiro, D. C., Russell, C. M. P., Sadun Bordoni, M., Burkert, A., Bourdarot, G., Drescher, A., Mang, F., Ott, T., Agapito, G., Agudo Berbel, A., Baruffolo, A., Bonaglia, M., ... Xompero, M. (2025). The gas streamer G1-2-3 in the Galactic Center. *Submitted to A&A Letters*, Article arXiv:2510.00897. 🌐 <https://doi.org/10.48550/arXiv.2510.00897>
- 2 **Kirilov, A., Calderón, D.**, Pejcha, O., & Duffell, P. C. (2025). Two-Dimensional Radiation-Hydrodynamic Simulations of Luminous Red Novae. *ApJL*, 994(2), L41. 🌐 <https://doi.org/10.3847/2041-8213/ae1ae7>

- 3 **Shaqil, W., Calderón, D.,** Rosswog, S., Cuadra, J., Ciurlo, A., Morris, M. R., Campbell, R. D., & Ghez, A. M. (2025). Tidal phenomena in the Galactic Center: The Curious Case of X7. *A&A*, 700, A134. <https://doi.org/10.1051/0004-6361/202555191>
- 4 Villanueva, V., Blaña, M., Bolatto, A. D., Rubio, M., Tarantino, E., Herrera-Camus, R., Burkert, A., Vaz, D., Read, J. I., Galaz, G., Muñoz, C., **Calderón, D.,** Behrendt, M., Carballo-Bello, J. A., Gray, E., & Fellhauer, M. (2025). The CHIMERA Survey: The first CO detection in Leo T, the lowest mass known galaxy still hosting cold molecular gas. *A&A*, 699, L11. <https://doi.org/10.1051/0004-6361/202555635>
- 5 **Calderón, D.,** Cuadra, J., Russell, C. M. P., Burkert, A., Rosswog, S., & Balakrishnan, M. (2025). The formation and stability of a cold disc made out of stellar winds in the Galactic centre. *A&A*, 693, A180. <https://doi.org/10.1051/0004-6361/202452800>
- 6 Blaña, M., Burkert, A., Fellhauer, M., **Calderón, D.,** Behrendt, M., & Schartmann, M. (2024). The Milky Way satellite galaxy Leo T: A perturbed cored dwarf. *A&A*, 692, A183. <https://doi.org/10.1051/0004-6361/202451649>
- 7 Balakrishnan, M., Corrales, L., Markoff, S., Nowak, M., Haggard, D., Wang, Q. D., Neilsen, J., Russell, C. M. P., **Calderón, D.,** Cuadra, J., & Baganoff, F. (2024). Multistructured Accretion Flow of Sgr A*. I. Examination of a Radiatively Inefficient Accretion Flow Model. *ApJ*, 974(1), 98. <https://doi.org/10.3847/1538-4357/ad6c08>
- 8 Balakrishnan, M., Russell, C. M. P., Corrales, L., **Calderón, D.,** Cuadra, J., Haggard, D., Markoff, S., Neilsen, J., Nowak, M., Wang, Q. D., & Baganoff, F. (2024). Multistructured Accretion Flow of Sgr A*. II. Signatures of a Cool Accretion Disk in Hydrodynamic Simulations of Stellar Winds. *ApJ*, 974(1), 99. <https://doi.org/10.3847/1538-4357/ad6866>
- 9 **Calderón, D.,** Pejcha, O., Metzger, B. D., & Duffell, P. C. (2024). The effect of relativistic precession on light curves of tidal disruption events. *MNRAS*, 528(2), 2568–2587. <https://doi.org/10.1093/mnras/stae194>
- 10 Pejcha, O., **Calderón, D.,** & Kurfürst, P. (2022). Supernovae in colliding-wind binaries: observational signatures in the first year. *MNRAS*, 510(3), 3276–3290. <https://doi.org/10.1093/mnras/stab3729>
- 11 **Calderón, D.,** Pejcha, O., & Duffell, P. C. (2021). Moving-mesh radiation-hydrodynamic simulations of wind-reprocessed transients. *MNRAS*, 507(1), 1092–1105. <https://doi.org/10.1093/mnras/stab2219>
- 12 Gómez, P. L., & Calderón, D. (2020). The Dynamics of the Wide-angle Tailed (WAT) Galaxy Cluster A562. *AJ*, 160(4), 152. <https://doi.org/10.3847/1538-3881/aba831>
- 13 **Calderón, D.,** Cuadra, J., Schartmann, M., Burkert, A., Prieto, J., & Russell, C. M. P. (2020). Three-dimensional simulations of clump formation in stellar wind collisions. *MNRAS*, 493(1), 447–467. <https://doi.org/10.1093/mnras/staa090>
- 14 **Calderón, D.,** Cuadra, J., Schartmann, M., Burkert, A., & Russell, C. M. P. (2020). Stellar Winds Pump the Heart of the Milky Way. *ApJL*, 888(1), L2. <https://doi.org/10.3847/2041-8213/ab5e81>
- 15 **Calderón, D.,** Cuadra, J., Schartmann, M., Burkert, A., Plewa, P., Eisenhauer, F., & Habibi, M. (2018). The Galactic Centre source G2 was unlikely born in any of the known massive binaries. *MNRAS*, 478(3), 3494–3505. <https://doi.org/10.1093/mnras/sty1330>
- 16 **Calderón, D.,** Bauer, F. E., Veilleux, S., Graciá-Carpio, J., Sturm, E., Lira, P., Schulze, S., & Kim, S. (2016). Searching for molecular outflows in hyperluminous infrared galaxies. *MNRAS*, 460(3), 3052–3062. <https://doi.org/10.1093/mnras/stw1210>
- 17 **Calderón, D.,** Ballone, A., Cuadra, J., Schartmann, M., Burkert, A., & Gillessen, S. (2016). Clump formation through colliding stellar winds in the Galactic Centre. *MNRAS*, 455(4), 4388–4398. <https://doi.org/10.1093/mnras/stv2644>

Service & Skills

Coding	■ C, FORTRAN, Python, SHELL scripts.
Languages	■ Czech (B1), English (C1), German (A2), Spanish (mother tongue).
Professional	■ SOC member at XIX Chilean Astronomical Society Annual Meeting (Nov 2024). ■ SOC member at 2nd Workshop of Astronomy Students (March 2017).
Referee	■ Astrophysical Journal (3), Czech Science Agency (2), Israel Science Foundation.
Representation	■ Postdoctoral Representative 2025 at Max Planck Institute for Astrophysics.
Supervision	■ Timea Unold - Master student at Technical University of Munich - since Oct 2025. ■ Anthony Kirilov - Ph.D. student at Charles University - expected Aug 2026. ■ Wasif Shaqil - Master student at University of Hamburg - Apr 2025. Next position Ph.D. student at Liverpool John Moores University, United Kingdom.
Thesis Committee	■ Michal Jireš - Bachelor in Physics at Charles University - Feb 2024. ■ Yelyzaveta Pulnova - Master in Physics at Charles University - Sep 2021.

Teaching Experience



2024-2025	■ Teaching assistant at Ludwig Maximilian University of Munich in graduate course: "Astrophysics Seminar" (Fall 2024, Spring 2025).
2023-2024	■ Teaching assistant at University of Hamburg in undergraduate course: "Introduction to Astronomy" (Spring 2023); and graduate course: "Astrophysical Hydrodynamics" (Fall 2023).
2019 - 2023	■ Co-organiser of Science Coffee (also as a class), Charles University.
Oct 2021	■ Special lecture: "Introduction to Radiation Hydrodynamics", Charles University.
2017	■ Science Coffee (in charge once per week), Pontificia Universidad Católica de Chile.
2015-2017	■ Teaching Assistant at Pontificia Universidad Católica de Chile in undergraduate courses: "Extragalactic Astrophysics" (Fall 2017), "Introduction to Physics" (Spring 2015), "Introduction to Astronomy" (Fall 2015); and graduate courses: "Galactic Centre Astrophysics" (Spring 2016), "Radiative Processes in Astrophysics" (Fall 2016).
2011-2012	■ Teaching Assistant at Universidad de Concepción in undergraduate courses: "General Astrophysics" (Fall 2012), and "Electromagnetic Theory" (Spring 2011).

Funding and Grants







2025-2026	■ Cycle 4 JWST Theory grant #8655 (PI: C. Russell) as co-Investigator, USA.
2025-2028	■ FONDECYT Regular 2025 (PI: J. Cuadra), as co-Investigator, ANID ¹ , Chile.
Jul 2024	■ Heraeus Fellowship (~5 k€), Wilhelm and Else Heraeus Foundation, Germany.
Sep 2023	■ Quantum Universe Postdoctoral Grant (10 k€), University of Hamburg, Germany.
Mar 2023	■ Humboldt Fellowship (~100 k€), Alexander von Humboldt Foundation, Germany.
Jan 2023	■ 2,210,400 CPU hours awarded , IT4Innovations Supercomputing Center, Czechia.
2022-2023	■ Cycle 24 Chandra Theory grant #24200412 (PI: C. Russell) as co-Investigator, USA.
Mar 2022	■ 936,000 CPU hours , IT4Innovations National Supercomputing Center, Czechia.
2021-2022	■ Cycle 23 Chandra Theory grant #23610258 (PI: C. Russell) as co-Investigator, USA.
2015-2019	■ Doctoral Fellowship (~45 k€), ANID, Chile - Plus internship abroad for 10 months and travel budget for 2 years (total: ~20 k€).
Mar 2015	■ Doctoral Excellence Award (~10 k€), Pontificia Universidad Católica de Chile.
2014, 2016, 2018	■ Adelina Gutiérrez Travel Grant , Chilean Astronomical Society (SOCHIAS).

¹ANID: National Agency for Research and Development





Funding and Grants (continued)

- 2013-2014  **Master Fellowship** (~15 k€), ANID, Chile.
- 2009-2012  **Undergraduate Scholarship** (~8 k€), Center for Excellence in Astrophysics and Associated Technologies (CATA).

Extended Workshops and Summer Schools

- Jul 2024  Special Meeting: 73rd Lindau Nobel Laureate Meeting , Lindau – Germany
- Jul 2023  School: Kavli Summer Program in Astrophysics, Garching – Germany
- Jul 2022  Workshop: “*Plasma Under Strong Gravity*”, Aspen Center for Physics, Aspen – USA.
- Aug 2017  School: “*Astrophysical Plasmas*”, Niels Bohr Institute, Copenhagen – Denmark.
- Apr 2015  School “*Scientific Writing for Young Astronomers*”, EDP Sciences, Puerto Varas – Chile.
- Jun 2014  School: “*Galaxies: Near and Far, Young and Old*”, Vatican Observatory – Vatican City



Invited Conference Talks

- May 2025  19th International Max Planck Research School Symposium - Germany.
- Jul 2024  17th Marcel Grossmann Meeting - Pescara, Italy.
- Feb 2024  Quantum Universe Postdoctoral Grant Prize talk at DESY - Hamburg, Germany.
- Apr 2023  Galactic Center Workshop - Granada, Spain.


























Conference Oral Contributions

- Nov 2025  RAGTIME27 Workshop - Opava, Czech Republic.
- Jun 2025  “*X-ray QPEs and Repeating Nuclear Transients*” Workshop - Madrid, Spain.
- Sep 2024  “*X-ray transients, theory and observational perspectives*” Conference - Warsaw, Poland.
-  “*Tidal Disruption Events and Nuclear Transients*” Conference - Heraklion, Greece.
- Apr 2024  RAMSES User Meeting 2024 - New York, USA.
- Dec 2023  “*Fundamental Physics at the Galactic Centre*” Workshop - Porto, Portugal.
- Jul 2023  “*Black-hole accretion discs 50 years on: current fortunes and new challenges*” and “*Supermassive Black Hole Transients and Their Host Galaxies*” Special Sessions at EAS - Kraków, Poland.
- Apr 2023  “*Quantum Universe Day*” at DESY - Hamburg, Germany.
- Nov 2022  6th Users’ Conference of IT4Innovations - Ostrava, Czech Republic.
- Oct 2022  RAGTIME24 Workshop - Opava, Czech Republic.
- Sep 2022  31st Texas Symposium on Relativistic Astrophysics - Prague, Czech Republic.
- Nov 2021  “*The Predictive Power of Computational Astrophysics as a Discovery Tool*” Symposium - Online.
- Sep 2021  RAGTIME23 Workshop - Opava, Czech Republic.
- Feb 2021  43rd COSPAR Assembly - Online Symposium.
- Jan 2021  XVI Chilean Astronomical Society (SOCHIAS) Annual Meeting - Online.
- Jul 2020  European Astronomical Society (EAS) Annual Meeting - Online.
- Oct 2019  “*Common-Envelope Evolution and Post-Common-Envelope Systems*” Workshop - London, UK.
- Sep 2018  RAMSES User Meeting 2018 - Lyon, France.
- Jul 2018  42nd COSPAR Assembly - Pasadena, USA.
- Nov 2016  XV Latin American Regional IAU Meeting (LARIM) - Cartagena, Colombia.
- Mar 2016  XIII Chilean Astronomical Society (SOCHIAS) Annual Meeting - Antofagasta, Chile.
- Feb 2016  “*Dynamics and Accretion at the Galactic Center*” Workshop - Aspen, USA.












Conference Oral Contributions (continued)

- Mar 2015  XII Chilean Astronomical Society (SOCHIAS) Annual Meeting - Puerto Varas, Chile.
Jun 2014  European Week of Astronomy and Space Sciences (EWASS) - Geneva, Switzerland.











Invited Talks at Research Institutions

- Aug 2025  Seminar at Astronomical Institute, Czech Academy of Sciences - Prague, Czechia.
Mar 2025  Astronomy seminar at Universidad de Santiago de Chile - Santiago, Chile.
 Astronomy seminar at Universidad de Concepción - Concepción, Chile.
Feb 2025  Institute seminar at Max Planck Institute for Astrophysics - Garching, Germany.
Jan 2025  Astronomy seminar at Departamento de Astronomía, Universidad de Chile - Santiago, Chile.
Apr 2024  Astrophysics seminar at University of Delaware - Newark, USA.
Jan 2024  Computational Astrophysics seminar at Ludwig Maximilian University - Munich, Germany.
Oct 2023  Astronomy seminar at Universidad de Valparaíso - Valparaíso, Chile.
 Astronomy seminar at Universidad Federico Santa María - Valparaíso, Chile.
Sep 2023  Astronomy colloquium at Universidad de Concepción - Concepción, Chile.
Jul 2023  Computational Astrophysics seminar at Ludwig Maximilian University - Munich, Germany.
Jun 2023  Observatory Colloquium at Hamburg Observatory - Hamburg, Germany.
Oct 2021  Relativistic Seminar at Silesian University - Opava, Czech Republic.
Sep 2021  Astronomy seminar at Masaryk University - Brno, Czech Republic.
Mar 2021  Stellar seminar at Czech Academy of Sciences - Online.
Feb 2021  Relativistic seminar at Charles University - Online.
Apr 2020  ELI Beamlines Scientific Seminar - Dolní Břežany, Czech Republic.
Feb 2020  Numerical Mathematics Seminar at Charles University - Prague, Czech Republic.
Oct 2019  Japan Aerospace Exploration Agency (JAXA) High-energy Seminar - Sagami-hara, Japan.
Aug 2019  European Southern Observatory (ESO) Seminar - Santiago, Chile.
Oct 2018  G2G on WR140 Workshop at Royal Observatory of Edinburgh - Edinburgh, Scotland.
Sep 2018  Centre for mathematical Plasma-Astrophysics seminar at KU Leuven - Leuven, Belgium.
Jul 2017  High-energy Astrophysics Seminar at Max Planck Institute for Astrophysics - Germany.
Feb 2017  Infrared group Tea meeting at Max Planck Institute for Extraterrestrial Physics - Germany.
Jun 2016  Astronomy seminar at Universidad de Concepción - Concepción, Chile.

Conference Poster Contributions

- Nov 2022  "The Impact of Binaries on Stellar Evolution" Workshop - Garching, Germany.
Jul 2020  European Astronomical Society (EAS) Annual Meeting - Leiden, Netherlands.
Oct 2019  "New Horizons in Galactic Center Astronomy and Beyond" Workshop - Yokohama, Japan.
Jun 2017  European Week of Astronomy and Space Sciences (EWASS) - Prague, Czech Republic.
Oct 2016  xv Latin American Regional IAU Meeting (LARIM) - Cartagena, Colombia.
Jul 2016  "The Multi-Messenger Astrophysics of the Galactic Centre" Symposium - Cairns, Australia.
Jul 2015  International Workshop on Wolf-Rayet stars - Potsdam, Germany.
Mar 2015  "Unveiling the AGN-Galaxy Evolution Connection" Workshop - Puerto Varas, Chile.
Jul 2014  European Week of Astronomy and Space Sciences (EWASS) - Geneva, Switzerland.
Jan 2014  223rd American Astronomical Society Meeting - Baltimore, USA.
Nov 2013  xiv Latin American Regional IAU Meeting (LARIM) - Florianópolis, Brazil.

Outreach Efforts

- May 2025  *"Lunch with an Astrophysicist"* at Max Planck Institute for Astrophysics, Germany.
- Jul 2024  Galactic Centre Virtual Reality at *"Sternstunden Festival"*, Hamburg Observatory.
- Jun 2024  Galactic Centre Virtual Reality at *"Quantum Universe Day"* at DESY in Hamburg.
- 2023-2024  Editor of the Hamburg Observatory Newsletter.
- Jul 2023  *"Ask an Astronomer"* and Tour Guide at *"Sternstunden Festival"*, Hamburg Observatory.
- 2020  Interview at online newspaper *"El Contraste"* during Solar Eclipse 2020, Chile.
- 2014-2016  Quantum Physics course for high-school teachers, Pontificia Universidad Católica de Chile.
- 2015  Special lectures for students during the *"Day of Astronomy"* in Curicó, Chile.
- 2013-2014  Physics courses for high-school students at Pontificia Universidad Católica de Chile.
- 2011-2012  Guide of public astronomical observations at Universidad de Concepción, Chile.

References

Prof. Dr. Andreas Burkert

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