

Diego Calderón

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Research Positions

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| 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

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

Honors and Awards

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| 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: 15 published (+1 submitted, +1 in press, +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 in press*, Article arXiv:2508.09257.  <https://doi.org/10.48550/arXiv.2508.09257>

- 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>

[ADS library link](#)

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).
- Referee SOC member at 2nd Workshop of Astronomy Students (March 2017).
- Representation Astrophysical Journal (3), Czech Science Agency (2), Israel Science Foundation.
- Supervision Postdoctoral Representative 2025 at Max Planck Institute for Astrophysics.
- 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, ANID¹, 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 - Sagamihara, 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) - Florianopolis, 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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