

Antonio Casares

*Postdoctoral Researcher in Theoretical
Computer Science*

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Birth date: 11 April 1997

Research Experience

- Oct 2025 – **PostDoc**, *University of Kaiserslautern-Landau, (Germany)*.
Now Supervisor: Anthony Lin.
- Dec 2023 – **PostDoc**, *University of Warsaw, (Poland)*.
Oct 2025 Supervisor: Mikołaj Bojańczyk.
- Oct 2020 – **PhD Thesis**, *LaBRI, Université de Bordeaux, (France)*.
Nov 2023 Title: *Structural properties of automata over infinite words and memory for games*.
Supervisors: Nathanaël Fijalkow and Igor Walukiewicz.
PhD Thesis Award “Science and Technology” from the University of Bordeaux.
- April 2020 – **Master Thesis**, *IRIF, Université de Paris, (France)*.
July 2020 Title: *Optimal transformations of Muller conditions*.
Supervisors: Thomas Colcombet and Nathanaël Fijalkow.
- Sept 2018 – **Bachelor Thesis**, *Universidad de Valladolid, (Spain)*.
July 2019 Title: *Valuations, Hardy fields and o-minimal structures*.
Supervisor: Fernando Sanz Sánchez.

Education

- 2019 – 2020 **Master in Mathematical Logic and Foundations of Computer Science**,
Université de Paris, (France), Average grade: 19.26/20.
Supported by the Fondation Sciences Mathématiques de Paris.
- 2015 – 2019 **Bachelor in Mathematics**, *Universidad de Valladolid, (Spain)*, Average grade:
8.88/10.
Premio Extraordinario Fin de Grado (Special award for the best student record).
- 2018 – 2019 **Erasmus exchange program**, *Université de Versailles, (France)*, Average grade:
18.74/20.
Courses of the first year of master on algebra and cryptography.

Publications

Book chapters

- Scheduled for **Positionality and Memory**, in “*Games on Graphs*” (Cambridge University
April 2026 Press), with Pierre Ohlmann and Pierre Vandenholve, edited by Nathanaël
Fijalkow.
<https://arxiv.org/abs/2305.10546>

Surveys

- Bulletin
EATCS Oct
2025
- Transition-Based vs State-Based Acceptance for Automata over Infinite Words**, (*Survey, single author*).
<http://eatcs.org/beatcs/index.php/beatcs/article/view/864>
◦ Invited for presentation at the [online FLAT seminar](#).

Journals

- TheoretiCS
2026
- Positional ω -Regular Languages**, with Pierre Ohlmann.
<https://doi.org/10.46298/theoretics.26.5>
- LMCS (to
appear)
- Infinite Lexicographic Products of Positional Objectives**, with Pierre Ohlmann, Michał Skrzypczak and Igor Walukiewicz.
<https://arxiv.org/abs/2506.14544>
- LMCS 2025
- Characterising Memory in Infinite Games**, with Pierre Ohlmann.
<https://lmcs.episciences.org/15411>
- TheoretiCS
2024
- From Muller to Parity and Rabin Automata: Optimal Transformations Preserving (History) Determinism**, with Thomas Colcombet, Nathanaël Fijalkow and Karoliina Lehtinen.
<https://doi.org/10.46298/theoretics.24.12>
- LMCS 2024
- Half-Positional Objectives Recognized by Deterministic Büchi Automata**, with Patricia Bouyer, Mickael Randour and Pierre Vandenhoë.
<https://lmcs.episciences.org/14130>

Peer-reviewed international conferences

- LICS 2026
- Layered Automata: A canonical model for ω -regular languages**, with Christof Löding and Igor Walukiewicz.
<https://arxiv.org/abs/2601.15940>
- LICS 2026
- An automata model for the MSO-Borel theory of the full binary tree**, with Mikołaj Bojańczyk, Sven Manthe and Paweł Parys.
<https://antonio-casares.github.io/Publications/BCMP26Borel.pdf>
- ICALP 2025
- The Memory of ω -Regular and $BC(\Sigma_2^0)$ Objectives**, with Pierre Ohlmann.
DOI: 10.4230/LIPIcs.ICALP.2025.149
- CSL 2025
- On the Minimisation of Deterministic and History-Deterministic Generalised (co)Büchi Automata**, with Olivier Idir, Denis Kuperberg, Corto Mascle and Aditya Prakash.
DOI: 10.4230/LIPIcs.CSL.2025.22
- TACAS 2025
- Fast Value Iteration: A Uniform Approach to Efficient Algorithms for Energy Games**, with Michaël Cadilhac and Pierre Ohlmann.
DOI: 0.1007/978-3-031-90653-4_16
- LICS 2024
- Positional ω -Regular Languages**, with Pierre Ohlmann.
<https://amu.hal.science/hal-04894058/document>
- MFCS 2024
- The Complexity of Simplifying ω -Automata through the Alternating Cycle Decomposition**, with Corto Mascle.
DOI: 10.4230/LIPIcs.MFCS.2024.35

- SOSA 2024 **Simple and Tight Complexity Lower Bounds for Solving Rabin Games**, with Marcin Pilipczuk, Michal Pilipczuk, Uéverton S. Souza, K. S. Thejaswini.
DOI: 10.1137/1.9781611977936.16
- ICALP 2023 **Characterising Memory in Infinite Games**, with Pierre Ohlmann.
DOI: 10.4230/LIPIcs.ICALP.2023.122
- CONCUR 22, IJCAI 2023 **Half-Positional Objectives Recognized by Deterministic Büchi Automata**, with Patricia Bouyer, Mickael Randour and Pierre Vandenhovere.
DOI: 10.4230/LIPIcs.CONCUR.2022.20
 - Invited for publication in LMCS special issue.
 - Invited for presentation at IJCAI 2023 (Best Papers from Sister Conferences Track).
<https://www.ijcai.org/proceedings/2023/713>
- ICALP 2022 **On the Size of Good-For-Games Rabin Automata and its Link with the Memory in Muller Games**, with Thomas Colcombet and Karoliina Lehtinen.
DOI: 10.4230/LIPIcs.ICALP.2022.117
- TACAS 2022 **Practical Applications of the Alternating Cycle Decomposition**, with Alexandre Duret-Lutz, Klara J. Meyer, Florian Renkin and Salomon Sickert.
DOI: 10.1007/978-3-030-99527-0_6
- CSL 2022 **On the Minimisation of Transition-Based Rabin Automata and the Chromatic Memory Requirements of Muller Conditions**.
DOI: 10.4230/LIPIcs.CSL.2022.12
 - Helena Rasiowa Award (Best Student Paper Award).
 - Invited for publication in LMCS special issue (declined).
- ICALP 2021 **Optimal Transformations of Games and Automata using Muller Conditions**, with Thomas Colcombet and Nathanaël Fijalkow.
DOI: 10.4230/LIPIcs.ICALP.2021.123

Preprints (unpublished)

- 2024 **A Positional Π_0^3 -Complete Objective**, with Pierre Ohlmann and Pierre Vandenhovere.
<https://arxiv.org/abs/2410.14688>
- History-deterministic Büchi automata are succinct**, with Aditya Prakash and K. S. Thejaswini.
<https://arxiv.org/abs/2603.05380>

Awards and Honours

Thesis Prize “Sciences and Technologies”, *Award for excellent thesis dissertation*, Université de Bordeaux, 2024.

Helena Rasiowa Award for the Best Student Paper, CSL 2022.

Laureate of the *Paris Graduate School of Mathematics (PGSM)*, *Scholarship awarded by the Fondation Sciences Mathématiques de Paris*, 2019.

Premio extraordinario fin de grado, *Special award to the best record of the undergraduate degree*, Universidad de Valladolid, 2019.

Supervising activities

- May 2026 - **Émilie Neyraud. Three-month M1 internship**, *Topic: Boolean combinations of layered automata*, (only supervisor).
August 2026 University of Kaiserslautern-Landau, Germany.
- Sept 2024 - **Kacper Lewandowski. Master Thesis (M2)**, *Topic: On the size of deterministic and history-deterministic automata*, (only supervisor).
Sept 2025 University of Warsaw, Poland.
- May 2025 - **Alan Le Brech. Two-month M1 internship**, *Topic: Universal value-iteration algorithms*, (only supervisor).
August 2025 University of Warsaw, Poland.
- Oct 2023 **Kacper Lewandowski. 3 weeks internship**, *Topic: Lower bounds for energy-games algorithms*, (with Nathanaël Fijalkow and Pierre Vandenhove, 33% supervision).
LaBRI, Université de Bordeaux.

Talks

Invited talks, in workshops and other events.

- [Online FLAT seminar](#), Dec 2025 – *Transition-based vs. state-based acceptance for automata over infinite words*.
- [Young Research Forum](#) (satellite of MFCS 2025), Warsaw, Aug 2025 – *How to write a good introduction*.
- [Young Research Forum](#) (satellite of MFCS 2025), Warsaw, Aug 2025 - *Panel member*.
- Day of the EDMI (Doctoral School in Mathematics and Computer Science) of Bordeaux, April 2025 – *Can we program using only for loops?*
- Talk for the Thesis Prize Ceremony of the University of Bordeaux, Nov 2024.

Seminar talks, under invitation.

- Rouen, Séminaire d'informatique théorique (France), May 2026.
- IRISA, ENS Rennes (France), March 2025.
- Automata Team, IRIF, Paris (France), Feb 2026.
- MOVE Team, Marseille (France), Nov 2025.
- Plume Team, ENS Lyon (France), Nov 2025.
- BAAM Team, Marne La Vallée (France), Nov 2025.
- ISTA Vienna, groups of T. Henzinger and K. Chatterjee (Austria), Oct 2025.
- Automata Seminar, MIMUW, University of Warsaw (Poland), May 2025.
- MPI Kaiserslautern, Georg Zetsche's group (Germany), April 2025.
- Plume Team, LIP Lyon (France), Nov 2024.
- Automata Team, IRIF, Paris (France), Nov 2024.
- Pôle Modèles, LMF, Paris-Saclay (France), Oct 2024.
- Automata Seminar, MIMUW, University of Warsaw (Poland), Oct 2024.
- MOVE Team, LIS, Marseille (France), April 2024.
- Automata Seminar, MIMUW, University of Warsaw (Poland), Dec 2023.
- Automata Team, IRIF, Paris (France), Oct 2023.
- LX Team, LaBRI, Bordeaux (France), Sept 2023.
- Automata Seminar, MIMUW, University of Warsaw (Poland), Dec 2022.
- MOVE Team, LIS, Marseille (France), Dec 2021.
- LX Team, LaBRI, Bordeaux (France), Nov 2021.
- Hebrew University of Jerusalem, Orna Kupferman's group (Israel, online), July 2021.
- Automata Team, IRIF, Paris (France), July 2021.
- Formal Methods Department, LaBRI, Bordeaux (France), Dec 2020.

Contributed talks at workshops.

- GT Verif, Créteil (France), Nov 2025.
- SAMSA Workshop, Warsaw (Poland), May 2025.
- Program Synthesis Days, LaBRI, Bordeaux (France), Nov 2024.
- ATLAS Workshop, Rennes (France), April 2024.
- GT DAAL Meeting, Rennes (France), April 2024.
- GT Verif, LaBRI, Bordeaux (France), July 2022.
- ANR Delta Meeting, CIRM, Marseille (France), May 2022.
- ANR Delta Meeting, IRIF, Paris (France), June 2021.
- GT ALGA, Online, June 2021.
- Spotlight on Games Workshop, Online, Nov 2020.

Conference talks.

- Highlights 2025, Saarbrücken (Germany).
- ICALP 2025, Aarhus (Denmark).
- LICS 2024, Tallin (Estonia).
- Highlights 2024, Bordeaux (France).
- MFCS 2024, Bratislava (Slovakia).
- Highlights 2023, Kassel (Germany).
- ICALP 2022, Paris (France).
- Highlights 2022, Paris (France).
- CSL 2022, Online.
- Highlights 2021, Online.
- ICALP 2021, Online.

Scientific outreach talks, (see also *Invited talks*).

- PhD Student Seminar, Bordeaux (France), March 2023 – *Some logical paradoxes*.
- Student Seminar of the Toulouse Mathematics Institute (online), Feb 2021 – *The synthesis problem: From logic to games*.
- National Meeting of Mathematics Students (ENEM) (online), July 2020 – *Can we program using only for loops?*

Organization of scientific events and professional activities

- Oct 2021 – **Publicity Chair of the International Conference “Highlights of Logic, Games and Automata”**
- Oct 2025
- Member of the Steering Committee.*
- Dec 2021 – **Vice-president of the AFoDIB (PhD student association)**
- Dec 2022 *LaBRI and INRIA, Bordeaux, France.*
- Sept 2021 – **Co-organizer of the Formal Methods and Models Seminar**
- Sept 2022 *LaBRI, Bordeaux, France.*
- Sept 2021 – **Organizer of the Sémi-doc Seminar (PhD student seminar)**
- Dec 2022 *LaBRI and INRIA, Bordeaux, France.*
- Mars 2021 – **Member of the board of the AFoDIB (PhD student association)**
- Nov 2023 *LaBRI and INRIA, Bordeaux, France.*
- Sept 2020 **Member of the Organizing Committee of Highlights of Logic, Games and Automata**
- Online.*

Reviewing activities

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| Conferences | Reviewer for LICS (2021, 2022, 2024, 2025, 2026), ICALP (2024, 2025, 2026), CAV (2025), CONCUR (2026), SODA (2025, 2026), STACS (2022, 2023, 2025), FOSSACS (2023, 2026), CSL (2026), MFCS (2021, 2022, 2024), FSTTCS (2021, 2022), LATIN (2024), DLT (2023), GandALF (2021). |
| Journals | Reviewer for LMCS (2024,2025), ToCL (2021). |

Participation in invitation-based scientific events

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| Jan – May 2021 | Simons Institute Spring 2021 research program “Theoretical Foundations of Computer Systems program” (online). |
| July 2025 | Autobóz research camp (Grenaa, Denmark). |
| July 2024 | Autobóz research camp (Keibu, Estonia). |
| Jun 2024 | Dagstuhl Seminar “Stochastic Games”. |
| Sept 2023 | Dagstuhl Seminar “The Futures of Reactive Synthesis ”. |
| July 2023 | Autobóz research camp (Kassel, Germany). |
| April 2022 | Nomad Automata Workshop (Hauteluze, France). |
| Nov 2021 | Dagstuhl Seminar “Unambiguity in Automata Theory” (online participation). |
| Dec 2022 | Visit to the automata team of MIMUW, University of Warsaw, Poland. |

Teaching

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| Spring 2025 | Automated Reasoning , <i>Master course</i> , 16h, Lectures on SAT solving, decidability of logics and the simplex method. RPTU Kaiserslautern, Germany. |
| Fall 2025 | Winter Seminar on Logic and Verification , <i>Tutoring Master students reading papers on neural-networks and program synthesis</i> . RPTU Kaiserslautern, Germany. |
| April 2024 | Two invited lectures on Universal graphs for games , <i>Bachelor Course “Algorithmic aspects of game theory”</i> . University of Warsaw, Poland. |
| Jan 2024 | Invited lecture on Positionality of parity games , <i>Master Course “Advanced topics in automata”</i> . University of Warsaw, Poland. |
| Fall 2023 | Algorithmic Aspects of Game Theory (3rd-4th year bachelor) , <i>Problem sessions</i> , 24 hours. University of Warsaw, Poland. |
| Fall 2022 | Programmation Impérative 1 (3rd year bachelor) , <i>Teacher assistant</i> , 20 hours, Programming in C. ENSEIRB-MATMECA, Bordeaux INP, France. |
| Fall 2022 | Systèmes de Gestion de Bases de Données (4th year bachelor) , <i>Teacher assistant</i> , 12 hours, Database modeling and SQL. ENSEIRB-MATMECA, Bordeaux INP, France. |
| Spring 2022 | Algorithmique des Tableaux (1st year bachelor) , <i>Teacher assistant</i> , 32 hours, Sorting algorithms in Python. Université de Bordeaux, France. |

- Spring 2022 **Modèles de la Programmation et du Calcul (3rd year bachelor)**, *Teacher assistant*, 32 hours, Automata theory.
Université de Bordeaux, France.
- Spring 2021 **Modèles de la Programmation et du Calcul (3rd year bachelor)**, *Teacher assistant*, 32 hours, Automata theory.
Université de Bordeaux, France.
- Fall 2020 **Coloration Informatique (1st year bachelor)**, *Teacher assistant*, 32 hours, Programming project in Python.
Université de Bordeaux, France.

Languages

- Spanish: Native
- English: Fluent
- French: Fluent
- Polish: Basic

Other Interests

Music (violin and piano, former member of several orchestras: OSiUP, JOUVA, BISYOC).
Philosophy of science, language and the mind. Sports (ultimate frisbee and badminton).