

# Antonio Casares

*PhD Student in Theoretical Computer Science*

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🎂 Birth date: 11 April 1997

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## Research Experience

- Oct 2020 – **PhD Thesis**, *LaBRI, Université de Bordeaux, (France)*
- Summer 2023 Title: *Structural properties of  $\omega$ -automata and infinite games.*  
Supervisors: Thomas Colcombet (IRIF, CNRS), Nathanaël Fijalkow (LaBRI, CNRS), Igor Walukiewicz (LaBRI, CNRS).
- April 2020 – **Master Thesis**, *IRIF, Université de Paris, (France)*
- July 2020 Title: *Optimal transformations of Muller conditions.*  
Supervisors: Thomas Colcombet (IRIF, CNRS), Nathanaël Fijalkow (LaBRI, CNRS).
- Sept 2018 – **Bachelor Thesis**, *Universidad de Valladolid, (Spain)*
- July 2019 Title: *Valuations, Hardy fields and  $\omega$ -minimal structures.*  
Supervisor: Fernando Sanz Sánchez (Universidad de Valladolid).

## 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 programme**, *Université de Versailles, (France)*, Average grade: 18.74/20  
Last year of the Bachelor's degree. Courses of the first year of master on applied algebra.

## Publications

### Conferences

- CONCUR 2022 **Half-Positional Objectives Recognized by Deterministic Büchi Automata**,  
Invited for publication in LMCS special issue  
With Patricia Bouyer, Mickael Randour and Pierre Vandenhover.
- 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.
- TACAS 2022 **Practical Applications of the Alternating Cycle Decomposition**  
With Alexandre Duret-Lutz, Klara J. Meyer, Florian Renkin and Salomon Sickert.

- CSL 2022 **On the Minimisation of Transition-Based Rabin Automata and the Chromatic Memory Requirements of Muller Conditions**, 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.

### Preprints

- Submitted to **Characterising Memory in Infinite Games**  
ICALP 2023 With Pierre Ohlmann.
- 2021 **On the ESL Algorithm for Energy Games**  
With Pierre Ohlmann.

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### Talks

- Dec 2022 **A correspondence between memory and automata for Muller languages**, *MIMUW Automata Theory Seminar*, University of Warsaw, Poland
- July 2022 **On the size of good-for-games Rabin automata and its link with the memory in Muller games**  
*Highlights and ICALP 2022*, Paris, France.
- July 2022 **Half-positional objectives recognized by deterministic Büchi automata**  
*National GT Verif Meeting*, LaBRI, Bordeaux, France.
- May 2022 **Half-positional objectives recognized by deterministic Büchi automata**  
*ANR Delta Meeting*, CIRM, Marseille, France.
- Feb 2022 **On the minimisation of transition-based Rabin automata and the chromatic memory requirements of Muller conditions**  
*CSL 2022 (Online)*, Göttingen, Germany.
- Dec 2021 **On a correspondence between memory structures for Muller games and Rabin automata**  
*Seminar for the team MOVE*, LIS, Marseille, France.
- Nov 2021 **On a correspondence between memory structures for Muller games and Rabin automata**  
*Seminar for the team LX*, LaBRI, Bordeaux, France.
- Sept 2021 **The arena-independent memory requirements of Muller conditions**  
*Highlights 2021 (online)*, Aachen, Germany.
- July 2021 **Optimal transformations of games and automata using Muller conditions**  
*ICALP 2022 (online)*, Glasgow, Scotland.
- July 2021 **On the minimisation of transition-based Rabin automata**  
*Seminar at the Hebrew University of Jerusalem (online)*, Israel.
- July 2021 **Optimal transformations of games and automata using Muller conditions**  
*Seminar Automata Group at IRIF*, Paris, France.
- June 2021 **On the minimisation of transition-based Rabin automata**  
*ANR Delta Meeting*, IRIF, Paris, France.
- June 2021 **Optimal transformations of Muller conditions**  
*GT ALGA Annual Meeting (online)*, Bordeaux, France.

- Feb 2021 **The synthesis problem: from logic to games**  
*Student Seminar of the Toulouse Mathematics Institute (online)*, Toulouse, France.
- Dec 2020 **Optimal transformations of Muller conditions**  
*Seminar of the Formal Methods team (online)*, LaBRI, Bordeaux, France.
- Nov 2020 **Memory requirements for generalised reachability games**  
*Presentation of a problem at Spotlight on Games Workshop (online)*.
- July 2020 **Can we program using only for loops?**  
*National Meeting of Mathematics Students (ENEM)*, Valladolid (online), Spain.

## Organization of Scientific Events and Professional Activities

- Oct 2021– **Publicity Chair of Highlights of Logic, Games and Automata**  
Now *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)**  
Now *LaBRI and INRIA, Bordeaux, France.*
  - Sept 2020 **Member of the Organizing Committee of Highlights of Logic, Games and Automata**  
*Online.*
- Reviewing activities**
- Conferences Reviewer for STACS 2023, FOSSACS 2023, DLT 2023, STACS 2022, LICS 2022, MFCS2022, FSTTCS 2022, LICS 2021, MFCS 2021, GandALF 2021, FSTTCS 2021.
  - Journals Reviewer for ToCL (2021).

## Attendance of Scientific Events

- Dec 2022 Visit to the automata team of MIMUW, University of Warsaw, Poland.
- July 2022 Meeting of the GT Verif, Bordeaux, France.
- July 2022 Highlights and ICALP 2022, Paris, France.
- March 2022 Meeting of the GT DAAL, Lille, France.
- Feb 2022 CSL 2022 (online).
- Dec 2021 Visit to the MOVE team, LIS, Marseille, France.
- Jan – May 2021 Simons Institute Spring 2021 research program. Participant in the Theoretical Foundations of Computer Systems program (online).
- Sept 2021 IMS Workshop: Automata Theory and Applications 2021, (online).
- Sept 2021 Highlights of Logic, Games and Automata 2021, (online).
- July 2021 ICALP 2021, (online).

- June 2021 Meeting of the ANR DELTA, IRIF, Paris, France.
- Nov 2020 Spotlight on Games Workshop, (online).
- June 2020 *MOVEP 2020* 14th Summer School on Modelling and Verification of Parallel Processes, (online).
- July 2020 *XXI ENEM*, National Meeting of Mathematics Students, (online).
- July 2018 *XIX ENEM*, National Meeting of Mathematics Students, Universidad de Valencia, Spain.
- July 2017 *Algebraic Topology Summer School*, Gulbenkian Foundation, Lisbon, Portugal.
- July 2017 Summer school on *Intelligent Transport Systems*, UNED, Plasencia, Spain.

## Scholarships and Awards

- 2022 Helena Rasiowa Award (Best Student Paper Award of the conference CSL).
- 2019 Laureate of the *Paris Graduate School of Mathematics (PGSM)*. Scholarship awarded by the *Fondation Sciences Mathématiques de Paris*.
- 2019 *Premio extraordinario fin de grado*, Universidad de Valladolid. Special award to the best record among the mathematics graduates of the year.

## Teaching

- Fall 2022 **Programmation Impérative 1 (3<sup>rd</sup> year bachelor)**, *Teacher assistant*, 20 hours, Programming in C  
ENSEIRB-MATMECA, Bordeaux INP, France.
- Fall 2022 **Systèmes de Gestion de Bases de Données (4<sup>th</sup> year bachelor)**, *Teacher assistant*, 12 hours, Database modeling and SQL  
ENSEIRB-MATMECA, Bordeaux INP, France.
- Spring 2022 **Algorithmique des Tableaux (1<sup>st</sup> year bachelor)**, *Teacher assistant*, 32 hours, Sorting algorithms in Python  
Université de Bordeaux, France.
- Spring 2022 **Modèles de la Programmation et du Calcul (3<sup>rd</sup> year bachelor)**, *Teacher assistant*, 32 hours, Automata theory  
Université de Bordeaux, France.
- Spring 2021 **Modèles de la Programmation et du Calcul (3<sup>rd</sup> year bachelor)**, *Teacher assistant*, 32 hours, Automata theory  
Université de Bordeaux, France.
- Fall 2020 **Coloration Informatique (1<sup>st</sup> year bachelor)**, *Teacher assistant*, 32 hours, Programming project in Python  
Université de Bordeaux, France.

## Other Interests

Music (violin and piano, former member of several orchestras: OSiUP, JOUVA, BISYOC). Philosophy of science, language and the mind. Sports (ultimate frisbee, badminton and basket-ball). Dancing (salsa). Board games.