

Alejo García-Sassi

🏠 IME-USP – Rua do Matão, 1010, Cidade Universitária, São Paulo, SP, Brazil
📞 +55 11 3091 6101 📩 alejogarciasassi@gmail.com 🌐 agarciassassi.com

S U M M A R Y

- **Broad interest in mathematics:** dynamical systems, geometry and topology, and their application to other fields (i.e. astrodynamics).
- **1 single-authored published article.**
- **2 long-form research articles** under consideration by high-quality journals.
- Currently **co-supervising Master student.**
- **Solid speaking activity:** Invited talks, seminars, and a minicourse at international venues.
- **13 years of teaching experience,** 11 at university level; consistently strong evaluations.
- **Strong outreach profile:** 5 years with the TMU project (workshops, public lectures and science events), science-communication columns and interviews, and a popular-science book in preparation (preliminary stage).
- **Robust fellowship record**, including Master's, PhD, and postdoctoral awards.
- **3x visiting PhD at IMJ-PRG - Sorbonne Université.**
- **Ongoing collaboration** with researchers at **IMJ-PRG, USP** and **UdeLaR**.
- Native Spanish speaker, fluent in **English and Portuguese**, competent in **French**.

P O S I T I O N S

POSTDOCTORAL RESEARCHER FAPESP – São Paulo, BR	Oct25 – Current
Competitive call: position granted among over 20 applicants worldwide. Project: <i>Dynamics and geometry in low dimensions.</i>	
JUNIOR PROFESSOR IMERL – Montevideo, UY	Aug19 – Current
Competition-awarded permanent position since 2023.	
POSTDOCTORAL RESEARCHER PEDECIBA – Montevideo, UY	Oct24 – Sep25
Ranked 1st in the selection process. Project: <i>Rotation sets and actions on curves for higher genus surface homeomorphisms.</i>	
JUNIOR PROFESSOR CMAT – Montevideo, UY	Aug23 – Sep24
Junior professorship awarded during the transition from my PhD to PostDoc status.	
TEACHING ASSISTANT CMAT – Montevideo, UY	Aug16 – Mar18
Teaching duties during my bachelor's training (resigned to accept master's scholarship).	
TEACHING ASSISTANT IMERL – Montevideo, UY	Mar15 – Jul19
Teaching duties during my bachelor's and Master's training.	
MATH OLYMPIAD INSTRUCTOR Los Pinos – Montevideo, UY	Feb14 – Feb18
Training the best national students for the International Mathematical Olympiad.	
MATH OLYMPIAD INSTRUCTOR OPM – Ciudad de Panamá, PA	Jan14 – Feb14
Training the National Panamanian Team for the International Mathematical Olympiad.	

HEAD OF MATH OLYMPIAD TRAINING PROGRAM | *ELEF – Montevideo, UY* Mar13 – Dec17
Mentored an eventual Math Olympiad National Champion, and several national medalists.

EDUCATION

PHD IN APPLIED MATHEMATICS | *USP-UdelaR – São Paulo, BR* 2024

- Graduated with honors.
- Visiting PhD at Sorbonne Université, working with Pierre-Antoine Guihèneuf.
- Thesis: *Fully chaotic conservative models for some torus homeomorphisms*.
- Advisors: Alejandro Passeggi – Fábio Armando Tal.

MSC IN MATHEMATICS | *UdelaR – Montevideo, UY* 2020

- Graduated with honors, due to original results.
- Thesis: *Fixed points for branched covering maps of the plane*.
- Advisor: Juliana Xavier.

BACHELOR IN MATHEMATICS | *UdelaR – Montevideo, UY* 2017

- Monograph: *Homeomorfismos del plano: toda órbita periódica enlaza un punto fijo*.
- Advisor: Juliana Xavier.

PUBLICATIONS AND PREPRINTS

FULLY CHAOTIC CONSERVATIVE MODELS FOR SOME TORUS HOMEOMORPHISMS 2024

With Fábio Armando Tal | *arXiv:2404.02341*

Under consideration by **Memoirs AMS**

GEODESIC TRACKING AND THE SHAPE OF ERGODIC ROTATION SETS 2023

With Pablo Lessa and Pierre-Antoine Guihèneuf | *arXiv:2312.06249*

Under Consideration by **ASENS**

FIXED POINTS FOR BRANCHED COVERING MAPS OF THE PLANE 2021

Published in **Fundamenta Mathematicae** 254 (2021), 1-14

SUPERVISION AND PROFESSIONAL TRAINING

LARA DE ASSUMPÇÃO MAFFEI PIEROBON 2025

Master student | *Topological horseshoes*

Co-supervision with Fábio Armando Tal. Ongoing.

TMU PROJECT  2017 – 2021

Including workshops for high-school teachers on math problem-solving.

INVITED TALKS

• *Where is the caos? Models for surface dynamics* 2025

9º COLOQUIO URUGUAYO DE MATEMÁTICA | *UdelaR – Montevideo, Uruguay*.

• *Fully chaotic models for higher genus surface homeomorphisms*

8º ESCOLA BRASILEIRA DE SISTEMAS DINÂMICOS | *IMPA – Rio de Janeiro, Brazil*.

• *Explicit uniform bounds for fixed elliptic islands*

INTL. CONF. ON ADVANCED TOPICS IN DYNAMICAL SYSTEMS | *Nankai University – Tianjin, China*.

- *Fully chaotic models for some torus homeomorphisms* 2024
DYNAMICAL SYSTEMS SEMINAR | **IMPA** – Rio de Janeiro, Brazil.
- *Fully chaotic conservative models for some torus homeomorphisms*
DYNAMICAL SYSTEMS SEMINAR | **UdelaR** – Montevideo, Uruguay.
- *Uniform bounds in strictly toral dynamics* 2023
SURFACES IN BANYULS | **Observatoire Océanologique de Banyuls-sur-mer** – France.
- *A little bit of forcing in strictly toral dynamics*
SÉMINAIRE DE DYNAMIQUE SAUVAGE | **Sorbonne Université** – Paris, France.
- *Applications of Haefliger's Theorem* 2022
SCHOOL: FOLIACIONES Y FLUJOS DE ANOSOV EN DIMENSIÓN 3 | **UdelaR** – Montevideo, Uruguay.
- *Topologically chaotic surface homeomorphisms* 2021
ENCUENTRO DE ESTUDIANTES DE POSGRADO | **UdelaR** – Montevideo, Uruguay.
- *Minicourse - Topics in plane topological dynamics* (with Juliana Xavier) 2019
7º COLOQUIO URUGUAYO DE MATEMÁTICA | **UdelaR** – Montevideo, Uruguay.
- *Fixed point theorems for branched covering maps of surfaces*
7º COLOQUIO URUGUAYO DE MATEMÁTICA | **UdelaR** – Montevideo, Uruguay
- *Growth rate of periodic orbits for branched covering maps*
DYNAMICAL SYSTEMS SEMINAR | **Universidad de Santiago de Chile** – Chile.
- *Combinatorial invariants* 2017
6º COLOQUIO URUGUAYO DE MATEMÁTICA | **UdelaR** – Montevideo, Uruguay.
- *Linking fixed points in plane homeomorphisms*
DYNAMICAL SYSTEMS SEMINAR | **UdelaR** – Montevideo, Uruguay.

TEACHING

GRADUATE COURSES

- Applications of Linear Algebra | **IMERL** 2024
Coordination + problem sessions

UNDERGRADUATE COURSES

Course Coordination

- Discrete Mathematics | **CMAT** 2024
- Complex Analysis | **CMAT** 2024
- Probability and Statistics | **IMERL** 2023
- Multivariable Calculus | **IMERL** 2021
- Introduction to Topology | **CMAT** 2017
- Geometry of Curves and Surfaces | **CMAT** 2017

Lecturer

- Vector Calculus | **IMERL** 2025
- Geometry and Linear Algebra | **IMERL** 2024
- Multivariable Calculus | **IMERL** 2021, 2022

Problem sessions

- Geometry and Linear Algebra | **IMERL** 2015, 2025
- Complex Analysis | **IMERL, CMAT** 2018, 2024
- Discrete Mathematics | **IMERL, CMAT** 2015, 2017, 2018, 2024
- Differential Equations | **IMERL** 2019, 2020, 2021, 2024
- Probability and Statistics | **IMERL** 2023
- Vector Calculus | **IMERL** 2020
- Introduction to topology | **CMAT** 2017

- Mathematics for Biologists | CMAT 2016
- Single-variable Calculus | IMERL 2016, 2017, 2019
- Multivariable Calculus | IMERL 2016

INSTITUTIONAL EVALUATIONS

Consistently strong student evaluations, averaging above **4.72/5 over 165+ evaluations** across multiple courses in the last five years.

EDUCATIONAL RESOURCES

- REVISTA TMU** ↗ 2020
Compilation of notes prepared specifically for TMU workshops
- TÓPICOS EN DINÁMICA TOPOLOGÍCA PLANA** ↗ 2019
Conference minicourse notes | 7º Coloquio Uruguayo de Matemática
With Juliana Xavier.
- SEMINARIOS DE PROBLEMAS** ↗ 2017 – 2021
Over 30 notes, each containing a brief theoretical overview and a curated set of problems.
- TALLERES – CAMPAMENTO MATEMÁTICO** ↗ 2014 - 2018
Math Summer Camp | *Centro Educativo Los Pinos*

OUTREACH

- OUTREACH PROJECT** 2017 – 2021
Coordination, organization and teaching in *Talleres Matemática Udelar TMU*. ↗
 - Problem-solving workshops for IMO preparation (students and teachers).
 - Organization of plenary talks and annual science recreational days, receiving in total, thousands of students and teachers from across the country.
- SCIENCE POPULARIZATION**
 - **Science-communication columns** in *Núcleo Delirante #3, #6 - Desembarco TV*. ↗ . 2025
 - **Interview #12** of the series *Mis profes en Fing*. ↗ 2024
 - **Contribution to exhibitions:** *Íngeniería de Muestra* ↗ 2022, 2024
Día internacional de la Matemática – Fing ↗ 2024
Imaginary – Un viaje por la matemática ↗ , 2015
 - **Outreach seminar:** Inter-School Mathematical seminar - The British Schools. 2015

EVENT ORGANIZATION

Mathematical Olympiad National Final | *Facultad de Ingeniería* 2019

COMMUNITY SERVICE

Jury member and tutor | *Uruguayan Math Delegation* 2011-2015
In national and international mathematical olympiads.

POPULAR-SCIENCE BOOK

A collection of short stories built around rich mathematical concepts. In preparation

FELLOWSHIPS AND RESEARCH INTERNSHIPS

I have been awarded more than 160K USD in graduate and postdoc fellowships, and more than 25K USD in previous scholarships.

FELLOWSHIPS

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|--|-----------------|
| • FAPESP postdoc fellowship 332K BRL ~ 61K USD | Oct25 – Current |
| • PEDECIBA postdoc fellowship 934K UYU ~ 23K USD | Oct24 – Sep25 |
| • CAP PhD fellowship 2.38M UYU ~ 59K USD | Apr20 – Mar24 |
| • CAP Master's fellowship 640K UYU ~ 19K USD | Mar18 – Feb20 |
| • IMPA Summer School scholarship 2400BRL ~ 800 USD | Jan17 – Feb17 |
| • ELEF <i>Beca a la excelencia académica</i> scholarship 504K UYU ~ 25K USD | Mar10 – Dec12 |

RESEARCH INTERNSHIPS

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|---|---------------|
| • IMPA with Alejandro Kocsard | Aug24 |
| • IMJ-PRG, Sorbonne Université with Pierre-Antoine Guihénéuf | Jun24 |
| • IMJ-PRG, Sorbonne Université with Pierre-Antoine Guihénéuf | Sep23 – Dec23 |
| • IMJ-PRG, Sorbonne Université with Pierre-Antoine Guihénéuf | Sep22 – Oct22 |
| • USP with Fábio Armando Tal | Feb22 – Aug22 |
| • USACH with Andrés Navas | Aug19 |

HONOURS AND AWARDS

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| • 2x Honourable Mentions: International Mathematical Olympiad | 2011, 2012 |
| • 3x Bronze Medals: Iberoamerican Mathematical Olympiad | 2012 |
| Iberoamerican Physics Olympiad | 2012 |
| Asian-Pacific Mathematical Olympiad | 2012 |
| • 2x Gold Medals: National Mathematical Olympiad | 2011, 2012 |

LANGUAGES

SPANISH | Mother tongue

ENGLISH | Proficient

PORTUGUESE | Proficient

FRENCH | Competent