

Alejo García-Sassi

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SUMMARY

- **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.**

POSITIONS

POSTDOCTORAL RESEARCHER | FAPESP – São Paulo, BR Oct25 - Current
Competitive call: position granted among over 20 applicants worldwide.
Project: *Dynamics and geometry in low dimensions.*

JUNIOR PROFESSOR | IMERL – Montevideo, UY Aug19 – Current
(on leave)
Competition-awarded permanent position since 2023.

POSTDOCTORAL RESEARCHER | PEDECIBA – Montevideo, UY Oct24 - Sep25
Ranked 1st in the selection process.
Project: *Rotation sets and actions on curves for higher genus surface homeomorphisms.*

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 Guihéneuf.
- 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 Guihéneuf | *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
9° COLOQUIO URUGUAYO DE MATEMÁTICA | **UdelaR** – Montevideo, Uruguay.
- *Fully chaotic models for higher genus surface homeomorphisms*
8° 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 TOPOLÓGICA 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:** *Ingeniería 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

- **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** *Beca a la excelencia académica* scholarship | 504K UYU ~ 25K USD Mar10 – Dec12

RESEARCH INTERNSHIPS

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

HONOURS AND AWARDS

- **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*