

Marcelo Ribeiro de Resende Alves

University of Augsburg Birthdate: May 7, 1986.
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Education

- Oct. 2014 DOCTEUR EN MATHÉMATIQUES FONDAMENTALES, Université Paris-Saclay, France.
Nov. 2015 Thesis: *On the relations between contact topology and the dynamics of Reeb flows.*
Defended on the 19th of November of 2015
Supervisor: Frédéric Bourgeois.
Co-supervisor: Chris Wendl.¹
- Sept. 2011 DOCTEUR EN SCIENCES, Université Libre de Bruxelles, Belgium.
Dec. 2014 Thesis : *Growth rate of Legendrian contact homology and dynamics of Reeb flows.*
Defended on the 5th of December of 2014
Supervisor: Frédéric Bourgeois.
Co-supervisor: Chris Wendl.²
- Feb. 2009 MASTER IN MATHEMATICS, Universidade de São Paulo, Brazil.
May 2011 Master's project written under the supervision of Pedro A.S. Salomão.
- Feb. 2005 BACHELOR in Mathematics, Universidade Federal de Minas Gerais, Brazil.
Dec. 2008

Positions

- Oct. 2025 *Postdoctoral researcher* - University of Augsburg.
Sept. 2027
- Oct. 2024 *Substitute lecturer - fixed-term position* - Université Libre de Bruxelles.
Sept. 2025
- Nov. 2024 *Postdoctoral researcher* - University of Antwerp, Belgium.
Dec. 2024
- Nov. 2020 *FWO Senior Postdoctoral Fellow* - University of Antwerp, Belgium.
Oct. 2024
- Dec. 2018 *Postdoctoral researcher* - Université Libre de Bruxelles, Belgium.
Oct. 2020
- Oct. 2017 *Postdoctoral researcher* - Ruhr-Universität Bochum, Germany.
Nov. 2018
- Jan. 2016 *Postdoctoral researcher* - Institut de Mathématiques de l'Université de Neuchâtel, Switzerland.
Sept. 2017

¹For administrative reasons Professor Chris Wendl was not officially my co-supervisor, but during my two Ph.D. thesis I worked with both him and Professor Frédéric Bourgeois.

²The same as above.

Sept. 2015 *Postdoctoral researcher* - Institut Mittag-Leffler, Stockholm, Sweden.
Dec. 2015

Dec. 2014 *Researcher* - Université Libre de Bruxelles, Belgium.
Sept. 2015

Oct. 2014 *Doctoral student* - Université Paris-Sud, France.
Nov. 2015

Sept. 2011 *Doctoral student* - Université Libre de Bruxelles, Belgium.
Dec. 2014

Research interests

Symplectic and contact topology, Hamiltonian dynamics, Dynamics of Reeb flows.
I am particularly interested in the relations between Floer theoretical invariants of symplectic/contact manifolds and the dynamical complexity of Reeb flows and Hamiltonian diffeomorphisms.

Fellowships & prizes

2009-2011 Master's fellowship, CNPQ-Brasil.
10/2011– Doctoral fellowship FRIA , FNRS-Belgique.
09/2015

10/2015– Postdoctoral fellowship, Institut Mittag-Leffler, Sweden.
12/2015

11/2020– Senior Postdoctoral fellowship, FWO-Belgium, Belgium.
10/2024

Ambizione fellowship

My research project “*Entropies of Reeb flows and its relations to symplectic topology and Hamiltonian dynamics*” was selected by the FNS-Suisse for an Ambizione fellowship valid for four years, from September-2018 to August-2022, but I decided not to accept the fellowship.

Publications

Published and accepted articles

M.R.R. Alves, L. Dahinden, M. Meiwes and A. Pirnapasov. *C^0 -stability of topological entropy for Reeb flows in dimension 3.*

Accepted for publication in the **Journal of the European Mathematical Society**.
Available at <https://arxiv.org/abs/2311.12001>.

M.R.R. Alves and M. Mazzucchelli. *From curve shortening to flat link stability and Birkhoff sections of geodesic flows.* **J. É. Polytech. Math.** Vol. 12, (2025), 801-851

M.R.R. Alves and M. Meiwes. *Braid stability and the Hofer metric.* **Ann. Henri Lebesgue.** Volume 7, pp. 521-581, 2024.

A. Abbondandolo, M.R.R. Alves, M. Saglam and F. Schlenk. *Entropy collapse and entropy rigidity for Reeb and Finsler flows.* **Sel. Math. New Ser.** Vol. 29 (5), 2023.

M.R.R. Alves, L. Dahinden, M. Meiwes, and L. Merlin. *C^0 -robustness of topological entropy for geodesic flows.* **J. Fixed Point Theory Appl.** Vol. 24 (2), 1-43, 2022.

M.R.R. Alves and A. Pirnapasov. *Reeb orbits that force topological entropy*. **Ergod. Theory Dyn. Syst.** Vol. 42 (10), 3025-3068, 2022.

M.R.R. Alves and M. Meiwes. *Dynamically exotic contact spheres in dimensions ≥ 7* . **Comment. Math. Helv.** , Vol. 94, Issue 3, p. 569-622, 2019.

M.R.R. Alves, V. Colin and K. Honda. *Topological entropy for Reeb vector fields in dimension three via open book decompositions*. **J. É. Polytech. Math.**, Volume 6, p. 119-148, 2019.

M.R.R. Alves. *Legendrian contact homology and topological entropy*. **J. Topol. Anal.**, Vol. 11, No. 01, p. 53-108, 2019.

M.R.R. Alves. *Positive topological entropy for Reeb flows on 3-dimensional Anosov contact manifolds*. **J. Mod. Dyn.**, Vol. 10, p. 497-509, 2016.

M.R.R. Alves. *Cylindrical contact homology and topological entropy*. **Geom. Topol.**, Vol. 20, p. 3516-3569, 2016.

Works in preparation

M.R.R. Alves, U. Hryniewicz, M. Meiwes, A. Pirnapasov and P.A.S. Salomão. *A Denz-Mackay theorem for Reeb flows*. Work in preparation.

M.R.R. Alves, M. Meiwes and B. Sohn. *Braid stability and the γ -norm*. Work in preparation.

Thesis

M.R.R. Alves. On the relations between contact topology and the dynamics of Reeb flows. *Doctoral thesis*, Université Paris-Saclay, November 2015.

M.R.R. Alves. Growth rate of Legendrian contact homology and dynamics of Reeb flows. *Doctoral thesis*, Université Libre de Bruxelles, December 2014.

M.R.R. Alves. Propriedades da dinâmica Hamiltoniana em níveis de energia convexos de $\mathbb{R}^4$. *Master thesis* Universidade de São Paulo, 2011.

Teaching experience

TEACHING EXPERIENCE AS MAIN INSTRUCTOR

- Spring 2025: **Calcul différentiel et intégral II: Part 2** Université Libre de Bruxelles (Belgium). Taught in French. On-site lectures.
- Autumn 2024: **Calcul différentiel et intégral II: Part 1** Université Libre de Bruxelles (Belgium). Taught in French. On-site lectures.
- Autumn 2024: **Complex analysis**. University of Antwerp (Belgium). Taught in English. On-site lectures.

- Autumn 2024: **Analysis in Dynamics: Morse theory for geodesics.** University of Antwerp (Belgium). Taught in English. On-site lectures.
- Autumn 2023 and Autumn 2022: **Analysis in Dynamics: Morse homology.** University of Antwerp (Belgium). Taught in English. On-site lectures.
- Autumn 2021: **Analysis in Dynamics: Introduction to Ergodic Theory.** University of Antwerp (Belgium). Taught in English. Mixed online/on-site lectures.
- Autumn 2020: **Analysis in Dynamics: Introduction to Global Analysis and Morse theory for geodesics.** University of Antwerp (Belgium). Taught in English. Online lectures.

TEACHING EXPERIENCE AS ASSISTANT

- Fall 2019: **Géométrie différentielle.** Université Libre de Bruxelles (Belgium). Taught in French. On site lectures.
- Spring 2019: **Géométrie Riemannienne.** Université Libre de Bruxelles (Belgium). Taught in French. On-site lectures.
- Spring 2018: **Kurven und Flächen.** Ruhr-Universität Bochum (Germany). Taught in English.

Research presentations

From curve shortening to Birkhoff sections of geodesic flows. *Geometry and Dynamics seminar*, Tel-Aviv University, January 8, 2025.

C^0 -stability of topological entropy for 3-dimensional Reeb flows. *Surfaces in Banyuls - In honor of Philip Boyland's 70th Birthday.* December 6, 2023.

C^0 -stability of topological entropy for 3-dimensional Reeb flows. *Conference: From smooth to C^0 -symplectic geometry: topological aspects and dynamical implications.* CIRM-Luminy, 3-7 July, 2023

Hofer's geometry and braid stability. *Symplectic zoominar.* Joint IAS, Princeton, Montreal, Paris, Tel-Aviv Symplectic Geometry Zoominar. December 16, 2022.

Flat knots and forcing of topological entropy via cylindrical contact homology, *Workshop on Conservative dynamics and its interactions*, Bernoulli Center - EPFL, August 20, 2019.

Periodic motions and forcing of positive entropy for Reeb flows, *Geometry and Dynamics seminar*, Tel-Aviv University, March 13, 2019.

Algebraic growth of wrapped Floer homology and contact spheres with positive entropy, *Dynamische Systeme Workshop*, Mathematisches Forschungsinstitut Oberwolfach, 13 July, 2017.

Languages

Portuguese (native speaker), French and English (fluent), Romanian (good command), Russian (basic).