Alfredo **Calderón**

personal details

Alfredo E. Calderón Céspedes
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languages

spanish ●●●
portuguese ●●●
english ●●○

teaching experience

+10 years

Summary

I have a Ph.D. in Mathematics with a focus on dynamical systems. I am interested in the topological dynamics of piecewise continuous maps and their diverse applications. In addition, I am involved in outreach activities and the promotion of mathematics. Currently, I work as an Associate Researcher at the Catholic University Silva Henríquez since March 2023.

Academic Qualifications

2016–2020 — **Ph.D. in Mathematics** — *Valparaíso, Chile*
Pontificia Universidad Católica de Valparaíso (PUCV), Universidad Técnica Federico Santa María (USM) and Universidad de Valparaíso (UV) -- Consortium Program.
Advisors: Pierre Guiraud (UV) and Eleonora Catsigeras (Universidad de la República, Montevideo, Uruguay – UDELAR).

2013–2014 — **Master's degree in Mathematics** — *Salvador (BA), Brazil*
Universidade Federal da Bahia -- UFBA.
Advisor: Manuel Stadlbauer (Universidade Federal do Rio de Janeiro, Brazil – UFRJ).

2006–2010 — **Bachelor's degree in Mathematics** — *Santiago, Chile*
Universidad de Chile.

Projects Participation

⚠ **2023–2026** — **Fondecyt Iniciación 2023 N°11230064:** ``Dynamical aspects of piecewise continuos maps". (responsible researcher)

⚠ **2023–2027** — **Fondecyt Regular 2023 N°1230569:** ``Dynamics and applications of piecewise contractions". (co-researcher)
Responsible researcher: Pierre Guiraud (UV).

⚠ **2023–2026** — **Núcleo de Investigación UCSH: Sistemas Dinámicos y Vinculación con el Medio:** ``Matemática a ciegas" (responsible researcher)

⚠ **2023–2025** — **MathAmsud 22-MATH-10:** ``Topological, combinatorial, and probabilistic aspects in dynamical systems". (co-researcher)
Responsible researcher: Pierre Guiraud (UV).

⚠ **2022–2024** — **MathAmsud 22-MATH-08:** ``Existence and uniqueness, numerical approximation, stability and applications in population dynamics using stochastic Volterra differential equations with switching". (co-researcher)
Responsible researcher: Héctor Araya (UAI).

2021 — **CIMFAV Project CIDI 0403 (aproved by REXE RA 315/1850/2021)** (collaborator)
Responsible researcher: Gerardo Honorato (UV).

2020 — **CIMFAV Project CIDI 0403 (aproved by REXE RA 315/3448/2020)** (collaborator)
Responsible researcher: Soledad Torres (UV).

2019–2020 — **Conicyt REDES 180151:** ``Interdisciplinary network on dynamical systems, graph theory and biological networks". (thesis student)
Responsible researcher: Pierre Guiraud (UV).

2018–2020 — **Fondecyt Regular 1171427:** ``Partial hyperbolic diffeomorphisms with multidimensional center direction". (thesis student)
Responsible researcher: Carlos Vasquez (PUCV).

2017–2018 — **MathAmSud "Physeco" 16-MATH-06:** ``Statistical properties of partially hyperbolic, sequential and contracting systems". (thesis student)
Responsible researchers: Sandro Vaienti (Toulon University, France) – Pierre Guiraud (UV) – Eleonora Catsigeras (UDELAR).

Research Activities

In Progress	**Space of piecewise continuous maps on the complex plane** A joint work with N. Alvarado (UC) and E. Oregón (University of California, Berkeley – UCBerkeley). This article is being partially supported by the projects Fondecyt Regular 2023 No. 1230569 and Fondecyt Initiation 2023 No. 11230064.
In Preparation	**Topological entropy for piecewise continuous interval maps** A joint work with E. Villar-Sepúlveda (Bristol University). This article is being partially supported by the MathAmsud projects 22-MATH-10 and 22-MATH-08, Fondecyt Regular 2023 No. 1230569 and Fondecyt Initiation 2023 No. 11230064.
In Progress	**Space of piecewise continuous maps on the interval** A joint work with E. Villar-Sepúlveda (Bristol University). This article is being partially supported by the projects Fondecyt Regular 2023 No. 1230569 and Fondecyt Initiation 2023 No. 11230064.
In Progress	**Existence of ergodic probabilities for piecewise interval contracting maps** A joint work with E. Catsigeras (UDELAR) and P. Guiraud (UV). This article is being partially supported by the projects Fondecyt Regular 2023 No. 1230569 and Fondecyt Initiation 2023 No. 11230064.
Submitted	**Piecewise contracting maps on the interval: Hausdorff dimension, entropy and attractors** (2023) A joint work with E. Villar-Sepúlveda (submitted in Canadian Mathematical Bulletin). This article was partially supported by the MathAmsud projects 22-MATH-10 and 22-MATH-08, Fondecyt Regular 2023 No. 1230569 and Fondecyt Initiation 2023 No. 11230064.
⚠ Publication	**A spectral decomposition of the attractor of piecewise-contracting maps of the interval** A joint work with E. Catsigeras and P. Guiraud (published in Ergodic Theory & Dynamical Systems. ISSN: 0143-3857). (Publication year: 2021)
Doctoral Thesis	**Dynamics of piecewise contracting interval maps** (2020) **Advisors:** Pierre Guiraud (UV) and Eleonora Catsigeras (UDELAR). **Members of the commission:** Godofredo Iommi (Pontificia Universidad Católica de Chile – UC), Arnaud Meyroneinc (UV) and Edgardo Ugalde (Universidad Autónoma de San Luis Potosí, México – UASLP).
Nov.2019	**Research internship** San Luis Potosí, México *One month internship that took place at the Universidad Autónoma de San Luis Potosí, in order to advance current research topics.*
May.2019	**Research internship** Montevideo, Uruguay *2-week internship that took place at the Universidad de la República with Eleonora Catsigeras, in order to advance current research topics.*

Teaching Activities

2022	**Teaching, UCSH (campus central)** Santiago, Chile **Elemental Mathematics**.
Jan.2023	**Evaluator professor, Magister en Matemática Aplicada (Universidad Católica de Temuco)** Temuco, Chile Evaluator professor of the master's thesis of the student Jorge Otto, whose title is: "**Solución analítica de la ecuación convección-difusión-reacción fraccional con el método de análisis de homotopía**".
Jan.2023	**Evaluator professor, Bachelor's degree in Mathematics (Universidade Federal do Recôncavo da Bahia)** BA, Brasil Evaluator professor of the bachelor's thesis of the student Revva Dos Santos Sacramento, whose title is: "**Um estudo sobre o comportamento dinâmico dos homeomorfismos do círculo**".
2022	**Teaching, UCT (campus norte)** Temuco, Chile **Calculus I**, **Calculus II**, **Linear Algebra** and **Numerical Calculus**.
2021	**Teaching, USM (Casa Central, San Joaquin and Vitacura)** Valparaíso, Chile **Calculus I** ($\times 3$), **Algebra** ($\times 2$), **Calculus III** and **practical exercise sessions** ($\times 6$) for Calculus I - II and Algebra.

In Progress	**Statistical Mathematics, UV (teaching notes for doctoral course)**	Valparaíso, Chile

In Progress — **Statistical Mathematics, UV (teaching notes for doctoral course)** — Valparaíso, Chile
A joint work with Soledad Torres (UV). Associated with the CIMFAV Project CIDI 0403 (REXE RA 315/3448/2020).

2020 — **Measure Theory, USM (teaching notes for bachelor course)** — Valparaíso, Chile
A joint work with Leonelo Iturriaga (USM).

2020 — **Teaching, USM (Casa Central and San Joaquin)** — Valparaíso, Chile
Calculus I ($\times 2$), **Linear Algebra** and **Measure Theory**. These courses were taught during the year 2020 as part-time teacher.

2019 — **Teaching, USM (Casa Central)** — Valparaíso, Chile
Calculus of Several Variables and **Linear Algebra**. These courses were taught during the year 2019 as part-time teacher.

2018 — **Teaching, USM (Casa Central)** — Valparaíso, Chile
Differential Geometry and **Topology**. These courses were taught during the year 2018 as part-time teacher.

2017 — **Teaching, USM (Casa Central)** — Valparaíso, Chile
Differential Geometry and **Linear Algebra**. These courses were taught during the year 2017 as part-time teacher.

2016 — **Teaching, USM (Casa Central)** — Valparaíso, Chile
Differential Geometry and **Topology**. These courses were taught during the year 2016 as part-time teacher.

2015 — **Teaching, USM (San Joaquin)** — Santiago, Chile
Calculus I ($\times 2$), **Calculus II** ($\times 2$) and **Algebra II** ($\times 2$). These courses were taught during the year 2015 as part-time teacher.

2013.1 — **Teaching, Duoc UC (Alameda)** — Santiago, Chile
Calculus I and **Calculus II** courses taught during the first semester of 2013 as a teacher with a fixed-term contract.

2011.1 — **Teaching, Duoc UC (Melipilla)** — Santiago, Chile
Elementary Mathematics and **Algebra** courses taught during the first semester of 2011 as a teacher with fixed-term contract.

Participation in Events, Congresses and Exhibitions

Jan.2023 — **A mini-course was taught in `Cursos de Verano 2023 del Departamento de Ciencias Físicas' (UFRO)** — Temuco, Chile
The talk was held at the Universidad de la Frontera.

Dec.2022 — **Invitation to exhibit in `Ciclo de charlas del Departamento de Cs. Matemáticas y Físicas' (UCT)** — Temuco, Chile
The talk was held at the Universidad Católica de Temuco.

Aug.2022 — **Invitation to exhibit in `Seminario del programa de doctorado en Ciencias mención Matemática' (UFRO)** — Temuco, Chile
The talk was held at the Departamento de Matemática y Estadística (DME) of the Universidad de la Frontera.

Nov.2021 — **`Encuentro de geometría compleja y dinámica holomorfa-aritmética' (UFRO-PUCV-UV-UACH)** — Chile
The talk was held online.

Apr.2020 — **Colloquium of postgraduate students `Dinámica en Casa por Zoom' (PUCV-USM-UV-PUC)** — Chile
The talk was held online.

Nov.2019 — **Invitation to exhibit in `Seminario Tartaglia' (UASLP)** — San Luis Potosí, México
The talk was held at the Universidad Autónoma de San Luis Potosí.

Dec.2018 — **Dynamics in Valparaíso (PUCV)** — Valparaíso, Chile
Poster presentation: *spectral decomposition of injective piecewise contracting dynamics on the interval.*

Oct.2018 — **Invitation to exhibit in colloquium for postgraduate students (UBB)** — Concepción, Chile
The talk was held at the Universidad del Bío-Bío.

Oct.2018 — **Short communication in `Semana de la Matemática' (PUCV)** — Valparaíso, Chile
The talk was held at the Pontificia Universidad Católica de Valparaíso.

Sep.2018	**Invitation to exhibit in `2nd Feria de Postgrado 2018' (USM)**	Valparaíso, Chile

Poster presentation and short communication: *Spectral decomposition of piecewise contracting dynamics on the interval.*

Sep.2018	**Invitation to exhibit in colloquium for postgraduate students (UC)**	Santiago, Chile

The talk was held at the Pontificia Universidad Católica de Chile.

Aug.2018	**International congress of mathematicians (ICM2018)**	Rio de Janeiro (RJ), Brazil

Poster presentation: *Spectral decomposition of piecewise contracting dynamics on the interval.*

Dec.2017	**Final scientific meeting of the MathAmSud Project "Physeco"**	Montevideo, Uruguay

The event was held at the Universidad de la República.

Nov.2017	**Invitation to exhibit in colloquium for postgraduate students (UBB)**	Concepción, Chile

The talk is about my doctoral thesis and was held at the Universidad del Bío-Bío.

Dec.2016	**1st Joint Meeting SOMACHI-UMA: SUMA$^\chi$ (USM)**	Valparaíso, Chile

The event was held at the Universidad Técnica Federico Santa María.

Oct.2014	**3eira Escola Brasileira de Sistemas Dinâmicos**	Bento Gonçalves (RS), Brazil

Poster presentation: *a random version of Ruelle's theorem.*

Oct.2014	**Probability in Bahia (UFBA)**	Salvador (BA), Brazil

The event was held at the Universidade Federal da Bahia.

May.2013	**IV MACI Congress (UTN.BA)**	Buenos Aires, Argentina

Minicourse: introduction to robust estimation.
The event was held at the Universidad Tecnológica Nacional de Buenos Aires.