Alberto Cerezo Cid

Curriculum Vitae

Positions

2026-Present	**Profesor Ayudante Doctor (Assistant professor)**, *Universidad de Castilla-La Mancha*, Department of Mathematics (Ciudad Real, Spain).
2022-2025	**FPI contract (PhD)**, *Universidad de Granada*, Department of Geometry and Topology (Granada, Spain). Funded by the Spanish Ministry of Science and Innovation.

Education

2022-2025 **PhD in Mathematics**, *Universidad de Sevilla*, Spain.
- Title of the thesis: **Constant mean curvature annuli with free boundary**.
- PhD awarded with **cum laude** honors and *mención internacional*.
- Advisors: Isabel Fernández Delgado (Universidad de Sevilla) and Pablo Mira Carrillo (Universidad Politécnica de Cartagena).

2021-2022 **Master's Degree in Mathematics**, *Universidad de Sevilla*, Spain.
Average mark: 9,72/10 (**Link** to academic record).

2016-2021 **Double Bachelor's Degree in Mathematics and Physics**, *Universidad de Sevilla*, Spain.
Average marks (**Link** to academic records):
- Mathematics: 9,79/10.
- Physics: 9,70/10.

Research overview

My research lies within **Geometric Analysis**, focusing on constant mean curvature (CMC) and minimal surfaces with free boundary, as well as overdetermined problems.

I completed my PhD in 2025 with *cum laude* honors at Universidad de Sevilla. In my thesis, I have solved several open problems, most notably:

- The existence of non-rotational, embedded free boundary CMC annuli in the unit ball, solving a **1995 problem by Henry C. Wente**.
- A global bifurcation result for an overdetermined problem in $\mathbb{S}^2$, which disproved a **2005 conjecture by Rabah Souam**.

This latter work provides the **first known global bifurcation result** in the field of overdetermined problems for elliptic PDEs. The strategy introduced therein has recently been applied to obtain a further global bifurcation result for a Serrin-type problem in $\mathbb{R}^2$ [4].

The results obtained in my thesis have led to two publications (*Crelle's Journal* [6] and *Calc. Var. PDE* [5]), two single-author preprints [2, 3], and a work currently in preparation [1], derived from Chapter 6 of the dissertation.

Publications

[6] A. Cerezo, I. Fernández, P. Mira: Annular solutions to the partitioning problem in a ball. **Journal für die reine und angewandte Mathematik** (Crelle's Journal) 828 (2025), 57–81 (arXiv:2212.07986).

[5] A. Cerezo, I. Fernández, P. Mira: Free boundary CMC annuli in spherical and hyperbolic balls. **Calculus of variations and Partial Differential Equations** 64 (2025) 37 (arXiv:2403.04595).

Preprints

[4] A. Cerezo, I. Fernández, P. Mira: On the classification of Serrin planar domains, preprint (2026), arXiv:2601.09649.

[3] A. Cerezo: Free boundary saddle disks in the unit ball, preprint (2025), arXiv:2511.02812.

[2] A. Cerezo: Free boundary minimal annuli in geodesic balls of $\mathbb{H}^3$, preprint (2025), arXiv:2502.20303.

[1] A. Cerezo, I. Fernández, P. Mira: Schiffer-Robin ring domains in the 2-sphere, in preparation (2026).

Research Projects

2025-present **Geometría de superficies y ecuaciones en derivadas parciales geométricas**.
- Principal Investigator: José Antonio Gálvez López (Universidad de Granada).
- Funding: Spanish Ministry of Science and Innovation.
- Reference: PID2024-160586NB-I00.
- Role: research member.

2022-2025 **Teoría de superficies y ecuaciones en derivadas parciales geométricas**.
- Principal Investigator: José Antonio Gálvez López (Universidad de Granada).
- Funding: Spanish Ministry of Science and Innovation.
- Reference: PID2020-118137GB-I00.
- Role: research member.

Teaching Experience

2022-2025 **Undergraduate instructor** at Universidad de Sevilla (Spain).
- Delivered **160** hours of instruction.
- Courses: Introduction to Discrete Mathematics, Discrete Mathematics.

Relevant Experience

2024 **Research stay**, *IMPA*, Rio de Janeiro (Brazil). Advisor: Lucas Ambrozio. Stay funded by the Spanish Ministry of Science and Innovation.
- Research topic: Min-max theory for minimal and CMC surfaces. Extension to equivariant and free boundary setup.

2021-2022 **Introduction to Research grant**, *IMUS*, Sevilla (Spain). Advisor: Isabel Fernández Delgado (Universidad de Sevilla). Paid internship funded by Universidad de Sevilla.
- Research topic: Hopf's problem for Weingarten surfaces in homogeneous spaces.

2021 **Grant programme PI3 - IMUS: Introduction to Research**, *IMUS*, Sevilla (Spain). Advisor: Isabel Fernández Delgado (Universidad de Sevilla).
- Research topic: Weierstrass representation.

2020-2021 **Collaboration grant**, *Universidad de Sevilla*, Spain. Advisor: Isabel Fernández Delgado (Universidad de Sevilla). Paid internship funded by the Spanish Ministry of Education.
  ○ Research topic: minimal and constant mean curvature surfaces.

2020 **Grant programme Severo Ochoa – ICMAT: Introduction to Research 2020**, *ICMAT*, Madrid (Spain). Advisor: David Martín de Diego (ICMAT).
  ○ Research topic: discrete differential geometry.

2019-2020 **Student intern at Geometry and Topology department**, *Universidad de Sevilla*, Spain. Advisors: Isabel Fernández Delgado and Ramón Jesús Flores Díaz (Universidad de Sevilla).
  ○ Research topic: minimal and mean curvature surfaces.

Honors

2024 **Finalist, Three Minute Thesis (3MT) Contest**, Universidad de Sevilla (Spain).

2024 **Awarded talk** at the Lightning Talks session at the 9th European Congress of Mathematics.

2021-2022 **Qualified with Honors** in 50% of the courses from the Master's Degree in Mathematics.

2021-2022 **Qualified with 9.0 or higher** in 90% of the courses from the Master's Degree in Mathematics.

2017-2021 **Qualified with Honors** in 47% of the courses from the Double Bachelor's Degree in Mathematics and Physics.

2017-2021 **Qualified with 9.0 or higher** in 97% of the courses from the Double Bachelor's Degree in Mathematics and Physics.

2020 **Third prize** in the XXVII International Mathematics Competition for University Students.

Conferences and events

Presented talks

2025 **Geometry and Algebra seminar at Università degli Studi dell'Aquila** (L'Aquila, Italy). Title of the talk: Global bifurcations for capillary minimal annuli and overdetermined problems.

2025 **Séminaire de géométrie IMJ-PRG/LAMA** (Paris, France). Title of the talk: Embedded free boundary CMC and capillary minimal annuli.

2025 **Second IMAG-OCAMI Joint Conference on Differential Geometry** (Granada, Spain). Title of the talk: Free boundary minimal and CMC annuli with spherical curvature lines.

2024 **REAG Young Researchers Meeting** (Santiago de Compostela, Spain). Title of the talk: Construction of free boundary minimal and CMC annuli in space forms.

2024 **European Congress of Mathematics** (Sevilla, Spain). Gave a short talk at the EMS Young Academy session.

2024 **European School of Differential Geometry** (Granada, Spain). Presented a poster.

2024 **Geometry seminar at Universidade Federal Fluminense** (Niterói, Brazil). Title of the talk: Construction of free boundary minimal and CMC annuli in space forms.

2024 **IMPA Geometry seminar** (Rio de Janeiro, Brazil). Title of the talk: Free boundary minimal and CMC annuli in space forms.

2023 **Recent advances in the theory of submanifolds**, INDAM (Rome, Italy). Title of the talk: Embedded free boundary CMC annuli in the unit ball.

2023 $\mathcal{H}$-**Workshop 2023**, IMAG (Granada, Spain). Title of the talk: Embedded free boundary CMC annuli in the unit ball.

2021 **Grant programme PI3 - IMUS: Introduction to Research**, IMUS (Sevilla, Spain). Gave a short talk about Weierstrass representation for minimal surfaces.

Delivered courses

2024 **6-hour mini course at Universidad de Granada** (Spain). Topic of the course: Introduction to Simon-Smith min-max theory & applications.

2024 **3-hour mini course at IMPA** (Rio de Janeiro, Brazil). Topic of the course: Introduction to min-max theory.

Event organization

2025 **Parallel session in Geometric Analysis** held at RSME's 7th Congress of Young Researchers (Bilbao, Spain).

2023-2024 **Mathematics PhD seminars**, IMUS (Sevilla, Spain).

Student seminars

2026 **Baby Seminar**, Institut Henri Poincaré (Paris, France). Title of the talk: Mean curvature and geometric PDEs.

2025 **Mathematics PhD seminar** at IMUS (Sevilla, Spain). Title of the talk: Minimal surfaces, mean curvature and a (very) critical conjecture.

2025 **Young Researchers Seminar**, Universidad de Granada (Spain). Title of the talk: A minimal road to geometry.

2024 **Beer & Science PhD seminar** at Universidad de Sevilla (Spain). Title of the talk: La geometría detrás del cálculo de variaciones.

2023 **Mathematics PhD seminar** at IMUS (Sevilla, Spain). Title of the talk: Variando variedades variacionales.

Outreach

2025 **Co-organizer and host** for the visit of high school I.E.S. Joaquín Romero Murube to the Faculty of Mathematics (Sevilla).

2025 **Co-organizer** of the school visit of high school I.E.S. Triana to IMUS (Sevilla).

Attended events

2025 **Bifurcation theory and overdetermined problems**, 8-hour course at Universidad de Sevilla.

2024 **VI Geometric Analysis seminar at Universidad de Jaén** (Spain).

2023 **Summer School in Geometric Analysis**, Université Libre de Bruxelles (Belgium).

2023 **Topics in Geometric Flows and Minimal Surfaces**, St. Mary's College (United States).

2023 **V Geometric Analysis seminar at Universidad de Jaén** (Spain).

2022 **9$^{\text{th}}$ Heidelberg Laureate Forum**, Neue Universität (Heidelberg, Germany).

2022 **Geometric Analysis at Granada**, IMAG (Granada, Spain).

2020 **XIII JAE School of Mathematics 2020**, ICMAT, (Madrid, Spain).

2018 **XIX School of Mathematics "Lluis Santaló". Interactions between PDEs and probability**, UIMP (Santander, Spain).

Languages

English	B2 First (Cambridge English).
French	B2 DELF.
Portuguese	Currently preparing for CELPE-BRAS exam (*Certificado Intermediário Superior*).
Chinese	Currently preparing for HSK2 level exam.
Spanish	Native speaker.