

December 2022

**Personal details**

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Name Eduardo García-Juárez  
 Date of birth February 20, 1989  
 Nationality Spanish  
 Web page <https://egarciajuarez.com/>

Current Position **Ramón y Cajal Researcher**  
 Departamento de Análisis Matemático  
 Universidad de Sevilla  
 C/ Tarfia s/n, 41012, Sevilla

**Previous Positions**

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09/2021-11/2022 **Marie Skłodowska-Curie Individual Fellow**, *Universitat de Barcelona*, Spain  
 07/2020-09/2021 **Post-doctoral researcher**, *Universitat de Barcelona*, Spain  
 ERC St-G CAPA (PI Javier Gómez-Serrano)  
 08/2018-06/2020 **Hans Rademacher Instructor of Mathematics**, *University of Pennsylvania*, USA  
 06/2018-07/2018 **Post-doctoral researcher**, *Universidad de Sevilla*, Spain  
 ERC St-G Fluid-Interface (PI Francisco Gancedo)  
 09/2015-06/2018 **FPU Predoctoral Fellow**, *Universidad de Sevilla*, Spain  
 11/2014-06/2018 **PhD candidate**, *Universidad de Sevilla*, Spain

**Education**

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11/2014-06/2018 **Mathematics PhD**, *Universidad de Sevilla*, Spain  
 09/2007-09/2012\* **Industrial Engineering** (five-year degree), *Universidad de Sevilla*, Spain  
 09/2014 Final Project  
 11/2010-12/2013\* **Mathematics** (four-year degree), *Universidad de Sevilla*, Spain  
 07/2014 Final Project

**PhD Thesis**

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Title Global Regularity for Incompressible Fluid Interfaces  
 Advisor Francisco Gancedo  
 Defense June 11, 2018, at *Instituto de Matemáticas de la Universidad de Sevilla (IMUS)*, Spain  
 Committee Peter Constantin (Princeton University), Diego Córdoba (ICMAT), Raphaël Danchin (Université Paris-Est Créteil), Luis Escauriaza (UPV/EHU), Pedro Marín (Universidad de Sevilla).

**Publications**

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9. Global regularity of 2D N-S free boundary with small viscosity contrast, with F. Gancedo. Accepted in *Annales de l'Institut Henri Poincaré C, Analyse non linéaire*, *arXiv:2109.08764*, (2021).

8. Quantitative Hölder Estimates for Even S.I.O. on patches, with F. Gancedo. *Journal of Functional Analysis*, 283 (9), (2022).
7. Self-similar solutions for the Muskat equation, with J. Gómez-Serrano, H. Q. Nguyen, B. Pausader. *Advances in Mathematics*, 399, (2022).
6. The Peskin Problem with Viscosity Contrast, with Y. Mori, R. Strain. To appear in *Analysis & PDE*, *arXiv:2009.03360*, (2020).
5. Global Regularity for Gravity Unstable Muskat Bubbles, with F. Gancedo, N. Patel, R. Strain. To appear in *Memoirs of the American Mathematical Society*, *arXiv:1902.02318*, (2019).
4. Regularity Results for Viscous 3D Boussinesq Temperature Fronts, with F. Gancedo. *Communication in Mathematical Physics*. 376, 1705-1736, (2020).
3. On the Muskat problem with viscosity jump: Global in time results, with F. Gancedo, N. Patel, R. Strain. *Advances in Mathematics*, 345, p. 552-597, (2019).
2. Global Regularity of 2D Density Patches for Inhomogeneous Navier-Stokes, with F. Gancedo. *Archive for Rational Mechanics and Analysis*, 229, 339-360, (2018).
1. Global Regularity for 2D Boussinesq Temperature Patches with No Diffusion, with F. Gancedo. *Annals of PDE*, 3:14, (2017).

## Fellowships and awards

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09/2022	<i>Ramón y Cajal Fellowship</i> , Ministerio de Ciencia e Innovación (Spain)
12-2021	<i>Contratado Doctor</i> , Spanish National Accreditation Agency (ANECA)
06-2021	<i>Extraordinary Doctorate Award</i> , Universidad de Sevilla
09/2021-08/2023	<i>MSCA-IF-2020 – Individual Fellowship</i> , Horizon 2020 Framework Programme Project 101031111 CAMINFLOW (160 932.48 eur)
07/2019-07/2021	<i>AMS-Simons Travel Grant</i> , American Mathematical and Simons Foundations, \$4000.
03/2018-06/2018	<i>FPU Travel Grant</i> , Government of Spain
03/2018-06/2018	<i>Travel Grant PP2018-9421</i> , Plan Propio de la Universidad de Sevilla
09/2015-06/2018	<i>Formación de Personal Universitario</i> , FPU, PhD Fellowship, Government of Spain
07/2012-09/2012	<i>Introduction to research scholarship</i> , Plan Propio de Investigación, Universidad de Sevilla
09/2011-06/2012	<i>Collaboration scholarship</i> , Government of Spain

## Research Stays

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08/09/2021-10/12/2021	Short-term scholar, <i>ICERM at Brown University</i> , USA
31/03/2018-31/05/2018	Visiting Student Research Collaborator, <i>Princeton University</i> , USA
01/06/2017-31/07/2017	Visiting Research Scholar, <i>University of Pennsylvania</i> , USA

## Participation in funded projects

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09/2021-	Title: <i>Computer-assisted Analysis and Applications of Moving Interfaces in Incompressible Flows</i> H2020 Marie Skłodowska-Curie Actions, CAMINFLOW 101031111, 160 932 eur Principal Investigator: Eduardo García-Juárez
07/2020-	Title: <i>Global existence and Computer-Assisted Proofs of singularities in</i>

*incompressible fluids, with Applications*

European Research Council, Stg. Grant CAPA-852741, 1 485 000 eur

Principal Investigator: Javier Gómez-Serrano

09/2015-

Title: *Analysis of moving incompressible fluid interfaces*

European Research Council, Stg. Grant Fluid-Interface-2251-0791, 1 106 936 eur

Principal Investigator: Francisco Gancedo

09/2018-08/2021

Title: Formación de singularidades en fluidos incompresibles

Ministerio de Ciencia e Innovación (Spain), MTM-2017-88976-P, 51 425 eur

Principal Investigator: Diego Córdoba

01/2014-02/2019

Title: Formación de singularidades en interfaces de flujos incompresibles

Junta de Andalucía, P12-FQM-2466, 205 802 eur

Principal Investigator: Francisco Gancedo

## Invited Presentations

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- 10/10/2022 Workshop New trends in Mathematics of Dispersive, Integrable and Nonintegrable Models in Fluids, Waves and Quantum Physics, *BIRS*, Banff, Canada.
- 12/09/2022 Workshop Free boundary problems in biology and fluid dynamics, *Universidad de Cantabria*, Cantabria, Spain.
- 28/04/2022 Fluid Fair Workshop, *IMUS*, Sevilla, Spain.
- 20/04/2022 Analysis and PDEs seminar, *ICMAT*, Madrid, Spain.
- 18/01/2022 Free Boundary Problems in Physics and Biology Special Session, *Congreso Bienal de la RSME*, Ciudad Real, Spain.
- 21/12/2021 I Jornadas de Premios Extraordinarios de Tesis, *IMUS*, Sevilla, Spain.
- 15/11/2021 Calderón-Zygmund Analysis Seminar, *The University of Chicago*, USA.
- 10/11/2021 PDE seminar for Postdocs and Graduate Students, *ICERM*, *Brown University*, USA.
- 27/09/2021 Analysis seminar, *Brown University*, USA
- 21/06/2021 Seminari d'Anàlisi de Barcelona, *Universitat Autònoma de Barcelona and Universitat de Barcelona*, Spain.
- 17/06/2021 One World Meeting of Young Mathematicians in Fluid Dynamics, online.
- 23/01/2020 MathBio seminar, *University of Pennsylvania*, Philadelphia, USA
- 10/05/2019 Partial Differential Equations seminar, *Brown University*, Providence, USA
- 28/03/2019 Differential Equations seminar, *University of Michigan*, Ann Arbor, USA
- 21/02/2019 Analysis of Fluids and Related Topics seminar, *Princeton University*, Princeton, USA
- 18/01/2019 Special Session on Math. Anal. In Fluid Dynamics, *Joint Mathematics Meetings 2019 of the American Mathematical Society*, Baltimore, USA
- 10/01/2019 Conversaciones Fluidas seminar, *IMUS*, Sevilla, Spain
- 11/10/2018 Analysis seminar, *University of Pennsylvania*, Philadelphia, USA
- 20/11/2017 Ecuaciones Diferenciales seminar, *IEMATH-Granada*, Granada, Spain
- 07/09/2017 IV Young Researchers Meeting, *RSME*, Valencia, Spain
- 25/05/2017 Conversaciones Fluidas seminar, *IMUS*, Sevilla, Spain
- 10/05/2017 PDEs and fluid mechanics seminar, *ICMAT*, Madrid, Spain
- 23/05/2015 PHD seminar, *IMUS*, Sevilla, Spain
- 29/05/2015 Workshop on Mathematics and its Applications, *BCAM*, Bilbao, Spain

## Organization experience

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- 13/12/2019-14/12/2019 Co-organizer of the sessions Recent Results in Incompressible Fluid Mechanics, Part I, II, III, at *2019 SIAM Conference on Analysis of Partial Differential Equations*, La Quinta, USA
- Sept. 2018-May 2020 Co-organizer of the *Analysis seminar*, University of Pennsylvania, Philadelphia, USA
- 12/06/2018-15/06/2018 Co-organizer of the workshop Mathematical Analysis in Incompressible Fluids (*MathFluids Workshop*), IMUS, Sevilla, Spain
- Sept. 2017-May 2018 Co-organizer of the *Conversaciones Fluidas seminar*, IMUS, Sevilla, Spain
- Sept. 2017-June 2018 Co-organizer of the *PHD seminar*, IMUS, Sevilla, Spain

## Teaching Experience

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- Feb. 2022-May 2022 Introduction to Fluid Mechanics (10h), BGSMath Graduate Course, *Universitat de Barcelona*, Spain
- Jan. 2021-June 2021 Equacions Diferencials (6 ECTS), 3<sup>rd</sup> year BSc (Mathematics degree), *Universitat de Barcelona*, Spain
- Jan. 2020-May 2020 Partial Differential Equations (Math 425), 4<sup>th</sup> year BSc, *University of Pennsylvania*, USA
- Jan. 2020-May 2020 Calculus IV, PDE (Math 241), 2<sup>nd</sup> year BSc, *University of Pennsylvania*, USA
- Aug. 2019-Dec. 2019 Multivariate Calculus, with Probability and Matrices (Math 115), 1<sup>st</sup> year BSc, *University of Pennsylvania*, USA
- Jan. 2019-May 2019 Partial Differential Equations (Math 425), 4<sup>th</sup> year BSc, *University of Pennsylvania*, USA
- Jan. 2019-May 2019 Linear Algebra (Math 312), 3<sup>rd</sup> year BSc, *University of Pennsylvania*, USA
- Aug. 2018-Dec. 2018 Linear Algebra (Math 312), 3<sup>rd</sup> year BSc, *University of Pennsylvania*, USA
- Sept. 2017-Feb. 2018 Infinitesimal Calculus (1 ECTS), 1<sup>st</sup> year BSc (Mathematics degree), *Universidad de Sevilla*, Spain
- Sept. 2017-Feb. 2018 Mathematical Analysis (2.25 ECTS), 1st year BSc (Physics degree), *Universidad de Sevilla*, Spain
- Sept. 2017-Feb. 2018 Mathematics (1.6 ECTS), 1<sup>st</sup> year BSc (Chemistry degree), *Universidad de Sevilla*, Spain
- Sept. 2016-Feb. 2017 Mathematical Analysis (2.25 ECTS), 1st year BSc (Physics degree), *Universidad de Sevilla*, Spain
- Sept. 2016-Feb. 2017 Mathematics (2.4 ECTS), 1<sup>st</sup> year BSc (Chemistry degree), *Universidad de Sevilla*, Spain
- Sept. 2016-Feb. 2017 Differentiation of functions in  $R^n$  (0.4 ECTS), 2<sup>nd</sup> year BSc, *Universidad de Sevilla*, Spain
- Sept. 2016-Feb. 2017 Integration of functions in  $R^n$  (0.4 ECTS), 2<sup>nd</sup> year BSc, *Universidad de Sevilla*, Spain

## Other activities

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- 11/05/2022 Talk at the Workshop *How to successfully write an Individual Marie Curie Fellowship proposal in Mathematics and Computer Science*, *Universitat de Barcelona*.
- 19/11/2019 Dinner Chat at Kings Court English College House, University of Pennsylvania.
- Sept. 2018-May 2020 Member of the Library Committee at University of Pennsylvania.

Sept. 2019-May 2020

Reviewer

Math Major Advisor at University of Pennsylvania.

Archive for Rational Mechanics and Analysis; Annales de l'Institut Henri Poincaré C - Analyse non Linéaire; Journal of Nonlinear Science; Proceedings of the American Mathematical Society; Journal of Functional Analysis; Zeitschrift für angewandte Mathematik und Physik; Indiana University Mathematics Journal; Nonlinearity; Communications in Mathematical Sciences; Journal of Mathematical Physics; Mathematical Modeling of Natural Phenomena; Nonlinear Analysis Series B: Real World Applications; zbMath.

## Languages

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Spanish	Native
English	Advanced – C1
French	Beginner – B1(B2, Spain National Language School, 2007)
German, Italian	Beginner – A1/A2 (Universidad de Sevilla, 2008)

## References

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Francisco Gancedo	<a href="mailto:fgancedo@us.es">fgancedo@us.es</a>
Robert M. Strain	<a href="mailto:strain@math.upenn.edu">strain@math.upenn.edu</a>
Javier Gómez-Serrano	<a href="mailto:jgomezerrano@ub.edu">jgomezerrano@ub.edu</a>
Yoichiro Mori	<a href="mailto:y1mori@sas.upenn.edu">y1mori@sas.upenn.edu</a>