

September 2021

**Personal details**

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Name Eduardo García-Juárez  
 Date of birth February 20, 1989  
 Nationality Spanish  
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 Current Position **ERC Postdoc at Universitat de Barcelona**  
 Department de Matemàtiques i Informàtica  
 Gran Via de les Corts Catalanes, 585  
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**Positions**

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01/09/2021- **MSCA-IF-2020**, *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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- 2021 Global regularity of 2D N-S free boundary with small viscosity contrast, with F. Gancedo. *Preprint, arXiv:2109.08764*, (2021).
- 2021 Quantitative Hölder Estimates for Even S.I.O. on patches, with F. Gancedo. *Preprint arXiv:2109.08762*, (2021).
- 2021 Self-similar solutions for the Muskat equation, with J. Gómez-Serrano, H. Q. Nguyen, B. Pausader. *Preprint, arXiv:2109.02565*, (2021).
- 2020 The Peskin Problem with Viscosity Contrast, with Y. Mori, R. Strain. *Accepted for publication in Analysis & PDE, arXiv:2009.03360*, (2020).
- 2019 Global Regularity for Gravity Unstable Muskat Bubbles, with F. Gancedo, N. Patel, R. Strain. *Accepted for publication in Memoirs of the AMS, arXiv:1902.02318*, (2019).
- 2020 Regularity Results for Viscous 3D Boussinesq Temperature Fronts, with F. Gancedo. *Communication in Mathematical Physics*. 376, 1705-1736, (2020).
- 2019 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).
- 2018 Global Regularity of 2D Density Patches for Inhomogeneous Navier-Stokes, with F. Gancedo. *Archive for Rational Mechanics and Analysis*, 229, 339-360, (2018)
- 2017 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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- 06-2021 *Extraordinary Doctorate Award*, Universidad de Sevilla
- 09/2021-08/2023 *MSCA-IF-2020 – Individual Fellowship*, Horizon 2020 Framework Programme Project 101031111 CAMINFLOW (160 932.48 eur)
- 07/2019-07/2021 *AMS-Simons Travel Grant*, American Mathematical and Simons Foundations, \$4000.
- 03/2018-06/2018 *FPU Travel Grant*, Government of Spain
- 03/2018-06/2018 *Travel Grant PP2018-9421*, Plan Propio de la Universidad de Sevilla
- 09/2015-06/2018 *Formación de Personal Universitario*, FPU, PhD Fellowship, Government of Spain
- 07/2012-09/2012 *Introduction to research scholarship*, Plan Propio de Investigación, Universidad de Sevilla
- 09/2011-06/2012 *Collaboration scholarship*, Government of Spain

## Research Stays

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09/2021-12/2021	Short-term scholar, <i>ICERM at Brown University</i> , USA
04/2018-05/2018	Visiting Student Research Collaborator, <i>Princeton University</i> , USA
06/2017-07/2017	Visiting Research Scholar, <i>University of Pennsylvania</i> , USA

## Invited Presentations

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21/06/2021	Seminari d'Anàlisi de Barcelona, <i>Universitat Autònoma de Barcelona and Universitat de Barcelona</i> , Spain.
17/06/2021	One World Meeting of Young Mathematicians in Fluid Dynamics, Online.
23/01/2020	MathBio seminar, <i>University of Pennsylvania</i> , Philadelphia, USA
10/05/2019	Partial Differential Equations seminar, <i>Brown University</i> , Providence, USA
28/03/2019	Differential Equations seminar, <i>University of Michigan</i> , Ann Arbor, USA
21/02/2019	Analysis of Fluids and Related Topics seminar, <i>Princeton University</i> , Princeton, USA
18/01/2019	Special Session on Math. Anal. In Fluid Dynamics, <i>Joint Mathematics Meetings 2019</i> of the American Mathematical Society, Baltimore, USA
10/01/2019	Conversaciones Fluidas seminar, <i>IMUS</i> , Sevilla, Spain
11/10/2018	Analysis seminar, <i>University of Pennsylvania</i> , Philadelphia, USA
20/11/2017	Ecuaciones Diferenciales seminar, <i>IEMATH-Granada</i> , Granada, Spain
07/09/2017	IV Young Researchers Meeting, <i>RSME</i> , Valencia, Spain
25/05/2017	Conversaciones Fluidas seminar, <i>IMUS</i> , Sevilla, Spain
10/05/2017	PDEs and fluid mechanics seminar, <i>ICMAT</i> , Madrid, Spain
23/05/2015	PHD seminar, <i>IMUS</i> , Sevilla, Spain
29/05/2015	Workshop on Mathematics and its Applications, <i>BCAM</i> , 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 <i>2019 SIAM Conference on Analysis of Partial Differential Equations</i> , La Quinta, USA
Sept. 2018-May 2020	Co-organizer of the <i>Analysis seminar</i> , University of Pennsylvania, Philadelphia, USA
12/06/2018-15/06/2018	Co-organizer of the workshop <i>Mathematical Analysis in Incompressible Fluids</i>

(*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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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), 1<sup>st</sup> 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), 1<sup>st</sup> 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  $\mathbb{R}^n$  (0.4 ECTS), 2<sup>nd</sup> year BSc, *Universidad de Sevilla*, Spain

Sept. 2016-Feb. 2017 Integration of functions in  $\mathbb{R}^n$  (0.4 ECTS), 2<sup>nd</sup> year BSc, *Universidad de Sevilla*, Spain

## Participation in funded projects

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07/2020- Title: *Global existence and Computer-Assisted Proofs of singularities in incompressible fluids, with Applications*  
European Research Council, Starting Grant CAPA-852741, 2020-2025  
Principal Investigator: Javier Gómez-Serrano

- 09/2015- Title: *Analysis of moving incompressible fluid interfaces*  
European Research Council, Starting Grant Fluid-Interface-2251-0791  
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  
Principal Investigator: Diego Córdoba
- 01/2014-02/2019 Title: Formación de singularidades en interfaces de flujos incompresibles  
Junta de Andalucía, P12-FQM-2466  
Principal Investigator: Francisco Gancedo

### Conferences attended

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- 11/12/2019-14/12/2019 SIAM Conference on Analysis of Partial Differential Equations, La Quinta, USA
- 24/06/2019-28/06/2019 Summer School on Fluids Mechanics, ICMAT, Madrid, Spain
- 02/07/2018-20/07/2018 Summer School and Workshop: Geometric Function Theory in Fluid Mechanics, BGSMath, Barcelona, Spain
- 12/06/2018-15/06/2018 Workshop Mathematical Analysis in Incompressible Fluids, IMUS, Sevilla, Spain
- 04/09/2017-08/09/2017 IV Young Researchers Meeting, RSME, Valencia, Spain
- 05/06/2017-09/06/2017 Summer School and Workshop: Mathematical Analysis of Water Waves and Related Models, Bodega Marine Laboratory, UC Davis, Bodega Bay, USA
- 25/01/2017-27/01/2017 Workshop Recent Advances in PDEs: Analysis, Numerics, and Control, IMUS, Sevilla, Spain
- 19/09/2016-21/09/2016 Spanish-French Workshop on Analysis of PDEs from fluid Mechanics, ICMAT, Madrid, Spain
- 11/07/2016-15/07/2016 International Summer School on Evolution Equations, Charles University and Institute of Mathematics of the Czech Academy of Sciences, Prague, Czech Republic
- 10/10/2015-13/10/2015 Mini-School and workshop Analysis of PDEs of Fluid Mechanics and Related Models, Rice University, Houston, USA
- 27/07/2015-07/08/2015 Summer Graduate School Incompressible Fluid Flows at High Reynolds Number, Mathematical Sciences Research Institute (MSRI), Berkeley, USA

### Other activities

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- 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 Math Major Advisor at University of Pennsylvania.

Reviewer 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.

## Languages

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Spanish	Native
English	Advanced – C1/C2
French	Intermediate – 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>
Yoichiro Mori	<a href="mailto:y1mori@sas.upenn.edu">y1mori@sas.upenn.edu</a>
Javier Gómez-Serrano	<a href="mailto:jgomez-serrano@ub.edu">jgomez-serrano@ub.edu</a>
Diego Córdoba	<a href="mailto:dco@icmat.es">dco@icmat.es</a>