

# Eduardo García-Juárez

## *Curriculum Vitae*

May 2019

### Personal details

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Department of Mathematics  
University of Pennsylvania  
David Rittenhouse Lab. 209 South 33rd Street  
Philadelphia, PA 19104-6395

Email: edugar@math.upenn.edu  
Web page: <https://egarciajuarez.com>

Nationality: Spanish

Current position: Hans Rademacher Instructor August 2018

### Research interests

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Analysis, partial differential equations and fluid mechanics.

### Education

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**Mathematics PhD** Nov. 2014 - June 2018  
Universidad de Sevilla  
Advisor: Francisco Gancedo

**Mathematics (4 years Degree)** Nov. 2010 - Dec. 2013  
Universidad de Sevilla (except final project, July 2014)

**Industrial Engineering (5 years Degree)** Sept. 2007 - Sept. 2012  
Universidad de Sevilla (except final project, Sept. 2014)  
Specialisation in Systems and Automation

### Publications

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1. “Global regularity for 2D Boussinesq temperature patches with no diffusion”, with F. Gancedo. **Ann. PDE** (2017), 3: 14.
2. “Global regularity of 2D density patches for inhomogeneous Navier-Stokes”, with F. Gancedo. **Arch. Ration. Mech. Anal** (2018), 229:339.
3. “On the Muskat problem with viscosity jump: Global in time results”, with F. Gancedo, N. Patel, R. Strain. **Adv. Math.**, Vol. 345, P. 552-597, (2019).
4. “Regularity results for viscous 3D Boussinesq temperature fronts”, with F. Gancedo. **Submitted**, *arXiv:1809.00701*, (2018).
5. “Global Regularity for Gravity Unstable Muskat Bubbles”, with F. Gancedo, N. Patel, R. Strain. **Submitted**, *arXiv:1902.02318*, (2019).

## Fellowships and awards

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- High school award from the Government of Spain (2007)
- *Collaboration* scholarship from the Government of Spain (October 2011 - June 2012)
- *Introduction to research* scholarship from Universidad de Sevilla (July and September 2012)
- *Formación de Personal Universitario, FPU*, Ph.D. fellowship from the Government of Spain (September 2015 - September 2019)
- *FPU Travel Grant* from Government of Spain, 2018.
- *AMS-Simons Travel Grant*. American Mathematical Society and Simons Foundation. July 2019 - July 2021

## Grants

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Title: *Analysis of moving incompressible fluid interfaces*  
European Research Council, Starting Grant *Fluid-Interface 639227* 2015 - 2020  
Principal Investigator: Francisco Gancedo

Title: *Formación de Singularidades en Fluidos Incompresibles*  
MEC MTM2017-89976-P 2018 - 2020  
Principal Investigator: Diego Córdoba

Title: *Formación de Singularidades en Interfases de Flujos Incompresibles*  
Junta de Andalucía, Proyecto de Excelencia P12-FQM-2466 2014 - 2018  
Principal Investigator: Francisco Gancedo

Title: *Análisis Matemático*  
Plan Andaluz de Investigación, Desarrollo e Innovación FQM104  
Principal Investigator: Juan Arias de Reyna

## Research visits

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- University of Pennsylvania (Philadelphia, USA) June - July 2017  
Host: Robert M. Strain
- Princeton University (New Jersey, USA) April - May 2018  
Host: Peter Constantin

## Seminars and Talks

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- BCAM, Bilbao. May 2015
- *PHD* Seminar, IMUS, Sevilla. September 2015
- *PDEs and fluid mechanics* Seminar, ICMAT-CSIC, Madrid. May 2017
- *Conversaciones fluidas* Seminar, IMUS, Sevilla. May 2017

- IV Young Researchers Meeting, RSME, Valencia. September 2017
- *Ecuaciones Diferenciales* Seminar, IEMath-GR, Granada. November 2017
- *Analysis* Seminar, University of Pennsylvania, Philadelphia. October 2018
- *Conversaciones fluidas* Seminar, IMUS, Sevilla. January 2019
- *Joint Mathematics Meetings*, Baltimore. January 2019  
AMS Special Session on Math. Anal. in Fluid Dynamics.
- *Analysis of Fluids and Related Topics* Seminar, February 2019  
Princeton University, Princeton.
- *Differential Equations* Seminar, March 2019  
University of Michigan, Ann Arbor.
- *Partial Differential Equations* Seminar, May 2019  
Brown University, Providence.

## Conferences

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- Workshop on Mathematics and its Applications, BCAM. May 2015, Bilbao.
- Summer Graduate School Incompressible Fluid Flows at High Reynolds Number, MSRI. 27 July - 7 August 2015, Berkeley, California.
- Mini-school and workshop Analysis of PDEs of Fluid Mechanics and Related Models, Rice University. October 2015. Houston, Texas.
- International Summer School on Evolution Equations, Charles University and Institute of Mathematics of the Czech Academy of Sciences. July 2016, Prague.
- Spanish-French Workshop on Analysis of PDEs from fluid Mechanics, ICMAT. September 2016, Madrid.
- Workshop Recent advances in PDEs: Analysis, Numerics and Control, IMUS. January 2017, Sevilla.
- Summer School and Workshop: Mathematical Analysis of Water Waves and Related Models, Bodega Marine Laboratory, University of California, Davis. June 2017, Bodega Bay, CA, USA.
- IV Young Researchers Meeting, Real Sociedad Matemática Española. June 2017, Valencia.
- Workshop Mathematical Analysis in Incompressible Fluids, IMUS. June 2018, Sevilla.
- Summer School and Workshop: Geometric Function Theory in Fluid Mechanics, BGSMath. July 2018, Barcelona.

## Organization activities

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- Co-organizer of *PHD Seminar*, IMUS (2017-18)
- Co-organizer of *Conversaciones Fluidas Seminar*, IMUS (2017-18)
- Co-organizer of the workshop *Mathematical Analysis in Incompressible Fluids*, Sevilla, June 12-15th, 2018.
- Co-organizer of the *Analysis Seminar*, University of Pennsylvania (2018-19)

## Teaching experience

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- Partial Differential Equations (Math 425) Spring 2019
- Linear Algebra (Math 312) Spring 2019
- Linear Algebra (Math 312) Fall 2018
- Infinitesimal Calculus 2017/18 (1.00 ECTS)
- Math. Analysis (Physics degree) 16/17 (2.25 ECTS), 17/18 (2.25 ECTS)
- Mathematics (Chemistry degree) 16/17 (2.40 ECTS), 17/18 (1.60 ECTS)
- Differentiation of functions in  $\mathbb{R}^n$  2016/17 (0.40 ECTS)
- Integration of functions in  $\mathbb{R}^n$  2016/17 (0.40 ECTS)

## Languages

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- Spanish: Native.
- English: Advanced - C1/C2.
- French: Intermediate - B1/B2. (Spain National Language School, 2007)
- German, Italian: Elementary - A1/A2. (Universidad de Sevilla, 2008)

## References

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- Francisco Gancedo, fgancedo@us.es
- Robert M. Strain, strain@math.upenn.edu
- Diego Córdoba, dcg@icmat.es
- Antonio Rojas, arojas@us.es (teaching)