

# TOMÁS SANZ-PERELA

## CONTACT INFORMATION AND PERSONAL DATA

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Av. Diagonal, 647, 08028 Barcelona (Spain) [tomas.sanz@upc.edu](mailto:tomas.sanz@upc.edu)

BIRTH: Barcelona (Spain) — May 1993 RESEARCHERID: J-9900-2017  
CITIZENSHIP: Spanish ORCID ID: 0000-0002-1210-1111

## RESEARCH INTERESTS

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Elliptic partial differential equations  
Variational problems and stable solutions  
Reaction-diffusion equations, phase transitions, and minimal surfaces  
Integro-differential equations  
Music and mathematical modelling

## CURRENT POSITION

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09/2019 - **Postdoctoral Fellow**  
BCAM - Basque Center for Applied Mathematics, Bilbao (Spain)  
Prof. L. Vega (669689 – HADE ERC-2014-AdG project)

## EDUCATION

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06/2019 | **Ph.D. in Applied Mathematics**  
Universitat Politècnica de Catalunya, Barcelona (Spain)  
Thesis: “Stable solutions to nonlinear equations with fractional diffusion”  
Advisor: Prof. Xavier CABRÉ — [Link to the thesis](#)  
GRADE (AVERAGE): Excellent Cum Laude

07/2016 | **Master in Advanced Mathematics and Mathematical Engineering**  
Universitat Politècnica de Catalunya, Barcelona (Spain)  
Thesis: “Stable solutions to nonlinear equations with fractional diffusion”  
Advisor: Prof. Xavier CABRÉ — [Link to the thesis](#)  
GRADE (AVERAGE): 9.63/10

07/2015 | **Bachelor’s degree in Mathematics**  
Universitat Politècnica de Catalunya, Barcelona (Spain)  
Thesis: “De l’equació d’ones a l’afinació del piano: un model basat en la teoria de la dissonància”  
Advisor: Prof. Xavier GRÀCIA — [Link to the thesis](#)  
GRADE (AVERAGE): 8.36/10  
2014: Erasmus semester at Universidade de Lisboa (Portugal)

## GRANTS

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| 09/2016 - 07/2019 | <b>PhD 3-years position by the BGSMath through the María de Maeztu programme</b><br>MDM-2014-0445, Ministry of Economy, Industry, and Competitiveness, Government of Spain                           |
| 04/2016 - 07/2016 | <b>Teaching's support studentship (Beca per a les activitats acadèmiques dirigides de suport al professorat)</b><br>2016AAD00167-UPCA01, Ministry of Business and Knowledge, Government of Catalonia |

## PRIZES AND AWARDS

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| 04/2018 | <b>Accessit at Évariste Galois Prize 2018 (Best Master's Thesis award)</b><br>Catalan Society of Mathematics  |
| 10/2016 | <b>Best academic records of the 2015-2016 year</b><br>Master in Advanced Mathematics and Mathematical Engineering   |
| 06/2012 | <b>Award to the students with higher grades in the access exam to the university (Reconeixement a l'esforç i a l'excel·lència acadèmica)</b><br>CatalunyaCaixa foundation |

## RESEARCH ARTICLES AND PREPRINTS

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- [1] Felipe-Navarro, J.C. & Sanz-Perela, T. (2019) Semilinear integro-differential equations II: one-dimensional and saddle-shaped solutions to the Allen-Cahn equation. Submitted. Preprint available at [arXiv](#).
- [2] Felipe-Navarro, J.C. & Sanz-Perela, T. (2019) Semilinear integro-differential equations I: odd solutions with respect to the Simons cone. To appear in *J. Funct. Anal.*, preprint available at [arXiv](#).
- [3] Felipe-Navarro, J.C. & Sanz-Perela, T. (2018). Uniqueness and stability of the saddle-shaped solution to the fractional Allen-Cahn equation. To appear in *Rev. Mat. Iberoam.*, preprint available at [arXiv](#).
- [4] Sanz-Perela, T. (2018). Regularity of radial stable solutions to semilinear elliptic equations for the fractional Laplacian. *Commun. Pure Appl. Anal.*, 17, 2547–2575.  
doi: [10.3934/cpaa.2018121](#)
- [5] Gràcia, X. & Sanz-Perela, T. (2017). The wave equation for stiff strings and piano tuning. *Rep. @SCM*, 3, 1–16.  
doi: [10.2436/20.2002.02.11](#).

## ARTICLES IN PREPARATION

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- [1] Cabré, X. & Sanz-Perela, T. (2019) BMO and  $L^\infty$  estimates for stable solutions to fractional semilinear elliptic equations. In preparation.

## INVITED TALKS AT CONFERENCES

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- INDAM Intensive Period 2019 “Shape optimization, control and inverse problems for PDEs” (May-July, 2019. Università degli Studi di Napoli Federico II, Naples, Italy)  
Title: “Stable solutions to fractional semilinear equations”.
- Barcelona Analysis Conference 2019 (June 25-28, 2019. Universitat de Barcelona, Barcelona, Spain)  
Title: “Stable solutions to fractional semilinear equations”.
- Second BYMAT Conference (May 20-24, 2019. Instituto de Ciencias Matemáticas, Madrid, Spain)  
Title: “Stable solutions to fractional semilinear equations”.
- First BYMAT Conference (May 7-9, 2018. Instituto de Ciencias Matemáticas, Madrid, Spain)  
Title: “Integro-differential Allen-Cahn equations: the saddle-shaped solution”.

## TEACHING

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SPRING 2019	<b>Ecuacions en derivades parcials (Partial differential equations)</b> Facultat de Matemàtiques i Estadística Universitat Politècnica de Catalunya, Barcelona (Spain) Undergraduate course, 30 h.
SPRING 2018	<b>Anàlisi funcional (Functional Analysis)</b> Facultat de Matemàtiques i Estadística Universitat Politècnica de Catalunya, Barcelona (Spain) Undergraduate course, 30 h.
SPRING 2016	<b>Linear algebra and computer programming</b> Universitat Politècnica de Catalunya, Barcelona (Spain) Undergraduate problem sessions, 15 h.

## ATTENDANCE TO SEMINARS, CONFERENCES AND COURSES

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- INDAM Intensive Period 2019 “Shape optimization, control and inverse problems for PDEs” (May-July, 2019. Università degli Studi di Napoli Federico II, Naples, Italy)
- Barcelona Analysis Conference (June 25-28, 2018. Universitat de Barcelona, Barcelona, Spain).
- 16th School on Interaction between Dynamical Systems and Partial Differential Equations (June 17-21, 2019. Centre de Recerca Matemàtica, Barcelona, Spain).
- Second BYMAT Conference (May 20-24, 2018. Instituto de Ciencias Matemáticas, Madrid, Spain).
- Geometry and PDE in front of the Alhambra (January 22-25, 2019. Universidad de Granada, Granada, Spain).
- Winter Meeting on Nonlocal PDEs and Applications (December 10-12, 2018. Universidad Autónoma de Madrid, Madrid, Spain).
- PDEs and Geometric Measure Theory (October 29 - November 2, 2018. ETH Zurich, Zurich, Switzerland).

- 16th School on Interaction between Dynamical Systems and Partial Differential Equations (June 25-29, 2018. Centre de Recerca Matemàtica, Barcelona, Spain).
- Trobada d'EDPs i Aplicacions (June 31, 2018. Universitat de Girona, Girona, Spain).
- INDAM: Nonlinear PDEs in Geometry and Physics (June 11-15, 2018. Palazzone di Cortona, Cortona, Italy).
- First BYMAT Conference (May 7-9, 2018. Instituto de Ciencias Matemáticas, Madrid, Spain).
- First Belgium-Chile-Italy Conference in PDEs (November 13-17, 2017. Université libre de Bruxelles, Brussels, Belgium).
- BMS-BGSMath Junior Meeting (October 9-10, 2017. Institut d'Estudis Catalans, Barcelona, Spain).
- 15th School on Interaction between Dynamical Systems, Geometry and Partial Differential Equations (June 26-30, 2017. Centre de Recerca Matemàtica, Barcelona, Spain).
- Llavifest: A Broad Perspective on Finite and Infinite Dimensional Dynamical Systems (June 12-16, 2017. Universitat de Barcelona, Barcelona, Spain).
- Trobada d'EDPs i Aplicacions (June 8, 2017. Universitat de Girona, Girona, Spain).
- Advanced School/Workshop on Nonlocal Partial Differential Equations and Applications to Geometry, Physics and Probability (May 22 - June 2, 2017. International Centre for Theoretical Physics, Trieste, Italy).
- Nonlinear Diffusion and Free Boundary Problems. A conference on the occasion of the 70th anniversary of Juan Luis Vázquez (May 17-19, 2017. Universidad Autónoma de Madrid, Madrid, Spain).
- Barcelona Mathematical Days 2017 (April 27-28, 2017. Institut d'Estudis Catalans, Barcelona, Spain).
- Abel in Barcelona (January 16, 2017. Institut d'Estudis Catalans, Barcelona, Spain).
- Czech, Slovenian, Austrian, Slovak and Catalan Mathematical Societies joint meeting (October 20-23, 2016. Institut d'Estudis Catalans, Barcelona, Spain).
- 14th Workshop on Interactions between Dynamical Systems and Partial Differential Equations (July 11-15, 2016. Universitat Politècnica de Catalunya, Barcelona, Spain).
- 13th DANCE Winter School RTNS2016: Recent Trends in Nonlinear Science 2016 (January 25-29, 2016. Instituto de Matemáticas de la Universidad de Sevilla, Sevilla, Spain).

## LANGUAGES

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CATALAN: Native  
 SPANISH: Native  
 ENGLISH: B2 level  
 PORTUGUESE: B1.2 level

## COMPUTER SKILLS

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Advanced knowledge: Matlab, C++, Java, LaTeX.  
 Intermediate Knowledge: PL/SQL, R, Objective-C.