

Part A. PERSONAL INFORMATION

CV date	04/10/2018
----------------	------------

First and Family name	Francisco Torralbo Torralbo		
Researcher numbers	Researcher ID	H-1661-2016	
	Orcid code	0000-0001-7799-7919	

A.1. Current position

Name of University/Institution	Universidad de Granada		
Department	Geometría y Topología		
Address and Country	Campus de Fuentenueva s/n. E-18071 Granada (Spain)		
Phone number	958 2 42793	E-mail	ftorralbo@ugr.es
Current position	Incorporación Jóvenes Doctores	From	01/09/2018
Espec. cód. UNESCO	120404		
Keywords	Geometric Analysis, Riemannian Geometry, homogeneous spaces, Kähler manifolds, stability and isoperimetric problem, constant mean curvature surfaces, minimal surfaces, parallel mean curvature surfaces, Lagrangian surfaces		

A.2. Education

PhD	University	Year
Mathematics	Universidad de Granada	2010

A.3. JCR articles, h Index.

Papers				Indices	
Total	1st quartile	Cites		h-index	i10
11	5	168	<i>Google Scholar</i>	7	6
		75	<i>MathSciNet</i>	6	2

Part B. CV SUMMARY (max. 3500 characters, including spaces)

I got my degree in Mathematics in 2005, obtaining a special mention in the most outstanding student award at state level. After that, I joined the Dpt. of Geometry and Topology in the University of Granada, first as a Ph.D. student and, after obtaining the doctoral degree in 2010, as a postdoc where I worked until 2014 involved in different research projects. I then moved to KU Leuven (Belgium) as a postdoc funded by the Interuniversity Attraction Pole "DYGEST". I also worked in Centro Universitario de la Defensa (Murcia, Spain) and Universidad de Cádiz (Spain) as an assistant professor. I am currently a research fellow at the Dpt. of Geometry and Topology of the University of Granada under the Young Researchers Fellowship Program.

I have collaborated in several research projects, national and international ones, all of them concerning geometric analysis, an area in which my research can be situated. I have been the principal researcher of one project directed to young researchers within the GENIL program.

Throughout my career, I have had the chance to stay at different universities and research institutions, especially at IMPA (Brazil) and at KU Leuven (Belgium). My research is supported by eleven publications in JCR journals, five of them placed in the first quartile. I have participated in the organization of national and international research meetings on Differential Geometry.

My research has been mainly focused on problems related with the theory of minimal and constant mean curvature surfaces (CMC in the sequel). Regarding the existence of compact minimal and CMC surfaces, I extended a technique developed by Lawson to homogeneous spaces (specifically the family of Berger spheres) constructing compact minimal surfaces of

arbitrary genus (Ann Global Anal Geo). Besides, I showed that embedded compact minimal surfaces of odd Euler characteristic are not allowed in $S^2 \times R$ as well as constructing examples of the rest of topological types (Comm Ana Geom). Developing further this technique it has been possible to construct new examples of CMC surfaces in $S^2 \times R$ and $H^2 \times R$ (Michigan Math J.) as well as compact arbitrary genus ones in $S^2 \times R$ (preprint).

Regarding the stability problem, the most important result was the classification of the compact stable CMC surfaces in a subfamily of the Berger spheres (Indiana U Math J), which allowed solving the isoperimetric problem in those manifolds. For that purpose, the rotationally invariant examples were first described (Diff Geo App). In codimension bigger than one, the classification of compact minimal stable surfaces was done in certain product manifolds (Proc Amer Soc) as well as the characterization of Lagrangian surfaces critical points of a certain variational problem (Math Z).

In codimension two, I studied the minimal and parallel mean curvature surfaces (PMC in the sequel, the natural generalization of CMC surfaces) in the product of two spheres or hyperbolic planes. In the minimal case, a comprehensive study of them was done in $S^2 \times S^2$ (J Geom Anal) as well as the development of a geometrical correspondence in the case of $H^2 \times H^2$ (J Math Anal Appl). The classification of the PMC spheres in the Riemannian products $S^2 \times S^2$ and $H^2 \times H^2$ was done characterizing a big family of new examples (Trans Amer Soc).

Finally, I have also studied problems concerning the Gauss curvature classifying the compact flat ones in homogeneous manifolds (Proc Amer Soc).

Part C. RELEVANT MERITS

C.1. Publications (including books)

José M. Manzano, Julia Plehnert, Francisco Torralbo, 2016. Compact embedded minimal surfaces in $S^2 \times S^1$. Comm. Anal. Geom. 24 (2): 409–429.

Francisco Torralbo, 2015. A geometrical correspondence between maximal surfaces in anti-De Sitter space-time and minimal surfaces in $H^2 \times R$. J. Math. Anal. Appl. 423 (2): 1660–1670.

Francisco Torralbo, Francisco Urbano, 2015. Minimal surfaces in $S^2 \times S^2$. J. Geom. Anal. 25 (2): 1132-1156.

Francisco Torralbo, Francisco Urbano, 2014. On stable compact minimal submanifolds. Proc. Amer. Math. Soc. 142 (2): 651-658.

Francisco Torralbo, Francisco Urbano, 2012. Surfaces with parallel mean curvature vector in $S^2 \times S^2$ and $H^2 \times H^2$. Trans. Amer. Soc. 364 (2):785-813.

Francisco Torralbo, Francisco Urbano, 2012. Compact stable constant mean curvature surfaces in homogeneous 3-manifolds. Indiana U. Math. J. 3 (61):1129-1156.

Francisco Torralbo, 2012. Compact minimal surfaces in the Berger spheres. Ann. Global Anal. Geom. 4 (41):391-405.

Ildefonso Castro, Francisco Torralbo, Francisco Urbano, 2012. On Hamiltonian stationary Lagrangian spheres in non-Einstein Kähler surfaces. Math. Z. 271 (1):257-270.

Francisco Torralbo, 2010. Rotationally invariant constant mean curvature surfaces in homogeneous 3-manifolds. Diff. Geo. Appl. 28(5): 593-607.

Francisco Torralbo, Francisco Urbano, 2010. On the Gauss curvature of compact surfaces in homogeneous 3-manifolds. Proc. Amer. Math. Soc. 138 (2):2561-2567.

C.2. Research projects and grants

As the principal researcher:

Project: Parallel mean curvature surfaces in Thurston 4-dimensional geometries.

Funding institution: Granada Excellent Network of Innovation Laboratories (GENIL, University of Granada).

Funding: 3000 €

Period: April 2014 – December 2014.

As a member of the research team:

Project: Problemas variacionales geométricos, análisis geométrico y aplicaciones (MTM2017-84851-C2-1-P)

Funding institution: Ministerio de Economía, Industria y Competitividad *Funding:* 139.392 €

Head of the project: Joaquín Pérez Muñoz

Period: January 2018 – December 2020

Project: Análisis Geométrico (MTM2014-52368-P)

Funding institution: Ministerio de Economía y Competitividad *Funding:* 201 586 €

Head of the project: Joaquín Pérez Muñoz

Period: January 2015 – December 2018

Project: IAP “Dynamics, Geometry and Statistical Physics”

Funding institution: Belgian Science Policy

Funding: 2,5 millions €

Head of the project: P. Bielavsky (UC Louvain)

Period: February 2014-August 2015

Project: Geometría de Lorentz y Gravitación (P09-FQM-4496)

Funding institution: Junta de Andalucía

Funding: 181 524 €

Head of the project: Miguel Sánchez Caja

Period: October 2010 – February 2014

Project: Análisis Geométrico (MTM2007-61775)

Funding institution: Junta de Andalucía

Funding: 500 819 €

Head of the project: Antonio Ros Mulero

Period: October 2007 – October 2012

C.3. Contracts

Enterprise: Genially Web S.L.

Funding: 1748,45 €

Period: October 1, 2018 – November 30, 2018

Type: Technological

Description: Development of a geometric library to assist in the features of the Genially editor.

C.4. Patents

C.5 Awards

2005: Mención especial en los Premios Nacionales Fin de Carrera, *special mention in the most outstanding student in Spain award in the Degree in Mathematics 200-2005.*

Ministerio de Educación y Ciencia. 238 de 5/10/2006, Orden ECI/3045/2006.

2005: Premio Fin de Carrera, awarded to the most outstanding student in the Degree in Mathematics, 2000-2005, University of Granada.

C.6. Organization of research events

Title: Seminario de Geometría *Scope:* Internacional
Place: Granada (Spain) *Dates:* October 2007 – September 2013
Remark: Weekly activity of the Dpt. Geometry and Topology, Universidad de Granada (more info <http://geometry.ugr.es/seminar/>).

Title: 2nd European Young and Mobile Workshop: Geometric analysis and Partial Differential Equations *Scope:* International
Place: Granada (Spain) *Dates:* 28-30 November 2011

Title: VI International Meeting on Lorentzian Geometry *Scope:* International
Place: Granada (Spain) *Dates:* 6-9 September 2011

Title: Escuela Lluís Santaló 2010 de la RSME “Análisis Geométrico” *Scope:* International
Place: Granada (Spain) *Dates:* 28 June – 2 July 2010

C.7 Participation in research networks

Title: Red Española de Análisis Geométrico
Referencias: MTM2006-27480-E, MTM2008-01013-E, MTM2009-06054-E, MTM2010-09693-E, MTM2011-15848-E, MTM2014-57309-REDT, MTM2016-81938-REDT
Dates: may 2007 – June 2019
Funding institution: Ministerio de Economía y Competitividad

Title: International Scientific Coordination Network: Geometric Analysis
Member institutions: Laboratoire d’Analyse et de Mathématiques Appliquées (Marnée-la-Vallée, Francia), Laboratoire de mathématiques et physique théorique (Tour, Francia), Laboratoire de mathématiques de Brest (CNRS), Dpto. de Geometría y Topología (Universidad de Granada, Spain), Instituto de Ciencias Matemáticas (CSIC), Dpto. de Matemáticas (Universidad de Murcia), Dpto. de Geometría y Topología (Universidad de Valencia)
Dates: January 2011 – December 2014