

Part A. PERSONAL INFORMATION

CV date 04/09/2019

First and Family name	Francisco M. Guillén-González		
Social Security, Passport, ID number	34032034S	Age	53
Researcher numbers	Researcher ID	H-1477-2015	
	Orcid code	0000-0001-5539-5888	

A.1. Current position

Name of University/Institution	Universidad de Sevilla		
Department	EDAN		
Address and Country	Av. Reina Mercedes, s/n, 41012. Spain		
Phone number	954559906	E-mail.	guillen@us.es
Current position	Full professor	From	03/2009
Espec. cód. UNESCO	1202.20,1206.13,2205.04		
Palabras clave	Partial Differential Equations, Fluids mechanics, Phase-field, Chemotaxis		

A.2. Education

PhD	University	Year
M.S. Mathematics	Universidad de Sevilla	1988
PhD Mathematics	Universidad de Sevilla	1992

A.3. JCR articles, h Index, thesis supervised...

- Publications: 75 (WoS, since 2001), 68 (Scopus, since 2000), 103 (MathSciNet),
- Total publications in Q1 (last 10 years): 21
- 4 sexenios de investigación (six-year-research term): 1992/97; 1998/2003; 2004/2009; 2010/2015
- Advisor of 5 PhD theses in the last 10 years (and 8 in total).
- Citations: 513 (WoS), 661 (Scopus, since 2003), 742 (MathSciNet), 1152 (Google Scholar) 726 since 2014.
- Averaged citations/year (last 5 years): 58,4 (WoS)
- h index: 12 (WoS), 13 (Scopus), 19 (Google Scholar).

- Referee for more than 30 scientific international journals.
- Member of the Editorial Board of Sema Journal
- Scientific advisor for *Agencia Nacional de Evaluación y Prospectiva* (Spain).

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

My scientific research started in the 90's with the mathematical analysis of partial differential equations (PDE) systems modeling fluids: Navier-Stokes, density-dependent fluids, non-Newtonian fluids, Oceanography, liquid crystals, etc. The task is to prove qualitative properties of the PDEs systems such as, existence, uniqueness, regularity, periodicity, continuous dependence, behavior at infinite time, etc.

In the 2000s, the numerical analysis of PDEs is also considered, designing efficient numerical schemes that inherit the properties of the continuous problem, obtaining stability, convergence, error estimates, etc. These results are complemented by numerical simulations using computer codes, which allow a complete study: mathematical and numerical analysis and scientific programming.

In the 2010s I have studied phase field models (with diffuse interface) widely used for modeling phase transitions (solid, liquid, gas and intermediate phases), and for the theory of mixtures or multi-components (immiscible fluids).

In the last years, my scientific objective is to study (analytical and numerically) PDE problems modeling Biological processes.

More than seventy five papers published in indexed scientific journals: *J. Comput. Phys* (4), *Z. Angew. Math. Mech* (4), *J. Comp Appl Math*, *Appl Num Math* (2), *Intern J. Num Meth Eng*, *Comm Comp Physics*, *J. Sci. Comput*, *Siam J. Numer. Anal* (2), *Comp. Methods App. Mech. Engineer*, *Num.Math.* (3), *Arch Computat Methods Eng* (2), *Siam J. Sci. Comput.*, *Diff. Int. Equ.* (3), *Nonlinear Anal.* (5), *Siam J. Math. Anal* (2), *J. Comput. Math.*, *Comput. Math. Appl.*, *European J. Appl. Math.*, *Int. J. Numer. Anal. Model.*, *ESAIM Math. Model. Numer. Anal.*, *Proc. Amer. Math. Soc.*, *Discrete Contin. Dyn. Syst.* (3), *IMA J. Numer. Anal*, *Math. Comp.* (2), *J. Bifur. Chaos*, *Appl. Sci. Engrg*, *Commun. Pure Appl. Anal.*, *C. R. Math. Acad. Sci. Paris* (8), *IMA J. Math. Control Inform.*, *Math. Model. Methods Applied Sci*, *Model. Math. Anal. Num*, *Math. Nach.*, *J. Math. Fluid Mech.*, *Proc. Royal. Soc. London*, *J. Math. Anal. Appl* (2), *Z. Angew. Math. Phys.*, *Abstract and Applied Analysis*, *Appl. Math. Letters*, *Ann. I.H.Poincaré AN*, *Czechoslovak Math J.*, *Electronic J. Diff. Equ.*, *Applicable Analysis*, *Asymptotic Analysis*, *Comm. PDE*.

Year/papers: 1992: 1; 1993: 1; 1994: 1; 1995: 1; 1996: 0; 1997: 1; 1998: 1; 1999: 1; 2000: 1; 2001: 4; 2002: 2; 2003: 2; 2004: 4; 2005: 3; 2006: 2; 2007: 3; 2008: 4; 2009: 5; 2010: 5; 2011: 6; 2012: 2; 2013: 4; 2014: 5; 2015: 9; 2016: 3; 2017: 3; 2018: 1; 2019: 3.

Part C. RELEVANT MERITS

C.1. Publications (including books)

1. Guillén-González, F.; Gutiérrez-Santacreu J.V. 2019. From a cellmodel with active motion to a Hele-Shaw-like system: a numerical approach. *Numerische Mathematik* (2019) 143:107-137. Q1

2. Guillén-González, F.; Rodríguez-Bellido, M.A., Rueda-Gómez D.A. 2019. Unconditionally energy stable fully discrete schemes for a chemo-repulsion model. *Math. Comput.* 88, 319: 2069-2099. Q1

3. Guillén-González, F.; Tierra, G. 2018. Unconditionally energy stable numerical schemes for phase-field vesicle membrane model. *J. Comput. Phys.* 354, 67–85. Q1

Impact Factor: 2.746 (2016). Ranking: 3/55 (Physics, Mathematical). Q1

4. F.Guillén-González, M.V.Redondo-Nebbe. 2017. Optimal first-order error estimates of a fully segregated scheme for the Navier-Stokes equations. *J. Comp. Appl. Math.* 321, 348-370.

Impact factor: 1.357 (2016). Ranking: 63/255 (MATHEMATICS, APPLIED). Q1

5. Guillén-González, F., Rodríguez-Bellido, M.A., Tierra-Chica, G., 2016. Linear unconditional energy-stable splitting schemes for a phase-field model for Nematic-Isotropic flows with anchoring effects. *Int. J. Numer. Meth. Engng.* Vol. 108. Núm. 6. Pag. 535-567.

Impact factor: 2.162. Ranking: 22/100 (Mathematics, Interdisciplinary Applications). Q1

6. G.Grun, F.Guillén-González, S.Metzger. 2016. On fully decoupled, convergent schemes for diffuse interface models for two-phase flow with general mass densities. *Communications in Computational Physics.* 19, no. 5, 473–1502.

Impact factor: 2.004 (2016). Ranking: 10/55 PHYSICS, MATHEMATICAL (Q1)

7. F.Guillén-González, J.Koko. 2015. A Splitting in Time Scheme and Augmented Lagrangian Method for a Nematic Liquid Crystal Problem. *J. Sci. Comput.*, Vol. 65, No. 3, 1129-1144.

Impact factor: 1.700 (2014). Ranking: 23/257 MATHEMATICS, APPLIED. (Q1)

8. F.Guillén-González, G.Tierra. 2015. Approximation of Smectic-A liquid crystals. *Comp. Methods App. Mech. Engineer*, 290, 342-361.
Impact factor: 2.959 (2014). Ranking: 4/99 MATHEMATICS, INTERDISCIPLINARY APPLICATIONS. Cuartil: Q1.

9. F.Guillén-González, J.R.Rodríguez-Galván. 2015. Analysis of the Hydrostatic Stokes problem and finite-element approximation in non-structured meshes. *Num.Math.* 130 (2) 225-256.
Impact factor: 1.608 (2014). Ranking: 32/255 MATHEMATICS, APPLIED. Cuartil: Q1.

10. R.C.Cabral, F.Guillén-González and J.V.Gutiérrez-Santacreu. 2015. A time-splitting Finite-Element approximation for the Ericksen-Leslie equations. *SIAM J. SCI. COMPUT.*, Vol. 37, 2, B261-B282.
Impact factor: 1.854 (2014). Ranking: 19/255 MATHEMATICS, APPLIED. Cuartil: Q1.

C.2. Research projects and grants

1. Reference: **MTM2015-69875-P**. Title: **Diffusion, reaction and phase field problems applied to living organisms**. Funding body and call for proposals: **Ministerio de Economía y Competitividad, Spain**. Date of start and end of the project: : **01/01/2016-31/12/2018**. Amount of funding: **68.000 euros**. Type of participation: **Principal Investigator**.

2. Reference: **MTM2012-32325**. Title: **Campo de fases y aplicaciones: Multi-fluidos, Solidificación y Tumores**. Funding body and call for proposals: **Ministerio de Economía y Competitividad + FEDER**. Principal investigator and institution affiliation: **Francisco Guillen-Gonzalez. Universidad de Sevilla**. Date of start and end of the project: **01/01/2013-31/12/2015**. Amount of subsidy: **42.120 euros**. Type of participation: **Principal Investigator**.

3. Reference: **MTM2009-12927**. Title: **Análisis Teórico-numérico de cristales líquidos y campo de fases**. Funding body and call for proposals: **Ministerio de Ciencia y Tecnología**. Principal investigator and institution affiliation: **Francisco Guillen-Gonzalez. Universidad de Sevilla**. Date of start and end of the project: **01/01/2010-31/12/2012**. Amount of subsidy: **53.482,01 euros**. Type of participation: **Principal Investigator**.

4. Reference: **P06-FQM-02373**. Title: **Análisis de modelos de cristales líquidos**. Funding body and call for proposals: **Proyecto excelencia, Junta de Andalucía, Convocatoria 2006**. Principal investigator and institution affiliation: **Francisco Guillen-Gonzalez. Universidad de Sevilla**. Date of start and end of the project: **13/04/2007 – 14/04/2010**. Amount of subsidy: **115.936,30 euros**. Type of participation: **Principal Investigator**.

5. Reference: **MTM2006-07932**

Title: **Análisis y Control de EDPs No lineales con Origen en Física y Otras Ciencias**

Funding body and call for proposals: **Ministerio De Ciencia Y Tecnología, Programas Del Plan**

Nacional I+D. Principal investigator and institution affiliation: **Enrique Fernández-Cara, Universidad de Sevilla**. Date of start and end of the project: **01/01/2006 – 31/12/2009**. Amount of subsidy: **172.425 euros**.

Type of participation: **Researcher**.

6. Reference: **PHB2005-0042-PC**. Title: **Ecuaciones en derivadas parciales y control**. Funding body and call for proposals: **Programa Hispano-Brasileño, Convocatoria 2005. Ministerio de Educación y Ciencia**. Date of start and end of the project: **Francisco Guillen-Gonzalez. Universidad de Sevilla**. Duración (fecha inicio - fecha fin): **01/01/2006 – 31/12/2007**. Amount of subsidy: **17.319 euros**. Type of participation: **Principal Investigator**.

C.3. Contracts

- Asesoramiento en estrategias de organización y gestión del Congreso ICIAM 2019-Valencia ([3011/0806](#))
- Asesoramiento en estrategias de organización y gestión del Congreso ICIAM2019-Valencia ([2634/0806](#))

C.4. Patents

C.5, C.6, C.7... (e. g., Institutional responsibilities, memberships of scientific societies...)

C.5 Organizer of knowledge transference activities

1. Organizer of the congress: ECMI Postgraduated /VI Iberian/NeEDS Modelling Week. July 2019.<http://gestioneventos.us.es/22663/detail/ecmi-postgraduate-vi-iberian-needs-modelling-week.html>
2. Co-organizer of the congress: Workshop on PDEs for Biology Systems. April 2019.
<http://congreso.us.es/sevillaiciam2019/workshop/>
3. Co-organizer of a Minisymposia at ICIAM 2019 congress
3. Profesor and Advisor of the doc-course at IMUS “Partial Differential Equations: Analysis Numerics and Control” 2018.
<http://www.imus.us.es/DOC-COURSE18/en/presentation>
4. Co-organizer of courses in the doctoral program of Mathematics at IMUS:
 - a. 8 hours course: “Boundedness vs Blow-up in cross-diffusive parabolic systems modeling chemotaxis” given by Michael Winkler (12-15 December 2017)
<https://www.imus.us.es/es/actividad/2018>
 - b. 4 hours course “Chemotaxis Models with logistic source- an introduction” given by Johannes Lankeit (27-30 April 2018). <https://www.imus.us.es/es/actividad/2112>
5. Co-organizer and advisor of the doc-course at IMUS “Applied Mathematics and Optimization” 2015:
http://www.imus.us.es/DC/2014_OPT/

C.6. Participation in research evaluation.

- * Associate Editor of SEMA Journal.
- * Reviewer of the spanish research evaluation: Agencia Nacional de Evaluación y Prospectiva (ANEP).
- * Referee for scientific journals:

SNAS, JDEA, JOMP, CMAM, JDE, IMAJNA, Physica A, ZAMM, CAM, CPAA, NMPDE, AAA, AAM, NORWA, DIE, DE, M2AS, M2AN, COAM, DCDS-A, DCDS-B, JCP, SINUM, SIMA, CMAME, CAMWA, Num. Math, Asymptotic Analysis, JMAA, Nonlinearity (NON), CPDE, etc.
- * Reports for Mathematical Reviews y Zentralblatt MATH.
- * External Reviewer of research projects in Spain and Chile.