

Part A. Personal Information

DATE	10/12/2019
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Surname(s)	MUÑOZ MARTINEZ	
Forename	MIGUEL ANGEL	
Social Security, Passport, ID number	25.996.890J	
Sex	Male	
Age	52	
Researcher codes	WoS Researcher ID (*)	M-4099-2015
	SCOPUS Author ID(*)	
	Open Researcher and Contributor ID (ORCID)	0000-0003-0152-9080

(*) At least one of these is mandatory

A.1. Current position

Post/ Professional Category	Full professor (physics)	
UNESCO Code		
Key Words	Statistical Mechanics, Complex Systems, Phase transitions	
Name of the University/Institution	University of Granada	
	Department/Centre	Inst. Carlos I for theoretical and Computational Physics
	Full Address	Campus Fuentenuva s/n. 18071 Granada
	Email Address	mamunoz@onsager.ugr.es
	Phone Number	958-240097
Start date	December 2010	

A.2. Education (title, institution, date)

Year	University	Degree	Title
1990	GRANADA	First degree	Degree in Physics
1991	GRANADA	Masters (if appropriate)	Master in Physics
1994	GRANADA	PhD	Ph.D in Physics

A.3. Indicators of Quality in Scientific Production (See the instructions)

I have published more than 140 articles in JRC journals. Among others, I published in the last few years articles in Review of Modern Physics (impact factor 36,3), Physical Review X (IF. 14.3), Nature Communications (IF. 11.8), PNAS (IF. 9.6) and a total of 20 articles in the prestigious Physical Review Letters (IF. 9.2). According to the "Web of Science", the total number of citations is 4300 (respectively, 6850 in google.scholar) with an average of 380 per year in the last five years (520 citations / year in google.scholar). My **h index is 33 (41 in google.scholar)**. One of my papers is "Highly cited" (top 1%) according to WOS. The most cited article has 370 citations (780 in google.scholar). More than 90% of my publications are Q1 type. I appear in the Spanish lists of most cited authors (<http://indice-h.webcindario.com>) and in the top 1.4% of authors of the American Physical Society (<http://www.physauthorsrank.org>). I have 4 positively evaluated research periods "sexenios" (maximum possible). I have an Excellence Research Award from the University of Granada and the recognition of "Outstanding Referee" of the American Physical Society. In the last 10 years, I advised 7 PhD theses (and 3 more in course), all with the highest qualification and European or international doctorate

Part B. Free Summary of CV (Max. of 3.500 characters, including spaces)

I obtained my Bachelor and Master at the University of Granada (1990) with Extraordinary Bachelor's Degree and "Prize of the Academy of Sciences of Granada". A grant from the Ministry allowed me to obtain the Ph.D also in Granada, under the supervision of Prof. P. Garrido (Cum laude, and Extraordinary Doctorate Award). This training period was followed by almost 5 years of postdoctoral stays abroad (financed by the Spanish Ministry, NATO, EU "Marie Curie" program, etc.) at the IBM research center in Yorktown-Heights NewYork with G. Grinstein (1994-1996), Univ. of California San Diego (T. Hwa, 1996), "La Sapienza" Rome, in the group of L. Pietronero (1996-1998); ICTP Trieste Italy, (1998-1999) with A. Vespignani. In 1999 I rejoined the University of Granada, where soon (2001) I became a professor, and then full professor (2010). I have taught courses in Statistical Physics, Materials Physics, Statistical Mechanics, Nonlinear Physics, Complex Systems, Critical Phenomena, both in Bachelor's and Master's degrees and in Doctorate programs, both in Granada and in other universities (Barcelona, Italy, Brazil). I have directed 7 doctoral theses (and 3 more in course), 15 final Master theses and I have received 7 postdoctoral students (5 foreigners) in my research group. I have published more than 130 articles in international journals, including 1 in Nature Comm., 5 PNAS, 20 in Physical Review Letters, and a review article for "Review of Modern Physics". These publications have received more than 3480 (6850) citations according to ISI WOS (resp. Google scholar), with an index h 33 (41). The most cited article has 370 (771) citations. I appear in the Spanish lists of most cited authors (<http://indice-h.webcindario.com>) and in the top 1.4% of authors of the APS (<http://www.physauthorsrank.org>). I have published with more than 100 different co-authors, of many nationalities, and I maintain collaborations with prestigious international groups (Princeton, NIH Bethesda, IBM NewYork, Rome, Paris, etc.). I have given dozens of talks and conferences at international and national conferences (Statphys, APS March meeting, Dynamics days, Netsci, ECCS, FISES, etc.) and organized several conferences (Granada Seminar, FISES, NIPS, etc.). I have been IP of our research group at the University of Granada for the last 8 years, and I have been IP of various regional, national, and international projects and responsible for nodes in Granada of 2 European Projects/Networks (FRACTALS and COSIN). I have been a member of the Editorial Board of Physical Review E (2009-2015), and I am currently the Editor of "Scientific Reports". I review articles for the most important journals in the field (Nature, Science, PNAS, PRL, etc.), and evaluate research projects for the main agencies (NSF, ANEP, French ANR, Italian...). My interests in research cover both fundamental aspects and interdisciplinary applications of Statistical Physics. Some of my specialties are: stochastic process theory, phase transitions, non-equilibrium physics, self-organization, renormalization group, and in general, emergent or complex phenomena. I combine these interests with fascination with problems inspired by biology -including neuroscience, theoretical ecology, and evolutionary and systems biology- and their quantitative analysis.

Part C. Relevant accomplishments

C.1. Publications

- 1- M. A. Muñoz, Criticality and Dynamical scaling in living systems. Reviews of Modern Physics 90, 031001 (2018).
- 2- S. di Santo, P. Villegas, R. Burioni, and M.A. Muñoz, Landau–Ginzburg theory of cortex dynamics: Scale-free avalanches emerge at the edge of synchronization, Proc. Natl. Acad. Sci (USA) 115, E1356–E1365, (2018).
- 3- M. Martinello, J Hidalgo, S di Santo, A Maritan, D Plenz, M. A. Muñoz, Neutral theory and scale-free neural dynamics, Phys Rev. X 7, 041071 (2017).
- 4-. Di Santo, S; Burioni, R; Vezzani, A; Muñoz, Miguel A. 2016. Self-Organized Bistability Associated with First-Order Phase Transitions. Physical Review Letters. 116: 240601

- 5- Benitez, F; Duclut, C; Chaté, H; Delamotte, B; Dornic, I; Muñoz, Miguel A. 2016. Langevin equations for reaction-diffusion processes. *Physical Review Letters*. 117:100601
- 6- Villa-Martín, Paula; Bonachela, JA; Levin, Simon A.; Muñoz, Miguel A. 2015. Eluding catastrophic shifts. *Proceedings of the National Academy of Science*. 112: E1828-E1836.
- 7- Hidalgo, J; Grilli, J; Suweis, S; Muñoz, Miguel A.; Banavar, J.; Maritan. 2014. Information-based fitness and the emergence of criticality in living systems. *Proceedings of the National Academy of Sciences*. 111: 10095-10100.
- 8- Donetti, L.; Johnson, S.; Dominguez-García, V.; Muñoz, Miguel Á. 2014. Trophic coherence determines food-web stability. *Proceedings of the National Academy of Sciences*. 111: 17923-17928.
- 9- Borile, C.; Azaele, S; Banavar, J.; Maritan A, Muñoz, Miguel A. 2014. Spontaneously broken neutral symmetry. *Physical Review Letters*. 109: 038102-
- 10- Moretti, Paolo; Muñoz, Miguel A. 2013. Griffiths phases and the stretching of criticality in brain networks. *Nature Communications*. 4: 2521

C.2. Research Projects and Grants

MICINN, FIS2017- -P, Proyectos de Excelencia del MINECO
"Frontiers in complex systems"

P.I. Miguel A. Muñoz (UGR). 2018-2020. Budget: 157.300 €.

MINECO FIS2013-43201-P, Proyectos de Excelencia del MINECO

"Física estadística de los sistemas complejos: de los principios básicos a las fronteras de la física de la materia, ecología y neurociencia"

P.I. Miguel A. Muñoz (UGR). 2014-2017. Budget: 175.450 €.

P09-FQM4683 Proyectos de Excelencia de la Junta de Andalucía,
"Redes complejas y sus aplicaciones interdisciplinarias".

P.I. Muñoz, Miguel A. (UGR). 2010-2014. Budget: 266.500 €.

P07-FQM02725 Proyectos de Excelencia" de la Junta de Andalucía,
"Fenómenos colectivos en sistemas complejos: teoría y aplicación",

P.I: P. L. Garrido (UGR). 2008-2012. Budget: 199.668 €.

P06-FQM1505 "Proyectos de Excelencia" de la Junta de Andalucía",

"Modelos fisicomatemáticos de procesos cooperativos en el cerebro y sus aplicaciones en biología, neurociencia y computación"

P.I. J. Marro Borau (UGR). 2007-2011 Budget: 200.000 €.

FIS2005-00791, Proyectos del Plan Nacional I+D Ministerio de Ciencia y Tecnología

"Física estadística de los sistemas complejos: teoría y aplicaciones".

I.P J. Marro (UGR). 2005-2009. Budget: 216.580 €.

C.3. Contracts

W0854121- Bilateral agreement for scientific collaboration: University of Granada - IBM (Yorktown-Heights NEW YORK). Coordinator: Miguel Á. Muñoz. 2009-2010.

C.4. Patents and other IPR

C.5, C.6, C.7... Other

C.5 Awards:

Awarded a prize to the most outstanding graduate from the university of Granada (1990). Award of the Granada academy of sciences to the best graduate student in Physics (1990). Award of the University of Granada to the best Ph.D thesis in Physics Award of the University of Granada to the best research paper (2006). "OUTSTANDING REFEREE" of the American Physical Society, 2017. European "Marie-Curie Skłodowska" fellowship, ERBFMBICT960925, Università di Roma 1, "La Sapienza", Roma (Italia, 96/98).

C.6 Scientific training experience:

(A) Ph. Theses: (1) Omar Al Hammal. Universidad de Granada. "Langevin equation for non-equilibrium phase transitions". Apto cum laude. Granada 2007. (2) Juan Antonio Bonachela Fajardo. Universidad de Granada. "Universality in Self-organized criticality". Apto cum laude". Granada, 2008. (3) Jorge Hidalgo, "Novel mechanisms for phase transitions and self-organization in complex systems". Universidad de Granada 2014. Apto cum laude.

(4) Virginia Domínguez García. "On the architectural features of biological and ecological networks". Universidad de Granada, 2015. Apta cum laude. (5) Paula Villa Martín, "Phase transitions and diversification in complex systems", Universidad de Granada, 2017. Cum laude. (6) Pablo Villegas (March 2018). Cum laude (7) Serena di Santo (University of Parma, March 2018). Cum laude.

(B) Other projects: 15 Master theses at the Universities of Granada and Roma 1 "La Sapienza".

C.7. Scientific Activities.

(A) Associated Editor of Scientific Report, Nature (2015-present). Editorial Board member of Physical Review E (American Physical Society) 2009-2015.

(B) Evaluator of National and International Research Projects for the main funding agencies: National Science Foundation (NSF, USA), MINECO y ANEP, CONICET (Argentina), FONCYT (Argentina), Agencia Nacional de Promoción Científica y Técnica (ANPCYT), Netherlands Organisation for Scientific Research (NWO), Fondazione Caparigo, Ministero italiano, CINECA (Italia), Agence Nationale de la Recherche (ANR, Francia).

(C) Referee for the main Journals: Nature, Science, Proceedings of the National Academy of Sciences, Physical Review Letters, Physical Review B, Physical Review E, Journal of Phys. A, Europhysics Letters, Physics Letters A, New Journal of Physics, Journal of Statistical Mechanics, Advances in Operations Research, Journal of Statistical Physics, and European J. of Physics B. J. Theor. Biology. PlosONE, Scientific Reports, Science Advances, Nature Communications, etc.

(D) Organizer of more than 10 international conferences and meetings.
Member of the "International Advisory Committee" of the "STATPHYS".