

CURRICULUM VITAE

Cristina Sardón

April 2016

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1 PERSONAL INFORMATION

- **Full name:** Cristina Sardón Muñoz.
- **Date of birth:** 5/1/1985.
- **Document No.:** 70892223-J
- **Nationality:** Spanish.
- **Email:** cristinasardon@usal.es (preferred); cristinasardon@gmail.com
- **Personal Website:** www.cristinasardon.com

2 PRESENT POSITION

- 2 years PHD (2010-2012) scholarship by the University of Salamanca for research training and teaching assistance. Held at the University of Salamanca, SPAIN and University of Warsaw, POLAND. Doctoral thesis: Lie systems, Lie symmetry and reciprocal transformations.
Advisor: Pilar García Estévez. Full Professor of Theoretical Physics at the University of Salamanca. SPAIN.
Coadvisor: Javier de Lucas Araújo. Assistant Professor at KMMF (Mathematical Methods for Physics Cathedra). University of Warsaw. POLAND.
- 2 years PHD (2012-2014) contract by the University of Salamanca for research training and teaching assistance. Held at the University of Salamanca, SPAIN. Doctoral thesis: Lie systems, Lie symmetry and reciprocal transformations.
Advisor: Pilar García Estévez. Full Professor of Theoretical Physics at the University of Salamanca. SPAIN.
Coadvisor: Javier de Lucas Araújo. Assistant Professor at KMMF (Mathematical Methods for Physics Cathedra). University of Warsaw. POLAND.
- Completed PHD on the 15th May, 2015.
Thesis defense: Lie systems, Lie symmetries and reciprocal transformations.
University of Salamanca and iUFFyM (Instituto de Física Fundamental y Matemáticas).
International Doctorate Mention.
MARK: Cum Laude.
- Postdoctoral contract
1 April 2016- 1 April 2017
Instituto de Ciencias Matemáticas, ICMAT-CSIC, Cantoblanco, Madrid.

3 ACADEMIC RECORD

- 2003: University access exam.
MARK: 9.3/10

- 2003- 2008: **Physics degree.**
Orientation: Fundamental Physics.
University of Salamanca.
- 2008-2009: **Master in “Cosmology and Particle Physics”** .
University of Salamanca.
- 2009: **Final Masters’ thesis:** “*Symmetry and reduction of the first element of the hierarchy associated with the Camassa Holm equation in 2+1 dimensions*”.
Advisor: Pilar García Estévez.
University of Salamanca.
MARK: 9.5/10
- 2009-2010: Enrollment in the **PHD program** of the **Institute of Fundamental Physics and Mathematics.** University of Salamanca.
- 24th of March 2010: **Minor thesis defense:** “*Título propio Grado de Salamanca of the University of Salamanca*” titled “*Symmetry and reduction of the complete hierarchy associated with the Camassa Holm equation in 2+1 dimensions*”
Advisor: Pilar García Estévez,
University of Salamanca.
MARK: Sobresaliente, Cum Laude.
- November 2010-November 2012: Concession of **2-year scholarship for Research Formation awarded by the University de Salamanca, Junta de Castilla y León and Fundación Banco Santander,** for research and thesis writing.
Advisor: Pilar García Estévez. University of Salamanca.
Coadvisor: Javier de Lucas Araújo. University of Warsaw.
Held at the University of Salamanca.
- November 2012-November 2014: **2-year contract period of the scholarship for Research Formation** for thesis writing and teaching assistance by the University of Salamanca for researcher’s education and training.
Advisor: Pilar García Estévez. University of Salamanca.
Coadvisor: Javier de Lucas Araújo. University of Warsaw.
Held at the University of Salamanca and 3-month stay at the University of Warsaw.
- 15th May 2015: Defense of doctoral thesis entitled: “*Lie systems, Lie symmetries and reciprocal transformations*”.
International Doctorate Mention
MARK: Sobresaliente, Cum Laude.
- December 2015: *Extraordinary award of research* given by the **University of Salamanca** for doctoral thesis draft and defense.
- December 2015: Accreditation as Assistant professor, awarded by **ANECA**, Spain.
- April 2016: Start of a contract at Instituto de Ciencias Matemáticas, ICMAT-CSIC, Cantoblanco, Madrid.

4 FOREIGN LANGUAGES

- **Spanish:** First language
- **English :** Proficiency. *Proficiency Cambridge Certificate Test 2009 and 100 TOELF iBT.*
- **German:** Intermediate. *Goethe Institut Diploma in 2003.*
- **Hebrew:** Basics
- **Polish:** Basics

5 SCHOLARSHIPS AND CONTRACTS

- **Scholarship** for Masters in “Cosmology and Particle Physics” 2008/2009, awarded by of the **Institute of Fundamental Physics and Mathematics** of the **University of Salamanca**.
- **2-year scholarship for Research formation**, funded by **Universidad de Salamanca, Grupo Santander y Junta de Castilla y León**, during the period 2010-2012 for the writing a doctoral thesis in the field of Mathematical Physics. University of Salamanca.
- **2-year contract associated with the scholarship for Research formation** funded by the **Universidad de Salamanca, Grupo Santander y Junta de Castilla y León** for writing a doctoral thesis in the field of Mathematical Physics and teaching assistance at the University of Salamanca during 2012-2014.
- **1-year contract** at Instituto de Ciencias Matemáticas, ICMAT-CSIC, Madrid, Spain.

6 PUBLICATIONS

1. Similarity reductions arising from nonisospectral Camassa Holm hierarchy in 2+1 dimensions,
P.G. Estévez, J.D. Lejarreta, C. Sardón,
J. Nonlin. Math. Phys. **18**, 9–28 (2011).
2. A new Lie systems approach to second-order Riccati equations,
J.F. Cariñena, J. de Lucas, C. Sardón,
Int. J. Geom. Methods Mod. Phys. **9**, 1260007 (2012).
3. Miura reciprocal transformations for hierarchies in 2+1 dimensions,
P.G. Estévez, C. Sardón,
J. Nonlin. Math. Phys. **20**, 552–564 (2013).

4. Integrable 1+1 dimensional hierarchies arising from reduction of a non-isospectral problem in 2+1 dimensions,
P.G. Estévez, J.D. Lejarreta, C. Sardón,
Appl. Math. Comput. **224**, 311–324 (2013).
5. On Lie systems and Kummer–Schwarz equations,
J. de Lucas, C. Sardón,
J. Math. Phys. **54**, 033505 (2013).
6. From constants of motion to superposition rules of Lie–Hamilton systems,
A. Ballesteros, J.F. Cariñena, F.J. Herranz, J. de Lucas, C. Sardón,
J. Phys. A: Math. Theor. **46**, 285203 (2013).
7. Lie–Hamilton systems: theory and applications,
J.F. Cariñena, J. de Lucas, C. Sardón,
Int. J. Geom. Methods Mod. Phys. **10**, 0912982 (2013).
8. Dirac–Lie systems and Schwarzian equations,
J.F. Cariñena, J. Grabowski, J. de Lucas, C. Sardón,
J. Differential Equations **257**, 2303–2340 (2014).
9. Lie–Hamilton systems on the plane: theory, classification and applications,
A. Ballesteros, A. Blasco, F.J. Herranz, J. de Lucas, C. Sardón,
J. Differential Equations **258**, 2873–2907 (2015).
10. Lie symmetries for Lie systems: applications to systems of ODEs and PDEs,
P.G. Estévez, F.J. Herranz, J. de Lucas, C. Sardón,
Appl. Math. Comput. **273**, 435–472 (2016).
arXiv:1404.2740
11. Lie–Hamilton systems on the plane: applications and superposition rules,
A. Blasco, F.J. Herranz, J. de Lucas, C. Sardón,
J. Phys. A: Math. Theor. **48**, 345202 (2015).
12. Iterative symmetry search and reduction of a wave model in 2+1 dimensions,
P.G. Estévez, J.D. Lejarreta, C. Sardón,
Accepted in *Nonlinear dynamics*.
13. Hamilton–Jacobi theory on Nambu–Poisson manifolds,
M. de León. C. Sardón.
Sent to *Journal of Mathematical Physics*
<https://arxiv.org/abs/1604.08904>
14. A Geometric approach to solve time dependent and dissipative Hamiltonian systems,
M. de León. C. Sardón.
Sent to *Journal of Mathematical Physics*
<https://arxiv.org/abs/1607.01239>

PROCEEDINGS

1. Miura reciprocal transformations for two integrable hierarchies in 1+1 dimensions, P.G. Estevez, C. Sardón, *Proceedings GADEIS*, Protaras, Cyprus (2012), arXiv:1301.3636
2. Jacobi–Lie systems: fundamentals and low-dimensional classification, F.J. Herranz, J. de Lucas, C. Sardón, *Proceedings AIMS*, Madrid, Spain (2014), arXiv:1412.0300
3. Quasi-algorithmical construction of reciprocal transformations, C. Sardón
<https://arxiv.org/abs/1604.01941>

BOOKS

Lie systems, Lie symmetries and reciprocal transformations, C. Sardón,
To be sent for publication
ArXiv:1508.00726

ON GOING WORK

1. Quasi Lie Schemes and Quantum Mechanics, J.F. Cariñena, J. de Lucas, C. Sardón.
2. Derivation of Lax pairs for 3 + 1 dimensional nonlinear PDEs, C. Sardón.
3. Discrete geometric Hamilton–Jacobi theory for nonlinear oscillators, L. Escudero, M. de León, C. Sardón.

7 CONFERENCES AND INTERNATIONAL SCHOOLS

- Attendance to the congress: *Fourth workshop New Challenges in Quantum Mechanics: Integrability and supersymmetry*.
From the 1st and 2nd of October 2009, at the **University of Valladolid, Spain**
TALK: “*Similarity reductions arising from a non isospectral Camassa Holm hierarchy in 2+1 dimensions*”.
- Attendance to the congress: *Fifth International workshop: Group Analysis of Differential Equations and Integrable Systems*
From the 6th to the 10th of June of 2010 in **Protaras, Cyprus**.
TALK: “*Similarity reductions arising from a non isospectral Camassa Holm hierarchy in 2+1 dimensions*”.
- Attendance to the summer course: *Integrability Methods in Quantum and Classical systems*.
From the 18th to the 23rd of July 2010 at the **University of Kent (Great Britain)**.
Organized by the London Mathematical Society and EPSRC.

- Attendance to the congress: *6th workshop of Group Analysis of Differential Equations and Integrable Systems*.
From the 17th to the 21th of June 2012 in **Protaras, Cyprus**.
TALK: “*Miura-reciprocal transformations for hierarchies in 2+1 dimensions*”.
- Attendance to the International conference: *NEEDS 1012 (Nonlinear Evolution Equations and Dynamical Systems)*.
From the 8th to the 15th of July, 2012. **Kolymbari, Crete, Greece**.
TALK supported with poster session: “*Miura-reciprocal transformations for hierarchies in 2+1 dimensions*”.
- Attendance to the conference: *3rd Iberoamerican Meeting on Geometry, Mechanics and Control*.
From the 3rd to the 7th of September of 2012 in **Salamanca, Spain**
Organized by the **Geometry, Mechanics and Control network and University of Salamanca**.
- Attendance to the *7th International Young Researchers Workshop on Geometry, Mechanics and Control*.
From the 17th to the 19th of December 2012, in **Madrid, Spain**.
Organized by the **Institute of Mathematical Sciences (CSIC-UAM-UC3M-UCM)**.
- Attendance to the conference: *XVth Winter meeting: Geometry, Mechanics and Control theory*
From the 30th and 31st of January of 2013. **University of Zaragoza, Spain**.
INVITED TALK: “*From constants of motion to superposition rules for Lie-Hamilton systems*”.
- Attendance to the conference of the *Thematic day on Dirac Structures and Applications*.
1st February 2013.
University of Zaragoza, Spain.
- Attendance to the meeting of *Research group Lie systems: theory, generalizations, applications*.
From the 19th to the 25th of May 2013 at **IMPAN, Banach Center, Warsaw**.
TALK: “*From constants of motion to superposition rules of Lie Hamilton systems*”.
- Attendance to the *8th International Young researchers workshop on Geometry, Mechanics and Control*
From the 11th to the 13rd of December 2013 at the **Politechnic University of Catalonia, Barcelona, Spain**.
Organized by Research group **DGDSA (Differential geometry, dynamical systems and applications)**.
TALK: “*Lie-Hamilton systems on the plane: properties, classification and applications*”
- Attendance to the *XVIth winter meeting in Geometry, Mechanics and Control theory*
From the 31st of January to the 1st of February 2014 at the **University of Zaragoza, Spain**
TALK: “*Dirac-Lie systems and Schwarzian equations*”.
- Attendance to the conference of the “*Thematic day on Discrete Mechanics and Geometric Integrators*”

On the 30th of January 2014,
University of Zaragoza, Spain.

- Attendance to the *XXIInd International Conference on Integrable Systems and Quantum symmetries (ISQS-22)* in **Prague, Czech Republic** from the 23rd to the 29th June, 2014.
TALK: “*Lie–Hamilton systems on the plane: properties, classification and applications*”.
- Talk at the *contributed session ODEs and Applications* of the *10th AIMS Conference on Dynamical Systems, Differential Equations and Applications*, held in Madrid from the 7-11th July 2014, organized by **UAM and ICMAT**.
TALK: “*Lie–Hamilton systems on the plane: classification, constants of the motion and superposition rules*”.
- Attendance to the 2nd meeting of *Research group Lie systems: theory, generalizations, applications*.
From the 21th to the 27th of September 2014 at **IMPAN, Banach Center, Warsaw**.
TALK: *Lie symmetries for Lie systems*.
- Attendance to the *9th International young researchers workshop on Geometry, Mechanics and Control*,
From the 19th to the 21st January 2015, held in Facultad de Ciencias Matemáticas, **Universidad de Zaragoza, Spain**.
POSTER: *Jacobi-Lie systems and low dimensional classification*.
- Attendance to the *XVII meeting on Geometry, Mechanics and Control*,
From the 22th to 23th January 2015, held at Facultad de Ciencias Matemáticas, **Universidad de Zaragoza, Spain**.
- Attendance to *Joint STAMP conference and 9th ICMAT International GMC Summer school on Symplectic Geometry, Classical Mechanics and interactions with spectral theory*. Hosted from 29th June to 3rd July, 2015 by the **Institute for the Mathematical Sciences (CSIC-UAM-UC3M-UCM), Madrid, Spain**.
POSTER: *Lie Hamilton systems on the plane: properties and applications*
- Attendance to the workshop: *XXIV International Fall workshop on Geometry and Physics*,
From the 31st August to the 4th September, 2015, by **Centro Universitario de la Defensa (CUD) and University of Zaragoza**.
TALK: *Integrability approaches to differential equations*.
- Attendance to the workshop: *III Meeting on Lie systems*. From the 21st-26th September, 2015, by **Institute of Mathematics of the Polish Academy of Sciences, Warsaw, Poland**.
TALK: *Quantum Quasi Lie systems: two examples*.
- Attendance to the *XVII meeting on Geometry, Mechanics and Control*,
26 and 27 January 2016, held at Facultad de Ciencias Matemáticas, **Universidad de Zaragoza, Spain**.
- Attendance to the meeting *Thematic day on Integrability*,
28th January 2016, held at Facultad de Ciencias Matemáticas, **Universidad de Zaragoza, Spain**.
TALK: *Integrability check: quasi algorithmic methods and solutions*.

- Attendance to the meeting *10th International Summer School on Geometry, Mechanics and Control*, 20–24 June 2016, by the Institute of Mathematical Sciences **CSIC-UAM-UC3M-UCM**, Madrid, Spain.
POSTER: *Hamilton–Jacobi theory on Nambu–Poisson manifolds*.

8 INVITED SEMINARS

- Invited seminar given at the **University of Burgos, Spain** on the 21st of March 2013.
TALK: *“Symmetries, reciprocal transformations and Lie systems”*.
- Invited seminar given at the **University of Burgos** on the 14th. May 2014
TALK: *“Superposition rules for Lie–Hamilton systems”*.
- Invited seminar in **Universidad Rey Juan Carlos**, Madrid. 15th October 2015.
TALK: *An introduction to Lie systems*
- Invited seminar at the **University of Glasgow**, Glasgow, UK.
5th November 2015.
TALK: *An introduction to Lie systems*.
- Invited seminar at the **Universidad Politécnica de Cataluña, UPC**, Barcelona, Spain.
3rd December 2015
TALK: *Lie–Hamilton systems: theory and applications*.
- Invited seminar at **ICMAT, CSIC**, Madrid, Spain.
18 February 2016
TALK: *An introduction to Lie systems*

9 SHORT STAYS IN NATIONAL AND INTERNATIONAL CENTERS

- Short research stay at the department of Theoretical Physics at the **University of Zaragoza, Spain**.
From the 30th november to the 4th December, 2012.
- Short stay at the **University of Burgos, Spain**.
From the 20th to the 23rd of March, 2013.
- Short stay at the **Institute of Mathematics of the Polish Academy of Sciences (IMPAN), Poland**.
From the 19th to the 25th of May, 2013.
- Stay at the **KMMF (Mathematical Methods for Physics Cathedra) of the University of Warsaw, Poland**.
From the 10th to the 31st of August, 2013.

- Stay at the **University of Burgos**.
From the 13th to the 16th May, 2014.
- Stay at the **KMMF (Mathematical Methods for Physics Cathedra)** of the **University of Warsaw, Poland**.
From the 9th August to October 5th, 2014.
- Research stay at **Univeritá degli Studi Roma Tre** in Rome.
From the 29th to the 6th of December, 2014.

10 TEACHING ACTIVITY

I have been a part of the teaching staff at the University of Salamanca (Spain), during the last three years. PhD Spanish fellowships account for four years of economic support. There are two distinct periods in the fellowship. The first one (two years) is strictly a scholarship with financial tuition. The other two years are a contract with the same financial support. It is not mandatory but highly recommended to choose the teaching option alongside the last two years of research (contract period). In this way, I have covered the following as a teaching assistant:

- **2012-2013:** *Differential equations* for undergraduate students in the second year of Grade in Physics. I was in charge of seminar classes for solving problems proposed, for a total of *eight hours*.
- **2013-2014:** *Differential equations* for undergraduate students in their second year of Grade in Physics. I was in charge of seminar classes for solving problems proposed, for a total of *twelve hours*.
- **2013-2014:** *Mechanics I* for undergraduate students in their second year of Grade in Physics. I was in charge of seminar classes for solving problems proposed, for a total of *eight hours*.
- **2014-2015:** *Physics I* for undergraduate students in their first year of Grade in Mathematics. I was in charge of seminar classes for solving problems proposed, for a total of *twelve hours*.

11 PARTICIPATION IN RESEARCH PROJECTS I+D OF PUBLIC CALLS

- National project in research and development of new technologies
“Energy generation based on photovoltaic cells of thin layer. ATON.” 2009-2012.
Contract Number: **CDTI-CEN20091009**
Plan: CENIT-E
Year: (08/02/2010)
Supported by: Ministry of Science and Technology of Spain.
Quantity: 9.129.236 euros (70.000 euros).
Institution: University of Salamanca.

- National project
“*Regrigeration in milikelvins without liquid helium*” 2010-2011.
Contract Number: **PCT-310000-2009-3**
Plan: ACTEPARQ2009
Year: (09/04/2010)
Supported by: Ministry of Science and Technology of Spain.
Quantity: 353.000 euros.
Institution: University of Salamanca.
- National project
“*Nanotechnology Sala Blanca of the University of Salamanca*” 2012-2013.
Contract Number: **PCT-420000-2010-008**
Plan: INNPLANTA 2010.
Year: (27/12/2010)
Supported by: Ministry of Science and Technology of Spain.
Institution: University of Salamanca.
- National project
“*Nonlinear phenomena and quantum nanosystems: Applications in graphene and other systems of low dimensionality*”. 2009-2012.
Contract Number: **FIS2009-07880**
Plan: subprogram for research projects.
Year: (26/12/2008).
Supported by: Ministry of Science and Technology of Spain.
Quantity: 72.600 euros.
Institution: University of Salamanca.
- Regional project
“*Electronic nanostructures in graphene and other materials and its applications in terahertz technology*”. 2013-2016.
Contract Number: **SA226U13**
Plan: support for research projects starting in 2013.
Year: 2013.
Supported by: Junta de Castilla y León.
Quantity: 30.000 euros.
Institucion: University of Salamanca.
- National project
“*Geometry, Mechanics and Control*” 2012-2014
Contract Number: **MTM2011-15725-E**
Supported by: Ministerio de Educación.
Institution: University of La Laguna.
- National project
“*Non linear effects and disorder in quantum nanodevices based on graphene: modeling, manufacturing and characterization*”. 2013.
Contract number: **KBBB**
Supported by University of Salamanca, Agency of Research.
Institution: University of Salamanca.
- International project
Program HARMONIA 2012-2015

Contract number: **DEC-2012/04/M/ST1/00523**.

Supported by: the Polish National Science Center.

Institution: University of Warsaw.

- National project
“*Design, fabrication and characterization of electronic bidimensional nanodispositives*, 2014–2016.
Contract number: **MAT2013-46308-C2-1-R**.
Supported by: Ministerio de Economía e Innovación.
Plan: State program I+D+i.
Year: (08/10/2014)
Quantity: 100.997,96 euros.
Institution: University de Salamanca.

12 INVOLVEMENT IN CONGRESSES AND WORKSHOP ORGANIZATION

- Collaboration as a **volunteer in organization** tasks on the *10th AIMS Conference on Dynamical Systems, Differential Equations and Applications*.
Held in Madrid, 7-11th July 2014.
- **Chairwoman** in *Contributed Session 1: Differential equations and applications* at the *10th AIMS Conference on Dynamical Systems, Differential Equations and Applications*.
Held in Madrid, 7-11 July 2014.

13 EDITORIAL/TRANSLATION OF SCIENTIFIC PUBLICATIONS

- Editorial member of the electronic bulletin associated with the Geometry, Mechanics and Control network (GMC network) with national research project **MTM2011-15725-E** by Ministerio de Educación and University of la Laguna.
- Translation of the book “An introduction course to ordinary differential equations” into spanish as “Curso introductorio a las ecuaciones diferenciales ordinarias” by Norbert Euler.
- Translation of the book “Problems, theory and solutions in Linear Algebra: Part I” into spanish as “ Problemas, teoría y soluciones en Álgebra Lineal: parte I”.
- Blogger for Science divulgation at MADRI+D blog.

14 REVIEWER FOR SCIENTIFIC JOURNALS

- European Physical Journal- Plus (3)
- Annals of Physics
- Banach Conference Series
- Journal of Geometric Mechanics
- Reports for Mathematical Physics
- International Journal of Geometric Methods in Modern Physics
- Advances in Mathematical Physics

15 EDUCATIONAL COURSES

- *“Extraordinary Courses of a Foreign Language: English”*.
Duration: 60 hours theoretical and practice.
University of Salamanca
Starting on: July 2001.
- Assitance to the *“Intensive English Course in High Advanced Level”*.
Duration: 15 hours a week, during three weeks.
Private school **MANHATTAN LANGUAGE SCHOOL in New York**.
From the 22nd September to the 10th October, 2008.
- *“GNU/Linux, Free software for the university community”*.
Duration: 30 hours.
Departament of Informatics and Automatics of the University of Salamanca and AUGCyL
Starting on: 17th May, 2008.
- *“Artistic exchange: masterpieces, artists and models”*.
Duration: 20 hours.
Service of continuous training of the University of Salamanca.
Starting on: 12th of April, 2008.
- *“Scientific software in Mathematics: Mathematica and Matlab” (XIVth edition)*.
Duration: 30 hours.
Service of Extraordinary courses and continuous training of the University of Salamanca.
From the 10th to 14th September, 2007.
- *“Mathematica: Introduction and applications in teaching”*.
Duration: 10 hours.
Universitary Institute of education Sciences in collaboration with the Faculty of Science of the University of Salamanca, in the university professors training Plan 2011.
From the 6th to the 14th April, 2011.

- “*Meeting on Science boundaries, Physics time*”.
Duration: 15 hours.
University of Salamanca and organized by **Duques de Soria Foundation**.
From the 20th and 21st, February, 2013.
- “*Latex: preparation of scientific texts, presentations and much more*”.
Duration: 25 hours.
University of Salamanca and organized by **the Mathematics section of the University of Sciences of Salamanca**.
From the 14-18th July, 2014.

16 AWARDS

- Winner of the first award in Science divulgation with the work titled: *Solitons in nature*, awarded by **Vicerrectorado de Atención al Estudiante y Extensión Universitaria de la Universidad de Salamanca**.
In Salamanca 20th May, 2014.
- *Extraordinary award* for the best doctoral thesis in the Department of Fundamental Physics of the **University of Salamanca**.

17 DIVULGATIVE DUTIES

- Writer for the blog MADRID INVESTIGACION MADRI+D.
 1. La danza clásica y las matemáticas
 2. Teoría de grupos: más allá del formalismo
 3. Solitones, las ondas solitarias
 4. Música y Matemáticas: a modo de inicio.
 5. Música y Matemáticas: la escuela pitagórica.
 6. Día Internacional de la danza y la Física.
 7. La armonía del mundo.
 8. Instrumentos, animales y Matemáticas.
 9. Neurociencia y Matemáticas. Efecto Mozart, efecto o realidad?
 10. Cuántos matemáticos son músicos?
 11. Matemática fractal
- Interview for RTVE in Radio Clásica.
- Runner of my blog <http://cristinasardon.com/blog> with divulgative entries.
- Collaborator for “Matemáticas y sus fronteras”.

18 OTHER SKILLS

- *Mathematica* programming.
- Wide knowledge of *Maple and Latex* programming.
- Basic programming in *C language*.

19 COLLABORATORS

- Dr. Pilar Garcia Estevez
Full Professor of Theoretical Physics.
University of Salamanca. SPAIN.
Email: pilar@usal.es
- Dr. Javier de Lucas Araújo
Associate Professor of Mathematical Methods in Physics.
KMMF University of Warsaw. POLAND.
Email: javier.de.lucas@fuw.edu.pl
delucasaraujo@gmail.com
- F. José Cariñena
Full Professor of theoretical Physics.
University of Zaragoza. SPAIN.
Email: jfc@unizar.es
- Dr. Francisco J. Herranz Zorrilla
Professor of Applied Physics.
Escuela Politécnica Superior.
University of Burgos. SPAIN.
Email: fherranz@ubu.es
- Dr. Ángel Ballesteros
Full Professor of Applied Physics.
University of Burgos. SPAIN.
Email: angelb@ubu.es
- Dr. Alfonso Blasco
Associate Professor of Applied Physics.
University of Burgos, SPAIN.
Email: ablasco@ubu.es
- Dr. Janusz Grabowski
Professor at Banach Center.
IMPAN, Warsaw. POLAND.
Email: J.Grabowski@impan.pl

- Dr. Silvia Vilariño
Professor at Centro Universitario de la Defensa.
Zaragoza, SPAIN.
Email: silviavf@unizar.es
- Dr. J.D. Lejarreta
Professor of Applied Physics.
Escuela Politécnica de Béjar.
University of Salamanca, SPAIN.
Email: leja@usal.es
- Dr. Manuel de León
Professor of Mathematics
ICMAT-CSIC, Madrid
Email: mdeleon@icmat.es
- Dr. Lorena Escudero
Postdoctoral researcher in HEP
Cambridge University, UK.
Email: lorena.escudero.sanchez@gmail.com

20 OTHER FIELDS OF INTEREST

- Integrability of equations in Fluid Dynamics: Reciprocal Methods, hodograph transformations, symmetries and reduction. Other algorithmic methods: Singular manifold method.
- Dynamical systems.
- Solitons and their dynamics.
- Derivation of Lax pairs and their associated Quantum Mechanical problems.
- Geometric methods in Mathematical Physics.
- Geometric structures. Symplectic, Presymplectic, Poisson, Dirac, Jacobi and Riemmanian Geometry.
- Lie systems and geometric structures: Lie systems, Lie-Hamilton systems, Dirac-Lie systems and Jacobi-Lie systems.
- Supersymmetry and Supermanifolds. Noncommutative geometry.
- Applications of Geometry in General Relativity.
- Finance Mathematics.
- String theory and its geometric background.
- Random matrices and Stochastic Dynamics.
- Rational differential equations and isomonodromy deformations.
- Control theory and Mechanics.

- Theoretical Mechanics.
- Cosmology and Celestial Mechanics.
- Geometric Hamilton Jacobi theories.
- Nonlinear phenoma: applications in biology and medical purposes.

21 OTHER PREVIOUS EMPLOYMENT

Teacher of private classes at private Academies “**Ciencia Exacta**” and “**Alfonso X el Sabio**” to support undergraduate students in certain subjects. I had groups of students of the first and second year of undergraduate studies in Physics and Computer engineering.