



Arturo Vieiro Yanes

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Arturo Vieiro Yanes

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 Name: **Arturo**
 DNI: **36524958S**
 ORCID: **0000-0003-2584-2717**
 Date of birth: **28/09/1979**
 Gender: **Male**
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Current professional situation

Employing entity: Universitat de Barcelona

Department: Faculty of Mathematics and Computer Science, Department of Mathematics and Computer Science

Professional category: Lecturer Professor

Start date: 15/09/2017

Type of contract: Others

Dedication regime: Full time

Primary (UNESCO code): 120612 - Ordinary differential equations

Secondary (UNESCO code): 120000 - Mathematics

Performed tasks: FILL THE INFORMATION ABOUT PRESENT PROFESSIONAL OCUPATION IN YOUR TEXT'S CURRICULA TAB

Previous positions and activities

	Employing entity	Professional category	Start date
1	Universitat de Barcelona	Investigador postdoctoral de formació en docència i recerca	14/02/2011
2	Universitat Politècnica de Catalunya	Postdoc I-Math Future	01/10/2010
3	Universitat de Barcelona	Ajudant LOU	15/09/2006
4	Universitat de Barcelona	Becari 2003FI00318 Generalitat de Catalunya	11/04/2004
5	Universitat de Barcelona	Professor associat a temps parcial	15/09/2003

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Employing entity: Universitat de Barcelona
Professional category: Investigador postdoctoral de formació en docència i recerca
Start date: 14/02/2011 **Duration:** 2 years - 9 months - 18 days

2 **Employing entity:** Universitat Politècnica de Catalunya
Professional category: Postdoc I-Math Future
Start date: 01/10/2010 **Duration:** 4 months - 13 days

3 **Employing entity:** Universitat de Barcelona
Professional category: Ajudant LOU
Start date: 15/09/2006 **Duration:** 4 years

4 **Employing entity:** Universitat de Barcelona
Professional category: Becari 2003FI00318 Generalitat de Catalunya
Start date: 11/04/2004 **Duration:** 2 years - 5 months - 5 days

5 **Employing entity:** Universitat de Barcelona
Professional category: Professor associat a temps parcial
Start date: 15/09/2003 **Duration:** 6 months - 28 days



Education

University education

1st and 2nd cycle studies and pre-Bologna degrees

University degree: Diploma / Degree / Activities
Name of qualification: Llicenciatura de Matemàtiques
City degree awarding entity: Spain
Degree awarding entity: Universitat de Barcelona
Date of qualification: 26/02/2002
Average mark: Good

Doctorates

- 1** **Doctorate programme:** Doctorat en Matemàtiques
Degree awarding entity: Universitat de Barcelona **Type of entity:** University
City degree awarding entity: Spain
Date of degree: 21/07/2009
Thesis title: Study of the Effect of Conservative and Weakly Dissipative Perturbations on Symplectic Maps and Hamiltonian systems (Doctorat Europeu)
Thesis director: Carles Simó Torres
Obtained qualification: Excellent Cum Laude and Extraordinary Award
- 2** **Doctorate programme:** Programa de Doctorat en Matemàtiques
Degree awarding entity: Universitat de Barcelona **Type of entity:** University
City degree awarding entity: Spain
Date of degree: 09/2004
- 3** **Doctorate programme:** Suficiència Investigadora
DEA awarding entity: Universitat de Barcelona
Date DEA was awarded: 2004
Thesis title: 'Possibles omega-límits de la dinàmica: Difeomorfismes del pla feblement dissipatiu' i 'Càlcul de corbes invariants amb dinàmica no-lineal'
Thesis director: C. Simó, A. Jorba
Obtained qualification: Excellent



Specialised, lifelong, technical, professional and refresher training (other than formal academic and healthcare studies)

- 1** **Type of training:** Course
Training title: JISD2010: Jornades d'introducció als sistemes dinàmics i a les EDP's
Awarding entity: Universitat Politècnica de Catalunya **Type of entity:** University
End date: 23/06/2010

- 2** **Type of training:** Course
Training title: Advanced Course on Stability and Instability in Mechanical Systems: Recent Progress and Mathematical Theory
Awarding entity: Centre de Recerca Matemàtica **Type of entity:** Body, others
End date: 26/09/2008

- 3** **Type of training:** Course
Training title: CAP'08: Taylor Methods and Computer Assisted Proofs (course given by Prof. M. Berz and Prof. K.Makino)
Awarding entity: IMUB **Type of entity:** Body, others
End date: 07/06/2008

- 4** **Type of training:** Course
Training title: SAM'07: Specific Algebraic Manipulators (Barcelona)
Awarding entity: IMUB **Type of entity:** Body, others
End date: 12/09/2007

- 5** **Type of training:** Course
Training title: LTI: Long Term Integrations (Barcelona)
Awarding entity: IMUB **Type of entity:** Body, others
End date: 07/09/2007

- 6** **Type of training:** Course
Training title: NLA: Advanced Course on Numerical Linear Algebra (Barcelona)
Awarding entity: IMUB **Type of entity:** Body, others
End date: 06/07/2007

- 7** **Type of training:** Course
Training title: CAP'07: Computer Assisted Proofs in Dynamics (course given by Prof. P. Zyglinisky)
Awarding entity: IMUB **Type of entity:** Body, others
End date: 23/02/2007

- 8** **Type of training:** Course
Training title: '4th winter school' de sistemas dinàmics DANCE (Granada)
Awarding entity: Red Tematica DANCE **Type of entity:** Body, others
End date: 09/02/2007

- 9** **Type of training:** Course
Training title: '2nd winter school' de sistemas dinàmics DANCE (Castellón)
Awarding entity: Red Tematica DANCE **Type of entity:** Body, others
End date: 28/01/2005



Language skills

Language	Listening skills	Reading skills	Spoken interaction	Speaking skills	Writing skills
English	C1	C1	C1	B2	B2
Catalan	C2	C2	C2	C2	C2
Spanish	C2	C2	C2	C2	C2

Teaching experience

Experience supervising doctoral thesis and/or final year projects

Project title: Transport phenomena and anomalous diffusion in conservative systems of low dimension

Type of project: Ph.D. Thesis

Entity: Universitat de Barcelona

City of entity: Spain

Student: Narcís Miguel Baños

Obtained qualification: Excellent

Date of reading: 2016

Other activities/achievements not included above

- 1 Description of the activity:** Courses and Seminars - Taught: Xerrada-Taller: Com i per què es pot viatjar per l'espai.
End date: 21/11/2012
- 2 Description of the activity:** Courses and Seminars - Taught: Curs d'estiu Els Juliol 2012: Viatge matemàtic al cel.
End date: 20/07/2012
- 3 Description of the activity:** Other teaching merits: Certificat d'Aptitud Pedagògica (CAP)
Organising entity: Institut de Ciències de l'Educació de la Universitat de Barcelona.
End date: 2004



Scientific and technological experience

Scientific or technological activities

R&D projects funded through competitive calls of public or private entities

- 1** **Name of the project:** Barcelona Graduate School of Mathematics (BGSMath)
Entity where project took place: Universitat de Barcelona **Type of entity:** University
City of entity: Barcelona, Spain
Name principal investigator (PI, Co-PI....): Marcos Noy Serrano
Funding entity or bodies: Ministerio de Economía y Competitividad **Type of entity:** State or Central Administration
City funding entity: Spain
Code according to the funding entity: MDM-2014-0445
Start-End date: 01/07/2015 - 30/06/2019 **Duration:** 4 years
Participating entity/entities: Universitat de Barcelona
Total amount: 2.000.000 €
- 2** **Name of the project:** Dynamics and Bifurcations of Dissipative and Conservative Systems.
Entity where project took place: Universitat de Barcelona **Type of entity:** University
City of entity: Barcelona, Spain
Name principal investigator (PI, Co-PI....): D. Turaev
Funding entity or bodies: Nizhny Novgorod State University **Type of entity:** University
City funding entity: Russia
Code according to the funding entity: 14-41-00044
Start-End date: 01/01/2014 - 31/12/2017 **Duration:** 4 years
Participating entity/entities: Imperial College London
Total amount: 200.000 €
- 3** **Name of the project:** Grup de Sistemes Dinàmics
Entity where project took place: Universitat de Barcelona **Type of entity:** University
City of entity: Barcelona, Spain
Name principal investigator (PI, Co-PI....): Angel Jorba Monte
Nº of researchers: 18
Funding entity or bodies: Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR) **Type of entity:** Autonomous Administration
City funding entity: 08003 Barcelona, Spain
Code according to the funding entity: 2014SGR1145
Start-End date: 01/01/2014 - 31/12/2016 **Duration:** 3 years
Participating entity/entities: sense especificar
Total amount: 43.000 €

**4 Name of the project:** Aspectos teóricos y computacionales de los sistemas dinámicos y sus aplicaciones.**Entity where project took place:** Universitat de Barcelona **Type of entity:** University**City of entity:** Barcelona, Spain**Name principal investigator (PI, Co-PI....):** Ernest Fontich Julia**Nº of researchers:** 11**Funding entity or bodies:**

Ministerio de Economía y Competitividad

Type of entity: State or Central Administration**City funding entity:** Spain**Code according to the funding entity:** MTM2013-41168-P**Start-End date:** 01/01/2014 - 31/12/2016**Duration:** 3 years**Participating entity/entities:** Universitat de Barcelona**Total amount:** 82.793,75 €**5 Name of the project:** Sistemas Dinámicos Diferenciables y Aplicaciones.**Entity where project took place:** Universitat de Barcelona **Type of entity:** University**City of entity:** Barcelona, Spain**Name principal investigator (PI, Co-PI....):** Ernest Fontich Julia**Nº of researchers:** 12**Funding entity or bodies:**

Ministerio de Ciencia e Innovación

Type of entity: State or Central Administration**City funding entity:** Spain**Code according to the funding entity:** MTM2010-16425**Start-End date:** 01/01/2011 - 31/12/2013**Duration:** 3 years**Participating entity/entities:** sense especificar**Total amount:** 177.100 €**6 Name of the project:** Grup de Sistemes Dinàmics**Entity where project took place:** Universitat de Barcelona **Type of entity:** University**City of entity:** Barcelona, Spain**Name principal investigator (PI, Co-PI....):** Angel Jorba Monte**Nº of researchers:** 20**Funding entity or bodies:**

Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR)

Type of entity: Autonomous Administration**City funding entity:** 08003 Barcelona, Spain**Code according to the funding entity:** 2009SGR67**Start-End date:** 03/07/2009 - 31/12/2013**Duration:** 4 years - 5 months - 29 days**Participating entity/entities:** sense especificar**Total amount:** 72.800 €**7 Name of the project:** Métodos locales y globales en sistemas dinámicos. Aplicaciones**Entity where project took place:** Universitat de Barcelona **Type of entity:** University**City of entity:** Barcelona, Spain**Name principal investigator (PI, Co-PI....):** Carlos Simo Torres**Nº of researchers:** 13

**Funding entity or bodies:**

Ministerio de Educación y Ciencia

Type of entity: State or Central Administration**City funding entity:** Spain**Code according to the funding entity:** MTM2006-05849/**Start-End date:** 01/10/2006 - 30/09/2011**Duration:** 5 years**Participating entity/entities:** Universitat de Barcelona**Total amount:** 236.240 €**8 Name of the project:** Resonant phenomena in Hamiltonian Systems**Entity where project took place:** University of Warwick**Type of entity:** University**City of entity:** COVENTRY, United Kingdom**Name principal investigator (PI, Co-PI....):** Vassili Gelfreich**Funding entity or bodies:**

Royal Society of Great Britain

Type of entity: Nonprofit Private Institutions**City funding entity:** United Kingdom**Code according to the funding entity:** JP0869734**Start-End date:** 2008 - 2011**Duration:** 3 years - 1 day**Participating entity/entities:** University of Warwick**9 Name of the project:** Dinámica, atractores y no linealidad: caos y estabilidad**Entity where project took place:** Universidad de Valladolid**Type of entity:** University**City of entity:** Spain**Name principal investigator (PI, Co-PI....):** Carmen Nuñez Jimenez**Nº of researchers:** 6**Funding entity or bodies:**

Ministerio de Educación y Ciencia

Type of entity: State or Central Administration**City funding entity:** Spain**Code according to the funding entity:** MTM2009-06507-E**Start-End date:** 01/01/2010 - 31/12/2010**Duration:** 1 year**Participating entity/entities:** Universidad de Valladolid**Total amount:** 16.000 €**10 Name of the project:** Consolider I-MATH: DocCourse 'Computational Methods in Dynamical Systems and Applications'**Entity where project took place:** Universitat de Barcelona**Type of entity:** University**City of entity:** Spain**Name principal investigator (PI, Co-PI....):** Àngel Jorba**Funding entity or bodies:**

Ministerio de Ciencia e Innovación

Type of entity: State or Central Administration**City funding entity:** Spain**Code according to the funding entity:** MIGS-T4-0263**Start-End date:** 2010 - 2010**Duration:** 1 day**Participating entity/entities:** Facultat de Matemàtiques de la Universitat de Barcelona**Total amount:** 68.000 €



- 11 Name of the project:** Proyecto Ingenio Mathematica (I-Math)
Entity where project took place: Universitat de Barcelona **Type of entity:** University
City of entity: Spain
Name principal investigator (PI, Co-PI....): Àngel Jorba
Funding entity or bodies: Ministerio de Ciencia e Innovación **Type of entity:** State or Central Administration
City funding entity: Spain
Code according to the funding entity: SAIRT-C4-0189
Start-End date: 2009 - 2010 **Duration:** 1 year - 1 day
Participating entity/entities: Facultat de Matemàtiques de la Universitat de Barcelona
Total amount: 12.000 €
- 12 Name of the project:** Grup de Sistemes Dinàmics
Entity where project took place: Universitat de Barcelona **Type of entity:** University
City of entity: Barcelona, Spain
Name principal investigator (PI, Co-PI....): Angel Jorba Monte
Funding entity or bodies: Departament d'Universitats, Recerca i Societat de la Informació (Generalitat de Catalunya) DURSI **Type of entity:** Authonomous Administration
City funding entity: Spain
Code according to the funding entity: 2005SGR01028
Start-End date: 19/10/2005 - 18/10/2009 **Duration:** 4 years
Participating entity/entities: Universitat de Barcelona
Total amount: 42.200 €
- 13 Name of the project:** Dinámica, atractores y no linealidad: caos y estabilidad
Entity where project took place: Universitat de Barcelona **Type of entity:** University
City of entity: Barcelona, Spain
Name principal investigator (PI, Co-PI....): Angel Jorba Monte
Nº of researchers: 205
Funding entity or bodies: Ministerio de Educación y Ciencia **Type of entity:** State or Central Administration
City funding entity: Spain
Code according to the funding entity: MTM2007-29352-E
Start-End date: 01/01/2008 - 31/05/2009 **Duration:** 1 year - 5 months
Participating entity/entities: Universitat de Barcelona
Total amount: 12.000 €
- 14 Name of the project:** Escuela de Invierno de la Red Temática DANCE-RTNS2010
Entity where project took place: Universitat de Barcelona **Type of entity:** University
City of entity: Spain
Name principal investigator (PI, Co-PI....): Carmen Núñez
Funding entity or bodies: Consolider 2007 **Type of entity:** Other organisms
City funding entity: Unknown
Code according to the funding entity: MIGS-C5-0287



Start-End date: 2008 - 2008

Duration: 1 day

Participating entity/entities: Facultat de Matemàtiques de la Universitat de Barcelona

Total amount: 7.500 €

15 Name of the project: Escuela de Invierno de la Red Temática DANCE-RTNS08}

Entity where project took place: Universitat de Barcelona **Type of entity:** University

City of entity: Spain

Name principal investigator (PI, Co-PI....): Àngel Jorba

Funding entity or bodies:

Ministerio de Educación y Ciencia

Type of entity: State or Central Administration

City funding entity: Spain

Code according to the funding entity: SARE-C2-0082

Start-End date: 2008 - 2008

Duration: 1 day

Participating entity/entities: Facultat de Matemàtiques de la Universitat de Barcelona

Total amount: 6.000 €

16 Name of the project: Dinámica, atractores y no linealidad: caos y estabilidad

Entity where project took place: Universitat de Barcelona **Type of entity:** University

City of entity: Spain

Name principal investigator (PI, Co-PI....): Amadeu Delshams

Funding entity or bodies:

Ministerio de Educación y Ciencia

Type of entity: State or Central Administration

City funding entity: Spain

Code according to the funding entity: MTM2006-27481-E

Start-End date: 2007 - 2008

Duration: 1 year - 1 day

Participating entity/entities: Facultat de Matemàtiques de la Universitat de Barcelona

Total amount: 12.000 €

17 Name of the project: Dinámica, atractores y no linealidad: caos y estabilidad

Entity where project took place: Universitat de Barcelona **Type of entity:** University

City of entity: Spain

Name principal investigator (PI, Co-PI....): Jorge Galán

Funding entity or bodies:

Ministerio de Educación y Ciencia

Type of entity: State or Central Administration

City funding entity: Spain

Code according to the funding entity: MTM2006-26626-E

Start-End date: 2006 - 2007

Duration: 1 year - 1 day

Participating entity/entities: Facultat de Matemàtiques de la Universitat de Barcelona

Total amount: 3.000 €

18 Name of the project: Ajut per a Grups de recerca consolidats 2001

Entity where project took place: Universitat de Barcelona **Type of entity:** University

City of entity: Barcelona, Spain

Name principal investigator (PI, Co-PI....): Carles Simó

Nº of researchers: 32

Funding entity or bodies:



Comissió Interdepartamental de Recerca i Innovació Tecnològica de la Generalitat de Catalunya (CIRIT) **Type of entity:** Autonomous Administration

City funding entity: Spain

Code according to the funding entity: CIRIT 2001SGR-70

Start-End date: 2001 - 2004

Duration: 3 years - 1 day

Participating entity/entities: Universitat de Barcelona

Total amount: 54.000 €

R&D non-competitive contracts, agreements or projects with public or private entities

Name of the project: Efficient Usage of Self Validated Integrators for Space Applications (Ariadna ID: 07/5202)

Degree of contribution: Researcher

Entity where project took place: Universitat de Barcelona **Type of entity:** University

City of entity: Spain

Name principal investigator (PI, Co-PI....): Tamas Vinko

N° of researchers: 5

Participating entity/entities: Universitat de Barcelona

Funding entity or bodies:

Agencia Espacial Europea (ESA)

Type of entity: European Union Administration

City funding entity: European Union institutions

Code according to the funding entity: 20783/07/NL/CB

Start date: 2007

Duration: 1 year - 1 day

Total amount: 25.000 €

Scientific and technological activities

Scientific production

Publications, scientific and technical documents

- 1 Gelfreich, V.; Viero, A. Interpolating vector fields for near identity maps and averaging. Nonlinearity. (United Kingdom): IOP Publishing, 2018. ISSN 0951-7715
Type of production: Scientific paper **Format:** Journal
Relevant publication: Yes
- 2 Gonchenko, M.; Gonchenko, S.V.; Ovyannikov, I.; Viero, A. On local and global aspects of the 1:4 resonance in the conservative cubic Hénon maps. Chaos. 28, (United States of America): American Institute of Physics, 2018. ISSN 1054-1500
Type of production: Scientific paper **Format:** Journal
Total no. authors: 4
Relevant publication: Yes

- 3** Sánchez-Taltavull, D; Alarcón, T; Vieiro, A. Stochastic modelling of the eradication of the HIV-1 infection by stimulation of latently infected cells in patients under highly active anti-retroviral therapy. *Journal of Mathematical Biology*. (Germany): 2016. Available on-line at: <<http://link.springer.com/article/10.1007/s00285-016-0977-5>>. ISSN 0303-6812
- Type of production:** Scientific paper
Total no. authors: 3
Impact source: ISI
Impact index in year of publication: 1.566
Position of publication: 43
- Impact source:** ISI
Impact index in year of publication: 1.566
Position of publication: 28
- Format:** Journal
Category: BIOLOGY
Journal in the top 25%: No
No. of journals in the cat.: 85
- Category:** MATHEMATICAL & COMPUTATIONAL BIOLOGY
Journal in the top 25%: No
No. of journals in the cat.: 57
- 4** Miguel-Baños, N.; Simó, C.; Vieiro, A. Effect of Islands of Diffusive Properties of the Standard Map for Large Parameter Values. *Foundations of Computational Mathematics*. 15, pp. 89 - 123. (United States of America): Springer Verlag, 2014. ISSN 1615-3375
DOI: <https://doi.org/10.1007/s10208-014-9210-3>
- Type of production:** Scientific paper
Impact source: ISI
Impact index in year of publication: 2.152
Position of publication: 8
- Impact source:** ISI
Impact index in year of publication: 2.152
Position of publication: 8
- Impact source:** ISI
Impact index in year of publication: 2.152
Position of publication: 10
- Format:** Journal
Category: MATHEMATICS
Journal in the top 25%: Yes
No. of journals in the cat.: 312
- Category:** MATHEMATICS, APPLIED
Journal in the top 25%: Yes
No. of journals in the cat.: 257
- Category:** COMPUTER SCIENCE, THEORY & METHODS
Journal in the top 25%: Yes
No. of journals in the cat.: 102
- 5** Gonchenko, S.V.; Simó, C.; Vieiro, A. Richness of dynamics and global bifurcations in systems with a homoclinic figure-eight. *Nonlinearity*. 26 - 3, pp. 621 - 678. (United Kingdom): IOP Publishing, 2013. ISSN 0951-7715
DOI: <https://doi.org/10.1088/0951-7715/26/3/621>
- Type of production:** Scientific paper
Total no. authors: 3
Impact source: ISI
Impact index in year of publication: 1.386
Position of publication: 58
- Impact source:** ISI
Impact index in year of publication: 1.386
Position of publication: 29
- Format:** Journal
Category: MATHEMATICS, APPLIED
Journal in the top 25%: Yes
No. of journals in the cat.: 250
- Category:** PHYSICS, MATHEMATICAL
Journal in the top 25%: No
No. of journals in the cat.: 55
- 6** Gelfreich, V.; Simó, C.; Vieiro, A. Dynamics of 4D symplectic maps near a double resonance. *Physica D*. 243, pp. 92 - 110. (Holland): Elsevier B.V., 2013. ISSN 0167-2789
- Type of production:** Scientific paper
Impact source: ISI
Impact index in year of publication: 1.737
- Format:** Journal
Category: MATHEMATICS, APPLIED
Journal in the top 25%: Yes



Position of publication: 21

Impact source: ISI

Impact index in year of publication: 1.737

Position of publication: 21

Impact source: ISI

Impact index in year of publication: 1.737

Position of publication: 11

No. of journals in the cat.: 250

Category: PHYSICS, MULTIDISCIPLINARY

Journal in the top 25%: No

No. of journals in the cat.: 77

Category: PHYSICS, MATHEMATICAL

Journal in the top 25%: Yes

No. of journals in the cat.: 55

- 7** Míguel-Baños, N.; Simó, C.; Vieiro, A. From the Hénon conservative map to the Chirikov standard map for large parameter values. *Regular and Chaotic Dynamics*. 18 - 5, pp. 469 - 489. (Russia): Pleiades Publishing, 2013. ISSN 1560-3547

Type of production: Scientific paper

Impact source: ISI

Impact index in year of publication: 0.925

Position of publication: 90

Impact source: ISI

Impact index in year of publication: 0.925

Position of publication: 82

Impact source: ISI

Impact index in year of publication: 0.925

Position of publication: 38

Format: Journal

Category: MATHEMATICS, APPLIED

Journal in the top 25%: No

No. of journals in the cat.: 250

Category: MECHANICS

Journal in the top 25%: No

No. of journals in the cat.: 138

Category: PHYSICS, MATHEMATICAL

Journal in the top 25%: No

No. of journals in the cat.: 55

- 8** Simó, C.; Vieiro, A. Dynamics in chaotic zones of area preserving maps: close to separatrix and global instability zones. *Physica D*. 240 - 8, pp. 732 - 753. (Holland): Elsevier B.V., 2011. ISSN 0167-2789

Type of production: Scientific paper

Total no. authors: 2

Impact source: ISI

Impact index in year of publication: 1.555

Position of publication: 20

Impact source: ISI

Impact index in year of publication: 1.555

Position of publication: 23

Impact source: ISI

Impact index in year of publication: 1.555

Position of publication: 15

Format: Journal

Category: MATHEMATICS, APPLIED

Journal in the top 25%: Yes

No. of journals in the cat.: 245

Category: PHYSICS, MULTIDISCIPLINARY

Journal in the top 25%: No

No. of journals in the cat.: 82

Category: PHYSICS, MATHEMATICAL

Journal in the top 25%: No

No. of journals in the cat.: 55

- 9** Simó, C.; Vieiro, A. Some remarks on the abundance of stable periodic orbits inside homoclinic lobes. *Physica D*. 240 - 24, pp. 1936 - 1953. (Holland): Elsevier B.V., 2011. ISSN 0167-2789

Type of production: Scientific paper

Total no. authors: 2

Impact source: ISI

Impact index in year of publication: 1.555

Position of publication: 20

Impact source: ISI

Impact index in year of publication: 1.555

Format: Journal

Category: MATHEMATICS, APPLIED

Journal in the top 25%: Yes

No. of journals in the cat.: 245

Category: PHYSICS, MULTIDISCIPLINARY

Journal in the top 25%: No



Position of publication: 23

Impact source: ISI

Impact index in year of publication: 1.555

Position of publication: 15

No. of journals in the cat.: 82

Category: PHYSICS, MATHEMATICAL

Journal in the top 25%: No

No. of journals in the cat.: 55

- 10** Simó, C.; Vieiro, A. Planar Radial Weakly-Dissipative Diffeomorphisms. Chaos. 20, pp. 1 - 18. (United States of America): American Institute of Physics, 2010. ISSN 1054-1500

Type of production: Scientific paper

Impact source: ISI

Impact index in year of publication: 2.081

Position of publication: 14

Format: Journal

Category: MATHEMATICS, APPLIED

Journal in the top 25%: Yes

No. of journals in the cat.: 235

Impact source: ISI

Impact index in year of publication: 2.081

Position of publication: 10

Category: PHYSICS, MATHEMATICAL

Journal in the top 25%: Yes

No. of journals in the cat.: 54

- 11** Simó, C.; Vieiro, A. Resonant zones, inner and outer splittings in generic and low order resonances of area preserving maps. Nonlinearity. 22 - 5, pp. 1191 - 1245. (United Kingdom): IOP Publishing, 2009. ISSN 0951-7715

Type of production: Scientific paper

Total no. authors: 2

Impact source: ISI

Impact index in year of publication: 1.258

Position of publication: 51

Format: Journal

Category: MATHEMATICS, APPLIED

Journal in the top 25%: Yes

No. of journals in the cat.: 204

Impact source: ISI

Impact index in year of publication: 1.258

Position of publication: 27

Category: PHYSICS, MATHEMATICAL

Journal in the top 25%: No

No. of journals in the cat.: 47

- 12** Simó, C.; Vieiro, A. A physical dissipative system with a Poincaré homoclinic figure-eight. Progress and challenges in dynamical systems. 54, pp. 383 - 394. (United States of America): Springer, 2013. ISBN 978-3-642-38829-3

Type of production: Book chapter

Total no. authors: 2

Format: Book

- 13** Vieiro, A. Review on The decay of a normally hyperbolic invariant manifold to dust in a three degrees of freedom scattering system. Mathematical Reviews MR3158347. (United States of America): American Mathematical Society (AMS), 2014.

Type of production: Review

Format: Book

- 14** Vieiro, A. Review on Interacting global invariant sets in a planar map model of wild chaos. Mathematical Reviews MR3082484. (United States of America): American Mathematical Society (AMS), 2013.

Type of production: Review

Format: Book

- 15** Vieiro, A. Review on An estimation for the hyperbolic region of elliptic Lagrangian solutions in the planar three-body problem. Mathematical Reviews MR3146590. (United States of America): American Mathematical Society (AMS), 2013.

Type of production: Review

Format: Book

- 16** Vieiro, A. Review on A numerical study of infinitely renormalizable area-preserving maps. Mathematical Reviews MR2966155. (United States of America): American Mathematical Society (AMS), 2012.

Type of production: Review

Format: Book



- 17** Vieiro, A. Review on Chaotic orbits in a planar three-center problem of slightly negative energy. *Mathematical Reviews* MR3016145. (United States of America): American Mathematical Society (AMS), 2012.
Type of production: Review **Format:** Book
- 18** Alessi, E.M.; Farrés, A.; Jorba, A.; Simó, C.; Vieiro, A. Efficient Usage of Self Validated Integrators for Space Applications. pp. 1 - 82. (Holland): 2008. Available on-line at: <<http://www.esa.int/gsp/ACT/ariadna/studies.htm>>.
Type of production: Scientific-technical report
Total no. authors: 5
- 19** Fontich, E.; Simó, C.; Vieiro, A. The discrete Hamiltonian-Hopf bifurcation for 4D symplectic maps. *Extended Abstracts Spring 2014, Hamiltonian Systems and Celestial Mechanics; Virus Dynamics and Evolution (Part I)*.4, pp. 77 - 81. (United States of America): Springer, 2015. ISBN 978-3-319-22128-1
Type of production: Proceedings **Format:** Book
Total no. authors: 3
- 20** Alessi, E.M.; Farrés, A.; Jorba, A.; Simó, C.; Vieiro, A. Jet Transport and applications to NEO's. *Proceedings of 1st Planetary Defense Conference*. pp. 1 - 8. Granada (Spain): 2009.
Type of production: Proceedings **Format:** Book
Total no. authors: 5
- 21** Simó, C.; Vieiro, A. A numerical exploration of weakly dissipative two-dimensional maps. *Proceedings of ENOC'05*. pp. 1 - 9. Eindhoven (Holland): 2005. Available on-line at: <<http://www.maia.ub.es/dsg/2005/index.html>>. ISBN 9038626673
Type of production: Proceedings **Format:** Book

Works submitted to national or international conferences

- 1** **Title of the work:** The dynamics of the QR flow
Name of the conference: Interdisciplinary Workshop on Multiple Scale Systems, Systems with Hysteresis and Trends in Dynamical Systems, MURPHYS2018
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - oral communication
City of event: Barcelona, Spain
Date of event: 2018
End date: 2018
Vieiro, Arturo; Tatjer, Joan Carles.
- 2** **Title of the work:** The splitting of separatrices associated to a Hamiltonian-Hopf bifurcation under the effect of a periodic forcing
Name of the conference: 5th Bremen Winter School and Symposium on Dynamical Systems and Fluids
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - invited/keynote talk
City of event: Germany
Date of event: 2017
End date: 2017
Fontich, E.; Simó, C.; Vieiro, A.
- 3** **Title of the work:** Anomalous diffusion in 2D and 3D volume-preserving map.
Name of the conference: SIAM conference on Applications of Dynamical Systems
Type of event: Conference **Geographical area:** International



Type of participation: Participatory - oral communication

City of event: Snowbird, Utah, United States of America

Date of event: 2017

End date: 2017

Miguel-Baños, N; Simó, C.; Vieiro, A.

- 4** **Title of the work:** Double resonances in 4D symplectic maps and diffusive properties.
Name of the conference: XXV Congreso de ecuaciones diferenciales y aplicaciones (Cedya)
Type of event: Conference
Type of participation: Participatory - invited/keynote talk
City of event: Cartagena, Spain
Date of event: 2017
End date: 2017
Vieiro, A.

- 5** **Title of the work:** The dynamics of the QR flow
Name of the conference: Dynamics, Bifurcations and Strange Attractors
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - invited/keynote talk
City of event: Nizhny Novgorod, Russia
Date of event: 2017
End date: 2017
Tatjer, Joan Carles; Vieiro, Arturo.

- 6** **Title of the work:** Warwick Dynamical Systems Workshop
Name of the conference: Warwick Dynamical Systems Workshop
Type of event: Conference **Geographical area:** International
Type of participation: Organizing committee
City of event: United Kingdom
Date of event: 2016
End date: 2016
Organising entity: Real Sociedad Matemática Española **Type of entity:** Other organisms
Gelfreich, V.; Rom-Kedar, V.; Turaev, D.; Vieiro, A.

- 7** **Title of the work:** Geometry of double resonances of 4D symplectic maps and diffusive properties.
Name of the conference: Warwick Dynamical Systems Workshop
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - oral communication
City of event: Coventry, United Kingdom
Date of event: 2016
End date: 2016
V. Gelfreich; A. Vieiro.

- 8** **Title of the work:** Periodically perturbed Hamiltonian-Hopf.
Name of the conference: AIMS Conference on Dynamical Systems, Differential Equations and Applications
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - invited/keynote talk
City of event: Orlando (Florida), United States of America
Date of event: 2016
End date: 2016



Fontich, E.; Simó, C.; Vieiro, A.

- 9** **Title of the work:** Splitting of separatrices at a periodically forced Hamiltonian-Hopf bifurcation.
Name of the conference: Dynamics, Bifurcations and Strange Attractors
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - invited/keynote talk
City of event: Nizhny Novgorod, Russia
Date of event: 2016
End date: 2016
Fontich, E.; Simó, C.; Vieiro, A.
- 10** **Title of the work:** Periodic forcing of a 2-dof Hamiltonian undergoing a Hamiltonian-Hopf bifurcation
Name of the conference: Dynamics, Bifurcations and Chaos 2015
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - oral communication
City of event: Nizhny Novgorod, Russia
Date of event: 2015
End date: 2015
A. Vieiro; E. Fontich; C. Simó.
- 11** **Title of the work:** La bifurcación Hamiltonian-Hopf de 2 grados de libertad bajo el efecto de un forzamiento periódico
Name of the conference: Congreso de jóvenes investigadores RSME
Type of event: Conference
Type of participation: Participatory - invited/keynote talk
City of event: Murcia, Spain
Date of event: 2015
End date: 2015
Organising entity: Real Sociedad Matemática Española **Type of entity:** Other organisms
C. Simó; E. Fontich; A. Vieiro.
- 12** **Title of the work:** The discrete Hamiltonian-Hopf bifurcation for 4D symplectic maps
Name of the conference: Conference on Hamiltonian systems and Celestial Mechanics (HAMSYS2014)
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - oral communication
City of event: Barcelona, Spain
Date of event: 2014
End date: 2014
Organising entity: CEMAPRE - Centre for Applied Mathematics and Economics **Type of entity:** University
Fontich, E.; Simó, C.; Vieiro, A. "The discrete Hamiltonian-Hopf bifurcation for 4D symplectic maps", Research Perspectives CRM Barcelona, Spring 2014, vol. 4, in Trends in Mathematics, Springer-Birkhäuser, Basel".
- 13** **Title of the work:** The transition to complex-saddle in a Froeschlé-type map
Name of the conference: The 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications Madrid, Spain, on July 07-11, 2014.
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - invited/keynote talk
City of event: Madrid, Spain



Date of event: 2014

End date: 2014

Organising entity: ICMAT
Fontich, E.; Simó, C.; Vieiro, A.

Type of entity: State or Central Administration

- 14** **Title of the work:** Special session 111: computational dynamics in hamiltonian and dissipative systems
Name of the conference: The 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications

Type of event: Conference

Geographical area: International

Type of participation: Organizing committee

City of event: Madrid, Spain

Date of event: 2014

End date: 2014

Organising entity: ICMAT
Blesa, F; Serrano, S; Vieiro, A.

Type of entity: State or Central Administration

- 15** **Title of the work:** Sesión: Insight, not just numbers

Name of the conference: Ddays 2014

Type of event: Conference

Type of participation: Organizing committee

City of event: Badajoz, Spain

Date of event: 2014

End date: 2014

Organising entity: Universidad de Extremadura
Serrano, S; Vieiro, A.

Type of entity: University

- 16** **Title of the work:** Study of an electro-mechanical device with figure-eight homoclinics in a domain with dissipation

Name of the conference: Dynamics Bifurcations and Strange Attractors (dedicated to the memory of Professor Leonid Pavlovich Shilnikov)

Type of event: Conference

Geographical area: International

Type of participation: Participatory - oral communication

City of event: Nizhny Novgorod, Russia

Date of event: 2013

End date: 2013

Organising entity: Nizhny Novgorod State University
Simó, C.; Vieiro, A.

Type of entity: University

- 17** **Title of the work:** A global study of 2D dissipative diffeomorphisms with a Poincaré homoclinic figure-eight

Name of the conference: SIAM conference on Applications of Dynamical Systems

Type of event: Conference

Geographical area: International

Type of participation: Participatory - invited/keynote talk

City of event: Snowbird (Utah), United States of America

Date of event: 2013

End date: 2013

Organising entity: Society for Industrial and Applied Mathematics - SIAM

Type of entity: Associations

Goncheko, S.; Simó, C.; Vieiro, A.



- 18** **Title of the work:** Dynamics of 4d symplectic maps near a doubly resonant point.
Name of the conference: 4th one day meeting on dynamical systems
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - invited/keynote talk
City of event: Lisboa, Portugal
Date of event: 2013
End date: 2013
Organising entity: CEMAPRE - Centre for Applied Mathematics and Economics **Type of entity:** University
Gelfreich, V.; Simó, C.; Vieiro, A.
- 19** **Title of the work:** A global study of 2D dissipative diffeomorphisms with a Poincaré homoclinic figure-eight
Name of the conference: DS100P 2012
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - oral communication
City of event: Gijón, Spain
Date of event: 2012
End date: 2012
Organising entity: Universidad de Oviedo **Type of entity:** University
Vieiro, A.; Simó, C.; Gonchenko, S. "A physical dissipative system with a Poincaré homoclinic figure-eight".
- 20** **Title of the work:** A global study of 2D dissipative diffeomorphisms with a Poincaré homoclinic figure-eight
Name of the conference: DDDAYS 2012
Type of event: Conference
Type of participation: Participatory - invited/keynote talk
City of event: Benicàssim-Castelló, Spain
Date of event: 2012
End date: 2012
Organising entity: Universitat Jaume I **Type of entity:** University
Vieiro, A.; Simó, C.; Gonchenko, S.
- 21** **Title of the work:** Dynamics of 4d symplectic maps near a double resonance
Name of the conference: DytoComp 2012
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - invited/keynote talk
City of event: Poznan, Poland
Date of event: 2012
End date: 2012
Organising entity: Jagiellonian University **Type of entity:** University
Vieiro, A.
- 22** **Title of the work:** Dynamics in Chaotic zones (APMs): inner and outer splittings of separatrices
Name of the conference: Workshop on instabilities in Hamiltonian systems
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - oral communication
City of event: Toronto, Canada
Date of event: 2011
End date: 2011
Organising entity: Fields Institut **Type of entity:** University
Simó, C.; Vieiro, A.



- 23** **Title of the work:** Abundance of Stable periodic orbits inside homoclinic lobes
Name of the conference: Conference on Computational Methods in Dynamics
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - oral communication
City of event: Trieste, Italy
Date of event: 2011
End date: 2011
Organising entity: The Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy
Simó, C.; Vieiro, A.
- 24** **Title of the work:** Resonant chaotic zones: dynamical consequences of the differences between the inner/outer splittings of separatrices
Name of the conference: Equadiff 2011
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - oral communication
City of event: Loughborough, United Kingdom
Date of event: 2011
End date: 2011
Organising entity: Loughborough University **Type of entity:** University
Simó, C.; Vieiro, A.
- 25** **Title of the work:** Abundància d'òrbites periòdiques estables dins dels lòbuls homoclínic
Name of the conference: Trobada de Joves Investigadors de la Societat Catalana de Matemàtiques
Type of event: Conference
Type of participation: Participatory - oral communication
City of event: Barcelona, Spain
Date of event: 2011
End date: 2011
A. Vieiro.
- 26** **Title of the work:** Area preserving maps: normal forms, splitting of separatrices and some quantitative dynamical global aspects
Name of the conference: EU-Young and Mobile Workshop: Dynamical Systems and Number Theory
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - oral communication
City of event: Edimburgh,
Date of event: 2010
End date: 2010
Vieiro, A.
- 27** **Title of the work:** Dynamics in Chaotic zones of area preserving maps (APMs): close to separatrix and global instability zones
Name of the conference: 8th AIMS International Conference on Dynamical Systems, Differential Equations and Applications
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - oral communication
City of event: Dresden, Germany
Date of event: 2010
End date: 2010
Organising entity: American Institute of Mathematical Sciences
Simó, C.; Vieiro, A.



- 28** **Title of the work:** Dynamical description and inner-outer Splitting of resonances of APMs
Name of the conference: I ENJIM (Encuentro Nacional de Jóvenes Doctores)
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - oral communication
City of event: Sevilla, Spain
Date of event: 2010
End date: 2010
A. Vieiro.
- 29** **Title of the work:** PHD presentation: Study of the effect of conservative and weakly dissipative perturbations on symplectic maps and Hamiltonian systems
Name of the conference: Ddays'2010
Type of event: Conference
Type of participation: Participatory - oral communication
City of event: Calatayud, Spain
Date of event: 2010
End date: 2010
A. Vieiro.
- 30** **Title of the work:** Jet transport and applications to NEO's
Name of the conference: 1st. IAA Planetary Defense Conference
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - oral communication
City of event: Granada, Spain
Date of event: 2009
End date: 2009
Organising entity: International Academy of Astronautics **Type of entity:** Other organisms
Jorba, A.; Simó, C.; Alessi, E.M.; Farrés, A.; Vieiro, A."Jet transport and applications to NEO's".
- 31** **Title of the work:** Some quantitative global aspects of (perturbations of) area preserving maps
Name of the conference: International Workshop on Hamiltonian Approaches of ITER Physics
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - oral communication
City of event: Marsella, France
Date of event: 2009
End date: 2009
Organising entity: Centre International de Rencontres Mathematiques **Type of entity:** Foundation
Simó, C.; Vieiro, A.
- 32** **Title of the work:** Métodos intervalares de integración validada: aplicaciones a la mecánica celeste
Name of the conference: DDAYSO8
Type of event: Conference
Type of participation: Participatory - oral communication
City of event: Madrid, Spain
Date of event: 2008
End date: 2008
Jorba, A.; Simó, C.; Alessi, E.M.; Farrés, A.; Vieiro, A.



- 33** **Title of the work:** Quantitative global phase space analysis of APM
Name of the conference: Workshop on Stability and Instability in Mechanical Systems: Applications and Numerical Tools
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - oral communication
City of event: Barcelona, Spain
Date of event: 2008
End date: 2008
Simó, C.; Vieiro, A.
- 34** **Title of the work:** Towards a global study of Area Preserving Maps. Examples, Models and Applications
Name of the conference: Workshop on chaos and ergodicity of realistic Hamiltonian systems
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - oral communication
City of event: Montreal, Canada
Date of event: 2007
End date: 2007
Simó, C.; Vieiro, A.
- 35** **Title of the work:** Towards a global study of Area Preserving Maps. Examples, Models and Applications
Name of the conference: Workshop on mathematical aspects of celestial mechanics
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - oral communication
City of event: París, France
Date of event: 2007
End date: 2007
Simó, C.; Vieiro, A.
- 36** **Title of the work:** A Numerical exploration of weakly dissipative two-dimensional maps
Name of the conference: ENOC'05
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - oral communication
City of event: Eindhoven, Holland
Date of event: 2005
End date: 2005
Organising entity: European Mechanics Society (EUROMECH)
Simó, C.; Vieiro, A. "A Numerical exploration of weakly dissipative two-dimensional maps".
- 37** **Title of the work:** First steps in the study of Weakly dissipative two-dimensional maps
Name of the conference: NSDS'05
Type of event: Conference **Geographical area:** International
Type of participation: Participatory - oral communication
City of event: Seville, Spain
Date of event: 2005
End date: 2005
Simó, C.; Vieiro, A.



Works submitted to national or international seminars, workshops and/or courses

- 1** **Title of the work:** Dynamics of near identity maps and interpolating vector fields
Name of the event: Seminari de Sistemes Dinàmics UB-UPC
Type of event: Seminar
Reasons for participation: Speaker
City of event: Barcelona, Spain
Date of event: 02/04/2018
End date: 02/04/2018
- 2** **Title of the work:** Dynamics of systems with a homoclinic figure-eight
Name of the event: Seminário de Sistemas Dinamicos, Centro de Matemática e Aplicações Fundamentais (CMAF).
Reasons for participation: Speaker
City of event: Lisboa, Portugal
Date of event: 03/05/2013
End date: 03/05/2013
- 3** **Title of the work:** Una introducció informal a la dinàmica de (pertorbacions de) sistemes Hamiltonians
Name of the event: SIMBA: Seminari informal de matemàtiques de Barcelona
Type of event: Seminar
Reasons for participation: Speaker
City of event: Barcelona, Spain
Date of event: 08/11/2011
End date: 08/11/2011
- 4** **Title of the work:** Dynamics in Chaotic zones of area-preserving maps
Name of the event: Seminarium Równania Różniczkowe i Zagadnienia Pokrewne
Type of event: Seminar
Reasons for participation: Speaker
City of event: Krakow, Poland
Date of event: 2011
End date: 2011
- 5** **Title of the work:** Planar radial weakly-dissipative diffeomorphisms
Name of the event: Seminari de Sistemes Dinàmics UB-UPC
Type of event: Seminar
Reasons for participation: Speaker
City of event: Barcelona, Spain
Date of event: 2010
End date: 2010
- 6** **Title of the work:** Dynamical description and inner-outer splitting of resonances of APMs
Name of the event: Seminari de Sistemes Dinàmics UB-UPC
Type of event: Seminar
Reasons for participation: Speaker
City of event: Barcelona, Spain
Date of event: 2009
End date: 2009



- 7** **Title of the work:** Basic Notions of area preserving maps
Name of the event: Informal Seminar (<http://www.maia.ub.edu/dsg/wsem/0809.html>)
Reasons for participation: Speaker
City of event: Barcelona, Spain
Date of event: 2008
End date: 2008
- 8** **Title of the work:** Alguns aspectes rellevants sobre les aplicacions simplèctiques (I) i estudi de l'efecte de perturbacions dissipatives (II)
Name of the event: Informal seminar UB (<http://www.maia.ub.edu/dsg/wsem/0607.html>)
Reasons for participation: Speaker
City of event: Barcelona, Spain
Date of event: 2007
End date: 2007
- 9** **Title of the work:** Global Study of Area Preserving Maps
Name of the event: Dynamics Seminar
Reasons for participation: Speaker
City of event: Groningen, Holland
Date of event: 2007
End date: 2007
- 10** **Title of the work:** Cálculo de Curvas invariantes con dinámica no lineal
Name of the event: Informal Seminar (<http://www.maia.ub.edu/dsg/wsem/0405.html>)
Reasons for participation: Speaker
City of event: Barcelona, Spain
Date of event: 2005
End date: 2005

R&D management and participation in scientific committees

Scientific, technical and/or assessment committees

Committee title: Membre del Tribunal de Treball de Fi de Master (TFM): Adrià Simon López
Affiliation entity: UAB, UAB, UPC, URV, UdG, UdLL, UPF, UOC
Start date: 12/07/2011

Organization of R&D activities

- 1** **Title of the activity:** Barcelona Dynamical Systems Meeting (BDSM15)
Type of activity: Miembro del comité organizador del Workshop realizado en Barcelona (<http://www.maia.ub.es/dsg/bdsm15/>) en motivo del 60 aniversario del Prof. E. Fontich.
Start date: 2015
- 2** **Title of the activity:** Ddays 2014
Type of activity: Co-organizador (junto con S. Serrano, U Zaragoza) de la sesión 'Insight, not just numbers' dentro de la reunión de la red temática DANCE. 12-14 Noviembre. Badajoz (España)
Start date: 2014



- 3 Title of the activity:** AIMS 2014
Type of activity: Organizador de la sesión ss111: Computational dynamics in Hamiltonian and dissipative systems Organizadores: Fernando Blesa (U. Zaragoza), Sergio Serrano (U. Zaragoza), Arturo Vieiro.
Start date: 2014
- 4 Title of the activity:** Computational Methods in Dynamical Systems and Applications
Type of activity: Colaboración en la organización de los i-Math DocCourse (advanced courses)
Start date: 2010
- 5 Title of the activity:** Advanced Course on Numerical Linear Algebra, <http://www.imub.ub.es/nla07/>
Type of activity: Colaboración en la organización de los cursos de formación de investigadores.
Start date: 2007
- 6 Title of the activity:** Working Seminar de Sistemes Dinàmics
Type of activity: Seminari periòdic
Start date: 2006
- 7 Title of the activity:** Working Seminar de Sistemes Dinàmics
Type of activity: Seminari periòdic
Start date: 2005
- 8 Title of the activity:** Working Seminar de Sistemes Dinàmics
Type of activity: Seminari periòdic
Start date: 2004

Evaluation and revision of R&D projects and articles

- 1 Name of the activity:** Peer Reviewer: Communications in Nonlinear Science and Numerical Simulation
Type of activity: Review of articles in scientific or technological journals
Geographical area: International
Start date: 13/10/2012
- 2 Name of the activity:** Peer Reviewer: Communications in Nonlinear Science and Numerical Simulation
Type of activity: Review of articles in scientific or technological journals
Geographical area: International
Start date: 07/06/2012



Other achievements

Stays in public or private R&D centres

- 1** **Entity:** University of Warwick
City of entity: United Kingdom
Start date: 2015 **Duration:** 12 days
Goals of the stay: Guest
Provable tasks: Global Study of Four Dimensional Symplectic Maps: Arnold diffusion properties at double resonances.
- 2** **Entity:** Centre de Recerca Matemàtica
City of entity: Barcelona, Spain
Start date: 2014 **Duration:** 4 months
Goals of the stay: Postdoctoral - Collaboration with T.Alarcón y D.Sanchez-Taltavull
Provable tasks: Matemàtica Biològica
- 3** **Entity:** University of Warwick
City of entity: Warwick, United Kingdom
Start date: 2014 **Duration:** 12 days
Goals of the stay: Guest
Provable tasks: Global Study of Four Dimensional Symplectic Maps: Arnold diffusion properties at double resonances.
- 4** **Entity:** University of Warwick
City of entity: Warwick, United Kingdom
Start date: 2013 **Duration:** 11 days
Goals of the stay: Postdoctoral - Collaboration with V.G. Gelfreich
Provable tasks: Global Study of Four Dimensional Symplectic Maps: double resonances and Arnold difusion.
- 5** **Entity:** University of Warwick
City of entity: Warwick, United Kingdom
Start date: 2013 **Duration:** 12 days
Goals of the stay: Guest
Provable tasks: Global Study of Four Dimensional Symplectic Maps: Arnold diffusion properties at double resonances.
- 6** **Entity:** University of Warwick
City of entity: Warwick, United Kingdom
Start date: 2012 **Duration:** 13 days
Goals of the stay: Postdoctoral - Collaboration with V.G. Gelfreich
Provable tasks: Global Study of Four Dimensional Symplectic Maps: double resonances and Arnold difusion.
- 7** **Entity:** Jagiellonian University
City of entity: Krakow, Poland
Start date: 2011 **Duration:** 7 days



Goals of the stay: Guest

Provable tasks: Computer assisted proofs and dynamical systems: normal forms and strong resonances of area-preserving maps.

- 8** **Entity:** University of Warwick
City of entity: Warwick, United Kingdom
Start date: 2011 **Duration:** 14 days
Goals of the stay: Postdoctoral - Collaboration with V.G. Gelfreich
Provable tasks: Global Study of Four Dimensional Symplectic Maps
- 9** **Entity:** University of Warwick
City of entity: Warwick, United Kingdom
Start date: 2010 **Duration:** 21 days
Goals of the stay: Postdoctoral - Collaboration with V.G. Gelfreich
Provable tasks: Global Study of Four Dimensional Symplectic Maps
- 10** **Entity:** University of Warwick
City of entity: Warwick, United Kingdom
Start date: 2010 **Duration:** 7 days
Goals of the stay: Postdoctoral - Collaboration with V.G. Gelfreich
Provable tasks: Global Study of Four Dimensional Symplectic Maps
- 11** **Entity:** Universitat de Roma
City of entity: Roma, Italy
Start date: 2009 **Duration:** 14 days
Goals of the stay: Pre-Doctoral
Provable tasks: Weakly dissipative dynamics: applications to Celestial Mechanichs problems
- 12** **Entity:** University of Warwick
City of entity: Warwick, United Kingdom
Start date: 2009 **Duration:** 14 days
Goals of the stay: Postdoctoral - Collaboration with V.G. Gelfreich
Provable tasks: Global Study of Four Dimensional Symplectic Maps
- 13** **Entity:** Rijksuniversiteit Groningen
City of entity: Groningen, Holland
Start date: 2007 **Duration:** 45 days
Goals of the stay: Pre-Doctoral
Provable tasks: Global Study of Four Dimensional Symplectic Maps
- 14** **Entity:** University of Warwick
City of entity: Warwick, United Kingdom
Start date: 2007 **Duration:** 31 days
Goals of the stay: Pre-Doctoral
Provable tasks: Global Study of Four Dimensional Symplectic Maps



Obtained grants and scholarships

- 1** **Name of the grant:** Realització de Tesi Doctoral
Awarding entity: Generalitat de Catalunya
Conferral date: 2003
End date: 2006
Type of entity: Body, others
Duration: 4 years
- 2** **Name of the grant:** Assistència a ENOC'05
Awarding entity: Universitat de Barcelona
Conferral date: 07/08/2005
End date: 12/08/2005
Type of entity: University
Duration: 6 days
- 3** **Name of the grant:** Assistència a l'escola d'hivern RTNS2005 a Castelló
Awarding entity: Xarxa Temàtica DANCE
Conferral date: 24/01/2005
End date: 28/01/2005
Type of entity: Body, others
Duration: 5 days
- 4** **Name of the grant:** Assistència a l'escola d'hivern RTNS2004 a Mallorca
Awarding entity: 'Sa Nostra' Caixa de Balears
Conferral date: 02/02/2004
End date: 06/02/2004
Type of entity: Body, others
Duration: 5 days
- 5** **Name of the grant:** Estància pre-doctoral a la Universitat de Groningen.
Awarding entity: Universitat de Barcelona
Type of entity: University

Prizes, mentions and distinctions

- 1** **Description:** Acreditació de Lector
Awarding entity: AQU Catalunya
Conferral date: 08/07/2011
- 2** **Description:** Acreditació Col·laborador
Awarding entity: AQU Catalunya
Conferral date: 2004
- 3** **Description:** Premi extraordinari de doctorat 2009 Matemàtiques
Awarding entity: Universitat de Barcelona



Summary of other achievements

- 1** **Description of the achievement:** Research sections (six-year): Tram de recerca consolidat (estatal i autonòmic)
Conferral date: 14/10/2015
- 2** **Description of the achievement:** Workshop in Celestial Mechanics' (for the 60th anniversary of Prof. Gerard Gomez)
Accrediting entity: Universitat de Barcelona
Conferral date: 20/07/2012
- 3** **Description of the achievement:** Divulgative Publication: Article de premsa: 'The hammer of God' The Irish Times. agost 2011. E.M. Alessi, A. Farres, A. Jorba, C. Simó, A. Vieiro
Conferral date: 22/08/2011
- 4** **Description of the achievement:** Attending Scientific Meetings (without Presentation or publication): DSPDEs'10: International Conference on Emerging Topics in Dynamical Systems and Partial Differential Equations
Conferral date: 31/05/2010
- 5** **Description of the achievement:** Teaching sections (five-year): Tram de docència estatal
Conferral date: 30/12/2007
- 6** **Description of the achievement:** Attending Scientific Meetings (without Presentation or publication): DM3'07: International Conference on Dynamical Methods and Mathematical Modelling
Accrediting entity: Universidad de Valladolid
Conferral date: 18/09/2007
- 7** **Description of the achievement:** Attending Scientific Meetings (without Presentation or publication): International Conference on SCientific Computation And Differential Equations, SciCade'07
Conferral date: 09/07/2007
- 8** **Description of the achievement:** Teaching sections (five-year): Tram de docència autòmic
Conferral date: 01/01/2003
- 9** **Description of the achievement:** Teaching sections (five-year): Tram de docència estatal
Conferral date: 16/09/2002
- 10** **Description of the achievement:** Summary of the scientific trajectory (Scientific Career Summary)
L'objectiu de la meua recerca en Sistemes Dinàmics (SD) és desenvolupar eines adequades per l'estudi global i quantitatiu, amb un focus d'interès en les aplicacions. La metodologia emprada combina tècniques analítiques amb eines numèriques:
Un model raonable del problema pot involucrar moltes equacions (p.ex. una EDP). Sovint, la dinàmica interessant té lloc en una varietat invariant (possiblement finit dimensional) que atreu la majoria de condicions inicials. Calen tècniques massives de simulació per detectar tal varietat i obtenir un model reduït adequat D'aquest, s'ha de determinar l'esquelet (punts fixos, òrbites periòdiques, atractors, tors invariants, etc, i les varietats invariants dels objectes hiperbòlics). Calen mètodes de continuació, implementació de manipuladors algebraics, etc. S'han d'analitzar les bifurcacions que es detectin (dependència resp paràmetres).

Cal establir els diferents règims dinàmics (p.ex. calcul d'exp. de Lyapunov). Si es detecta alguna recurrència global que genera dinàmica rica (associada a trajectòries homo/heteroclíniques)) potser convé derivar alguna aplicació de retorn semi-global per descriure les propietats.

Si el model (o algun model simplificat rellevant) ho permet, es poden intentar realitzar simulacions masives per determinar propietats de transport per escales de temps adequades.

Aquest marc general s'ha usat per estudiar la dinàmica dins les zones caòtiques d'aplicacions que preserven àrea, per determinar la probabilitat de captura pels diferents atractors en afegir una pertorbació dissipativa, per l'estudi de les probabilitats de col·lisió de l'asteroid Apophis amb la Terra, en l'estudi de la figura vuit de Poincaré, en l'estudi de resonàncies dobles, en l'anàlisi de la bifurcació Hamiltonian-Hopf discreta i les seves implicacions en la difusió,...

Finalment, respecte a l'activitat científica realitzada destaquem:

Diversitat de temes: aspectes teòrics i numèrics per sistemes continus/discrets, de dimensió baixa/alta, conservatius/dèbilment dissipatius/dissipatius, i aplicacions.

Diverses publicacions científiques (6 en revistes del 1er quartil de l'àrea). Les 19 contribucions a congressos (molts internacionals) inclouen dues ponències invitades i tres publicacions en proceedings (amb peer-review). Tots els treballs combinen tècniques analítiques i numèriques avançades.

L'estudi realitzat per l'Agència Europea de l'Espai (ESA) analitza l'ús de tècniques de propagació d'errors en SD. Els resultats obtinguts sobre la probabilitat de col·lisió de l'asteroid Apophis en la Terra van ser divulgats en l'article The Hammer of Good, publicat al diari The Irish Times (22/08/2011).

En la tesi doctoral (2009), i sota la direcció del Prof. C. Simó (Univ. Barcelona), es van estudiar fenòmens exponencialment petits en aplicacions del pla i l'efecte de pertorbacions dissipatives en règims caòtics.

S'han realitzat diverses estades de recerca (de durada < 1 mes, degut a tasques docents): Holanda (Groningen, prof. H. Broer), Itàlia (Roma, prof. A. Celletti), Polònia (Warwick, Prof. P. Zgliczynski) i diverses estades al Regne Unit (Warwick, Prof. V. Gelfreich). La col·laboració establerta amb el Prof. V. Gelfreich donà lloc a un projecte de recerca (financiat per la Royal Society) en l'estudi de resonàncies dobles i difusió d'Arnold (veure Physica D (2013)).

Conjuntament amb el Prof. S. Gonchenko (Univ. Nizhny Novgorod, Rússia) s'han estudiat l'existència d'atractors estranys en el desplegament del 'vuit homoclínic de Poincaré' (veure Nonlinearity i proceedings DSP100 (2013)).

- 11 Description of the achievement:** Research lines: Area-preserving maps, resonant normal forms, splitting of separatrices, global dynamics, invariant manifolds, separatrix map.; --
Accrediting entity: Universitat de Barcelona
- 12 Description of the achievement:** Research lines: Four dimensional symplectic maps. Double resonances. Arnold diffusion.; --
Accrediting entity: Universitat de Barcelona, Warwick University
- 13 Description of the achievement:** Research lines: Global strange attractors, dissipative return maps, homoclinic dynamics.; --
Accrediting entity: Universitat de Barcelona, Nizhny Novgorod University
- 14 Description of the achievement:** Research lines: Multidimensional separatrix maps and scattering maps. Arnold diffusion.; --
Accrediting entity: Universitat Politècnica de Catalunya
- 15 Description of the achievement:** Heavy Equipment: Cluster d'ordinadors: Hidra ; Occasional user
- 16 Description of the achievement:** Technics/Specializations: Normal forms: theory and numerical computation.



- 17 Description of the achievement:** Technics/Specializations: Splitting of separatrices: exponentially small upper bounds, high precision computations, matching process.
- 18 Description of the achievement:** Technics/Specializations: Numerical computation of invariant manifolds: graph transform and parametrization methods. Algebraic manipulators.
- 19 Description of the achievement:** Technics/Specializations: Numerical integration of ODEs including Taylor integrators for high precision computations and jet transport methods for the computation of high order variational equations.
- 20 Description of the achievement:** Technics/Specializations: Coding in C/C++/Fortan, use of multiprecision packages, use of interval arithmetic, parallel computations.
- 21 Description of the achievement:** 2005: Asistencia a las jornadas: 'Jornades Doctorials: Desenvolupaments professional dels doctors i formació en la gestió de l'R+i'
Estades de recerca: S'han realitzat diverses estades, la majoria de durada inferior a un mes degut a que s'han compatibilitzat amb la feina docent. En concret,
Estància predoctoral de 45 dies a Groningen (Holanda) per treballar amb Prof. H.W. Broer,
Estància predoctoral de 31 dies a Warwick (UK) per treballar amb el Prof. V. Gelfreich,
Estància predoctoral de 14 dies a Roma (Itàlia) per treballar amb la Prof. A. Celletti.
Estància postdoctoral com a convidat a Krakovia (Polònia) per discutir temes de computer-assisted proofs amb el Prof. P. Zgliczynski (1 setmana 2011).
S'han realitzat múltiples visites a Warwick per treballar amb el Prof. V. Gelfreich en el marc del projecte JP0869734 (Royal Society of Great Britain). Es tenen previst realitzar més visites donada la col·laboració establerta amb el grup de sistemes dinàmics de Warwick.
Article de premsa:
The hammer of God. E.M. Alessi, A. Farres, A. Jorba, C. Simó, A. Vieiro. The Irish Times (07/08/2011).
Es pot trobar a:
<http://atomiumculture.eu/content/%E2%80%9C-hammer-god%E2%80%9D-eventuality-collision-asteroid-earth>
- 22 Description of the achievement:** Ajuda i orientació de l'alumnat: Participació com a ponent a la Jornada d'Orientació Professional (Feina UB i Facultat de Matemàtiques) les edicions de 2006, 2008 i 2009.