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## CURRICULUM VITÆ

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Julyan  
Cartwright



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Version of September 2013

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## CURRICULUM VITAE

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| SURNAME Cartwright | FIRST NAMES Julyan Harold Edward |
| AGE 46             | NATIONALITY British              |

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### ACADEMIC INFORMATION

#### 1st DEGREE

|                                      |                                                                   |
|--------------------------------------|-------------------------------------------------------------------|
| B.Sc. Honours in Theoretical Physics | School of Physics<br>University of Newcastle upon Tyne, UK        |
| Undergraduate thesis                 | The Spherical Pendulum Revisited:<br>Chaos in a Forced Oscillator |
| Thesis advisor                       | David J. Tritton                                                  |
| Date                                 | June 1988                                                         |

#### DOCTORATE

|                              |                                                                                 |
|------------------------------|---------------------------------------------------------------------------------|
| Ph.D. in Applied Mathematics | School of Mathematical Sciences<br>Queen Mary College, University of London, UK |
| Thesis                       | Chaos in Dissipative Systems:<br>Bifurcations and Basins                        |
| Thesis advisor               | David K. Arrowsmith                                                             |
| Date                         | August 1992                                                                     |

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### PROFESSIONAL SITUATION

Senior Investigator with the Consejo Superior de Investigaciones Científicas (CSIC), Spain

POSTAL ADDRESS Instituto Andaluz de Ciencias de la Tierra,  
Consejo Superior de Investigaciones Científicas–Universidad de Granada,  
Facultad de Ciencias,  
Campus Fuentenueva,  
E-18071 Granada, Spain.

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### CAREER SUMMARY

| DATES     | POST                              | INSTITUTION                                                                        |
|-----------|-----------------------------------|------------------------------------------------------------------------------------|
| Nov 98    | Investigator; subsequently        | Consejo Superior de Investigaciones Científicas (CSIC), Spain.                     |
| — present | Senior Investigator               |                                                                                    |
| Nov 99    | Visiting Scientist                | Lawrence Livermore Natl Laboratory,<br>University of California, USA.              |
| — Sep 02  |                                   |                                                                                    |
| Oct 97    | Lecturer                          | Bioengineering Institute & Dept of Physics,<br>Miguel Hernández University, Spain. |
| — Oct 98  |                                   |                                                                                    |
| Oct 95    | Research Scientist                | Centre for Informatics,<br>University of the Balearic Islands, Spain.              |
| — Oct 97  |                                   |                                                                                    |
| Mar 95    | Visiting Lecturer                 | Dept of Physics, Queen Mary College,<br>University of London, UK.                  |
| — Sep 95  |                                   |                                                                                    |
| Jan 93    | 'Marie Curie' Postdoctoral Fellow | Department of Physics,<br>University of the Balearic Islands, Spain.               |
| — Feb 95  | (HCM programme of the EU)         |                                                                                    |
| Nov 92    | Visiting Lecturer                 | Department of Physics,<br>University of the Balearic Islands, Spain.               |
| — Dec 92  |                                   |                                                                                    |
| Sep 92    | Visiting Lecturer                 | Dept of Physics, Queen Mary College,<br>University of London, UK.                  |
| — Oct 92  |                                   |                                                                                    |

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### FOREIGN LANGUAGES

Fluent Spanish, plus some French, German, Italian, and Catalan.

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Granada, Spain, Swptember 2013.

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## PUBLISHED WORK

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KEY: A=Article; B=Book, BC=Book Chapter; L=Letter, R=Review;

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AUTHORS: J. H. E. Cartwright, B. Escibano, H. Grothe, O. Piro, C. I. Sainz-Díaz, & I. Tuval.  
 TITLE: "Runaway electrification of friable self-replicating granular matter".  
 REF. JOURNAL/BOOK: *Langmuir* **??**, 2013. KEY: A

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AUTHORS: J. H. E. Cartwright, A. G. Checa, & M. Rousseau.  
 TITLE: "Pearls are self-organized natural ratchets".  
 REF. JOURNAL/BOOK: *Langmuir* **29**, 8370–8376, 2013. KEY: A

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AUTHORS: C. M. Pina, A. G. Checa, C. I. Sainz-Díaz, & J. H. E. Cartwright.,  
 TITLE: "Nacre: An Ancient Nanostructured Biomaterial".  
 REF. JOURNAL/BOOK: *Acta Futura* **6**, 37–42, 2013. KEY: A

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AUTHORS: J. H. E. Cartwright, B. Escibano, D. L. González, C. I. Sainz-Díaz, & I. Tuval.  
 TITLE: "Brinicles as a case of inverse chemical gardens".  
 REF. JOURNAL/BOOK: *Langmuir* **29**, 7655–7660, 2013. KEY: A

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AUTHORS: A. G. Checa, J. H. E. Cartwright, & M.-G. Willinger.  
 TITLE: "Mineral Bridges in Nacre Revisited".  
 REF. JOURNAL/BOOK: *Recent Advances in Pearl Research*, Eds., S. Watabe, K. Maeyama and H. Nagasawa, Terrapub, Tokyo, pp. 109–123, 2013. KEY: BC

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AUTHORS: J. H. E. Cartwright, O. Piro, P. A. Sánchez, & T. Sintès.  
 TITLE: "Ice polymorphism in the minimal Mercedes-Benz model of water".  
 REF. JOURNAL/BOOK: *J. Chem. Phys.* **137**, 244503, 2012. KEY: A

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AUTHORS: J. H. E. Cartwright, A. G. Checa, J. D. Gale, D. Gebauer, & C. I. Sainz-Díaz.  
 TITLE: "Calcium carbonate polymorphism and its role in biomineralization: How many amorphous calcium carbonates are there?".  
 REF. JOURNAL/BOOK: *Angew. Chem. Int. Ed.* **51**, 11960–11970, 2012. KEY: R

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AUTHORS: J. H. E. Cartwright, A. G. Checa, J. D. Gale, D. Gebauer, & C. I. Sainz-Díaz.  
 TITLE: "Die Polymorphie von Calciumcarbonat und ihre Bedeutung für die Biomineralisation: Wie viele amorphe Calciumcarbonat-Phasen gibt es?".  
 REF. JOURNAL/BOOK: *Angew. Chem.* **124**, 12126–12137, 2012. KEY: R

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AUTHORS: J. H. E. Cartwright, A. G. Checa, B. Escibano, & C. I. Sainz-Díaz.  
 TITLE: "Crystal growth as an excitable medium".  
 REF. JOURNAL/BOOK: *Phil. Trans. Roy. Soc. A* **370**, 2866–2876, 2012. KEY: A

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AUTHORS: J. H. E. Cartwright & A. L. Mackay.  
 TITLE: "Beyond crystals: the dialectic of materials and information".  
 REF. JOURNAL/BOOK: *Phil. Trans. Roy. Soc. A* **370**, 2807–2822, 2012. KEY: A

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AUTHORS: T. Bartels-Rausch, V. Bergeron, J. H. E. Cartwright, R. Escibano, J. L. Finney, H. Grothe, P. J. Gutiérrez, J. Haapala, W. F. Kuhs, J. B. C. Pettersson, S. D. Price, C. I. Sainz-Díaz, D. J. Stokes, G. Strazzulla, E. S. Thomson and H. Trinks, & N. Uras-Aytemiz.  
 TITLE: "Ice structures, patterns, and processes: A view across the icefields".  
 REF. JOURNAL/BOOK: *Rev. Mod. Phys.* **84**, 885–944, 2012. KEY: R

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AUTHORS: I. Nesteruk & J. H. E. Cartwright.  
 TITLE: "Turbulent skin-friction drag on a slender body of revolution and Gray's Paradox".  
 REF. JOURNAL/BOOK: *J. Phys.: Conf. Ser.* **318**, 022042, 2011. KEY: A

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AUTHORS: A. G. Checa, J. H. E. Cartwright, & M.-G. Willinger.  
 TITLE: "Mineral bridges in nacre".

- REF. JOURNAL/BOOK: J. Struct. Biol. **176**, 330–339, 2011. KEY: A
- 
- AUTHORS: J. H. E. Cartwright, B. Escibano, C. I. Sainz-Díaz, & L. S. Stodieck.  
 TITLE: "Chemical-garden formation, morphology and composition. II. Chemical gardens in microgravity".  
 REF. JOURNAL/BOOK: Langmuir **27**, 3294–3300, 2011. KEY: A
- 
- AUTHORS: J. H. E. Cartwright, B. Escibano, & C. I. Sainz-Díaz.  
 TITLE: "Chemical-garden formation, morphology and composition. I. Effect of the nature of the cations".  
 REF. JOURNAL/BOOK: Langmuir **27**, 3286–3293, 2011. KEY: A
- 
- AUTHORS: J. Vanyó, B. Escibano, J. H. E. Cartwright, D. L. González, O. Piro, & T. Tél.  
 TITLE: "A minimal dynamical model for tidal synchronization and orbit circularization".  
 REF. JOURNAL/BOOK: Celest. Mech. Dyn. Astr. **109**, 181–200, 2011. KEY: A
- 
- AUTHORS: J. H. E. Cartwright, B. Escibano, S. Khokhlov, & C. I. Sainz-Díaz.  
 TITLE: "Chemical gardens from silicates and cations of group 2: a comparative study of composition, morphology and microstructure".  
 REF. JOURNAL/BOOK: Phys. Chem. Chem. Phys. **13**, 1030–1036, 2011. KEY: A
- 
- AUTHORS: J. H. E. Cartwright.  
 TITLE: "Julyan Cartwright's Japan".  
 REF. JOURNAL/BOOK: The Quint, pp. 164–182, December 2010. KEY: A
- 
- AUTHORS: J. H. E. Cartwright, J. Douthett, D. L. González, R. Krantz, & O. Piro.  
 TITLE: "Two musical paths to the Farey series and devil's staircase".  
 REF. JOURNAL/BOOK: J. Math. and Music **4**, 57–74, 2010. KEY: A
- 
- AUTHORS: J. H. E. Cartwright.  
 TITLE: "Agent-based social simulation: A dynamical-systems viewpoint".  
 REF. JOURNAL/BOOK: Cybernetics and Systems **41**, 281–286, 2010. KEY: A
- 
- AUTHORS: P. A. Sánchez, T. Sintes, J. H. E. Cartwright & O. Piro.  
 TITLE: "Influence of microstructure on the transitions between mesoscopic thin-film morphologies in ballistic-diffusive models".  
 REF. JOURNAL/BOOK: Phys. Rev. E **81** 011140, 2010. KEY: A
- 
- AUTHORS: J. H. E. Cartwright, B. Escibano, & C. I. Sainz-Díaz.  
 TITLE: "Ice films follow structure zone model morphologies".  
 REF. JOURNAL/BOOK: Thin Solid Films **518**, 3422–3427, 2010. KEY: A
- 
- AUTHORS: J. H. E. Cartwright & D. J. Tritton.  
 TITLE: "Chaotic dynamics and reversal statistics of the forced spherical pendulum: comparing the Miles equations with experiment".  
 REF. JOURNAL/BOOK: Dynamical Systems **25**, 1–16, 2010. KEY: A
- 
- AUTHORS: J. H. E. Cartwright, U. Feudel, G. Károlyi, A. de Moura, O. Piro, & T. Tél.  
 TITLE: "Dynamics of finite-size particles in chaotic fluid flows".  
 REF. JOURNAL/BOOK: in Nonlinear Dynamics and Chaos: Advances and Perspectives, 51–87, Springer, 2010. KEY: BC
- 
- AUTHORS: P. A. Sánchez, T. Sintes, O. Piro & J. H. E. Cartwright.  
 TITLE: "Effects of the microstructure on mesoscopic morphological transitions in deposition growth models".  
 REF. JOURNAL/BOOK: Proc. Roy. Soc. A **465**, 3875–3884, 2009. KEY: A
- 
- AUTHORS: J. H. E. Cartwright, A. G. Checa, B. Escibano, & C. I. Sainz-Díaz.  
 TITLE: "Spiral and target patterns in bivalve nacre manifest a natural excitable medium from layer growth of a biological liquid crystal".

- REF. JOURNAL/BOOK: Proc. Natl Acad. Sci. USA **106** 10499–10504, 2009. KEY: A
- 
- AUTHORS: J. H. E. Cartwright, D. L. González, & O. Piro.  
 TITLE: "Nonlinear dynamics, the missing fundamental, and harmony".  
 REF. JOURNAL/BOOK: Proceedings of Mathematics and Computation in Music 2007, CCIS 37, 168–188, Springer, 2009. KEY: BC
- 
- AUTHORS: J. H. E. Cartwright & H. Nakamura.  
 TITLE: "What kind of a wave is Hokusai's *Great wave off Kanagawa*?".  
 REF. JOURNAL/BOOK: Notes Rec. Roy. Soc. **63**, 119–135, 2009. KEY: A
- 
- AUTHORS: J. H. E. Cartwright.  
 TITLE: "Nácar para regenerar huesos humanos".  
 REF. JOURNAL/BOOK: Época, 20–26 February, 68, 2009. KEY: A
- 
- AUTHORS: J. H. E. Cartwright, B. Escribano, & C. I. Sainz-Díaz.  
 TITLE: "Low-temperature ice films: The weird and wonderful forms of ice in space".  
 REF. JOURNAL/BOOK: G.I.T. Lab. J. Europe, (3/4), 16–18, 2009. KEY: A
- 
- AUTHORS: J. H. E. Cartwright, O. Piro, & I. Tuval.  
 TITLE: "Fluid dynamics in developmental biology: Moving fluids that shape ontogeny".  
 REF. JOURNAL/BOOK: HFSP Journal, **3**, 77–93, 2009. KEY: R
- 
- AUTHORS: A. G. Checa, J. H. E. Cartwright, & M. Willinger.  
 TITLE: "The key role of the surface membrane in why gastropod nacre grows in towers".  
 REF. JOURNAL/BOOK: Proc. Natl Acad. Sci. USA **106** 38–43, 2009. KEY: A
- 
- AUTHORS: B. Escribano, J. Vanyo, I. Tuval, J. H. E. Cartwright, D. L. González, O. Piro, & T. Tél.  
 TITLE: "Dynamics of tidal synchronization and orbit circularization of celestial bodies".  
 REF. JOURNAL/BOOK: Phys. Rev. E **78**, 036216, 2008. KEY: A
- 
- AUTHORS: J. H. E. Cartwright, B. Escribano, & C. I. Sainz-Díaz.  
 TITLE: "The mesoscale morphologies of ice films: Porous and biomorphic forms of ice under astrophysical conditions".  
 REF. JOURNAL/BOOK: Astrophys. J. **687**, 1406–1414, 2008. KEY: A
- 
- AUTHORS: J. H. E. Cartwright, N. Piro, O. Piro, & I. Tuval.  
 TITLE: "Fluid dynamics of nodal flow and left-right patterning in development".  
 REF. JOURNAL/BOOK: Developmental Dynamics **237**, 3477–3490, 2008. KEY: R
- 
- AUTHORS: C. I. Sainz-Díaz, B. Escribano, & J. H. E. Cartwright.  
 TITLE: "Microstructures in the formation of chemical gardens".  
 REF. JOURNAL/BOOK: Mater. Res. Soc. Symp. Proc. **1097E**, 1097-GG07-08, 2008. KEY: A
- 
- AUTHORS: A. G. Checa, J. H. E. Cartwright, B. Escribano, & C. I. Sainz-Díaz.  
 TITLE: "Nacre: A unique biomaterial patterned by liquid crystals".  
 REF. JOURNAL/BOOK: Mater. Res. Soc. Symp. Proc. **1094E**, 1094-DD01-02, 2008. KEY: A
- 
- AUTHORS: J. H. E. Cartwright, N. Piro, O. Piro, & I. Tuval.  
 TITLE: "Fluid dynamics of establishing left-right patterning in development".  
 REF. JOURNAL/BOOK: Birth Defects Research Part C: Embryo Today **84**, 95–101, 2008. KEY: R
- 
- AUTHORS: J. H. E. Cartwright, B. Escribano, O. Piro, C. I. Sainz-Díaz, P. A. Sánchez & T. Sintés.  
 TITLE: "Ice film morphologies and the structure zone model".  
 REF. JOURNAL/BOOK: AIP Conf. Series, **982**, 696–701, 2008. KEY: BC
- 
- AUTHORS: J. H. E. Cartwright & H. Nakamura.  
 TITLE: "Tsunami: A history of the term and of scientific understanding of the phenomenon in Japanese and Western culture".  
 REF. JOURNAL/BOOK: Notes Rec. Roy. Soc., **62**, 151–166, 2008. KEY: A

- 
- AUTHORS: J. H. E. Cartwright, R. Montagne, N. Piro, & O. Piro.  
 TITLE: "Fronts between rhythms: spatiotemporal dynamics of extended polyrhythmic media".  
 REF. JOURNAL/BOOK: Phys. Rev. Lett. **99**, 174101, 2007. KEY: A
- 
- AUTHORS: J. H. E. Cartwright & A. Checa.  
 TITLE: "The dynamics of nacre self assembly".  
 REF. JOURNAL/BOOK: J. Roy. Soc. Interface **4**, 491–504, 2007. KEY: A
- 
- AUTHORS: J. H. E. Cartwright, O. Piro, & I. Tuval.  
 TITLE: "Ostwald ripening, chiral crystallization, and the common-ancestor effect".  
 REF. JOURNAL/BOOK: Phys. Rev. Lett. **98**, 165501, 2007. KEY: A
- 
- AUTHORS: J. H. E. Cartwright.  
 TITLE: "Ice in the solar system".  
 REF. JOURNAL/BOOK: ASP Conf. Series **370**, 265–269, 2007. KEY: BC
- 
- AUTHORS: J. H. E. Cartwright, N. Piro, O. Piro, & I. Tuval.  
 TITLE: "Embryonic nodal flow and the dynamics of nodal vesicular parcels".  
 REF. JOURNAL/BOOK: J. Roy. Soc. Interface **4**, 49–55, 2007. KEY: A
- 
- AUTHORS: J. H. E. Cartwright, D. L. González, O. Piro.  
 TITLE: "The dynamics of a sensory apparatus: The case of the auditory system".  
 REF. JOURNAL/BOOK: AIP Conf. Series **887**, 29–39, 2006. KEY: BC
- 
- AUTHORS: J. H. E. Cartwright.  
 TITLE: "Is the Mexican wave really a ripple of excitation?".  
 REF. JOURNAL/BOOK: Europhys. News **37**, 22–23, 2006. KEY: A
- 
- AUTHORS: C. I. Sainz-Díaz, A. P. Marín-Islán, & J. H. E. Cartwright.  
 TITLE: "Chiral symmetry breaking and polymorphism in 1,1'-binaphthyl melt crystallization".  
 REF. JOURNAL/BOOK: J. Phys. Chem. B **109**, 18758–18764, 2005. KEY: A
- 
- AUTHORS: H. J. Fraser, P. Ehrenfreund, J. Blum, J. H. E. Cartwright, E. Hadamcik, A. C. Levasseur-Regourd, S. Price, F. Prodi, A. Sarkissian, & R. Seurig.  
 TITLE: "Ices in the universe: answers from microgravity".  
 REF. JOURNAL/BOOK: ESA SP1281 "Topical Teams in the Life and Physical Sciences: Towards New Research Applications in Space", pp. 52–76, 2005. KEY: BC
- 
- AUTHORS: J. H. E. Cartwright, J. M. García-Ruiz, O. Piro, C. I. Sainz-Díaz, & I. Tuval.  
 TITLE: "Chiral symmetry breaking during crystallization: An advection-mediated nonlinear autocatalytic process".  
 REF. JOURNAL/BOOK: Phys. Rev. Lett. **93**, 035502, 2004. KEY: A
- 
- AUTHORS: J. H. E. Cartwright, O. Piro, & I. Tuval.  
 TITLE: "Fluid-dynamical basis of the embryonic development of left-right asymmetry in vertebrates".  
 REF. JOURNAL/BOOK: Proc. Nat. Acad. Sci. USA **101**, 7234–7239, 2004. KEY: A
- 
- AUTHORS: J. H. E. Cartwright, M. O. Magnasco, O. Piro, & I. Tuval.  
 TITLE: "Bubbling and on-off intermittency in bailout embeddings".  
 REF. JOURNAL/BOOK: Phys. Rev. E **68**, 016217, 2003. KEY: A
- 
- AUTHORS: J. H. E. Cartwright.  
 TITLE: "In memory of my father: Albert Edward Cartwright, 1910–2002".  
 REF. JOURNAL/BOOK: Sternian 2003 (Lord Wandsworth College annual magazine), 47–48, 2003. KEY: A
- 
- AUTHORS: J. H. E. Cartwright, D. L. González, O. Piro, & D. Stanzial.  
 TITLE: "Dynamical systems: A golden gate from auditory physiology to musical aesthetics?".
-

REF. JOURNAL/BOOK: in "Meeting Alhambra, Isama-Bridges 2003 conference proceedings", Eds. J. Barallo, N. Friedman, R. Sarhangi, C. Séquin, J. Martínez, & A. Maldonado, pp. 331–338, U. Granada, 2003. KEY: BC

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AUTHORS: P. Ehrenfreund, H. J. Fraser, J. Blum, J. H. E. Cartwright, J. M. García-Ruiz, E. Hadamcik, A. C. Levasseur-Regourd, S. Price, F. Prodi & A. Sarkissian.  
TITLE: "Physics and chemistry of icy particles in the universe: Answers from microgravity".  
REF. JOURNAL/BOOK: Planetary & Space Science **51** 473–494, 2003. KEY: R

---

AUTHORS: J. H. E. Cartwright, O. Piro, & A. I. Villacampa.  
TITLE: "Cream on".  
REF. JOURNAL/BOOK: New Scientist **2379**, 93, 2003. KEY: L

---

AUTHORS: J. H. E. Cartwright, O. Piro, & A. I. Villacampa.  
TITLE: "Pattern formation in solutal convection: vermiculated rolls and isolated cells".  
REF. JOURNAL/BOOK: Physica A **314**, 291–298, 2002. KEY: A

---

AUTHORS: J. H. E. Cartwright, M. O. Magnasco, O. Piro, & I. Tuval.  
TITLE: "Noise-induced order out of chaos by bailout embedding".  
REF. JOURNAL/BOOK: Fluctuation & Noise Lett. **2**, 161–174, 2002. KEY: A

---

AUTHORS: J. H. E. Cartwright, M. O. Magnasco, O. Piro, & I. Tuval.  
TITLE: "Bailout embeddings and neutrally buoyant particles in three-dimensional flows".  
REF. JOURNAL/BOOK: Phys. Rev. Lett. **89**, 264501, 2002. KEY: A

---

AUTHORS: J. H. E. Cartwright, J. M. García-Ruiz, M. L. Novella, & F. Otálora.  
TITLE: "Formation of chemical gardens".  
REF. JOURNAL/BOOK: J. Colloid Interface Sci. **256**, 351–359, 2002. KEY: A

---

AUTHORS: J. H. E. Cartwright, M. O. Magnasco, & O. Piro.  
TITLE: "Noise- and inertia-induced inhomogeneity in the distribution of small particles in fluid flows".  
REF. JOURNAL/BOOK: Chaos **12**, 489–495, 2002. KEY: A

---

AUTHORS: J. H. E. Cartwright.  
TITLE: "Labyrinthine Turing pattern formation in the cerebral cortex".  
REF. JOURNAL/BOOK: J. Theor. Biol. **217**, 97–103, 2002. KEY: A

---

AUTHORS: L. Carotenuto, J. H. E. Cartwright, D. Castagnolo, J. M. García-Ruiz, & F. Otálora.  
TITLE: "Theory and simulation of buoyancy-driven convection around growing protein crystals in microgravity".  
REF. JOURNAL/BOOK: Micrograv. Sci. Tech. **13**, 14–21, 2002. KEY: A

---

AUTHORS: J. H. E. Cartwright, M. O. Magnasco, & O. Piro.  
TITLE: "Bailout embeddings, targeting of invariant tori, and the control of Hamiltonian chaos".  
REF. JOURNAL/BOOK: Phys. Rev. E **65**, 045203(R), 2002. KEY: A

---

AUTHORS: J. H. E. Cartwright, D. L. González, O. Piro, & D. Stanzial.  
TITLE: "Aesthetics, dynamics, and musical scales: A golden connection".  
REF. JOURNAL/BOOK: J. New Music Research **22**, 51–58, 2002. KEY: A

---

AUTHORS: J. H. E. Cartwright, D. L. González, & O. Piro.  
TITLE: "Pitch perception: A dynamical-systems perspective".  
REF. JOURNAL/BOOK: Proc. Nat. Acad. Sci. USA **98**, 4855–4859, 2001. KEY: A

---

AUTHORS: A. Babiano, J. H. E. Cartwright, O. Piro, & A. Provenzale.  
TITLE: "The transport of small particles by a fluid".  
REF. JOURNAL/BOOK: in "Coherent Structures in Complex Systems", Eds. D. Reguera, L. L. Bonilla, & M. Rubi, Lecture Notes in Physics, pp. 114–124, Springer, 2001. KEY: BC

---

- AUTHORS: J. H. E. Cartwright.  
TITLE: "Stranger than Fiction".  
REF. JOURNAL/BOOK: Nature **412**, 683, 2001. KEY: A
- 
- AUTHORS: L. Carotenuto, J. H. E. Cartwright, D. Castagnolo, J. M. García-Ruiz, M. L. Novella, F. Otálora, & B. R. Thomas.  
TITLE: "Depletion zone around sedimenting protein crystals in microgravity".  
REF. JOURNAL/BOOK: Proceedings of the first international symposium on microgravity research and applications in physical sciences and biotechnology, pp. 323–9, ESA, 2001. KEY: BC
- 
- AUTHORS: J. H. E. Cartwright.  
TITLE: "Drinker's legs".  
REF. JOURNAL/BOOK: New Scientist **2236**, 93, 2000. KEY: L
- 
- AUTHORS: A. Babiano, J. H. E. Cartwright, O. Piro, and A. Provenzale.  
TITLE: "Dynamics of a small neutrally buoyant sphere in a fluid and targeting in Hamiltonian systems".  
REF. JOURNAL/BOOK: Phys. Rev. Lett. **84**, 5764–5767, 2000. KEY: A
- 
- AUTHORS: J. H. E. Cartwright.  
TITLE: "Emergent global oscillations in heterogeneous excitable media: The example of pancreatic  $\beta$  cells".  
REF. JOURNAL/BOOK: Phys. Rev. E **62**, 1149–1154, 2000. KEY: A
- 
- AUTHORS: O. Calvo, J. H. E. Cartwright, D. L. González, O. Piro, & F. Sportolari.  
TITLE: "Three-frequency resonances in coupled phase-locked loops".  
REF. JOURNAL/BOOK: IEEE Trans. Circuits and Systems I **47**, 491–497, 2000. KEY: A
- 
- AUTHORS: J. H. E. Cartwright.  
TITLE: "Shades of pale".  
REF. JOURNAL/BOOK: New Scientist **2227**, 57, 2000. KEY: L
- 
- AUTHORS: J. H. E. Cartwright, D. L. González, O. Piro, & M. Zanna.  
TITLE: "Teoria dei sistemi dinamici: Una base matematica per la biologia".  
REF. JOURNAL/BOOK: Systema Naturae **2**, 215–254, 1999. KEY: A
- 
- AUTHORS: J. H. E. Cartwright.  
TITLE: "Nonlinear stiffness, Lyapunov exponents, and attractor dimension".  
REF. JOURNAL/BOOK: Phys. Lett. A **264**, 298–302, 1999. KEY: A
- 
- AUTHORS: J. H. E. Cartwright, D. L. González, & O. Piro.  
TITLE: "A new nonlinear model for pitch perception".  
REF. JOURNAL/BOOK: in "Statistical Mechanics of Biocomplexity", Eds. D. Reguera, M. Rubi, & J. Vilar, Lecture Notes in Physics **527**, pp. 205–216, Springer, 1999. KEY: BC
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- AUTHORS: A. I. Villacampa & J. H. E. Cartwright.  
TITLE: "Acid test".  
REF. JOURNAL/BOOK: New Scientist **2181**, 93, 1999. KEY: L
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- AUTHORS: J. H. E. Cartwright, D. L. González, & O. Piro.  
TITLE: "Nonlinear dynamics of the perceived pitch of complex sounds".  
REF. JOURNAL/BOOK: Phys. Rev. Lett. **82**, 5389–5392, 1999. KEY: A
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- AUTHORS: O. Calvo, J. H. E. Cartwright, D. L. González, O. Piro, & O. Rosso.  
TITLE: "Three-frequency resonances in dynamical systems".  
REF. JOURNAL/BOOK: Int. J. Bifurcation and Chaos **9**, 2181–2187, 1999. KEY: A
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- AUTHORS: J. H. E. Cartwright, V. M. Eguíluz, E. Hernández-García, & O. Piro.  
TITLE: "Dynamics of elastic excitable media".  
REF. JOURNAL/BOOK: Int. J. Bifurcation and Chaos **9**, 2197–2202, 1999. KEY: A

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- AUTHORS: J. H. E. Cartwright.  
 TITLE: "Newton maps: fractals from Newton's method for the circle map".  
 REF. JOURNAL/BOOK: Computers and Graphics **23**, 607–612, 1999. KEY: A
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- AUTHORS: J. H. E. Cartwright, J. M. García-Ruiz, & A. I. Villacampa.  
 TITLE: "Pattern formation in crystal growth: Liesegang rings".  
 REF. JOURNAL/BOOK: Computer Physics Communications **121**, 411–413, 1999. KEY: A
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- AUTHORS: J. H. E. Cartwright, M. Feingold, & O. Piro.  
 TITLE: "An introduction to chaotic advection".  
 REF. JOURNAL/BOOK: in "Mixing: Chaos and Turbulence", Eds. H. Chaté, E. Villermaux, & J. M. Chomez, Kluwer, pp. 307–342, 1999. KEY: BC
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- AUTHORS: J. H. E. Cartwright, D. L. González, & O. Piro.  
 TITLE: "Universality in three-frequency resonances".  
 REF. JOURNAL/BOOK: Phys. Rev. E **59**, 2902–2906, 1999. KEY: A
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- AUTHORS: O. Calvo & J. H. E. Cartwright.  
 TITLE: "Fuzzy control of chaos".  
 REF. JOURNAL/BOOK: Int. J. Bifurcation and Chaos **8**, 1743–1747, 1998. KEY: A
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- AUTHORS: O. Calvo & J. H. E. Cartwright.  
 TITLE: "Fuzzy control of chaos in electronic circuits: An introductory example".  
 REF. JOURNAL/BOOK: Proceedings of NDES98 (Nonlinear Dynamics in Electronic Systems), Ed. G. Kolumbán, Technical University of Budapest, pp. 157–160, 1998. KEY: BC
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- AUTHORS: O. Calvo, J. H. E. Cartwright, D. L. González, O. Piro, & F. Sportolari.  
 TITLE: "Three-frequency dynamics of coupled phase-locked loops".  
 REF. JOURNAL/BOOK: Proceedings of NDES98 (Nonlinear Dynamics in Electronic Systems), Ed. G. Kolumbán, Technical University of Budapest, pp. 91–94, 1998. KEY: BC
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- AUTHORS: J. H. E. Cartwright, D. L. González, & O. Piro.  
 TITLE: "On pitch perception of complex sounds: nonlinearity revisited".  
 REF. JOURNAL/BOOK: Proceedings of NATO ASI on Computational Hearing, Eds. S. Greenberg & M. Slaney, ICSI, Berkeley, pp. 141–146, 1998. KEY: BC
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- AUTHORS: J. H. E. Cartwright, D. L. González, & O. Piro.  
 TITLE: "On a new nonlinear model for pitch perception".  
 REF. JOURNAL/BOOK: Anales de Física, Eds. J. A. Cuesta & A. Sánchez, Ed. Ciemat, pp. 193–194, 1998. KEY: BC
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- AUTHORS: J. H. E. Cartwright, E. Hernández-García, & O. Piro.  
 TITLE: "Burridge-Knopoff models as elastic excitable media".  
 REF. JOURNAL/BOOK: Phys. Rev. Lett. **79**, 527–30, 1997. KEY: A
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- AUTHORS: J. H. E. Cartwright, M. Feingold, & O. Piro.  
 TITLE: "Chaotic advection in three-dimensional unsteady incompressible laminar flow".  
 REF. JOURNAL/BOOK: J. Fluid Mech. **316**, 259–84, 1996. KEY: A
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- AUTHORS: J. H. E. Cartwright, M. Feingold, & O. Piro.  
 TITLE: "Global diffusion in a realistic three-dimensional time-dependent nonturbulent fluid flow".  
 REF. JOURNAL/BOOK: Phys. Rev. Lett. **75**, 3669–72, 1995. KEY: A
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- AUTHORS: J. H. E. Cartwright & O. Piro.  
 TITLE: "Chaos in Biology".  
 REF. JOURNAL/BOOK: Proceedings of International Summer School on Biophysics, Palma de Mallorca, Spain, pp. 18–28, 1995. KEY: BC
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- AUTHORS: J. H. E. Cartwright, D. L. Gonzalez, L. Morettini, O. Piro, O. Rosso, & F. Sportolari.

- TITLE: "Pitch perception of complex sounds: nonlinearity revisited".  
 REF. JOURNAL/BOOK: Proceedings of 2nd International Conference on Acoustic and Musical Research (CIARM), Ferrara, Italia, 19–21 May 1995, Ed. F. Pedrielli, pp. 319–327, 1995. KEY: BC
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- AUTHORS: J. H. E. Cartwright, M. Feingold, & O. Piro.  
 TITLE: "Dynamically diffusive Lagrangian trajectories in time-periodic three-dimensional flows".  
 REF. JOURNAL/BOOK: Heat Transfer Enhancement by Lagrangian Chaos and Turbulence, Eds. H. Peerhossaini & A. Provenzale, ISITEM, Univ. Nantes, pp. 101–7, 1994. KEY: BC
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- AUTHORS: J. H. E. Cartwright, M. Feingold, & O. Piro.  
 TITLE: "Passive scalars and three-dimensional Liouvillian maps".  
 REF. JOURNAL/BOOK: Physica D **76**, 22–33, 1994. KEY: A
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- AUTHORS: D. K. Arrowsmith, J. H. E. Cartwright, A. N. Lansbury & C. M. Place.  
 TITLE: "The Bogdanov map: bifurcations, mode locking, and chaos in a dissipative system".  
 REF. JOURNAL/BOOK: Int. J. Bifurcation and Chaos **3**, 803–842, 1993. KEY: A
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- AUTHORS: J. H. E. Cartwright.  
 TITLE: "Chaos in dissipative systems: Bifurcations and basins".  
 REF. JOURNAL/BOOK: Ph.D. thesis, University of London 1992. KEY: B
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- AUTHORS: J. H. E. Cartwright & O. Piro.  
 TITLE: "The dynamics of Runge–Kutta methods".  
 REF. JOURNAL/BOOK: Int. J. Bifurcation and Chaos **2**, 427–449, 1992. KEY: A
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- AUTHORS: J. H. E. Cartwright.  
 TITLE: "Man of dreams".  
 REF. JOURNAL/BOOK: New Scientist **1819**, 53, 1992. KEY: L
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- AUTHORS: N. Buric, J. H. E. Cartwright, I. C. Percival & O. Piro.  
 TITLE: "On modular smoothing and scaling functions for mode locking".  
 REF. JOURNAL/BOOK: Phys. Lett. A **163**, 63–67, 1992. KEY: A
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## FUNDED PROJECTS

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- Co-organizer of conference "Chemical gardens: From self ordering of precipitation structures to modern materials science", financed by Lorentz Center, University of Leiden: 19 000 euros. Took place at: Lorentz Center, University of Leiden, Holland (2012).
- Principal investigator of "The dynamics of life", project FIS2010-22322-C02-02 of the MINCINN: 48 400 euros. Carried out at: IACT, CSIC-UGR (2011-2013).
- Member of the project "BIOMATERIALES DE INTERÉS BIOMIMÉTICO: NÁCAR Y MICROESTRUCTURAS RELACIONADAS" (RNM-6433) Proyecto excelencia de la Junta de Andalucía, 184 134.50 euros. Principal investigator: Antonio Checa (2011-2015).
- Co-organizer of conference "The physics of mixing", financed by Lorentz Center, University of Leiden: 19 000 euros. Took place at: Lorentz Center, University of Leiden, Holland (2011).
- Member of European COST Action TD0903. Principal investigator: Frederic Marin (2009-2014).
- Member of the project CADHYS: Procesos de interacción de hidrocarburos con sedimentos marinos en el Golfo de Cádiz: implicaciones medioambientales (Proyecto de excelencia Junta de Andalucía RNM-3581). Principal investigator: Pilar Mata. 208 000 euros Carried out at: IACT, CSIC-UGR (2009-2013).
- Principal investigator of "Dynamics, morphology, and growth of natural biomimetic systems", project 200930I049 of the CSIC: 30 000 euros. Carried out at: IACT, CSIC-UGR (2010).
- Member of the project "Morphology and crystal growth of natural systems in extreme conditions", project CGL2008-06245-C02-01 of MCI: 21 780 euros. Carried out at: IACT, CSIC-UGR (2008-2009).
- Co-organizer of conference "Eurolce 2008", financed by the European Science Foundation, and MEC: 17 000 euros. Took place at: University of Granada (2008).
- Principal investigator of "Chemical gardens in microgravity", project CTQ2007-29861-E/BQU C of MEC: 20 000 euros, for the "CSI-02 (CGBA Science Insert 2) joint research project on crystal garden growth in microgravity" for mission STS-118 with BioServe Space Technologies, Inc, A NASA Research Partnership Center, Colorado, USA. Carried out at: IACT, CSIC-UGR (2007-2009).
- Member of the consortium Consolider-INGENIO 2010 for the creation of a platform of crystallization and general crystallography services to serve Spanish academia and industry, the 'Factoría Española de Cristalización'.
- Spanish coordinator of the project "Functional Dynamics in Complex Chemical and Biological Systems (FUNCDYN)" of the European Science Foundation. Carried out at: IACT, CSIC-UGR (2006-2009).
- Principal investigator of "Crystal growth and chemistry of ice films in extreme conditions": Project HIELOCRIS of the Proyectos Intramurales de Frontera of the CSIC. Coordinator: Prof. Ignacio Sainz, of the Laboratorio de Estudios Cristalográficos (CSIC). Carried out at: IACT, CSIC-UGR (2005-2008).
- "Formation, dynamics and function of non-equilibrium structures in the spatial distribution of vegetation in arid regions": Project FIS2005-07083-C02-02 of the Plan Nacional de I + D. Principal investigator: Prof. Juan Puigdefabregas, of the Estacion Experimental de Zonas Aridas (CSIC). Carried out at: IACT, CSIC-UGR (2005-2008).
- "Crystalline polymorphism in bioactive compounds": Project CTQ2004-04648 of the Plan Nacional de I + D. Principal investigator: Prof. Ignacio Sainz, of the Laboratorio de Estudios Cristalográficos (CSIC). Carried out at: IACT, CSIC-UGR (2004-2007).
- Co-organizer of conference "Dynamics Days 2004", financed by CAIB, MPI, UIB: 20 000 euros. Took place at: Universitat de les Illes Balears (2004).
- Co-organizer of conference "Dynamics Days 2003", financed by CAIB, CSIC, ESF, MPI: 29 400 euros. Took place at: Universitat de les Illes Balears (2003).

- "Physics and chemistry of icy particles in the universe: answers from microgravity": ESA. Carried out at: IACT, CSIC-UGR (2001–2003).
- "Protein crystallization in the APCF (Advanced Protein Crystallization Facility) during the space missions STS-107 y 7A.I (ESA)": Project PNE-007/2000-C of the Plan Nacional del Espacio. Principal investigator: Prof. Fermín Otálora of the Laboratorio de Estudios Cristalográficos (CSIC). Carried out at: IACT, CSIC-UGR (2001–2002).
- "Theoretical and experimental studies for the development of an apparatus for the crystallization of proteins in space, extrapolable to terrestrial laboratories": Project ESP98-1347 of the Plan Nacional del Espacio. Principal investigator: Prof. Juan Manuel García Ruiz of the Laboratorio de Estudios Cristalográficos (CSIC). Carried out at: IACT, CSIC-UGR (2000–2001).
- "Vertical cavity lasers for technological applications and in optical communications": Project TIC97-0420 of the Dirección General de Investigación Científica y Técnica. Principal investigator: Prof. Claudio Mirasso of the Department of Physics of the Universitat de les Illes Balears. Carried out at: Universitat de les Illes Balears (1997–1998).
- Coordinator for the UIB of the project "Computer-Aided Learning of Basic Concepts of Computer Networks using Java": CoLoS (Computer-Aided Learning of Science) project of Hewlett Packard. Carried out at: Universitat de les Illes Balears (1996–1997).
- "Spatio-temporal dynamics of nonequilibrium systems": Project PB92-0046-C02-02 of the Dirección General de Investigación Científica y Técnica (Spain). Principal investigator: Prof. Oreste Piro of the Department of Physics of the Universitat de les Illes Balears. Carried out at: Universitat de les Illes Balears (1993–1994).
- "Spatio-temporal chaos and complex patterns in moderately high dimensional and extended dynamical systems": Project ERBCHBICT920200 of the UE Human Capital & Mobility program. Principal investigator: Prof. Oreste Piro of the Department of Physics of the Universitat de les Illes Balears. Carried out at: Universitat de les Illes Balears (1993–1995).

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### CONFERENCE PRESENTATIONS

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| TYPE OF PARTICIPATION: Talk: "Life from ice" The case for a cold origin of life".<br>CONFERENCE: 2nd EUMLS Conference "Mathematics for Life Sciences".<br>PLACE: Crimea, Ukraine.                                               | YEAR: 2013 |
| TYPE OF PARTICIPATION: Talk: "Pearls Are self-organized natural ratchets".<br>CONFERENCE: 12th International Symposium on Biomineralization 2013.<br>PLACE: Freiberg, Germany.                                                  | YEAR: 2013 |
| TYPE OF PARTICIPATION: Talk: "From chemical gardens to chemobionics".<br>CONFERENCE: Nonlinear Dynamics of Electronic Systems 2013.<br>PLACE: Bari, Italy.                                                                      | YEAR: 2013 |
| TYPE OF PARTICIPATION: Talk: "Pearls Are self-organized natural ratchets".<br>CONFERENCE: ESF COST workshop on Understanding and manipulating enzymatic and proteomic processes in biomineralization.<br>PLACE: Bologna, Italy. | YEAR: 2013 |
| TYPE OF PARTICIPATION: Talk: "From chemical gardens to chemobionics".<br>CONFERENCE: Workshop on Emergence in Chemical Systems.<br>PLACE: Anchorage, Alaska, USA.                                                               | YEAR: 2013 |
| TYPE OF PARTICIPATION: Talk: "Fish hearing: How do they hear?; how do they make their ears?".<br>CONFERENCE: Dynamics Days 2013.<br>PLACE: Madrid, Spain.                                                                       | YEAR: 2013 |

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TYPE OF PARTICIPATION: Talk: "2D chemobionics: Chemical gardens in (almost) two dimensions".

CONFERENCE: Solvay Workshop on patterns and hydrodynamic instabilities in reactive systems.  
PLACE: Brussels, Belgium. YEAR: 2013

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TYPE OF PARTICIPATION: Talk: "From ice to mice — or — the dynamics of biology".

CONFERENCE: Beyond Center Workshop. Engines of life: Thermodynamic pathways to metabolism.  
PLACE: Phoenix, Arizona, USA. YEAR: 2013

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TYPE OF PARTICIPATION: Talk: "Life from ice" The case for a cold origin of life".

CONFERENCE: NASA NAI Thermodynamics, Disequilibrium, and Evolution Focus Group Meeting.  
PLACE: Granada, Spain. YEAR: 2012

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TYPE OF PARTICIPATION: Talk: "Directed self assembly and the formation of biomaterials, or, Is there a gene for nacre?".

CONFERENCE: ESF COST workshop on Understanding and manipulating enzymatic and proteomic processes in biomineralization.  
PLACE: Aarhus, Denmark. YEAR: 2012

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TYPE OF PARTICIPATION: Talk: "On animal gaits, cilia, and group theory".

CONFERENCE: Keith-number meeting.  
PLACE: Faro de Ses Salines, Majorca, Spain. YEAR: 2012

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TYPE OF PARTICIPATION: Talk: "Genomic assembly complexity".

CONFERENCE: II international workshop on the mathematical structure of genetic information.  
PLACE: UIB campus, Majorca, Spain. YEAR: 2012

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TYPE OF PARTICIPATION: Talk: "Pearls: self-organized natural ratchets. A tale of liquid crystals, excitable media, and self-assembly".

CONFERENCE: Dynamics Days 2012.  
PLACE: Gothenburg, Sweden. YEAR: 2012

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TYPE OF PARTICIPATION: Talk: "Ice structures, patterns, and processes: A view across the ice-fields".

CONFERENCE: Complex Systems 2012.  
PLACE: Lavin, Switzerland. YEAR: 2012

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TYPE OF PARTICIPATION: Talk: "Thoughts on fluid dynamics and development in zebrafish: A confluence of ideas; and a confluence of problems".

CONFERENCE: Instituto Gulbenkian de Ciência workshop on biophysics of the left-right vertebrate organizer.  
PLACE: Lisbon, Portugal. YEAR: 2012

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TYPE OF PARTICIPATION: Organizer.

CONFERENCE: Lorentz Center Workshop on chemical gardens.  
PLACE: Leiden, Holland. YEAR: 2012

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TYPE OF PARTICIPATION: Talk: 'Mineral bridges in nacre'.

CONFERENCE: ESF COST workshop on Understanding and manipulating enzymatic and proteomic processes in biomineralization.  
PLACE: Cluj, Romania. YEAR: 2011

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TYPE OF PARTICIPATION: Talk: 'Pearls and nacre: from Nakahara and Wada to a physical understanding of nacre biomineralization'.

CONFERENCE: International Symposium on Pearl Research.  
PLACE: Tokyo, Japan. YEAR: 2011

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TYPE OF PARTICIPATION: Talk: 'Nonlinear dynamics of ice growth and charge production in thunderstorms'.

CONFERENCE: Dynamics Days 2011.

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| PLACE: Oldenberg, Germany.                                                                                                                                                                                                                                            | YEAR: 2011 |
| TYPE OF PARTICIPATION: Organizer.<br>CONFERENCE: Lorentz Center Workshop on the Physics of Mixing.<br>PLACE: Leiden, Holland.                                                                                                                                         | YEAR: 2011 |
| TYPE OF PARTICIPATION: Talk: 'Liquid crystals in biomineralization'.<br>CONFERENCE: ESF COST workshop on Understanding and manipulating enzymatic and proteomic processes in biomineralization.<br>PLACE: Newcastle, UK.                                              | YEAR: 2011 |
| TYPE OF PARTICIPATION: Talk 'The mesoscale morphologies of ice films: Porous and biomorphic forms of ice under astrophysical conditions'.<br>CONFERENCE: ISM2010 — Workshop on Interstellar Matter.<br>PLACE: Sapporo, Japan.                                         | YEAR: 2010 |
| TYPE OF PARTICIPATION: Talk 'Nonlinear dynamics of ice growth and charge production in thunderstorms'.<br>CONFERENCE: PCI2010 — Physics and Chemistry of Ice.<br>PLACE: Sapporo, Japan.                                                                               | YEAR: 2010 |
| TYPE OF PARTICIPATION: Talk 'Molluscs know far more than we do about self-assembly: the case of nacre'.<br>CONFERENCE: Gordon Research Conference on Oscillations & Dynamic Instabilities in Chemical Systems.<br>PLACE: Il Ciocco, Tuscany, Italy.                   | YEAR: 2010 |
| TYPE OF PARTICIPATION: Talk: 'Self-organization and self-assembly in biological materials: the example of nacre'.<br>CONFERENCE: ESF COST workshop on Understanding and manipulating enzymatic and proteomic processes in biomineralization.<br>PLACE: Pula, Croatia. | YEAR: 2010 |
| TYPE OF PARTICIPATION: Co-Convener of session on Atmospheric Ice Particles.<br>CONFERENCE: EGU General Assembly 2010.<br>PLACE: Vienna, Austria.                                                                                                                      | YEAR: 2010 |
| TYPE OF PARTICIPATION: Poster: 'Minimal dynamical model for tidal synchronization and orbit circularization'.<br>CONFERENCE: CELMEC V, The Fifth International Meeting on Celestial Mechanics.<br>PLACE: Viterbo, Italy.                                              | YEAR: 2009 |
| TYPE OF PARTICIPATION: Poster.<br>CONFERENCE: Dynamics Days 2009.<br>PLACE: Göttingen, Germany.                                                                                                                                                                       | YEAR: 2009 |
| TYPE OF PARTICIPATION: Poster: 'Patterns in MHD: from the red spot to sunspots via brown dwarfs'.<br>CONFERENCE: Suzhou Eclipse Meeting on The Dynamic Solar Corona.<br>PLACE: Suzhou, China.                                                                         | YEAR: 2009 |
| TYPE OF PARTICIPATION: Talk: 'Fluid dynamics in developmental biology: Moving fluids that shape ontogeny'.<br>CONFERENCE: Instituto Gulbenkian de Ciência workshop on Biophysical Mechanisms of Development.<br>PLACE: Lisbon, Portugal.                              | YEAR: 2009 |
| TYPE OF PARTICIPATION: Talk: 'Nacre as a fibrous composite'.<br>CONFERENCE: NATO ARW on Textile Composites.<br>PLACE: Kiev, Ukraine.                                                                                                                                  | YEAR: 2009 |

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| TYPE OF PARTICIPATION: Co-Convener of session on Atmospheric Ice Particles.<br>CONFERENCE: EGU General Assembly 2009.<br>PLACE: Vienna, Austria.                                                                                                                                                                                | YEAR: 2009 |
| TYPE OF PARTICIPATION: Organizer.<br>CONFERENCE: ESF Exploratory Workshop Euroice 2008.<br>PLACE: Granada, Spain.                                                                                                                                                                                                               | YEAR: 2008 |
| TYPE OF PARTICIPATION: Talks 'Beyond passive scalars' & 'Intelligent advection'.<br>CONFERENCE: Max Planck institute for Complex Systems Workshop on Dynamics of Inertial Particles: From Ocean and Atmosphere to Planets.<br>PLACE: Dresden, Germany.                                                                          | YEAR: 2008 |
| TYPE OF PARTICIPATION: Posters 'Dynamics of tidal synchronization and orbit circularization of celestial bodies' & 'Non-equilibrium phase-transition-like behaviours between bulk structures in ballistic-diffusive stochastic models of thin film growth'.<br>CONFERENCE: Física Estadística 2008.<br>PLACE: Salamanca, Spain. | YEAR: 2008 |
| TYPE OF PARTICIPATION: Talk 'The morphologies of thin icy films'.<br>CONFERENCE: IWCS 2007, 5th International Workshop on Complex Systems.<br>PLACE: Sendai, Japan.                                                                                                                                                             | YEAR: 2007 |
| TYPE OF PARTICIPATION: Talk 'Morphology and dynamics of amorphous and crystalline forms of ice'.<br>CONFERENCE: Nolineal 2007.<br>PLACE: Ciudad Real, Spain.                                                                                                                                                                    | YEAR: 2007 |
| TYPE OF PARTICIPATION: Talk 'Nonlinear dynamics, the missing fundamental, and harmony'.<br>CONFERENCE: Mathematics and Computation in Music 2007.<br>PLACE: Berlin, Germany.                                                                                                                                                    | YEAR: 2007 |
| TYPE OF PARTICIPATION: Talk 'Resonance and synchronization: Forced oscillators in the auditory system'.<br>CONFERENCE: "Klang und Ton" Helmholtz workshop.<br>PLACE: Berlin, Germany.                                                                                                                                           | YEAR: 2007 |
| TYPE OF PARTICIPATION: Talk 'The dynamics of nacre self assembly'.<br>CONFERENCE: FuncDyn 2007 workshop.<br>PLACE: Copenhagen, Denmark.                                                                                                                                                                                         | YEAR: 2007 |
| TYPE OF PARTICIPATION: Talk 'Ice morphologies'.<br>CONFERENCE: Hielocris 2007.<br>PLACE: Minorca, Spain.                                                                                                                                                                                                                        | YEAR: 2007 |
| TYPE OF PARTICIPATION: Talk 'The dynamics of nacre self assembly'.<br>CONFERENCE: Dynamics Days 2006.<br>PLACE: Crete, Greece.                                                                                                                                                                                                  | YEAR: 2006 |
| TYPE OF PARTICIPATION: Posters 'Experiments and simulations on morphologies of amorphous and crystalline ice' & 'Dynamical basis of the structure zone model of solid thin film growth'.<br>CONFERENCE: Física Estadística 2006.<br>PLACE: Granada, Spain.                                                                      | YEAR: 2006 |
| TYPE OF PARTICIPATION: Talk 'The dynamics of a sensory apparatus: The case of the auditory system'.<br>CONFERENCE: 9th Granada Seminar on Computational and Statistical Physics.<br>PLACE: Granada, Spain.                                                                                                                      | YEAR: 2006 |

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| TYPE OF PARTICIPATION: Talk 'Nacre: Organization of a biomineral composite'.<br>CONFERENCE: Biomat. Mathematics and Life Sciences: Models of Development.<br>PLACE: Granada, Spain.                                                                                                                                    | YEAR: 2006 |
| TYPE OF PARTICIPATION: Poster 'Ice in the solar system'.<br>CONFERENCE: Solar and Stellar Physics through Eclipses.<br>PLACE: Antalya, Turkey.                                                                                                                                                                         | YEAR: 2006 |
| TYPE OF PARTICIPATION: Organizer.<br>CONFERENCE: Dynamics Days 2004.<br>PLACE: Palma de Mallorca, Spain.                                                                                                                                                                                                               | YEAR: 2004 |
| TYPE OF PARTICIPATION: Talk 'Fluid-dynamical basis of the embryonic development of left-right asymmetry in vertebrates'.<br>CONFERENCE: Física Estadística 2003.<br>PLACE: Pamplona, Spain.                                                                                                                            | YEAR: 2003 |
| TYPE OF PARTICIPATION: Organizer.<br>CONFERENCE: Dynamics Days 2003.<br>PLACE: Palma de Mallorca, Spain.                                                                                                                                                                                                               | YEAR: 2003 |
| TYPE OF PARTICIPATION: Talk 'Dynamical systems: A golden gate from auditory physiology to musical aesthetics?'.<br>CONFERENCE: ISAMA (The International Society of the Arts, Mathematics, and Architecture) and BRIDGES (Mathematical Connections in Art, Music, and Science) Joint Meeting.<br>PLACE: Granada, Spain. | YEAR: 2003 |
| TYPE OF PARTICIPATION: Talk 'Chiral symmetry breaking in crystallization'.<br>CONFERENCE: ESF REACTOR workshop: Nonlinear phenomena in chemistry.<br>PLACE: Budapest, Hungary.                                                                                                                                         | YEAR: 2003 |
| TYPE OF PARTICIPATION: Talk 'Formation of chemical gardens'.<br>CONFERENCE: Max Planck institute for complex systems Workshop on Chemical and Biological Activity in Flows.<br>PLACE: Dresden, Germany.                                                                                                                | YEAR: 2002 |
| TYPE OF PARTICIPATION: Talk 'Formation of chemical gardens'.<br>CONFERENCE: Gordon Research Conference on Oscillations & Dynamic Instabilities in Chemical Systems.<br>PLACE: Oxford, UK.                                                                                                                              | YEAR: 2002 |
| TYPE OF PARTICIPATION: Talk 'Bailout embeddings for the control of Hamiltonian chaos, and the distribution of small particles in fluid flows'.<br>CONFERENCE: Dynamics Days 2002.<br>PLACE: Heidelberg, Germany.                                                                                                       | YEAR: 2002 |
| TYPE OF PARTICIPATION: Talk 'Formation of basalt columns'.<br>CONFERENCE: 24th International Conference on Mathematical Geophysics: Pattern and Form in Earth Dynamics.<br>PLACE: Turin, Italy.                                                                                                                        | YEAR: 2002 |
| TYPE OF PARTICIPATION: Talk 'The microscopic basis of chiral symmetry breaking in crystallization'.<br>CONFERENCE: No Lineal 2002.<br>PLACE: Cuenca, Spain.                                                                                                                                                            | YEAR: 2002 |
| TYPE OF PARTICIPATION: Poster 'Buoyancy-driven convection in crystallization from solution'.<br>CONFERENCE: Física Estadística 2002.<br>PLACE: Tarragona, Spain.                                                                                                                                                       | YEAR: 2002 |

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| TYPE OF PARTICIPATION: Talk 'Pattern formation in solutal convection systems — from 'Tia Maria' to crystal gardens'.                                                         |            |
| CONFERENCE: Horizons in Complex Systems.                                                                                                                                     |            |
| PLACE: Messina, Italy.                                                                                                                                                       | YEAR: 2001 |
| TYPE OF PARTICIPATION: Talk 'Dinámica no lineal en la percepción de altura'.                                                                                                 |            |
| CONFERENCE: Física Estadística 2000.                                                                                                                                         |            |
| PLACE: Santiago de Compostela, Spain.                                                                                                                                        | YEAR: 2000 |
| TYPE OF PARTICIPATION: Poster 'Protein crystallization in microgravity: Simulation and theory of experiments for space crystallization'.                                     |            |
| CONFERENCE: First International Symposium on Microgravity Research and Applications in Physical Sciences and Biotechnology.                                                  |            |
| PLACE: Sorrento, Italy.                                                                                                                                                      | YEAR: 2000 |
| TYPE OF PARTICIPATION: Talk 'From stationary patterns to interfacial turbulence: the example of solutal convection'.                                                         |            |
| CONFERENCE: Space Time Chaos: Characterization, Control and Synchronization.                                                                                                 |            |
| PLACE: Pamplona, Spain.                                                                                                                                                      | YEAR: 2000 |
| TYPE OF PARTICIPATION: Poster 'Pattern formation in crystal growth: 'Biomorphs' and crystal gardens'.                                                                        |            |
| CONFERENCE: XVII Sitges Conference on Statistical Mechanics: Coherent Structures in Classical Systems.                                                                       |            |
| PLACE: Sitges, Spain.                                                                                                                                                        | YEAR: 2000 |
| TYPE OF PARTICIPATION: Talk 'Dynamics of a small neutrally buoyant sphere in a fluid'.                                                                                       |            |
| CONFERENCE: No Lineal 2000.                                                                                                                                                  |            |
| PLACE: Almagro, Ciudad Real, Spain.                                                                                                                                          | YEAR: 2000 |
| TYPE OF PARTICIPATION: Talk 'Simulation and experiment in reaction-diffusion systems for crystallization'.                                                                   |            |
| CONFERENCE: CECAM Workshop on Computational issues in stochastic processes.                                                                                                  |            |
| PLACE: Lyon, France.                                                                                                                                                         | YEAR: 2000 |
| TYPE OF PARTICIPATION: Talk 'Nonlinear dynamics and pitch perception'.                                                                                                       |            |
| CONFERENCE: British Applied Mathematics Colloquium.                                                                                                                          |            |
| PLACE: Manchester, UK.                                                                                                                                                       | YEAR: 2000 |
| TYPE OF PARTICIPATION: Talks 'Transport and mixing in laminar flow: 2D versus 3D' & 'Is the perfect Lagrangian drifter an impossible dream?'.                                |            |
| CONFERENCE: ESF study centre on transport processes in the atmosphere and oceans.                                                                                            |            |
| PLACE: Mallorca, Spain.                                                                                                                                                      | YEAR: 1999 |
| TYPE OF PARTICIPATION: Posters 'Liesegang rings and other morphologies in precipitation Reactions' & 'The <i>Tia Maria</i> instability: Explorations in solutal convection'. |            |
| CONFERENCE: Física Estadística '99.                                                                                                                                          |            |
| PLACE: Santander, Spain.                                                                                                                                                     | YEAR: 1999 |
| TYPE OF PARTICIPATION: Poster 'Chaos in crystal growth: oscillatory zoning, Turing structures, and Liesegang rings'.                                                         |            |
| CONFERENCE: 1998 Conference on computational physics: Modelling collective phenomena in complex systems.                                                                     |            |
| PLACE: Granada, Spain.                                                                                                                                                       | YEAR: 1998 |
| TYPE OF PARTICIPATION: Talk & Poster 'A new nonlinear model for pitch perception'.                                                                                           |            |
| CONFERENCE: NATO ASI on computational hearing.                                                                                                                               |            |
| PLACE: Il Ciocco, Tuscany, Italy.                                                                                                                                            | YEAR: 1998 |
| TYPE OF PARTICIPATION: Talk 'Explorations in solutal convection', and Poster 'Ethanol-water                                                                                  |            |

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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Marangoni films'.<br>CONFERENCE: Max Planck institute for complex systems conference on small scale dynamics of physico-chemical processes at interfaces.<br>PLACE: Dresden, Germany.                                                                                  | YEAR: 1998 |
| TYPE OF PARTICIPATION: Talk 'Three-frequency dynamics involved in pitch perception and other physiological systems'.<br>CONFERENCE: XV Sitges conference on statistical mechanics: Statistical mechanics of biocomplexity.<br>PLACE: Sitges, Spain.                    | YEAR: 1998 |
| TYPE OF PARTICIPATION: Talk 'Transport and mixing in 3D laminar flows'.<br>CONFERENCE: EGS XXIII General Assembly.<br>PLACE: Nice, France.                                                                                                                             | YEAR: 1998 |
| TYPE OF PARTICIPATION: Talk 'Langrangian chaos and mixing in three-dimensional laminar flows'.<br>CONFERENCE: ESF 2nd annual workshop on transport processes in the atmosphere and oceans.<br>PLACE: Porto, Portugal.                                                  | YEAR: 1998 |
| TYPE OF PARTICIPATION: Talk 'Mixing and chaotic advection in 3D unsteady laminar flow'.<br>CONFERENCE: ESF workshop on chemical & biological effects of mixing.<br>PLACE: Cambridge, UK.                                                                               | YEAR: 1997 |
| TYPE OF PARTICIPATION: Poster 'Nonlinear dynamics can explain pitch at a peripheral level'.<br>CONFERENCE: Física Estadística '97.<br>PLACE: Getafe, Madrid, Spain.                                                                                                    | YEAR: 1997 |
| TYPE OF PARTICIPATION: Poster 'Fuzzy control of chaos'.<br>CONFERENCE: Third Euroconference on nonlinear dynamics in physics and related science 'Control of chaos: New perspectives in experimental and theoretical nonlinear science'.<br>PLACE: Montecatini, Italy. | YEAR: 1997 |
| TYPE OF PARTICIPATION: Poster 'Lubricated earthquakes in elastic excitable media'.<br>CONFERENCE: No Lineal '97.<br>PLACE: Avila, Spain.                                                                                                                               | YEAR: 1997 |
| TYPE OF PARTICIPATION: Poster 'Global diffusion in a realistic three-dimensional time-dependent nonturbulent fluid flow'.<br>CONFERENCE: NATO advanced research workshop 'Mixing, chaos, and turbulence'.<br>PLACE: Cargese, Corsica, France.                          | YEAR: 1996 |
| TYPE OF PARTICIPATION: Talk 'On fuzzy control of chaos'.<br>CONFERENCE: ICTP Workshop on nonlinear control and control of chaos.<br>PLACE: Trieste, Italy.                                                                                                             | YEAR: 1996 |
| TYPE OF PARTICIPATION: Talk 'Chaotic advection in three-dimensional unsteady incompressible laminar flow'.<br>CONFERENCE: Física Estadística '96.<br>PLACE: Zaragoza, Spain.                                                                                           | YEAR: 1996 |
| TYPE OF PARTICIPATION: Poster 'Global diffusion in a realistic three-dimensional time-dependent nonturbulent fluid flow' & 'On the perception of pitch'.<br>CONFERENCE: Dynamics Days '95.<br>PLACE: Lyon, France.                                                     | YEAR: 1995 |
| TYPE OF PARTICIPATION: Talk 'Chaotic advection in three-dimensional unsteady incompressible laminar flow'.<br>CONFERENCE: Chaos: towards the 21st century.<br>PLACE: Como, Italy.                                                                                      | YEAR: 1995 |

TYPE OF PARTICIPATION: Talk 'Pitch perception of complex sounds: nonlinearity revisited'.  
CONFERENCE: 2nd International Conference on Acoustic and Musical Research (CIARM).  
PLACE: Ferrara, Italy. YEAR: 1995

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TYPE OF PARTICIPATION: Talk 'Dynamically diffusive Lagrangian trajectories in time-periodic three-dimensional flows'.  
CONFERENCE: European Science Foundation study centre 'Transport in Fluids, Plasmas and Charged Beams'.  
PLACE: Turin, Italy. YEAR: 1994

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TYPE OF PARTICIPATION: Talk 'Passive scalars and three-dimensional Liouvillian maps'.  
CONFERENCE: Summer School 'Transport Processes in Geophysical Flows'.  
PLACE: Gignod, Aosta, Italy. YEAR: 1994

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TYPE OF PARTICIPATION: Poster 'Runge-Kutta dynamics'.  
CONFERENCE: Fields Institute workshop 'Integration Algorithms for Classical Mechanics'.  
PLACE: Waterloo, Canada. YEAR: 1993

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TYPE OF PARTICIPATION: Posters 'Passive scalars with and without inertia', 'The Bogdanov map' & 'The dynamics of Runge-Kutta methods'.  
CONFERENCE: NATO advanced study institute 'Chaos, Order & Patterns'.  
PLACE: Como, Italy. YEAR: 1993

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TYPE OF PARTICIPATION: Poster 'Chaotic scattering of passive scalars', 'The Bogdanov map' & 'The dynamics of Runge-Kutta methods'.  
CONFERENCE: Dynamics Days '93.  
PLACE: Poznan, Poland. YEAR: 1993

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TYPE OF PARTICIPATION: Poster 'Dynamical systems from Runge-Kutta methods'.  
CONFERENCE: Bath Conference on Nonlinear Science.  
PLACE: Bath, UK. YEAR: 1991

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TYPE OF PARTICIPATION: Poster 'On modular smoothing and scaling functions for mode locking'.  
CONFERENCE: NATO conference 'Chaos, Order & Patterns'.  
PLACE: Como, Italy. YEAR: 1990

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TYPE OF PARTICIPATION: Poster 'Chaos in nonlinear forced oscillators'.  
CONFERENCE: Dynamics Days '89.  
PLACE: Düsseldorf, Germany. YEAR: 1989

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## Seminars given during stays at other institutes

- ETH, Zurich, Seminar 'From chemical gardens to chemobionics', June 2013
- Fritz Haber Institute, Berlin, Seminar 'From chemical gardens to chemobionics', June 2013
- Department of Mechanical Engineering, UC Santa Barbara, Seminar "The belly phase: Geometric mixing, peristalsis, and the geometric phase of the stomach" May 2013
- NASA Jet Propulsion Laboratory, Pasadena, "Life from ice? The case for a cold origin of life" May 2013
- Institute for Neuroinformatics, ETH Zurich, Seminar "Directed self assembly: Genomic assembly complexity and the formation of biomaterials — or — Is there a gene for nacre?" March 2013
- Université Libre de Bruxelles, Seminar "From chemical gardens to chemobionics", January 2013
- Niels Bohr Institute, Copenhagen, Seminar 'From excitability to pearls: nacre as a complex system', November 2012
- Rotary Club, Palma de Mallorca, Spain, Seminar 'Francois Arago en Mallorca', October 2012
- Leiden University, Holland, Seminar 'Chemical gardens', May 2012
- Fritz Haber Institute, Berlin, Seminar 'Spirals, spirals, everywhere: pattern formation in nature', April 2012
- Loughborough University, Seminar 'Dynamics of finite-size particles in chaotic fluid flows', March 2012
- Exeter University, Seminar 'Self-organization and self-assembly in biological materials: the example of nacre', March 2012
- Basque Center for Applied Mathematics, Bilbao, Seminar 'From excitability to pearls: nacre as a complex system', February 2012
- Gulbenkian Institute of Science, Lisbon, Seminar "Nacre: Self-organization and self-assembly in biological materials" January 2012
- Universidad de Las Palmas de Gran Canaria, Seminar "Biomineralización: el ejemplo del nácar de los moluscos y de sus perlas" December 2011
- Graduate school of arts and sciences, University of Tokyo, Seminar: "Fluid dynamics, self-organization, and biology" October 2011
- Department of mathematics, Open University, UK. Seminar "Self-organization and self-assembly in biological materials: liquid crystals in biomineralization" January 2011.
- Department of physics, UNED, Madrid, Spain. Seminar "Pattern formation and the origins of life" June 2010.
- IRPHE, Marseilles, France. Seminar "What kind of a wave is Hokusai's *Great wave off Kanagawa*?" June 2009.
- Institute of Hydromechanics, National Academy of Sciences, Kiev, Ukraine. Seminar "Fluid dynamics in developmental biology" May 2009.
- Department of applied mathematics and theoretical physics, University of Cambridge, UK. Seminar "Fluid dynamics in developmental biology" February 2009.
- Institute of Particle Science and Engineering, University of Leeds, UK. Seminar "Chiral symmetry breaking in crystallization: a stir caused by stirring" February 2009.
- Max Planck institute for Complex Systems, Dresden, Germany. Seminar "Complex interacting entities in fluid flows" September 2008

- Departments of physics and mathematics, Strathclyde University, Glasgow, UK. Seminar "Complexity" June 2008
- Department of physics, Eotvos University, Budapest, Hungary. Seminar "The dynamics of life: Towards a mathematical basis for biology" October 2007
- Department of applied mathematics and theoretical physics, University of Cambridge, UK. Seminar "Self-assembly of nacre" February 2007.
- Faculty of Science, University of Zaragoza, Spain. Seminar "Crystallography: where do we go from here?" October 2006.
- Department of physics, University of Malaga, Spain. Seminar "The mathematics of life and its origins: towards a mathematical basis for biology" December 2005.
- Mathematics and Fundamental Physics Institute, CSIC, Madrid, Spain. Seminar "Mathematical methods in fluid mechanics" November 2005.
- Instituto Mediterraneo de Estudios Avanzados, CSIC, Mallorca, Spain. Seminar "The mathematics of life and its origins: towards a mathematical basis for biology" July 2005.
- Laboratory for Musical Acoustics, CNR, Venice, Italy. Seminar "Dynamical systems in the brain: the example of the auditory system" August 2002.
- Center for Studies in Physics and Biology, Rockefeller University, New York, USA. Seminar "Pitch perception" September 2001.
- Microgravity Research Center, Free University of Brussels, Belgium. Seminar "Transport of a small neutrally buoyant sphere in a fluid" June 2001.
- Department of Physics, University of Manchester, UK. Seminar "Transport of a small neutrally buoyant sphere in a fluid: Is the perfect Lagrangian tracer an impossible dream?" October 2000.
- Keck Foundation Center for Integrative Neuroscience, University of California at San Francisco, USA. Seminar "Nonlinear Dynamics of Pitch Perception" November 1999.
- Department of Mechanical and Aerospace Engineering, University of California at San Diego, USA. Seminar "Is the perfect Lagrangian drifter an impossible dream?" November 1999.
- Department of Mathematics, Trinity College Dublin, Ireland. Seminar "Fluid Mixing and Liouvillian Maps" December 1998.
- Department of Applied Physics, Polytechnic University of Catalonia, Spain. 1 June 98–7 June 98. Seminar "Explorations in solutal convection" June 1998.
- School of Experimental Sciences, King Juan Carlos University, Madrid, Spain. Seminar "Mixing in Three-Dimensional Fluid Flows" March 1998.
- Department of Interdisciplinary Physics, Mediterranean Institute for Advanced Studies, Spain. 1 February 98–7 February 98. Seminar "Thoughts on three-frequency systems and biological synchronization" February 1998.
- Department of Applied Mathematics and Analysis, University of Barcelona, Spain. 6 October 97–10 October 97. Seminar "Applications of Liouvillian maps to fluid dynamics" October 1997.
- Department of Physics, Queen Mary and Westfield College, University of London, UK. 25 April 95–31 May 95. Seminar "Passive scalars and three-dimensional Liouvillian maps" May 1995.
- School of Mathematical Sciences, Queen Mary and Westfield College, University of London, UK. Seminar "Nonlinear dynamics of fluid dynamics" May 1995.
- Department of Physics, University of Bremen, Germany. Seminar "The Bogdanov map, forced oscillators and dissipative dynamical systems" June 1993.

- Department of Physics, University of Bremen, Germany. Seminar “On the dynamics of Runge–Kutta methods” July 1992.

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### Courses taught

- Course “What can physics tell us about (marine) biology?” at Training School on Marine Organisms as model for research in biomineralization, Stareso (Station De Recherches Sous-Marines Et Oceanographiques, Calvi, Corsica, France, 2013
- Master course in biological fluid dynamics, Gulbenkian Institute of Science, Lisbon, 2012.
- Master course in the physics of complex systems, UNED, Madrid, 2011.
- Master course in the physics of complex systems, UNED, Madrid, 2010.
- First-year undergraduate course in Electromagnetism for the Industrial Engineering degree, Miguel Hernández University, 1997–1998.
- First-year undergraduate course in Physics for the Ambiental Sciences degree, Miguel Hernández University, 1997–1998.
- Setting up and running a new undergraduate physics teaching laboratory at Miguel Hernández University, including purchase and setup of experiments and writing of accompanying guides to the practicals, 1997–1998.
- Theoretical and practical course at an EU funded ERASMUS summer school on biophysics, ‘Chaos in Biology’, 1995–1996.
- Undergraduate course in Classical Dynamical Systems, Queen Mary College, University of London: in charge of problem classes, 1991–1992.
- Undergraduate course in Numerical Methods, Queen Mary College, University of London: in charge of problem classes, 1991–1992.

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### Theses supervised

- Doctorate, Bruno Escribano, University of Granada 2007–2010, “Non-linear dynamics in earth sciences: Morphology, self-organized structures, pattern formation and synchronization”
- Doctorate, Sergey Khokhlov, University of Granada 2007–, “Fluid dynamics of natural systems”
- Master, Bruno Escribano, University of Granada 2006–2007, “Morphology of ice growth”

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### Thesis committees

- Doctorate of Pedro Sánchez, University of the Balearic Islands 2011, “Transitions at the mesoscale: morphological changes in thin solid films and magnetic filaments”.
- Doctorate of Idan Tuval, University of the Balearic Islands 2005, “The dynamics of small bodies suspended in low Reynolds number flows: Applications in physics and biology”.
- Doctorate of Pablo Hurtado, University of Granada 2003, “Aspectos dinámicos de sistemas fuera del equilibrio: metaestabilidad, avalanchas, separación de fases, estados absorbentes y conducción del calor”.

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### Journal editor

- Philosophical Transactions, 2012, issue on “Beyond crystals: the dialectic of materials and information” with Alan Mackay.

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## Conferences organized

- Board member, Dynamics Days 2003–
- Co-organizer, Biomin XIII, 13th International Symposium on Biomineralization, Granada, Spain, 2015
- Co-organizer, ESF COST workshop on Understanding and manipulating enzymatic and proteomic processes in biomineralization, Granada, Spain, 2014
- Co-organizer, Keith-number meeting, Faro de Ses Salines, Majorca, Spain, 2012
- Co-organizer, Workshop on Chemical gardens: From self ordering of precipitation structures to modern materials science, Lorentz Center, Leiden, Holland, 2012
- Scientific Committee, The 1st International Conference on Computational Fluid Dynamics in Medicine and Biology, Dead Sea, Israel, 2012
- Co-organizer, Workshop on the Physics of Mixing, Lorentz Center, Leiden, Holland, 2011
- Co-Convener, session AS3.3, Atmospheric Ice Particles, EGU, Viena, Austria, 2010.
- Co-Convener, session AS3.13, Atmospheric Ice Particles, EGU, Viena, Austria, 2009.
- Programme committee, SPIE Complexity and Nonlinear Dynamics conference, Melbourne, Australia, 2008.
- Organizer, Eurolce 2008, Granada, Spain, 2008
- Programme committee, Conference on Complex Systems II, Canberra, Australia, 2007
- Programme committee, Complex Systems Conference of the SPIE International Symposium on Microelectronics, MEMS and Nanotechnology, Brisbane, Australia, 2005
- Organizer, Dynamics Days 2004, Palma de Mallorca, Spain, 2004
- Programme committee, SPIE 2004, Second International Symposium on Fluctuations and Noise, Las Palmas, Spain, 2004
- Organizer, Dynamics Days 2003, Palma de Mallorca, Spain, 2003
- Local organizer, ESF study centre on transport processes in the atmosphere and oceans, Palma de Mallorca, Spain, 1999

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## Referee for

Journals:

- Biophysical Chemistry
- Bulletin of Mathematical Biology
- Chaos
- Chemical Engineering Journal
- Complexity
- Crystal Growth & Design
- Crystal Research and Technology
- Dynamical Systems
- European Journal of Mechanics
- Fluctuation and Noise Letters
- Geochimica et Cosmochimica Acta

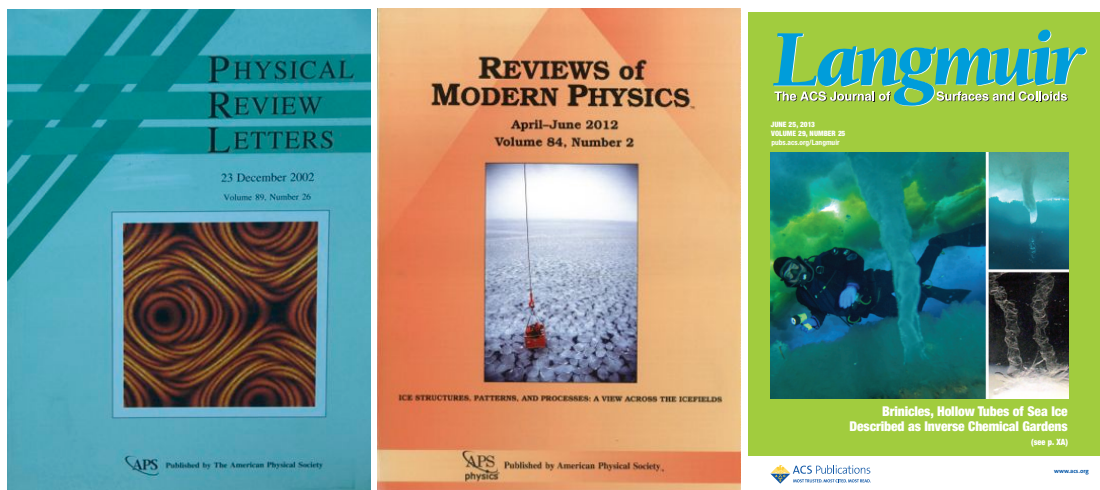
- IEEE Transactions on Circuits and Systems I
- Industrial & Engineering Chemistry Research
- International Journal of Bifurcation and Chaos
- Journal of Computational and Theoretical Nanoscience
- Journal of Crystal Growth
- Journal of Engineering Mathematics
- Journal of Fluid Mechanics
- Journal of Geophysical Research
- Journal of Physical Chemistry
- Journal of the Royal Society: Interface
- Langmuir
- Materials Characterization
- Materials Chemistry and Physics
- Nature
- Nonlinear Analysis
- Notes & Records of the Royal Society
- Physica A
- Physical Review E
- Physical Review Letters
- Plos Computational Biology
- Progress in Oceanography
- Reviews of Modern Physics
- Science
- SIAM Journal on Applied Dynamical Systems

#### Projects:

- Agence Nationale de la Recherche (France)
- American Chemical Society (USA)
- Engineering and Physical Sciences Research Council (UK)
- European Science Foundation (EU)
- National Science Foundation (USA)
- Technology Foundation STW (Holland)

#### Books:

- Cambridge University Press




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## Press on my research

- 2013 on pearls:
  - “Ratchet action misshapes pearls”, *Nature* 499, 8 (2013).
  - Sophie Bushwick, “As the pearl turns”, *Scientific American*, 27 June 2013.
  - Phil Ball, “How pearls get their round shape”, *BBC Future*, 24 June 2013.
  - “How to spin a perfect pearl”, *New Scientist* 2915, 17 (2013).
  - “Pearls And The Puzzle of How They Form Perfect Spheres”, *MIT Technology Review*, 18 April 2013.
- 2013 on brinicles:
  - Jeffrey Marlow, “Swimming Beneath the Brinicles, in Antarctica”, *Wired*, 7 May 2013.
  - Douglas Main, “Sea-Ice Brinicles As Spires of Life”, *Discovery.com*, 29 April 2013.
  - “‘Brinicles’ Form As Sea Ice Leaks Salty Water, New Research Explains”, *Huffington Post*, 26 April 2013.
  - Becky Evans, “‘Icicles of death’ discovered deep in polar oceans could hold clues to the origins of first life on Earth”, *Daily Mail*, 25 April 2013.
  - “All the Conditions Required for Life to Appear Are Here, in Antarctica’s Amazing Ice Stalactites”, *Smithsonian.com*, 9 April 2013.
  - “Brinicles and the Origin of Life”, *MIT Technology Review*, 9 April 2013.
- 2012 on self assembly:
  - Phil Ball, “Bringing crystals to life”, *Nature Materials* 11, 840 (2012).
  - Mark Buchanan, “Instructions for assembly”, *Nature Physics* 8, 577 (2012).
  - “Crystals, Information And The Origin of Life”, *MIT Technology Review*, 19 July 2012.
- 2012 on ice:
  - “The Mysterious Challenge Of Understanding Ice”, *MIT Technology Review*, 24 July 2012.
- 2011 on chemical gardens:
  - “Column: The crucible. Philip Ball considers the vegetative soul of an inorganic woodland”, *Chemistry World*, June 2011.
- 2009 on nacre:

- “Nácar de los moluscos para posible uso en la regeneración de huesos humanos”, El Día, 26 January 2009.
- “Hallan mecanismos de desarrollo del nácar útiles para la regeneración de huesos”, Ideal 19 January 2009.
- “La UGR halla mecanismos de desarrollo del nácar, til en la regeneración ósea”, Granada Hoy, 21 January 2009.
- “Descifran el mecanismo de crecimiento del nácar de los moluscos”, La Opinión de Granada, 20 January 2009.
- “El crecimiento del nácar y la regeneración de huesos”, Diario de Avisos, 22 January 2009.
- “Descifran el mecanismo de crecimiento del ncar de los moluscos”, La Provincia, 19 January 2009.
- 2009 on the development of left and right in the vertebrate embryo:
  - J. L. Lee, “Broken symmetry”, Science News, vol. 176, no. 7, p. 26, 2009.
  - J. Kiefer, “Calculating what’s left”, Highlights in DD, Developmental Dynamics, 2009.
- 2008 on ice:
  - “Very cold ice films in laboratory reveal mysteries of universe”, The Hindu, 6 November 2008.
  - “Palmeras y gusanos de hielo en el polvo interestelar ”, El Pais, 12 November 2008.
  - “Expertos estudian en Granada las propiedades del hielo”, Granada Hoy, 6 October 2008.
  - “El hielo espacial imita a las moléculas orgánicas” ABC, 6 November 2008.
- 2007 on ice:
  - “Chemistry and Life” (in Russian), December 2007.
- 2007 on chemical gardens in space:
  - “Endeavour despegue con éxito hacia la ISS. Un equipo del CSIC ensaya el crecimiento de jardines químicos en ausencia de la gravedad”, La Gaceta de los Negocios 10 August 2007.
  - “El ‘Endeavour’ lleva al espacio un experimento de expertos españoles”, El Mundo 9 August 2007.
  - “Un experimento español de jardines químicos viaja en el Endeavour”, La Razon 9 August 2007.
  - “Llevará Endeavour hasta ISS experimento español de ‘jardines químicos’”, El Mexicano, 8 August 2007.
  - Spanish TV and radio: Las Noticias de la Primera de Televisión Española; Las Noticias de la Quatro2; Interviews in Hora 25, Cadena SER, Radio Murcia, Radio COPE, and in Radio Exterior de España
  - And in the regional press: La Opinión de Granada; Ideal de Granada; Diario Vasco; Las Provincias, de Valencia; La Opinión de Málaga; Diario de Navarra; Galicia Hoxe; La Gaceta de Salamanca; Canarias7; Diario de Burgos; Diario de Avisos: de Canarias, etc.
- 2005 on symmetry breaking in crystallization:
  - C. Day, “Crushing a solution of left-handed and right-handed crystals breaks its chiral symmetry”, Physics Today, April 2005.
- 2004 on the development of left and right in the vertebrate embryo:
  - W. A. Wells, “Tilt back to turn left”, Journal of Cell Biology vol. 165, no. 4, p. 456, 2004.
  - M. Poveda, “Los cilios del nodo embrionario se encargan de asignar la asimetría en vertebrados”, Diario Médico 27 April 2004.

- “Pequeñas aspas que giran hacia la izquierda en el embrión determinan la colocación del corazón”, *El Mundo* 27 April 2004.
- A. Jahn, “Zilienschlag bestimmt Asymmetrie des Embryos”, *Wissenschaft*, 26 April 2004.
- 2003 on solutal convection and the ‘Tia Maria Effect’:
  - D. Stipp, “Mind Candy Cheers! A spunky magazine tells how this glass of Tia Maria tickles your brain”, *Fortune Magazine*, April 2003.
- 1999 on pitch perception in the auditory system:
  - P. Ball, “Pump up the Bass” *Nature Science Update*, 8 July 1999.
  - B. Stein, “Perceiving Musical Pitches” *Physics News Update*, 28 June 1999.
  - “A pitch for decoding frequency more simply” *Science News* Vol. 156, No. 1 (3 July 1999).
  - C. Day, *Web Watch*, *Physics Today*, September 1999.

### Journal covers

- *Langmuir* volume **29**, number 29, 2013: ‘Brinicles’ are hollow tubes of ice that grow downwards into the sea underneath ice sheets in the Antarctic ocean (image page 25).
- *Philosophical Transactions of the Royal Society A* volume **370**, number 1969, 2012: Periodic minimal surface (image page 19).
- *Reviews of Modern Physics* volume **84**, number 2, 2012: Pancake and frazil ice in the Weddell sea (image page 25).
- *Journal of the Royal Society Interface* volume **4**, number 14, 2007: Scanning electron microscope view of the nacreous surface of the shell of the turbinid gastropod *Bolma rugosa* (Linnaeus, 1767) showing towers of tablets of crystalline calcium carbonate (image page 19).
- *Physical Review Letters* volume **89**, number 26, 2002: A 2-dimensional slice of a chaotic 3-dimensional fluid flow showing the ‘temperature amplitude’ of small neutral-buoyancy particles in the flow (image page 25).
- *Nonlinearity*, volume **5**, 1992: The basins of attraction for a Newton map finding the edges of the  $1/2$  tongue in a subcritical sine circle map (image page 10).

