

Curriculum Vitae

Name: Aurora Hernández-Machado

Date: November, 2018

Surname Name: **HERNANDEZ-MACHADO**

Name: **AURORA**

D.N.I.: **46.218.701 - V**

Birthday: **March, 24th 1959**

Sex: **Female**

Nationality: **Spain**

RESEARCH ID: **H-7425-2012**

N.^o de funcionario: **4621870146-A0504**

ORCID: **0000-0002-0397-5255**

Present position

University: **Universitat de Barcelona**

Faculty: **Facultat de Física**

Dept.: **Física de la Matèria Condensada (FMC)**

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UNESCO Codes: **220510, 221307, 120808.**

Position: **Catedrática de Universidad (Full Professor)**

Professional Status: **Civil Servant**

Dedication: **Full time**

Research topics

- **Condensed Matter Physics. Statistical Physics out of Equilibrium. Physics of Complex Systems. Biophysics. Biomembranes. Microfluidics. Nanostructures**
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University Education

Degree	Center	Date
Física	Universidad de Barcelona	06/30/81
Grado Física	Universidad de Barcelona	06/25/82

Ph.D. Thesis	Center	Date
Física	Universidad de Barcelona	06/07/85

Ph.D. Advisor: Maximino San Miguel Ruibal

Previous positions

Position	Institution	Date
Profesor Ayudante	Univ. Aut3noma de Barcelona	10/1/1982 – 11/30/1983
Profesor Ayudante	Univ. de Barcelona	12/01/1983 – 04/08/1987
Becaria Postdoctoral (MEC)	Philipps Univ. Marburg (Germany)	10/01/1985 – 09/30/1986
Becaria Fulbright	Univ. Pittsburgh (USA)	01/01/1987 – 12/31/1987
Research Consultant	Univ. Pittsburgh (USA)	07/01/1988 – 09/30/1988
Research Consultant	Univ. Pittsburgh (U.S.A.)	10/01/1990 – 12/31/1990
Member ITP	Univ. California (U.S.A.)	08/01/1992 – 09/30/1992
Bec. Sab3tico (GenCat)	Univ. Paris 6 (France)	02/01/2001 – 07/31/2001
Profesora Titular	Univ. de Barcelona	04/08/1987 – 16/06/2011

Language skills (F = fluent)

Language	Speech	Reading	Writing
Castellano	F	F	F
English	F	F	F
French	F	F	F
Catal3	F	F	F

Research Activity

International Publications

Only 10 or more citations of isi web of knowledge and google citations are indicated

- 1.-AUTHORS: A. Hernández-Machado, J.M. Sancho, M. San Miguel, L. Pesquera;
TITLE: Joint probability distribution of nonmarkovian stochastic differential equations
JOURNAL: Zeit. Phys. B. Cond. Matter 52, 335-343 (1983)
Citations: Isi=30, Google=32
- 2.-AUTHORS: A. Hernández-Machado, F. Sagués;
TITLE: Joint probability distribution beyond the Smoluchowski limit for Brownian motion in position space
JOURNAL: Phys. Lett. A 98, 98-102 (1983)
- 3.-AUTHORS: A. Hernández-Machado, M. San Miguel;
TITLE: Dynamical properties of non-markovian stochastic differential equations
JOURNAL: J. Math. Phys. 25, 1066-1075 (1984)
Citations: Isi=14, Google=22
- 4.-AUTHORS: A. Hernández-Machado, M. San Miguel, J.M. Sancho;
TITLE: Relaxation time of processes driven by multiplicative noise
JOURNAL: Phys. Rev. A 29, 3388-3396 (1984)
Citations: Isi=80, Google=96
- 5.-AUTHORS: A. Hernández-Machado, M. San Miguel;
TITLE: Correlation functions of processes driven by external colored noise
JOURNAL: Lecture Notes in Phys. Springer-Verlag 199, 461-467 (1984)
(ISBN 3-540-12927-8) (invited)
- 6.-AUTHORS: A. Hernández-Machado, M. San Miguel, S. Katz;
TITLE: Intensity correlation functions of dye lasers: Short-time behavior
JOURNAL: Phys. Rev. A 31, 2362-2365, (1985)
Citations: Isi=36, Google=44
- 7.-AUTHORS: A. Hernández-Machado, M.A. Rodríguez, M. San Miguel;
TITLE: Correlation functions of nonlinear nuclear reactor models
JOURNAL: Ann. of Nuc. Ener., 12, 471-482 (1985)
- 8.-AUTHORS: A. Hernández-Machado, M. San Miguel;
TITLE: Dynamics of nonlinear stochastic differential equations with multiplicative colored noise
JOURNAL: Stochastic Processes applied to Physics, World Scientific Publ. Co., 270-275 (1985)
(ISBN 9971-978-20-2) (invited)
- 9.-AUTHORS: A. Hernández-Machado, M. San Miguel;
TITLE: Spectrum of transmitted light in optical bistability: Effects of phase fluctuations of the driving laser
JOURNAL: Phys. Rev. A 33, 2481-2490 (1986)

10.-AUTHORS: M. San Miguel, A. Hernández-Machado;
TITLE: Dynamic correlations in optical systems with parametric noise
JOURNAL: Optical Instabilities. Cambridge University Press, 4, 373-375 (1986)
(ISBN 0-521-32239-1) (invited)

11.-AUTHORS: A. Hernández-Machado, M. San Miguel, S. Katz;
TITLE: Correlations in a laser with fluctuating pump parameter
JOURNAL: Lecture Notes in Physics, 253, 368-371 (1986)
(ISBN 3-540-16489-8) (invited)

12.-AUTHORS: J.L. del Río-Correa, A. Hernández-Machado;
TITLE: A microscopic derivation of the generalized Onsager theory
JOURNAL: Lecture Notes in Physics, 253, 365-367 (1986)
(ISBN 0-521-32239-1) (invited)

13.-AUTHORS: M. San Miguel, L. Pesquera, M.A. Rodríguez, A. Hernández-Machado;
TITLE: Effective eigenvalue for the intensity correlations of single-mode and two-mode lasers
JOURNAL: Phys. Rev. A 35, 208-217 (1987)

14.-AUTHORS: A. Erzan, S. Grossmann, A. Hernández-Machado;
TITLE: Diffusion on random hierarchical systems
JOURNAL: J. Phys. A20, 3913-3934 (1987)
Citations: Isi=23

15.-AUTHORS: J. L. del Río-Correa, A. Hernández-Machado;
TITLE: Time evolution of the Onsager regression variables: A microscopic theory
JOURNAL: Phys. Lett. A 122, 111-116 (1987)

16.-AUTHORS: A. Hernández-Machado, D. Jasnow;
TITLE: Stability of a nonequilibrium steady state interface
JOURNAL: Phys. Rev. Rapid Comm. A 37, 656-659 (1988)
Citations: Isi=15, Google=20

17.-AUTHORS: A. Hernández-Machado, H. Guo, J.L. Mozos, D. Jasnow;
TITLE: Interfacial growth in driven diffusive systems
JOURNAL: Phys. Rev. A 39, 4783-4788 (1989)
Citations: Isi=10, Google=15

18.-AUTHORS: J. Casademunt, A. Hernández-Machado;
TITLE: Correlation functions near instabilities in systems driven by parametric noise
JOURNAL: Zeit. Physik B. Cond. Matter, 76, 403-411 (1989)

19.-AUTHORS: A. Hernández-Machado, J. Casademunt;
TITLE: Steady state dynamics in nonlinear nuclear reACTIVITYr systems
JOURNAL: NATO ASI Series. Plenum Press. B192, 247-259 (1989)
(ISBN 0-306-43102-5) (invited)

20.-AUTHORS: C.S.O. Yokoi, A. Hernández-Machado, L. Ramírez- Piscina;
TITLE: Some exact results for the lattice covering time problem
JOURNAL: Phys. Lett. A145, 82-86 (1990)
Citations: Isi=17, Google=18

- 21.-AUTHORS: A. Hernández-Machado, J.M. Sancho;
 TITLE: From lattice-gas models to nonlinear diffusion models: A derivation of macroscopic equations and fluctuations
 JOURNAL: Phys. Rev. A42, 6234-6237 (1990)
- 22.-AUTHORS: A. Hernández-Machado, J. Casademunt, M.A. Rodríguez, L. Pesquera, J.M. Noriega;
 TITLE: Theory for correlation functions of processes driven by external colored noise
 JOURNAL: Phys. Rev. A 43, 1744-1753 (1991);
 Citations: Isi=18, Google=19
- 23.-AUTHORS: J.M. Noriega, L. Pesquera, M.A. Rodríguez, J. Casademunt, A. Hernández-Machado;
 TITLE: Intensity correlation functions of dye-lasers: Comparison of colored-gain-noise and colored-loss-noise models
 JOURNAL: Phys. Rev. A 44, 2094-2101 (1991)
 Citations: Isi=24, Google=28
- 24.-AUTHORS: J.M. Noriega, L. Pesquera, M.A. Rodríguez, J. Casademunt, A. Hernández-Machado;
 TITLE: Analysis of the decay of intensity correlation functions for the gain-noise models of dye lasers
 JOURNAL: Springer-Verlag Procc. Phys. 55, 313-317 (1991) (ISBN 3-540-53602-7) (invited)
- 25.-AUTHORS: C. Yeung, T. Rogers, A. Hernández-Machado, D. Jasnow;
 TITLE: Phase separation dynamics in driven diffusive systems
 JOURNAL: J. Stat. Phys. 66, 1071-1088 (1992)
 Citations: Isi=48, Google=62
- 26.-AUTHORS: A.M. Lacasta, A. Hernández-Machado, J.M. Sancho, R. Toral;
 TITLE: Domain growth in binary mixtures at low temperatures
 JOURNAL: Phys. Rev. B 45, 5276-5281 (1992)
 Citations: Isi=39, Google=51
- 27.-AUTHORS: J. Casademunt, D. Jasnow, A. Hernández-Machado;
 TITLE: Interface equation and viscosity contrast in Hele-Shaw flow
 JOURNAL: Inter. J. Mod. Phys. B 6, 1647-1656 (1992)
 Citations: Isi=13, Google=19
- 28.-AUTHORS: C. Yeung, J.L. Mozos, A. Hernández-Machado, D. Jasnow;
 TITLE: Surface driven instability and enhanced relaxation in the dynamics of a nonequilibrium interface
 JOURNAL: J. Stat. Phys. 70, 1149-1174 (1993)
 Citations: Isi=24, Google=27
- 29.-AUTHORS: A.M. Lacasta, J.M. Sancho, A. Hernández-Machado, R. Toral;
 TITLE: Effects of domain morphology in phase separation dynamics at low temperature
 JOURNAL: Phys. Rev. B 48, 6854-6857 (1993)
 Citations: Isi=15, Google=18

- 30.-AUTHORS: L. Ramírez-Piscina, A. Hernández-Machado, J.M. Sancho;
 TITLE: Fluctuations in domain growth: Ginzburg-Landau equations with multiplicative noise
 JOURNAL: Phys. Rev. B 48, 119-124 (1993)
 Citations: Isi=17, Google=18
- 31.-AUTHORS: L. Ramírez-Piscina, J.M. Sancho, A. Hernández-Machado;
 TITLE: Numerical algorithm for Ginzburg-Landau equations with multiplicative noise: Application to domain growth
 JOURNAL: Phys. Rev. B 48, 125-131 (1993)
 Citations: Isi=53, Google=61
- 32.-AUTHORS: J. García-Ojalvo, A. Hernández-Machado, J.M. Sancho;
 TITLE: Effects of external noise on the Swift-Hohenberg equation
 JOURNAL: Phys. Rev. Lett. 71, 1542-1545 (1993)
 Citations: Isi=114, Google=162, Impact factor= 7.7
- 33.-AUTHORS: A.M. Lacasta, A. Hernández-Machado, J.M. Sancho;
 TITLE: Front and domain growth in the presence of gravity
 JOURNAL: Phys. Rev. B 48, 9418-9425 (1993)
 Citations: Isi=15, Google=21
- 34.-AUTHORS: J.M. Sancho, A. Hernández-Machado, L. Ramírez-Piscina, A.M. Lacasta;
 TITLE: Langevin equations with multiplicative noise: Application to domain growth
 JOURNAL: Acta Phys. Pol. B 24, 733-750 (1993) (invited)
- 35.-AUTHORS: A. Hernández-Machado, L. Ramírez-Piscina, J.M. Sancho;
 TITLE: Multiplicative noise in domain growth: Stochastic Ginzburg-Landau equations
 JOURNAL: NATO ASI Series B 304, 353-361 (1993) (ISBN 0-306-44481-X) (invited)
- 36.-AUTHORS: A.M. Lacasta, A. Hernández-Machado, J.M. Sancho, R. Toral;
 TITLE: Phase separation dynamics in binary mixtures at low temperatures
 JOURNAL: Computational Physics. World Scient. Publ. Cia. 314-320 (1993)
 (ISBN 981-02-1163-5) (invited)
- 37.-AUTHORS: J.L. Mozos, A. Hernández-Machado;
 TITLE: Interfacial growth in driven Ginzburg-Landau models: Short and long-time dynamics
 JOURNAL: J. Stat. Phys. 74, 131-146 (1994)
- 38.-AUTHORS: C. Van den Broeck, J.M.R. Parrondo, J. Armero, A. Hernández-Machado;
 TITLE: Mean field model for spatially extended systems in the presence of multiplicative noise
 JOURNAL: Phys. Rev. E 49, 2639-2643 (1994)
 Citations: Isi=90, Google=132
- 39.-AUTHORS: A. Hernández-Machado;
 TITLE: The effect of noise on spatio-temporal patterns
 JOURNAL: Santa Fe Institute Studies in the Sciences of Complexity 21, 521-527 Addisson Wesley
 (1994) (ISBN 0-201-40987-9) (invited)

40.-AUTHORS: J.M. López, M.A. Rodríguez, A. Hernández-Machado, A. Díaz-Guilera;
TITLE: Scaling relations and exponents in the growth of rough interfaces through random media
JOURNAL: Euro. Phys. Lett. 29, 197-202 (1995)

41.-AUTHORS: J.L. Mozos, A.M. Lacasta, L. Ramírez-Piscina, A. Hernández-Machado;
TITLE: Interfacial instability induced by external fluctuations
JOURNAL: Phys. Rev. E 53, 1459-1464 (1996)

42.-AUTHORS: R. González-Cinca, L. Ramírez-Piscina, J. Casademunt, A. Hernández-Machado,
L. Kramer, T. Toth Katona, T. Borzsonyi, A. Buka;
TITLE: Phase-field simulations and experiments of faceted growth in liquid crystals
JOURNAL: Physica D 99, 359-368 (1996)
Citations: Isi=17, Google=29

43.-AUTHORS: T. Toth Katona, T. Borzsonyi, Z. Varadi, J. Szabon, A. Buka, R.
González-Cinca, L. Ramírez-Piscina, J. Casademunt, A. Hernández-Machado;
TITLE: Pattern forming during mesophase growth in a homologous series
JOURNAL: Phys. Rev. E 54, 1574-1583 (1996)
Citations: Isi=19, Google=24

44.-AUTHORS: R. González-Cinca, L. Ramírez-Piscina, J. Casademunt, A. Hernández-Machado,
T. Toth Katona, T. Borzsonyi, A. Buka;
TITLE: Heat diffusion anisotropy in dendritic growth: phase-field simulations and experiments in
liquid crystals
JOURNAL: J. Crystal Growth 193, 712-719 (1998)
Citations: Isi=17, Google=28

45.-AUTHORS: A. M. Lacasta, L. Ramírez-Piscina, J. Casademunt, A. Hernández-Machado, M.
A. Rodríguez;
TITLE: Growth of unstable interfaces in disordered media
JOURNAL: Phys. Rev. E 57, 1459-1464 (1998)

46.-AUTHORS: R. Folch, J. Casademunt, A. Hernández-Machado, L. Ramírez-Piscina;
TITLE: Phase-field model for Hele-Shaw flows with arbitrary contrast I: theoretical approach
JOURNAL: Phys. Rev. E 60, 1724-1733 (1999)
Citations: Isi=99, Google=143

47.-AUTHORS: R. Folch, J. Casademunt, A. Hernández-Machado, L. Ramírez-Piscina;
TITLE: Phase-field model for Hele-Shaw flows with arbitrary contrast II: numerical study
JOURNAL: Phys. Rev. E 60, 1734-1740 (1999)
Citations: Isi=51, Google=70

48.-AUTHORS: R. Folch, J. Casademunt and A. Hernández-Machado;
TITLE: Viscous fingering in liquid crystals: Anisotropy and morphological transition
JOURNAL: Phys. Rev. E 61, 6632-6638 (2000)
Citations: Isi= 10, Google=17

49.- AUTHORS: T. Toth-Katona, T. Borzsonyi, A. Buka, R. González-Cinca, L. Ramírez-Piscina,
J. Casademunt, A. Hernández-Machado and L. Kramer;
TITLE: Pattern forming instabilities of the nematic smectic-B interface
JOURNAL: Physics Reports 337, 37-65 (2000)

- 50.- AUTHORS: R. González-Cinca, L. Ramírez-Piscina, J. Casademunt, A. Hernández-Machado;
 TITLE: Sidebranching induced by external noise in solutal dendritic growth;
 JOURNAL: Phys. Rev. E 63, 051602-1-05602-9 (2001)
 Citations: Isi=12, Google=24
- 51.- AUTHORS: A. Hernández-Machado, J. Soriano, A. M. Lacasta, M. A. Rodríguez, L. Ramírez-Piscina, J. Ortín;
 TITLE: Interface roughening in Hele-Shaw flows with quenched disorder: experimental and theoretical results
 JOURNAL: Euro. Phys. Lett. 55, 194-200 (2001)
 Citations: Isi=41, Google=65
- 52.- AUTHORS: R. Folch, T. Toth-Katona, A. Buka, J. Casademunt, A. Hernández-Machado;
 TITLE: Periodic forcing in viscous fingering of a nematic liquid crystal;
 JOURNAL: Phys. Rev. E 64, 056225-1-056225-9 (2001)
 Citations: Google=10
- 53.- AUTHORS: R. González-Cinca, L. Ramírez-Piscina, J. Casademunt, A. Hernández-Machado;
 TITLE: Sidebranching in solutal dendritic growth;
 JOURNAL: Branching in Nature, 403-408. EDF Sciences. Springer-Verlag (2001)
 (ISBN 3-540-41888-1) (invited)
- 54.- AUTHORS: R. Folch, J. Casademunt, A. Hernández-Machado; TITLE:
 Branching transition in viscous fingering with a liquid crystal;
 JOURNAL: Branching in Nature, 439-444. EDF Sciences. Springer-Verlag (2001)
 (ISBN 3-540-41888-1) (invited)
- 55.- AUTHORS: J. Soriano, J.J. Ramasco, M.A. Rodríguez, A. Hernández-Machado, J. Ortín;
 TITLE: Anomalous roughening of Hele-Shaw flows with quenched disorder;
 JOURNAL: Phys. Rev. Lett. 89, 026102-1-4 (2002)
 Citations: Isi=40, Google=61, Impact factor=7.7
- 56.- AUTHORS: J. Soriano, J. Ortín, A. Hernández-Machado;
 TITLE: Experiments of interfacial roughening in Hele-Shaw flows with weak quenched disorder;
 JOURNAL: Phys. Rev. E 66, 031603-1-18 (2002)
 Citations= 33, Google=50
- 57.- AUTHORS: J. Soriano, J. Ortín, A. Hernández-Machado;
 TITLE: Anomalous roughening in experiments of interfaces in Hele-Shaw flows with strong quenched disorder;
 JOURNAL: Phys. Rev. E 67, 056308-1-12 (2003)
 Citations: Isi=14, Google=26
- 58.- AUTHORS: A. Hernández-Machado, A.M. Lacasta, E. Mayoral, E. Corvera Poiré; TITLE: Phase-field model of Hele-Shaw flows in the high-viscosity contrast regime;
 JOURNAL: Phys. Rev. E. 68, 046310-1-6 (2003)
 Citations: Isi=16, Google=35
- 59.- AUTHORS: R. González-Cinca, Yves Couder, J. Maurer, A. Hernández-Machado;
 TITLE: The role of noise in sidebranching development;
 JOURNAL: Fluctuations and Noise Letters, 4, L535-L544 (2004)

60.- AUTHORS: R. González-Cinca, R. Folch, R. Benítez, L. Ramírez-Piscina, J. Casademunt, A. Hernández-Machado;

TITLE: Phase-field models in interfacial pattern formation out of equilibrium;

JOURNAL: Advances in condensed matter and statistical mechanics, 203-236. Nova Science Publishers (2004) (ISBN 1-59033-899-5) (invited)

Citations: Google=20

61.- AUTHORS: R. González-Cinca, Yves Couder, J. Maurer, A. Hernández-Machado;

TITLE: Deterministic versus noisy behavior in sidebranching;

JOURNAL: Noise in Complex Systems and stochastic Dynamics II, 5471 280-288. The International Society for Optical Engineering (2004) (ISBN 0-8194-5393-5)

Citations: Google=10

62.- AUTHORS: R. Ledesma-Aguilar, M. Quevedo-Reyes, E. Corvera Poiré, A. Hernández-Machado;

TITLE: Lateral instability in normal viscous fingers;

JOURNAL: Phys. Rev. E 71, 016312-1-7 (2005)

Citations: Google=11

63.- AUTHORS: Y. Couder, J. Maurer, R. González-Cinca, A. Hernández-Machado;

TITLE: Side-branch growth in two-dimensional dendrites. Part I: Experiments;

JOURNAL: Phys. Rev. E 71, 031602-1-12 (2005)

Citations: Isi=34, Google=42

64.- AUTHORS: R. González-Cinca, Yve Couder, A. Hernández-Machado;

TITLE: Side-branch growth in two-dimensional dendrites. Part II: Phase-field model;

JOURNAL: Phys. Rev. E 71, 051601-1-7 (2005)

65.- AUTHORS: J. Soriano, A. Mercier, R. Planet, A. Hernández-Machado, M. Rodríguez, J. Ortín;

TITLE: Anomalous roughening of viscous fluid fronts in spontaneous imbibition;

JOURNAL: Phys. Rev. Lett. 95, 104501-1-4 (2005)

Citations: Isi= 29, Google=49, Impact factor= 7.489

66.- AUTHORS: F. Campelo, A. Hernández-Machado;

TITLE: Dynamic model and stationary shapes of fluid vesicles;

JOURNAL: European Phys. J. E 20, 37-45 (2006)

Citations: Isi=49, Google=69

67.- AUTHORS: M. Torralba, J. Ortín, A. Hernández-Machado, E. Corvera Poiré;

TITLE: Fluctuations in Saffman-Taylor fingers with quenched disorder;

JOURNAL: Phys. Rev. E 73, 046302-1-7 (2006)

Citations: Google=10

68.- AUTHORS: M. Quevedo-Reyes, E. Corvera Poiré, A. Hernández-Machado;

TITLE: Phase-field approach to spatial perturbations in normal Saffman-Taylor fingers;

JOURNAL: Phys. Rev. E 73, 066308-1-8 (2006)

69.- AUTHORS: M. Pradas, A. Hernández-Machado;

TITLE: Intrinsic versus super-rough anomalous scaling in spontaneous imbibition;

JOURNAL: Phys. Rev. E 74, 041608 (2006)

Citations: Isi=15, Google=25

- 70.- AUTHORS: F. Campelo, A. Hernández-Machado;
 TITLE: Shape instabilities in vesicles: A phase-field model;
 JOURNAL: Eur. Phys. J. Special Topics 143, 101-108 (2007)
 Citations: Isi=23, Google=34
- 71.- AUTHORS: M. Pradas, J.M. López, A. Hernández-Machado;
 TITLE: Time-dependent couplings and crossover length scales in non-equilibrium surface roughening;
 JOURNAL: Phys. Rev. E Rapid Comm. 76, 010102 (R) (2007)
 Citations: Isi=12, Google=14
- 72.- AUTHORS: F. Campelo, A. Hernández-Machado;
 TITLE: Model for curvature-driven pearling instability in membranes;
 JOURNAL: Phys. Rev. Lett. 99, 088101 (2007)
 Citations: Isi=41, Google=63, Impact factor= 6.944
- 73.- AUTHORS: R. Ledesma-Aguilar, A. Hernández-Machado, I. Pagonabarraga;
 TITLE: Three dimensional aspects of fluid flows in channels. I. Meniscus and thin film regimes;
 JOURNAL: Phys. of Fluids 19, 102112 (2007)
 Citations: Isi=10, Google=12
- 74.- AUTHORS: R. Ledesma-Aguilar, I. Pagonabarraga, A. Hernández-Machado;
 TITLE: Three dimensional aspects of fluid flows in channels. II. Effects of Meniscus and thin film regimes on viscous fingers;
 JOURNAL: Phys. of Fluids 19, 102113 (2007)
 Citations: Google=17
- 75.- AUTHORS: R. Planet, M. Pradas, A. Hernández-Machado, J. Ortín;
 TITLE: Pressure-dependent scaling scenarios in experiments of spontaneous imbibition;
 JOURNAL: Phys. Rev. E 76 056312 (2007)
 Citations: Isi=11, Google=18
- 76.- AUTHORS: F. Campelo, A. Hernández-Machado;
 TITLE: Dynamic instabilities in biological membranes;
 JOURNAL: ASP Conference Series Proc. Appl. Math. Mech 7, 1121403(2007)
- 77.- AUTHORS: M. Torralba, J. Ortín, A. Hernández-Machado, E. Corvera Poiré; TITLE:
 Experiments of periodic forcing of Saffman-Taylor fingers;
 JOURNAL: Phys. Rev. E 77 03627-1-9 (2008)
- 78.- AUTHORS: M. Castro, M. Bravo-Gutiérrez, A. Hernández-Machado, E. Corvera Poiré;
 TITLE: Dynamic characterization of permeabilities and flows in microchannels;
 JOURNAL: Phys. Rev. Lett. 101, 224501-1-4 (2008) Impact factor= 7.18
- 79.- AUTHORS: M. Pradas, A. Hernández-Machado, M.A. Rodríguez;
 TITLE: Dynamical scaling of imbibition in columnar geometries;
 JOURNAL: Phys. Rev. E 77 056305-1-10 (2008)
- 80.- AUTHORS: F. Campelo, A. Hernández-Machado;
 TITLE: Polymer-induced tubulation in lipid vesicles;
 JOURNAL: Phys. Rev. Lett. 100 158103-1-4 (2008)
 Citations: Isi=26, Google=40, Impact factor= 7.18

- 81.- AUTHORS: R. Ledesma-Aguilar, A. Hernández-Machado, I. Pagonabarraga;
 TITLE: Dynamics of driven three-dimensional thin films: From hydrophilic to superhydrophobic substrates;
 JOURNAL: Phys. of Fluids 20 072101-1-12 (2008)
 Citations: Google=10
- 82.- AUTHORS: T. Laurila, M. Pradas, A. Hernández-Machado, T. Ala-Nissila;
 TITLE: Influence of disorder on phase-field models of interfacial growth;
 JOURNAL: Phys. Rev. E 78 031603-1-7 (2008)
- 83.- AUTHORS: M. Castro, A. Hernández-Machado, R. Cuerno;
 TITLE: Single phase-field model of stepped surfaces;
 JOURNAL: Phys. Rev. E 79 021601-1-8 (2009)
- 84.- AUTHORS: M. Pradas, J.M. López, A. Hernández-Machado;
 TITLE: Avalanche dynamics in fluid imbibition near the depinning transition;
 JOURNAL: Phys. Rev. E 80, 050101 Rapid Comm. (2009)
 Citations: Isi=16, Google=23
- 85.- AUTHORS: R. Ledesma-Aguilar, A. Hernández-Machado, I. Pagonabarraga;
 TITLE: Dynamics of gravity driven three-dimensional thin films on hydrophilic-hydrophobic patterned substrates;
 JOURNAL: Langmuir, 26, 3292 (2010)
- 86.- AUTHORS: I. Horger, F. Campelo, A. Hernández-Machado, P. Tarazona;
 TITLE: Constricting force of filamentary protein rings evaluated from experimental results;
 JOURNAL: Phys. Rev. E 81, 031922 (2010)
 Citations: Isi=10, Google=17
- 87.- AUTHORS: J.M. López, M. Pradas, A. Hernández-Machado;
 TITLE: Activity statistics, avalanche kinetics and velocity correlations in surface growth;
 JOURNAL: Phys. Rev. E 82, 031127 (2010)
 Citations: Isi=11, Google=20
- 88.- AUTHORS: R.A. Barrio, A. Hernández-Machado, C. Varea, J.R. Romero-Arias, E.R. Alvarez-Buylla;
 TITLE: Flower development as a interplay between dynamical physical fields and genetic networks;
 JOURNAL: Plos-one 5, e-13523 (2010)
 Citations: Isi=17, Google=30
- 89.- AUTHORS: E. Corvera Poiré, A. Hernández-Machado;
 TITLE: Frequency-induced stratification in viscoelastic microfluidics;
 JOURNAL: Langmuir, 26, 15084 (2010)
- 90.- AUTHORS: M. Bravo-Gutiérrez, M. Castro, A. Hernández-Machado, E. Corvera Poiré;
 TITLE: Controlling viscoelastic flow in microchannels with slip;
 JOURNAL: Langmuir 27, 2075-2079 (2011)
- 91.- AUTHORS: R. Ledesma-Aguilar, R. Nistal, A. Hernández-Machado, I. Pagonabarraga
 TITLE: Controlled drop emission by wetting properties in driven liquid filaments;
 JOURNAL: Nature Materials 10, 367-371 (2011)
 Citations: Isi=44, Google=60, Impact factor= 32.841

- 92.- AUTHORS: M. Queralt, M. Pradas, R. Rodríguez- Trujillo, M. Arundell, E. Corvera Poiré, A. Hernández-Machado;
 TITLE: Pinning and avalanches in hydrophobic microchannels;
 JOURNAL: Phys. Rev. Lett. 106, 194501 (2011)
 Citations: Isi=10, Google=24, Impact factor= 7.37
- 93.- AUTHORS: R. Travasso, E. Corvera Poiré, M. Castro, J. C. Rodríguez-Manzaneque, A. Hernández-Machado;
 TITLE: Tumor angiogenesis and Vascular patterning: A mathematical model;
 JOURNAL: Plos-one, 6, 19989 (2011)
 Citations: Isi=52, Google=91
- 94.- AUTHORS: C. Varea, R.A. Barrio, A. Hernández-Machado;
 TITLE: Curvature multiphase field model for phase separation on a membrane;
 JOURNAL: Phys. Rev. E 84, 061922 (2011)
- 95.- AUTHORS: R. Ledesma-Aguilar, A. Hernández-Machado, I. Pagonabarraga;
 TITLE: Growth saturation of unstable thin films on transverse-striped hydrophilic-hydrophobic micropatterns;
 JOURNAL: Soft Matter, 7, 6051-6060 (2011)
- 96.- AUTHORS: F. Campelo, A. Cruz, J. Pérez-Gil, L. Vazquez, A. Hernández-Machado;
 TITLE: Phase-field model for the morphology of monolayer lipid domains;
 JOURNAL: Euro. Phys. J. E 35, 49 (2012)
- 97.- AUTHORS: K.A. Melzak, G.R. Lazaro, A. Hernández-Machado, I. Pagonabarraga, J.M. Cardenas Diaz de Espada, J.L. Toca-Herrera;
 TITLE: AFM measurements and lipid rearrangement: evidence from red blood cell shape changes;
 JOURNAL: Soft Matter, 8, 7716 (2012)
 Citations: Isi=11, Google=21
- 98.- AUTHORS: R. Ledesma-Aguilar, A. Hernández-Machado, I. Pagonabarraga;
 TITLE: Theory of wetting-induced fluid entrainment by advancing contact lines on dry surfaces;
 JOURNAL: Phys. Rev. Lett. 110, 264502 (2013)
 Citations: Isi=11, Google=14, Impact factor=7.728
- 99.- AUTHORS: G.R. Lazaro, K.A. Melzak, J.L. Toca-Herrera, I. Pagonabarraga, A. Hernández-Machado;
 TITLE: Elastic energies and morphologies of the first stages of the discoechinocyte transition;
 JOURNAL: Soft Matter, 9, 6430-6441 (2013)
 Citations: Google=10
- 100.- AUTHORS: G.R. Lazaro, A. Hernández-Machado, I. Pagonabarraga;
 TITLE: Rheology of red blood cells under flow in high confined microchannels. I. Effect of elasticity;
 JOURNAL: Soft Matter, 10, 7195 (2014)
 Citations: Isi=21, Google=28
- 101.- AUTHORS: G.R. Lazaro, A. Hernández-Machado, I. Pagonabarraga;
 TITLE: Rheology of red blood cells under flow in high confined microchannels. II. Effect of focusing and confinement;
 JOURNAL: Soft Matter, 10, 7207 (2014)
 Citations: Isi=14, Google=17

- 102- AUTHORS: G.R. Lazaro, I. Pagonabarraga, A. Hernández-Machado;
TITLE: Phase-field theories for mathematical modeling of biological membranes;
JOURNAL: Chemistry and Physics of Lipids. Special Issue on Membrane Mechanics: from molecular to cellular scale, 185, 4660 (invited) (2015)
- 103-AUTHORS: S.A. Setu, R.P.A. Dullens, A. Hernández-Machado, I. Pagonabarraga, D.G.A.L. Aarts, R. Ledesma-Aguilar;
TITLE: Superconfinement tailors fluid flow at micro-scales;
JOURNAL: Nature Communications, 6, 7297 (2015)
Citation: Isi=11, Google=13 Impact factor=11.47
- 104-AUTHORS: C.B. Picallo, R.A. Barrio, C. Varea, T. Alarcón, A. Hernández-Machado;
TITLE: Phase-field modelling of the dynamics of Z-ring formation in liposomes: Onset of constriction and coarsening;
JOURNAL: European Phys. J. E, 38, 61 (2015)
- 105- AUTHORS: R.A. Barrio, C. Varea, T. Alarcón, C.B. Picallo, A. Hernández-Machado;
TITLE: Dynamics of Z-ring formation in liposomes;
JOURNAL: Proceedings of the International Symposium on Mathematical and Computational Biology, Ed. R.B. Mondaini. World Scientific Publ. Co. (2015) (ISBN 978-981-4667-93-7) (invited)
- 106-AUTHORS: C. Trejo-Soto, E. Costa-Miracle, I. Rodriguez-Villareal, J. Cid, T. Alarcón, A. Hernández-Machado;
TITLE: Capillary filling at the microscale: Control of fluid front using geometry;
JOURNAL: Plos-one, 0153559, 1-18 (2016)
- 107.- AUTHORS: C. Trejo-Soto, E. Costa-Miracle, I. Rodriguez-Villareal, J. Cid, M. Castro, T. Alarcon, A. Hernández-Machado;
TITLE: Front microrheology of the non-Newtonian behavior of blood: scaling theory of erythrocyte aggregation by aging;
JOURNAL: Soft Matter, 13, 3042 (2017)
DOI: [10.1039/C6SM02412B](https://doi.org/10.1039/C6SM02412B)
- 108.- AUTHORS: G.R. Lazaro, I. Pagonabarraga, A. Hernandez-Machado;
TITLE: Elastic and dynamic properties of membrane phase-field models;
JOURNAL: European Phys. J. E 40, 77 (2017)
- 109-AUTHORS: G.R. Lazaro, A. Hernandez-Machado, I. Pagonabarraga;
TITLE: Collective behavior of red blood cells in confined channels;
JOURNAL: Preprint (2018)
- 110-AUTHORS: R.A. Barrio, T. Alarcón, A. Hernández-Machado;
TITLE: Dynamics of shapes of the bacterial cell membrane;
JOURNAL: Soft Matter (Submitted) (2018)
- 111-AUTHORS: I.Dominguez-Roman, R.A. Barrio A. Hernandez-Machado;
TITLE: Fluid front advance in hydrophilic structured micro channels;
JOURNAL: Preprint (2018)
- 112-AUTHORS: S. Salinas-Almaguer, M. Mell, V.G. Almenro-Vedia, J.C. Ruiz-Suarez, F. Monroy, T. Alarcon, R. A. Barrio, A. Hernández-Machado;
TITLE: A biomechanical strategy to control bacterial proliferation;
JOURNAL: Nature Physics (Under revision) (2018)

- 113.- AUTHORS: C. Trejo-Soto, E. Costa-Miracle, I. Rodriguez-Villareal, J. Cid, M. Castro, T. Alarcon, A. Hernandez-Machado;
TITLE: Front microrheology of biological fluids;
JOURNAL: J. of Physics: Conf. Series, 1043, 012058 (2018)
- 114.-AUTHORS: E. Ruiz-Gutierrez, S. Armstrong, S. Leveque, C. Michel, I. Pagonabarraga, G. G. Wells, A. Hernández-Machado, R. Ledesma-Aguilar;
TITLE: The long cross-over dynamics of capillary imbibition;
JOURNAL: Preprint (2018)
- 115.-AUTHORS: L. Ortega-Tana, A.I. Rodriguez-Villarreal, J. Cid, J. Colomer-Farrarons, A. Hernandez-Machado, T. Alarcon, P.L. Miribel-Catala,;
TITLE: A micro-rheometer to measure blood viscosity based on microfluidic velocity;
JOURNAL: Preprint (2018)
- 116.- AUTHORS: C. Trejo-Soto, A. Hernandez-Machado;
TITLE: Relation between blood viscosity and bending rigidity of erythrocytes;
JOURNAL: Preprint (2018)
- 117.- AUTHORS: Y-H. Kim Im, R. Rodriguez-Trujillo, A. Hernandez-Machado;
TITLE: Experimental study of the liquid-liquid interface with coaxial flow focusing in microdevices;
JOURNAL: Microfluidics and nanofluidics (Under revision) (2018)
- 118.- AUTHORS: J. Flores, , A. Hernandez-Machado E. Corvera Poiré;
TITLE: Contact line dynamics of pulsatile fluid interfaces modulated by wetting;
JOURNAL: Preprint (2018)

Patent

AUTHORS: T. Alarcon, A.I. Rodriguez-Villarreal, J. Colomer, A. Hernandez-Machado, P.L. Miribel,

TITLE: Method, apparatus and micro-rheometer for measuring rheological properties of newtonian and non-newtonian fluids,

European Patent Office number: 15382248.1 (2016)

United States Patent Application Serial number: 15/574.021 (2017)

Patent in operation by the start-up Company Rheo Diagnostics S.L.

Research Projects

- Principal Investigator

TITLE: Biomechanics of biofluids and biomembranes at the microscale: Experiments and theory
FUNDED BY: Ministerio de Economía y Competitividad, Programa Estatal de Fomento de la Investigación Científica y Técnica de Excelencia
N. Proj. FIS2016-78883-C2-1-P,
PERIOD: 2017-19
AMOUNT: 60.000 euros
COORDINATOR: A. Hernandez-Machado

TITLE: Dynamics of interfacial systems at the micro and nanoscale: Biomembranes and microfluidics
FUNDED BY: Ministerio de Economía y Competitividad. Programa Estatal de Fomento de la Investigación Científica y Técnica de Excelencia
N.Proj. FIS2013-47949-C2-1-P **PERIOD:** 2014-17
AMOUNT: 72.600 euros
COORDINATOR: A. Hernández-Machado

TITLE: Dinámica interfacial en fluidos y sistemas biofísicos
FUNDED BY: Ministerio de Ciencia e Innovación. Programa Nacional de Física. N.Proj. FIS2009-12964-C05-02.
PERIOD: 2009-13.
AMOUNT: 177.870 euros.
RESEARCH LEADER: A. Hernández-Machado

TITLE: Dinámica interfacial en nanotecnología, fluidica y biofísica
FUNDED BY: Dirección General de Investigación (MCyT). Programa Nacional de Física. N.Proj. FIS2006-12253-C06-05.
PERIOD: 2006-09.
AMOUNT: 65.340 euros.
RESEARCH LEADER: A. Hernández-Machado

TITLE: Dinámica interfacial en nanoestructuras y fluidos complejos
FUNDED BY: Dirección General de Investigación Científica y Tecnológica (MCyT). Programa Nacional de Promoción General del Conocimiento. N.Proj. BFM2003-07749-C05-04.
PERIOD: 2003-2006.
AMOUNT: 102.740 euros.
RESEARCH LEADER: A. Hernández-Machado

TITLE: Dinámica no lineal y sus aplicaciones en medios porosos
FUNDED BY: Dirección General de Investigación Científica (MCT). Programa Nacional de Promoción General del Conocimiento P1. N.Proj. BFM2000-0628-C03-01.
Coordinated with Universidad de Cantabria.
PERIOD: 2000-2003.
AMOUNT: 4.580.000 ptas.
COORDINATOR: A. Hernández-Machado

TITLE: Estructuras espacio-temporales fuera del equilibrio: Dinámica y desorden
FUNDED BY: DGES. Programa Sectorial de Promoción General del Conocimiento. N.Proj. PB96-0378-C02-01.
Coordinated with Universidad de Cantabria.
PERIOD: 1997-2000.
AMOUNT: 10.900.000 ptas.
COORDINATOR: A. Hernández-Machado

TITLE: Estructuras espacio-temporales fuera del equilibrio
FUNDED BY: DGICyT. Programa Sectorial de Promoción General del Conocimiento. N.Proj. PB93-0054-C02-01.
Coordinated with Universidad de Cantabria.
PERIOD: 1994-97.
AMOUNT: 5.190.000 ptas.
COORDINATOR: A. Hernández-Machado

TITLE: Interfacial instabilities and pattern formation in physical systems
FUNDED BY: NATO Collaborative Research Grant No. 900328
Coordinated with University of Pittsburgh. (U.S.A.)
PERIOD: 1990 and Renewal 1991
AMOUNT: 300.000 BF and 200.000 BF
COORDINATOR: A. Hernández-Machado

TITLE: Nonlinear dynamics of pattern formation in physical systems
FUNDED BY: NATO Collaborative Research Grant No. 931018
Coordinated with McGill University, Montreal (Canada) and Lehigh University (U.S.A.)
PERIOD: 1993-1995
AMOUNT: 263.000 BF
COORDINATOR: A. Hernández-Machado

TITLE: Frontiers in interface physics: microfluidics, biomembranes and nanostructures
FUNDED BY: Ministerio de Economía y Competitividad. Accion complementaria N.Proj. FIS2009-07849-E and Centro de Ciencias de Benasque Pedro Pascual
PERIOD: 2010
AMOUNT: 10.000 euros
COORDINATOR: A. Hernández-Machado

Participation:

TITLE: Towards novel nano-scale technologies based on phoretic flow effects (NANOPHLOW)
FUNDED BY FINANCIADORA: HORIZON 2020 (2014-2020). FET-Open research and innovation actions (H2020-FETOPEN-1-2016-2017) . European Union
PERIOD: 2014 - 2020
AMOUNT: 573.750,00 euros
COORDINATOR: I. Pagonabarraga

TITLE: Cost Action “Flowing Matter” (MP1305)
FUNDED BY : European Union Framework Programme Horizon 2020
PERIOD: 2014-2018
AMOUNT: 100.000.000 euros
COORDINATOR: F. Toschi

TITLE: Barcelona Graduate School of Mathematics (BSGMATH)
FUNDED BY: Excelencia Maria de Maeztu 2015
PERIOD: 2014-2018
AMOUNT: 2.000.000 euros
COORDINATOR: M. Noy

TITLE: Pattern formation, noise and spatio-temporal chaos in complex systems
FUNDED BY FINANCIADORA: European network of the Fourth Framework Programme for the Training and Mobility of Researchers. European Commission. No. ERB FM RXCT 96-0085
PERIOD: 1996-2001.
AMOUNT: 1.704.000 ECU.
COORDINATOR: L. Kramer

TITLE: Nonequilibrium physics from complex fluids to biological systems
FUNDED BY : European network of the Fifth Framework Programme. for the Training and Mobility of Researcher Training Networks. European Commission. No. HPRN-CT- 2002-00312
PERIOD: 2002-2005.
AMOUNT: 1.400.000 Euros.
COORDINATOR: J. Casademunt

TITLE: Física no lineal
FUNDED BY: Grup de Recerca Consolidats en Fisica No Lineal. Generalitat de Catalunya
2001 SGR 00433, 2005 SGR 0507, 2009 SGR 00014, 2014 SGR 878, 2017 SGR 1061
PERIOD: 2001-2004, 2005-2008, 2009-2012, 2014-2016, 2017-2019
AMOUNT: 25.242,51 Euros, 41.200 Euros, 44.720 Euros, 38.400 Euros,
20.000 Euros
COORDINATOR: J. Ortín

Previous Projects:

TITLE: Fenómenos cooperativos en física teórica
FUNDED BY: CAICYT 596/81
PERIOD: 1982-1984
RESEARCH LEADER: L. Garrido

TITLE: Aplicaciones de la Metodología de los Procesos Estocásticos al Estudio de las Fluctuaciones y Transiciones de Fase en Sistemas Físicos
FUNDED BY: CAYCIT 361/84
Coordinated with Universidad de Santander
PERIOD: 1986-1988
COORDINATOR: M. San Miguel

TITLE: Cinética de Transiciones de Fase
FUNDED BY: Comité Conjunto Hispano-Americano CCB 8402025
Coordinated with Temple University and New York University (U.S.A.)
PERIOD: 1985-1987
COORDINATOR: J. Gunton

TITLE: Estudio de fluctuaciones e inestabilidades en sistemas físicos
FUNDED BY: DGICYT. PB87-0014
Coordinated with Universidad de Cantabria
PERIOD: 1989-1991
COORDINATOR: J.M. Sancho.

TITLE: Estudio de fluctuaciones e inestabilidades en sistemas físicos
FUNDED BY: DGICYT. PB90-0030
PERIOD: 1992-1994
RESEARCH LEADER: J.M. Sancho.

TITLE: Dinámica no lineal
FUNDED BY: Grup de Recerca Consolidats. Generalitat de Catalunya GRQ931004, 1995SGR00459, 1997SGR00090 y 1999SGR0001
PERIOD: 1995-96, 1996-97, 1998-99 y 2000-01
AMOUNT: 3.000.000, 3.500.000, 1.750.000 y 2.000.000 ptas.
COORDINATOR: F.Sagués

Awards, Fellowships, Sabbaticals

FELLOWSHIP: Postdoctoral
RECIPIENT: A. Hernández-Machado
FUNDED BY: Ministerio de Educación y Ciencia
PERIOD: Octubre-Septiembre 1985-86 (12 months)
CENTER: Philipps Universitat, Marburg (Germany)

FELLOWSHIP: Postdoctoral
RECIPIENT: A. Hernández-Machado
FUNDED BY: Comisión Fulbright
PERIOD: Enero-Diciembre 1987 (12 months)
CENTER: University of Pittsburgh (U.S.A.)

AWARD: A. Von Humboldt- J. C. Mutis 1994
RECIPIENT: L. Kramer
FUNDED BY: Dirección General de Investigación Científica y Técnica (MEC)
PROPOSED BY: A. Hernández-Machado

SABBATICAL: Beques per a la recerca fora de Catalunya
RECIPIENT: A. Hernández-Machado
FUNDED BY: Direcció General de Recerca, Generalitat de Catalunya
PERIOD: Febrero-Julio 2001 (6 months)
AMOUNT: 1.990.000 ptas.
CENTER: Universite Pierre et Marie Curie (France)

SABBATICAL: Beques de recerca per a professors visitants a Catalunya
RECIPIENT: E. Corvera Poire
FUNDED BY: Direcció General de Recerca, Generalitat de Catalunya
PERIOD: Febrero-Enero 2005-06 (12 months)
AMOUNT: 19.375 euros.
PROPOSED BY: A. Hernandez-Machado

SABBATICAL: Ayudas para la movilidad de profesores extranjeros
RECIPIENT: E. Corvera Poire
FUNDED BY: Secretaria de Estado de Universidades e Investigacion (MEC)
PERIOD: Febrero-Enero 2006-07 (12 months)
AMOUNT: 31.300 euros.
PROPOSED BY: A. Hernandez-Machado

AWARD: Award for outstanding doctoral thesis research in biological physics (2009)
RECIPIENT: F. Campelo
FUNDED BY: American Physical Society (U.S.A.)
SUPERVISOR: A. Hernández-Machado

AWARD: Premio de Científicos de Excelencia del Extranjero. Concurso Atracción de Capital Humano Avanzado del Extranjero (2018)
RECIPIENT: A. Hernandez-Machado
FUNDED BY: CONICYT (Chile)
PROPOSED BY: Claudia Trejo-Soto

Research Stays

(more than 4 weeks)

P=Postdoctoral, I=Invited C=Contrat, S=Sabbatical

CENTER: Fachbereich Physik. Philipps Universitat

PLACE: Marburg PAIS: Germany AÑO:1985-86 PERIOD: 12 months

TOPIC: Difussion on random hierarchical structures P

CENTER: Physics Department. University of Pittsburgh

PLACE: Pittsburgh PAIS: U.S.A. AÑO:1987 PERIOD: 12 months

TOPIC: Interfacial instabilities P

CENTER: Physics Department. University of Pittsburgh

PLACE: Pittsburgh PAIS: U.S.A. AÑO:1988 PERIOD: 3 months

TOPIC: Interfacial instabilities and pattern formation C

CENTER: Physics Department. University of Pittsburgh

PLACE: Pittsburgh PAIS: U.S.A. AÑO:1990 PERIOD: 3 months

TOPIC: Interfacial instabilities and pattern formation C

CENTER: Institute for Theoretical Physics. University of California

PLACE: Santa Barbara PAIS: U.S.A. AÑO:1992 PERIOD: 2 months

TOPIC: Spatio-temporal structures out of equilibrium I

CENTER: Department of Physics. McGill University.

PLACE: Montreal PAIS: Canada AÑO:1995 PERIOD: 5 weeks

TOPIC: Non-lineal dynamics and pattern formation in physical systems I

CENTER: Groupe de Physique des Solides. Universite Pierre et Marie Curie

PLACE: Paris PAIS: France AÑO: 2001 PERIOD: 6 months

TOPIC: Sidebranching in solids S

CENTER: Facultad de Química. Universidad Nacional Autónoma de México

PLACE: México D.F. PAIS: México AÑO: 2008 PERIOD: 2 months

TOPIC: Microfluidics I

Research Topics

MAIN TOPIC: Condensed Matter Physics, Non-equilibrium Statistical Physics, Physics of Complex Systems, Biophysics, Microfluidics

DATE:1981-...

KEY WORDS : Transitions, non-linear dynamics, fluctuations, liquid crystals, viscous liquids, solids, viscoelastic fluids, dynamic wetting, nanostructures, biological membranes, microchannels

LINE 1.: STOCHASTIC PROCESSES

TOPIC 1.1.: Theory

CENTER: Universidad de Barcelona. DATES:1981-91

KEY WORDS : Fokker-Planck equations, Langevin equations, Brownian motion, External noise, Non-markovicity, Correlation functions

PUBLICATIONS: [1-5,8,12,15,18,20,22]

TOPIC 1.2.: Applications

CENTER: Universidad de Barcelona. DATES: 1984-91

KEY WORDS : Fluctuations in dye-lasers and optical bistability, neutron fluctuations in nuclear reactors

PUBLICATIONS: [6,7,9-11,13,19,23,24]

TOPIC 1.3.: Disorder systems and turbulence

CENTER: Philipps Universitat. Marburgh (Germany) DATES: 1985-86

KEY WORDS : Anomalous diffusion, Intermittency, Master equation with disorder

PUBLICATIONS: [14]

LINE 2.: INTERFACES AND PATTERN FORMATION

TOPIC 2.1.: Interfacial instabilities

CENTER: University of Pittsburgh (U.S.A.)/Universidad de Barcelona. DATES: 1987-...

KEY WORDS : Non-equilibrium diffusive systems, viscous fluid flows in Hele-Shaw cells, Dendritic growth in liquid crystals and solids, external fluctuations

PUBLICATIONS: [16,17,25,27,28,37,41-44,46-50,52-54,58-64,77]

TOPIC 2.2.: Disordered media. Static disorder

CENTER: Universidad de Barcelona. DATES: 1994-..

KEY WORDS : Roughnesses, interfacial instabilities

PUBLICATIONS: [40,45,51,55-57,65,67-69,71,75,79,82,84,87]

LINE 3.: SPATIAL DEPENDENCE GROWTH AND FLUCTUATIONS

TOPIC 3.1.: Phase-separation dynamics and domain growth

CENTER: Universidad de Barcelona DATES: 1990-..

KEY WORDS : Ginzburgh-Landau models, scaling, fluctuations

PUBLICATIONS: [21,25,26,29-31,33-36,94]

TOPIC 3.2.: Fluctuations in systems with spatial dependence

CENTER: Universidad de Barcelona/ITP University of California (U.S.A.) DATES: 1992-94

KEY WORDS : Noise-induced transitions, Swift-Hohenberg equation

PUBLICATIONS: [32,38,39]

LINEA 4.: PHYSICS OF COMPLEX SYSTEMS

TOPIC 4.1.: Dynamic wetting and thin films

CENTER: Universite Pierre et Marie Curie/Universidad de Barcelona. DATE:2001-..

KEY WORDS : Contact line, histeresis, roughening and instabilities in three dimensions

PUBLICATIONS: [73,74,81,84,85,91,95,98,103]

TOPIC 4.2: Biophysics of biological membranes

CENTER: Universidad de Barcelona. DATES: 2003-..

KEY WORDS : Interface dynamics of biological membranes, domain growth in vesicles

PUBLICATIONS: [66,70,72,76,80,86,96,97,99,100,101,102,108]

TOPIC 4.3: Microfluidics

CENTER: Universidad de Barcelona. DATES: 2005-..

KEY WORDS : PUBLICATIONS: [78,89,90,92]

TOPIC 4.4: Nanostructures

CENTER: Universidad de Barcelona. DATES: 2006-..

KEY WORDS : Molecular epitaxy, terraces, nanopatterning

PUBLICATIONS: [83]

TOPIC 4.5: Division, differentiation and cellular growth

CENTER: Universidad de Barcelona. DATES: 2008-..

KEY WORDS : Flower development, angiogenesis and tumor growth, liposome constriction

PUBLICATIONS: [88,93,104,105]

TOPIC 4.6: Front Microrheology

CENTER: Universidad de Barcelona/Centre de Recerca Matemàtica.DATES: 2012-..

KEY WORDS : Nonlinear rheology, viscosity of biological fluids

PUBLICATIONS: [106, 107, 113]

Invited Conferences

1.- TYPE OF PARTICIPATION: Invited conference

TITLE: Correlation functions of processes driven by external colored noise

CONFERENCE: Recent Developments in Nonequilibrium Thermodynamics

PLACE: Bellaterra. España (1983)

2.- TYPE OF PARTICIPATION: Invited conference

TITLE: Dynamics of nonlinear stochastic differential equations with multiplicative colored noise

CONFERENCE: Stochastic Processes Applied to Physics

PLACE: Santander. España (1984)

3.- TYPE OF PARTICIPATION: Invited conference

TITLE: Steady state dynamics in non-linear nuclear reactor systems

CONFERENCE: NATO Advanced Research Workshop on Noise and Nonlinear Phenomena in Nuclear Systems

PLACE: Valencia. España (1988)

4.- TYPE OF PARTICIPATION: Invited conference

TITLE: Multiplicative noise in domain growth: Stochastic Ginzburg-Landau equations

CONFERENCE: NATO Advanced Research Workshop on Growth Patterns in Physical Sciences and Biology

PLACE: Granada. España (1991)

5.- TYPE OF PARTICIPATION: Invited conference

TITLE: Effects of noise on spatio-temporal patterns

CONFERENCE: Program on Spatially extended nonequilibrium systems

PLACE: Institute for Theoretical Physics. University of California. Santa Barbara. U.S.A. (1992)

6.- TYPE OF PARTICIPATION: Invited conference

TITLE: Effects of noise on spatio-temporal patterns

CONFERENCE: NATO Advanced Research Workshop on Spatio-temporal Patterns in Nonequilibrium Complex Systems

PLACE: Santa Fe Institute, New Mexico. U.S.A. (1993)

7.- TYPE OF PARTICIPATION: Invited conference

TITLE: Pattern forming during mesophase growth in a homologous series

CONFERENCE: Eotvos Graduate School on Structure Development in Condensed Matter Physics

PLACE: Budapest, Hungary (1996)

8.- TYPE OF PARTICIPATION: Invited conference

TITLE: Phase-field simulations and experiments of faceted growth in liquid crystals

CONFERENCE: European Network Workshop on Patterns, Noise and Chaos

PLACE: Barcelona. España (1996)

9.- TYPE OF PARTICIPATION: Invited conference

TITLE: Interface roughening in Hele-Shaw flows with quenched disorder: experimental and theoretical results

CONFERENCE: Pattern Formation and Self-Organization in Nonlinear Complex Systems

PLACE: Beijing, China (2001)

- 10.- TYPE OF PARTICIPATION: Invited conference
TITLE: Anomalous roughening of Hele-Shaw flows with quenched disorder
CONFERENCE: XXXI Winter Meeting on Statistical Physics
PLACE: Taxco, México (2002)
- 11.- TYPE OF PARTICIPATION: Invited conference
TITLE: Anomalous roughening in experiments of interfaces in Hele-Shaw flows with strong quenched disorder
CONFERENCE: III Workshop on Instabilities and Fluctuations in Surface Growth
PLACE: Barcelona. España (2003)
- 12.- TYPE OF PARTICIPATION: Invited conference
TITLE: The role of noise in sidebranching development
CONFERENCE: Noise in Complex and Stochastic Dynamics
PLACE: Maspalomas, Gran Canaria, España (2004)
- 13.- TYPE OF PARTICIPATION: Invited conference
TITLE: Shape instabilities in vesicles: A phase-field model
CONFERENCE: Stochastic and Complex Systems: New Trends and Expectations
PLACE: Santander, España (2006)
- 14.- TYPE OF PARTICIPATION: Invited conference
TITLE: Anomalous scaling in imbibition
CONFERENCE: NDCOS Workshop in New Directions in Complex Systems
PLACE: Istanbul, Turkey (2006)
- 15.- TYPE OF PARTICIPATION: Invited conference
TITLE: Instabilities in membranes
CONFERENCE: 6th International Congress on Industrial and Applied Mathematics
PLACE: Zurich, Switzerland (2007)
- 16.- TYPE OF PARTICIPATION: Invited conference
TITLE: A phase-field model for instabilities in membranes
CONFERENCE: 3th International Congress on Phase-Field Modeling
PLACE: Paris, France (2007)
- 17.- TYPE OF PARTICIPATION: Invited conference
TITLE: Curvature-driven pearling instabilities in membranes
CONFERENCE: XXI Meeting on complex fluids science and technology
PLACE: San Luis Potosí, México (2008)
- 18.- TYPE OF PARTICIPATION: Organization
CONFERENCE: International focus workshop on phase-field simulations: Material science meets biology and medicine
PLACE: Max Planck Institute, Dresden, Germany (2008)
- 19.- TYPE OF PARTICIPATION: Invited conference
TITLE: Vascularization and tumor growth
CONFERENCE: International focus workshop on phase-field simulations: Material science meets biology and medicine
PLACE: Max Planck Institute, Dresden, Germany (2008)

- 20.- TYPE OF PARTICIPATION: Invited conference
TITLE: Dynamic instabilities and morphology in biological membranes
CONFERENCE: XVI Conference de Física Estadística
PLACE: Huelva, España (2009)
- 21.- TYPE OF PARTICIPATION: Invited conference
TITLE: Cell differentiation in flower development
CONFERENCE: Patterning, segregation and differentiation in complex networks
PLACE: México D.F., México (2009)
- 22.- TYPE OF PARTICIPATION: Invited conference
TITLE: Curvature-driven dynamic instabilities and morphology in biological membranes
CONFERENCE: Mechanics of membranes
PLACE: Madrid, España (2010)
- 23.- TYPE OF PARTICIPATION: Invited conference
TITLE: Interface dynamics in microfluidics: Theory and experiments
CONFERENCE: Dynamical behaviour of complex systems
PLACE: Cocoyoc, México (2010)
- 24.- TYPE OF PARTICIPATION: Organization
CONFERENCE: Frontiers in interface physics: microfluidics, biomembranes and nanostructures
PLACE: Centro de Ciencias Pedro Pascual. Benasque. España (2010)
- 25.- TYPE OF PARTICIPATION: Invited conference
TITLE: Biomembranes and fronts at the microscale
CONFERENCE: Frontiers in interface physics: microfluidics, biomembranes and nanostructures
PLACE: Centro de Ciencias Pedro Pascual. Benasque. España (2010)
- 26.- TYPE OF PARTICIPATION: Invited conference
TITLE: Biophysics at the microscale: Theory and experiments
CONFERENCE: Congreso de física de sistemas complejos
PLACE: BIFI. Zaragoza. España (2011)
- 27.- ACTIVITY: Invited colloquium
TITLE: Elasticity of membranes and rheology of biofluids at the microscale
CONFERENCE: Mathematical biology and biophysics day
PLACE: Centre de Recerca Matemàtica. Campus de Bellaterra. (Espanya) (2012)
- 28.- TYPE OF PARTICIPATION: Scientific committee
CONFERENCE: Physics meets biology at the cell membrane
PLACE: San Sebastian. España (2013)
- 29.- TYPE OF PARTICIPATION: Invited conference
TITLE: Phase-field models for the dynamic evolution of shapes in membranes
CONFERENCE: Workshop on Modelization and phase-field
PLACE: Instituto de Matematicas, Universidad de Sevilla, España (2013)
- 30.- TYPE OF PARTICIPATION: Invited conference
TITLE: Rheology of vesicles under flow in microchannels
CONFERENCE: 4 Conference on Patterning, segregation and differentiation in complex networks
PLACE: México D.F., México (2014)

- 31.- TYPE OF PARTICIPATION: Invited conference
 TITLE: Tumor angiogenesis and vascular patterning: A mathematical model
 CONFERENCE: Mathematical Days 2014
 PLACE: Societat Catalana de Matematiques, IEC, Barcelona (2014)
- 32.- TYPE OF PARTICIPATION: Invited lecturer (8 hours)
 TITLE: Biological membranes and biofluids at the microscale
 CONFERENCE: Summer school on statistical physics of complex and small systems (Gefenol)
 PLACE: Centre de Recerca Matemàtica, Bellaterra, Barcelona (2015)
- 33.- TYPE OF PARTICIPATION: Invited conference
 TITLE: Phase-field models for the dynamic evolution of shapes in membranes: Red blood cells and liposomes
 CONFERENCE: XII World Conference on Computational Mechanics
 PLACE: Seoul, Corea (2016)
- 34.- TYPE OF PARTICIPATION: Invited conference
 TITLE: Drop emission by dynamic wetting in thin films at the microscale
 CONFERENCE: CECAM Workshop on Non-equilibrium dynamics of thin-films, solids, liquids and bioactive materials
 PLACE: Lausanne, Switzerland (2016)
- 35.- TYPE OF PARTICIPATION: Keynote lecture
 TITLE: Drop emission by dynamic wetting in thin films at the microscale: A Phase-Field Model Approach
 CONFERENCE: 19h International Conference on Finite Elements in Flow Problems - FEF 2017
 PLACE: Rome, Italy (2017)
- 36.- TYPE OF PARTICIPATION: Keynote lecture
 TITLE: Front microrheology of the Non-Newtonian behavior of blood
 CONFERENCE: Workshop on Fluid Mechanics 2017
 PLACE: Tarragona, Spain (2017)
- 37.- TYPE OF PARTICIPATION: Keynote lecture
 TITLE: Front microrheology of the Non-Newtonian behavior of blood
 CONFERENCE: XLVII Winter Meeting 2018
 PLACE: Puebla, Mexico, (2018)
- 38.- TYPE OF PARTICIPATION: Invited conference
 TITLE: Elastic and Dynamic Properties of Membrane Phase-field Models: the Viscosity of Blood and the Bending Rigidity of Red Blood Cells
 CONFERENCE: 13th World Congress on Computational Mechanics and 2nd Pan American Congress on Computational Mechanics,
 PLACE: New York City, U.S.A. (2018)
- 39.- TYPE OF PARTICIPATION: Invited conference
 TITLE: Elastic and dynamic properties of membrane phase-field models: the viscosity of blood and the bending rigidity of red blood cells
 CONFERENCE: 55th Annual Technical Meeting of the Society of Engineering Sciences (SES)
 PLACE: Leganes, Spain (2018)

Invited Seminars

- 1.- TITLE: External noise in steady states: Dynamics of fluctuations
ACTIVITY: Invited seminar
PLACE: Fachbereich Physik. Philipps Universitat. Marburgh (Germany) (1986)
- 2.- TITLE: Diffusion on random hierarchical system
ACTIVITY: Les Houches Summer School: Chance and Matter
PLACE: Les Houches (France) (1986)
- 3.- TITLE: Anomalous diffusion in random hierarchical models
ACTIVITY: Invited seminar
PLACE: Department of Physics. University of Pittsburgh. Pittsburgh (U.S.A.) (1987)
- 4.- TITLE: Interfaces in driven diffusive systems
ACTIVITY: Invited seminar
PLACE: James Franck Institute. University of Chicago. Chicago (U.S.A.) (1987)
- 5.- TITLE: Stability of a nonequilibrium steady state interface
ACTIVITY: Invited seminar
PLACE: Department of Physics. Carnegie-Mellon University. Pittsburgh (U.S.A.) (1987)
- 6.- TITLE: Interfacial instabilities in nonequilibrium steady states
ACTIVITY: Invited seminar in the Mini-workshop on Driven Diffusive Systems
PLACE: Department of Physics. Polytechnic Institute and State University. Virginia (U.S.A.) (1987)
- 7.- TITLE: Interfacial growth in driven diffusive systems
ACTIVITY: Invited seminar
PLACE: Department of Physics. Lehigh University (U.S.A.) (1988)
- 8.- TITLE: Stochastic processes: Internal and external noise
ACTIVITY: Invited seminar
PLACE: Department of Physics. University of Pittsburgh. Pittsburgh (U.S.A.) (1988)
- 9.- TITLE: Interfaces in nonequilibrium systems
ACTIVITY: Invited seminar
PLACE: Department of Physics. Carnegie-Mellon University. Pittsburgh (U.S.A.) (1988)
- 10.- TITLE: Dynamics of nonequilibrium interfacial instabilities
ACTIVITY: Invited seminar
PLACE: Department of Physics. McGill University. Montreal. (Canada) (1990)
- 11.- TITLE: Dynamics of nonequilibrium interfacial instabilities
ACTIVITY: Invited seminar
PLACE: Department of Physics. Brynmawr College. Brynmawr (U.S.A.) (1990)
- 12.- TITLE: Noise-induced transitions in the Swift-Hohenberg equation
ACTIVITY: Invited seminar
PLACE: Department of Chemistry. University of California at San Diego (U.S.A.) (1992)
- 13.- TITLE: Noise-induced structures in a stochastic Swift-Hohenberg equation
ACTIVITY: Invited seminar
PLACE: Department of Physics. University of Pittsburgh. Pittsburgh (U.S.A.) (1992)

- 14.- TITLE: Interfacial growth far from equilibrium
ACTIVITY: Invited seminar
PLACE: Physikalisches Institut. Universitat Bayreuth. Bayreuth (Germany) (1994)
- 15.- TITLE: An interfacial instability induced by external fluctuations
ACTIVITY: Invited seminar
PLACE: Department of Physics. McGill University. Montreal. (Canada) (1995)
- 16.- TITLE: Interface roughening in Hele-Shaw flows with quenched disorder: experimental and theoretical results
ACTIVITY: Invited seminar
PLACE: Groupe de Solids. Universite Pierre et Marie Curie. Paris (France) (2001)
- 17.- TITLE: Anomalous roughening in Hele-Shaw flows with quenched disorder
ACTIVITY: Invited seminar
PLACE: Laboratoire de Physique de la Matiere Condensee. Ecole Polytechnique. Palaiseau (France) (2001)
- 18.- TITLE: Nonlocal properties of forced fluid invasion in a Hele-Shaw cell
ACTIVITY: Invited seminar
PLACE: Laboratoire de Spectrometrie Physique. Universite Joseph Fourier. Grenoble (France) (2001)
- 19.- TITLE: A phase-field model of Hele-Shaw flow in the high viscosity regime
ACTIVITY: Invited seminar
PLACE: Departamento de Quimica. Universidad Nacional Autonoma de Mexico. Mexico D.F. (Mexico) (2002)
- 20.- TITLE: Deterministic behaviour in sidebranching development
ACTIVITY: Invited seminar
PLACE: Department of Physics. University of Pittsburgh. Pittsburgh (U.S.A.) (2003)
- 21.- TITLE: Forced imbibitions of a viscous fluid by a disordered Hele-Shaw cell
ACTIVITY: Invited seminar
PLACE: Biocomplexity Institute. University of Indiana. Bloomington (U.S.A.) (2003)
- 22.- TITLE: Phase-field models in interfacial pattern formation out of equilibrium
ACTIVITY: Invited seminar
PLACE: Department of Physics. Massachusetts Institute of Technology. Boston (U.S.A.) (2003)
- 23.- TITLE: Forced imbibition in disordered media
ACTIVITY: Invited seminar
PLACE: Department of Physics of Complex Systems. The Weizmann Institute of Science. Rehovot (Israel) (2004)
- 24.- TITLE: Instabilities in biological membranes
ACTIVITY: Invited seminar
PLACE: Department of Physics. University of Lisboa. Lisboa (Portugal) (2007)
- 25.- TITLE: Anomalous scaling in spontaneous imbibitions
ACTIVITY: Invited seminar
PLACE: Laboratory of Physics. Helsinki University of Technology. Helsinki (Finlandia) (2007)

- 26.- TITLE: Curvature-driven pearling and tubulation instabilities in membranes
ACTIVITY: Invited seminar
PLACE: Department of Physics. University of Oxford. Oxford (United Kindom) (2008)
- 27.- TITLE: Interface dynamics in microfluidics: Theory and experiments
ACTIVITY: Invited seminar
PLACE: Department of Physics. University of Coimbra. Coimbra (Portugal) (2010)
- 28.- TITLE: Interface dynamics in microfluidics: Theory and experiments
ACTIVITY: Invited seminar
PLACE: Centre de Recerca Matematica. Campus de Bellaterra. Barcelona (Espanya) (2011)
- 29.- TITLE: Elasticity of membranes and rheology of biofluids at the microscale
ACTIVITY: Invited colloquium
PLACE: CIC Biomagune. San Sebastian (Espanya) (2012)
- 30.- TITLE: Rheology of vesicles in microchannels
ACTIVITY: Invited colloquium
PLACE: Centre of Genomic Regulation. Barcelona. (Espanya) (2013)
- 31.- TITLE: Membrane rigidity controls pinching of bacterial membrane
ACTIVITY: Physics of Cellular Division Meeting
PLACE: Facultad de Quimica. Universidad Complutense, Madrid, (Espanya) (2013)
- 32.- TITLE: Membrane rigidity of bacterial membrane and the Min system
ACTIVITY: Invited seminar
PLACE: Centro Nacional de Biotecnologia, Madrid, (Espanya) (2013)
- 33.-TITLE: Phase-field models of membrane elasticity of cells in biofluids
ACTIVITY: Invited seminar
PLACE: Escuela Tecnica Superior De Caminos, A Coruña, (Espanya) (2014)
- 34.-TITLE: Elasticity of membranes and rheology of biofluids at the microscale
ACTIVITY: Invited seminar
PLACE: The Hong Kong University of Science and Technology, Hong Kong (China) (2014)
- 35.-TITLE: Biological and biofluids at the microscale
ACTIVITY: Invited seminar
PLACE: Van der Waals-Zeeman Institute, Institute of Physics, University of Amsterdam, Amsterdam (Holand) (2015)
- 36.TITLE: Roughness and wetting at microscales
ACTIVITY: Invited seminar
PLACE: Centre de Recerca Matemàtica, Bellaterra, Barcelona (2015)
- 37.TITLE: Nonlinear rheology of blood at the microscale
ACTIVITY: Invited seminar
PLACE: The Open University, Milton Keynes, London (United Kingdom) (2016)
- 38.TITLE: Roughness and wetting at microscales
ACTIVITY: Invited seminar
PLACE: Imperial College, London (United Kingdom) (2016)
- 39.TITLE: Drop emission by dynamic wetting in thin films at the microscale
ACTIVITY: Invited seminar
PLACE: Massachusetts Institute of Technology. Boston (U.S.A.) (2018)

Supervision of Ph.D. Thesis

1.- TITLE: Inestabilidades interfaciales y formación de estructuras en presencia de campos externos

Ph.D. STUDENT: Jose Luis de los Mozos

FUNDED BY: Becario de Formación de Personal Investigador(FPU)

UNIVERSITY: Barcelona FACULTY: Física

LECTURE: December 1993

SUPERVISOR: A. Hernández-Machado

2.- TITLE: Dinámica de separación de fases en sistemas con difusión dependiente de la concentración

Ph.D. STUDENT: Ana Maria Lacasta

FUNDED BY: Profesora Asociada. Universitat Politècnica de Catalunya

UNIVERSITY: Barcelona FACULTY: Física

LECTURE: October 1994

SUPERVISORS: J.M. Sancho and A. Hernández-Machado

3.- TITLE: Dinámica de Hele-Shaw mediante modelos de phase-field

Ph.D. STUDENT: Roger Folch

FUNDED BY: Becario de Formación de Personal Investigador(FPU)

UNIVERSITY: Barcelona FACULTY: Física

LECTURE: September 2000

SUPERVISORS: J. Casademunt and A. Hernández-Machado

4.- TITLE: Rugosidad con desorden estático en celdas de Hele-Shaw

Ph.D. STUDENT: Jordi Soriano

FUNDED BY: Becario de Formación de Personal Investigador(FPI)

UNIVERSITY: Barcelona FACULTY: Física

LECTURE: February 2003

SUPERVISORS: J. Ortín and A. Hernández-Machado

5.- TITLE: Shapes in cells. Dynamic instabilities, morphology and curvature in biological membranes

Ph.D. STUDENT: Felix Campelo

FUNDED BY: Becario de Formación de Personal Investigador(FPU)

UNIVERSITY: Barcelona FACULTY: Física

LECTURE: November 2008

AWARD: Premio extraordinario de doctorado Universidad de Barcelona

AWARD: For outstanding doctoral thesis research in biological physics by APS (U.S.A.)

SUPERVISOR: A. Hernandez-Machado

6.- TITLE: Interfaces in disordered media. Scaling growth, avalanche dynamics and microfluidic fronts

Ph.D. STUDENT: Marc Pradas

FUNDED BY: Becario de Formación de Personal Investigador(FPI)

UNIVERSITY: Barcelona FACULTY: Física

LECTURE: Septiembre 2009

SUPERVISOR: A. Hernández-Machado

7.- TITLE: Hydrophobicity in capillary flows: Dynamics and stability of menisci, thin films and filaments in confined geometries
Ph.D. STUDENT: Rodrigo Ledesma-Aguilar
FUNDED BY: Becario Predoctoral de la Fundación Carolina (México-España)
UNIVERSITY: Barcelona FACULTY: Física
LECTURE: Septiembre 2009
SUPERVISORS: A. Hernández-Machado and I. Pagonabarraga

8.- TITLE: Red blood cells mechanics: from elasticity to blood rheology
Ph.D. STUDENT: Guillermo Rodriguez-Lazaro
FUNDED BY: Contrato Predoctoral del Plan Nacional 2009-2012. Becari Predoctoral Generalitat de Catalunya
UNIVERSITY: Barcelona FACULTY: Física
LECTURE: June 2014
SUPERVISORS: A. Hernandez-Machado and I. Pagonabarraga

9.- TITLE: Experiments on rheology of viscoelastic fluids in microchannels
Ph.D. STUDENT: Claudia Trejo
FUNDED BY: Becaria Predoctoral del Gobierno de Chile
UNIVERSITY: Barcelona FACULTY: Física
LECTURE: July 2016
SUPERVISORS: A. Hernández-Machado

10.- TITLE: Dynamics of erythrocyte flickering with a stochastic phase-field model
Ph.D. STUDENT: Andreu Fernandez-Gallen
FUNDED BY: Becario de Formacion de Personal Investigador
UNIVERSITY: Barcelona FACULTY: Física
STARTING DATE: 2018
SUPERVISORS: A. Hernandez-Machado

11.- TITLE: Design and development of a microfluidic device for front microrheology for quality control and monitoring of blood during storage
Ph.D. STUDENT: Lourdes Mendez-Mora
UNIVERSITY: Barcelona FACULTY: Física
STARTING DATE: 2018
SUPERVISORS: A. Hernandez-Machado and T. Alarcon

12.- TITLE: Applications of front microrheology as a diagnostic and monitoring of haematological diseases
Ph.D. STUDENT: Samantha Lopez-Mochales
UNIVERSITY: Barcelona FACULTY: Física
STARTING DATE: 2018
SUPERVISORS: A. Hernandez-Machado and T. Alarcon

Supervision of Masters

1.- TITLE: Crecimiento de tumores cancerígenos y vascularización
MASTER STUDENT: A. Gómez-Sicilia
FUNDED BY: Fellowship from Formación de Personal Investigador (APIF)
UNIVERSITY: Barcelona FACULTY: Física
LECTURE: September 2008
SUPERVISOR: A. Hernández-Machado

2.- TITLE: A phase-field model for flower development
MASTER STUDENT: R. Nistal
UNIVERSITY: Barcelona FACULTY: Física
LECTURE: February 2009
SUPERVISOR: A. Hernández-Machado

3.- TITLE: Estudio experimental del avance de frentes en microfluídica
MASTER STUDENT: M. Queralt-Martín
FUNDED BY: Fellowship from Grup de Recerca
Consolidat
UNIVERSITY: Barcelona FACULTY: Física
LECTURE: July 2009
SUPERVISOR: A. Hernández-Machado

4.- TITLE: Derivation of a macroscopic model for biological membranes
MASTER STUDENT: G. R. Lazaro
FUNDED BY: Contrato asociado a Proyecto Plan Nacional
UNIVERSITY: Barcelona FACULTY: Física
LECTURE: June 2010
SUPERVISOR: A. Hernández-Machado and I. Pagonabarraga

5.- TITLE: Theoretical study of front velocity in microchannels
MASTER STUDENT: E. Costa-Miracle
FUNDED BY: Contrato asociado a Proyecto Plan Nacional
UNIVERSITY: Barcelona FACULTY: Física
LECTURE: June 2014
SUPERVISOR: A. Hernández-Machado

6.- TITLE: Controlling shapes in a coaxial flow focusing microfluidic
device: Experiments and theory
MASTER STUDENT: Y. Kim Im
FUNDED BY: Fellowship from Grup de Recerca
Consolidat
MASTER OF BIOMEDICAL ENGINEERING
UNIVERSITY: Barcelona FACULTY: Física
LECTURE: February 2017
SUPERVISOR: A. Hernández-Machado and R. Rodríguez-
Trujillo

7.- TITLE: Experimental study of red blood cells infected by malaria
MASTER STUDENT: Oihane Ezama
MASTER OF BIOMEDICAL ENGINEERING
UNIVERSITY: Barcelona FACULTY: Física
LECTURE: July 2017
SUPERVISOR: A. Hernandez-Machado and H. del Portillo

8.- TITLE: Dynamics of erythrocyte flickering with a stochastic phase-field model
MASTER STUDENT: Andreu Fernandez-Gallen
MASTER OF NANOSCIENCE AND NANOTECHNOLOGY
UNIVERSITY: Barcelona FACULTY: Física
SUPERVISOR: A. Hernandez-Machado

9.- TITLE: Micro-rheometer with a modular pump: theoretical approach
MASTER STUDENT: Josep Ferre-Torres
MASTER OF NANOSCIENCE AND NANOTECHNOLOGY
UNIVERSITY: Barcelona FACULTY: Física
SUPERVISOR: A. Hernandez-Machado

Supervision of Postdocs

1.- TITLE: Cell division in bacteria
POSTDOC: C.B. Picallo
FUNDED BY: Postdoctoral position of the Plan Nacional Project. FIS2009-12964-C05-02
UNIVERSITY: Barcelona FACULTAD: Física
PERIOD: February 2011- February 2012
SUPERVISOR: A. Hernández-Machado

2. TITLE: Experiments in rheology of red blood cells
POSTDOC: I. Rodriguez-Villarreal
FUNDED BY: Postdoctoral position of the Plan Nacional Project. FIS2009-12964-C05-02
UNIVERSITY: Barcelona FACULTAD: Física
PERIOD: November 2011-February 2013
SUPERVISOR: A. Hernández-Machado

Organization of Scientific Meetings (selected)

- . Scientific Coordinator of the Workshop "Phase-field simulations: material science meets biology and medicine". Max Planck Institute. Dresden. Germany. November (2008).
- . Scientific Coordinator of the Workshop "Frontiers in interface physics: microfluidics, biomembranes and nanostructures". Centro de Ciencias Pedro Pascual. Benasque. Spain. November (2010).
- . Scientific Coordinator of the Workshop "Microfluidics and Nanofluidics: from Technology to Science. Centro de Ciencias Pedro Pascual. Benasque. Spain. May (2019).

Transfer of Technology and Innovation

- . Co-founding of the startup company RheoDiagnostics, S.L. (2018)
- . Participation in Collider, the technology transfer venture builder of Mobile World Capital Foundation (2017-2018)
- . Participation in Eada Business School Barcelona Program of Business Plan Research (2017-2018)

Techniques and Specialities

TEC/ESP: Stochastic processes

KEY WORDS: Fokker Planck equations, Langevin equations

TEC/ESP: Analysis techniques

KEY WORDS: Scaling, stability, projection methods, phase-field models, non-linear instabilities

TEC/ESP: Computer simulations

KEY WORDS: Monte Carlo methods

TEC/ESP: Numerical methods

KEY WORDS : Numerical integration of equations with spatial dependence

Equipments

EQUIPMENT: VAX 8800 University of Pittsburgh (U.S.A.)

INITIAL DATA: 1987

EQUIPMENT: IBM 9375-60 University of Barcelona

INITIAL DATA: 1988

EQUIPMENT: IBM 3090 XA University of Barcelona

INITIAL DATA: 1991

EQUIPMENT: CRAY XMP CIEMAT

INITIAL DATA: 1991

EQUIPMENT: CRAY YMP CESCA

INITIAL DATA: 1992

EQUIPMENT: IBM RISC 6000 320H

INITIAL DATA: 1992

EQUIPMENT: PENTIUM PRO 200

INITIAL DATA: 1996

EQUIPMENT: MARE NOSTRUM SUPERCOMPUTER

INITIAL DATA: 2004

EQUIPMENT: Microfluidic Laboratory

INITIAL DATA: 2008

Other merits

1. Referee CODEST Projects. European Community Commission.
2. Referee NATO Scientific Exchange Program.
3. Referee of Area de Física y Matemáticas de la Agencia Nacional de Evaluación y Prospectiva (ANEP).
4. Referee Ideas Programs. European Research Council.
5. Referee of AGAUR. Generalitat de Catalunya.
6. Referee de la Agencia de Cualificaciones de Aragon.
7. Referee of Agencia Argentina de Evaluacion de Proyectos.
8. Referee of Foundation for Fundamental Research on Matter (FOM) Netherland.
9. Invited member of Scientific Committee of Reunión Española de Física Estadística (2002-2006).
10. Invited member of Grupo Especializado de Física Estadística y No lineal (RSEF) (2002-2012).
11. Editorial Board member of Frontiers in Biophysics Journal.
12. Referee of Phys. Rev. Lett., Phys. Rev.E, Phys. Rev. B, Physica D, Eur. Phys.J. B, J. Stat. Mech., Macromolecules, Physica A., Water Resources Research, Nonlinearity, Colloids and Surfaces A, Chemistry and Physics of Lipids, Eur. Phys. J. E., Frontiers in Materials, Soft Matter, Phys. Rev. Fluids, Journal of the Royal Society Interface.
13. Member of the Technical Committee of Flow 17 Conference, Paris, France (2017)
14. Acreditación nacional de Catedráticos de Universidad del Ministerio de Educación, May 2009.
15. Acreditacion avanzada AQU, Generalitat de Catalunya, 2005.
16. Member of Comisión ANEP, 1997.
17. Member of Comisión Ramon y Cajal y Juan de la Cierva (ANEP). 2009.
18. Member of Comisión de Evaluación de Proyectos de Excelencia y Retos MINECO, 2015
19. Member of Comisión de Cátedras de Excelencia, Universidad Carlos III de Madrid, 2017 y 2018
20. Scientific Committee of “ Catedras de Excelencia”, Universidad Carlos III, Madrid, Spain (2017 and 2018)

Quality Factors of the Research Activity

113 publications in international peer-reviewed journal and chapters in ISBN books

Isi Web of Knowledge Search: hernandez-machado* a* or hernandezmachado* a*

Articles with Citation = 95

Sum of the Times Cited = 1667

Average Citations per Article = 17.55

h-index = 23

i100index=1

- Most cited publication = 114 citations

Google Scholar:

Number of Citations = 2382 Since 2013 = 772

h-index = 27

- i10index =60
- i100index=3
- Most cited publications: 162 citations, 143 citations,132 citations

1 Nature Materials (2011) Ref [91] with impact factor 32.841

1 Nature Communications (2015) Ref [103] impact factor 11.47

8 Physical Review Letters Refs [32], [55], [65], [72], [78], [80], [92], [98] with impact factor 7.7

Sexenios: 5 in 2018