



CURRICULUM VITAE (CVA)

Name: Antonio Manuel Puertas López

Date: June, 2023

A.1. Current position

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|-------------------|--|-------------------------------------|-------------|
| Position | Profesor Titular de Universidad | | |
| Initial date | 13/07/2003 | | |
| Institution | Universidad de Almería | | |
| Department/Center | Química y Física | Facultad de Ciencias Experimentales | |
| Country | Spain | Teleph. number | 950 01 5917 |
| Key words | Complex fluids, physics of fluids, phase transitions | | |

A.2. Previous positions (research activity interruptions, art. 14.2.b))

| Period | Position/Institution/Country/Interruption cause |
|-----------------------|--|
| 1994-1995 | Becario colaborador, Dpto. Física Moderna, Univ. Granada |
| 01/07/1996–30/09/1999 | Becario de doctorado, Dpto. Física Aplicada, Univ. Almería |
| 01/10/1999–13/07/2003 | Profesor Asociado, Dpto. Física Aplicada, Univ. Almería |
| 01/10/1999-30/09/2001 | Post-doc (Ministerio de Educación, Cultura y Deporte), Dept. Of Physics and Astronomy, The University of Edinburgh |
| 13/07/2003- | Profesor Titular de Universidad, Física Aplicada, Univ. Almería |
| 01/05/2004–31/08/2004 | Stay (Ministerio de Educación, Cultura y Deporte), Dipartimento di Fisica, Università di Roma 'La Sapienza' |
| 01/07/2014–31/12/2014 | Invited professor (Plan Propio de la UAL), Fachbereich Physik, Universität Konstanz (Alemania) |

A.3. Education

| PhD, Licensed, Graduate | University/Country | Year |
|-------------------------|------------------------|------------|
| Licensed in Physics | Universidad de Granada | 4/09/1995 |
| PhD in Physics | Universidad de Granada | 23/07/1999 |

Part B. CV SUMMARY (max. 5000 characters, including spaces)

I did my Ph.D. at the University of Granada in simulations and experiments of colloidal heteroaggregation, supervised by Profs. F.Javier de las Nieves and Antonio Fernández-Barbero, in the period 1995-1999. This research line produced 13 JCR papers, and a book chapter. After this, I moved for a one year post-doc position to the University of Edinburgh in 2000-2001 (with a fellowship from the Spanish Ministerio de Educación, Cultura y Deporte). I started there a collaboration with Prof. Michael Cates and Prof. Matthias Fuchs, in glass transitions in colloidal systems. Within this topic, we published 16 papers, including a paper in "Science", which has been cited more than 600 times now. In 2004, As a part of this line, I visited the group lead by Prof. Francesco Sciortino, at the Università di Roma "La Sapienza", in 2004 for four months.

In 2006, I started a collaboration with Prof. Wilson Poon (Univ. of Edinburgh) in microrheology, comparing simulations and experiments, and later on also with Prof. Matthias Fuchs (by the time, at Univ. Konstanz, Germany), with theory models. So far, this topic has produced 21 JCR papers, and in 2014 I was visiting professor in Univ. Konstanz for six months. Also, three projects on microrheology has been funded by the Spanish Ministerio de Economía y Competitividad. This line is still active.

In connection with soft matter, a collaboration with other researchers in the Univ. of Almería, applying models and techniques of soft matter to economic systems was started. We have

studied the currency exchange markets and the dynamics of stocks with models of physical glasses, including the linear response formalism of fluctuating systems. Within this topic, I have co-authored 6 papers, and I have led two projects funded by the Spanish Ministerio de Ciencia, Innovación y Universidades.

Finally, I am conducting research in a different field, namely, thermal energy storage in connection with renewable energy. For this purpose, phase change materials are used, which store the energy in the form of latent heat. This research concerns modeling and experiments in the research center for solar energy at the Univ. Almería. Within this topic, I have lead an European project in the 2nd ERANet-LAC call, funded by national authorities (PCIN-2016-013). This project was participated by four research groups from Poland, Chile, Bolivia and Spain, and a Spanish company. Recently, a LIFE project has started (01.09.2021), led by the University of Wroclaw (Poland), where I coordinate the team at the Univ. Almería.

I have supervised two Ph.D. students; one of them studied the phase diagram of colloidal electrolytes (2002-2006), what produced 7 papers, and the other one in magnetorheological fluids (2010-2013), resulting in 3 papers.

In addition to these main lines, I have collaborated with many other researchers, resulting in international publications: Prof. German Urbina (IVIC, Venezuela), about emulsion aggregation; Dr. Gerardo Odriozola (IMP, Mexico), about the relationship between aggregation and phase transitions in colloids; Dr. Alejandro Cuetos (Univ. Pablo de Olavide, Spain), about the interaction of charged colloids; Dr. Peter Keim (Univ. Konstanz, Germany), crystallization of colloids in 2 dimensions; Prof. Alessandro Patti (Univ. Manchester, UK), application of MonteCarlo dynamics to microrheology; Dr. Paolo Magaretti (Univ. Stuttgart) and Prof. Ignacio Pagonabarraga (CECAM), on microrheology in corrugated channels.

In summary, I have coauthored 79 papers in peer-reviewed international journals (**51 papers in Q1**), receiving 2373 total cites (Web of Science database); 2553 cites (Scopus database); an average of 129.6 cites per year in the last 5 years. The h-index is currently 24 (WoS), or 25 (Scopus). I have lead 3 national projects, 1 regional one and 1 European one, and participated in other 7 projects. I have also worked in three contracts funded by private companies. I have been positively evaluated four times by the Spanish Comisión Nacional Evaluadora de la Actividad Investigadora.

Part C. RELEVANT MERITS (*sorted by typology*)

C.1. Selected publications (*see instructions*)

1. A.M. Puertas, J. Clara-Rahola, M.A. Sánchez-Granero, F.J. de las Nieves, J.E. Trinidad-Segovia. "A new look at financial markets efficiency from linear response theory", FINANCE RESEARCH LETTERS, **51**, 103455 (2023).
2. F. García Daza, A.M. Puertas, A. Cuetos, A. Patti, "Microrheology of colloidal suspensions via dynamic Monte Carlo Simulations", JOURNAL OF COLLOID AND INTERFACE SCIENCE **605**, 182-192 (2022).
3. A.M. Puertas, J.E. Trinidad Segovia, M.A. Sánchez-Granero, J. Clara-Rahola, F.J. de las Nieves, "Linear response theory in stock markets". SCIENTIFIC REPORTS **11**, 23076 (2021).
4. F. Orts, G. Ortega, E.M. Garzón, M. Fuchs, A.M. Puertas, "Dynamics and friction of a large colloidal particle in a bath of hard spheres: Langevin dynamics simulations and hydrodynamic description", PHYSICAL REVIEW E, **101**, 052607 (2020).
5. A.M. Puertas, P. Magaretti, I. Pagonabarraga, "Active microrheology in corrugated channels". THE JOURNAL OF CHEMICAL PHYSICS **149**, 174908 (2018).
6. J. Clara-Rahola, A.M. Puertas, M.A. Sánchez-Granero, J.E. Trinidad-Segovia, F.J. de las Nieves, "Diffusive and arrestedlike dynamics in currency exchange markets", PHYSICAL REVIEW LETTERS, **118**, 068301 (2017).
7. M. Gruber, G.C. Abade, A.M. Puertas, M. Fuchs. "Active microrheology in a colloidal glass", PHYSICAL REVIEW E, **94**, 042602 (2016).

8. "Fluids, Colloids and Soft Materials: An introduction to Soft Matter Physics", ed. A. Fernández-Nieves, A.M. Puertas. John Wiley & Sons, ISBN 9781118065624 (2016).
9. S. Deutschlaender, A.M. Puertas, G. Maret, P. Keim. "Specific heat in two-dimensional melting", PHYSICAL REVIEW LETTERS, **113**, 127801 (2014).
10. Antonio M. Puertas, Thomas Voigtmann. "Microrheology of colloidal systems", JOURNAL OF PHYSICS-CONDENSED MATTER, **26**, 243101 (2014).

C.2. Selected contributions to conferences

Authors: A.M. Puertas, P. Maggaretti, I. Pagonabarraga

Title: Transport in corrugated narrow channels by active microrheology

Type of presentation: Invited talk

Conference: Workshop on transport in narrow channels, Cargese, Córcega (France), 5-9 September 2022

Authors: A.M. Puertas, F. Orts, G. Ortega, E.M. Garzón, M. Fuchs

Title: Dynamics of a forced large particle in a bath of colloidal hard spheres: Simulations and theory

Type of presentation: Talk

Conference: International soft matter conference, Edinburgh (UK), 3-7 July 2019

Authors: A.M. Puertas, M.S. Romero-Cano, F.J. de las Nieves, S. Rosiek, F.J. Batlles

Title: Simulations and experiments of melting of encapsulated phase change materials

Type of presentation: Talk

Congreso: EuroSun 2018 – 12th ISES EuroSun Conference, Rapperswil (Switzerland), 10-13 September, 2018

Authors: A.M. Puertas, M. Gruber, G. Abade, M. Fuchs

Title: The colloidal glass transition probed by microrheology: A simulation study

Type of presentation: Oral

Conference: 4th International soft matter conference, Grenoble (France), 12-16 Sept. 2016

C.3. Research projects

Project Title: An innovative solar-powered cooling device, based on climate-friendly refrigerant and thermal energy storage. (Ref.: COOLSPACES 4 LIFE.)

Funding agency: European Comision (Programa LIFE20, Convocatoria LIFE CLIMATE CHANGE MITIGACION)

Institutions involved: Polytechnique University of Breslaw (Poland), Universidad de Almería, Prozon (Poland), Hedera Helix S.L. (Spain).

From: 01/09/2021 to: 31/08/2026 Budget: 375.416,00 euros (UAL)

Project leader: UAL: **Antonio M. Puertas López** Coordinator: Sabina Rosiek (PWR)

Number of researchers: 5 (UAL)

Project Title: Heterogeneidades dinámicas en sistemas complejos. (Ref: PID2021-127836NB-I00)

Funding agency: Ministerio de Ciencia e Innovación

Institutions involved: Universidad de Almería

From: 01/09/2022 to: 31/08/2025 Budget: 55.660,00 euros

Project leader: **Antonio M. Puertas López** / Juan E. Trinidad Segovia

Number of researchers: 4

Project Title: Mecánica estadística fuera del equilibrio en sistemas coloidales y mercados financieros (Ref. PGC2018-101555-B-I00)

Funding agency: Ministerio de Ciencia Innovación y Universidades

Institutions involved: Universidad de Almería

From: 01/01/2019 to: 31/12/2021 Budget: 24.200,00 euros

Project leader: **Antonio M. Puertas López** (UAL)

Number of researchers: 3

Project Title: Thermal Energy Storage with Phase Change Materials for Solar Cooling and Heating Applications -PCMSOL-. (Ref. PCIN2016-013).

Funding agency: Ministerio de Economía y Competitividad.

Institutions involved: Universidad de Almería; Technical University of Wroclaw (Poland); Universidad Católica de Bolivia (Bolivia); Universidad de Antofagasta (Chile); Phase change technologies S.L. (Spain).

From: 01/12/16 to: 31/11/19 Budget: 124.500,00 euros (UAL)

Project leader: **Antonio M. Puertas López** (UAL)

Number of researchers: 4 (UAL), 4 (TUW), 2 (UCB), 6 (UA).

Project Title: Simulaciones de microreología en sistemas coloidales de esferas duras en estados fluidos y vítreos, con trazadoras de distinto tamaño (Ref. FIS2015-69022-P)

Funding agency: Ministerio de Economía y Competitividad.

Institutions involved: Universidad de Almería

From: 01/01/16 to: 31/12/18 Budget: 11.858,00 euros

Project leader: **Antonio M. Puertas López** (UAL)

Number of researchers: 1

Project Title: Fluidos iónicos y complejos confinados. Aplicaciones en ciencia coloidal y foto-voltaica. (Proyecto de excelencia Ref. P09-FQM-4938).

Funding agency: Junta de Andalucía – Consejería de Innovación y Ciencia

Institutions involved: Universidad de Almería (UAL), Universidad de Sevilla (US), Universidad Pablo de Olavide (UPO), Universidad de Cádiz (UCA)

From: 03/02/10 to: 31/12/14 Budget: 207.923,68 euros

Project leader: **Antonio M. Puertas López** (UAL)

Number of researchers: 2 (US) + 4 (UAL) + 4 (UPO) + 4 (UCA)

C.4. Contracts, technological or transfer merits

Title of the contract: Diseño de estrategias de cobertura del riesgo de tipo de cambio

Funding company: Cosentino

Participants: Universidad de Almería, Cosentino

From: 01/11/2019 to: 31/10/2020 (suspended in 30/03/2020 due to COVID pandemics)

Project leader: Dr. Juan E. Trinidad Segovia Number of researchers: 4

Total budget: 8.000 euros

Title of the contract: Secado de fertilizantes líquidos

Funding company: Agrinova

Participants: Universidad de Almería, Agrinova

From: 1/09/2020 to: 31/08/2021

Project leader: Prof. F.Javier Batlles Garrido Number of researchers: 3

Total budget: 50.000 euros
