

Part A. PERSONAL INFORMATION		CV date		20/11/2023
First and Family name	Alejandro Jacobo CABRERA CRESPO			
Social Security, Passport, ID number	44472767J	Age	43	
Researcher codes	Open Researcher and Contributor ID (ORCID)	0000-0003-3384-5061		
	SCOPUS Author ID)	16480134400		
	WoS Researcher ID	G-9948-2015		

A.1. Current position

Name of University/Institution	UNIVERSIDAD DE VIGO		
Department	Applied Physics Department / Aerospace Engineering School		
Address and Country	Edificio do Campus da Auga, Rúa Canella da Costa da Vela 12, Campus Sur, 32004, Ourense		
Phone number	988387425	E-mail	alexbexe@uvigo.es
Current position	Full Professor	From	26/09/2023
Key words	CFD, SPH, coastal protection, wave energy		

A.2. Education

PhD, Licensed, Graduate	University	Year
Applied Physics PhD	Universidade de Vigo	2008
Batchelor's Degree in Physics	Universidade de Vigo	2003

A.3. General indicators of quality of scientific production

Thesis supervised: 3 (2014, 2015, 2023) and 2 in progress

Publications: 94 documents, 5374 citations by 2450 documents (SCOPUS)

Citations/year: 895 in 2022, 818 in 2021, 459 in 2020, 536 in 2019, 389 in 2018 (SCOPUS)

h-index: 38 (SCOPUS)

Part B. CV SUMMARY (max. 3500 characters, including spaces)

B.1. Teaching activity

- More than 1000 teaching hours in: Physics Degree, Environmental Science Degree, Food Science and Technology Degree, Agriculture Engineering Degree, Aerospace Engineering Degree, Applied Physics Master, Climate Science Master, Internal Oceanography Master, International COMEN Master and PhD programmes.
- Student supervision: 3 PhD students (2014, 2015, 2022), 7 Master thesis students (2010-2020), 5 End of degree projects (2014-2023).
- Publication of 7 chapters of book related with teaching activity.
- 29 contributions in conferences about teaching.
- 6 different institutional responsibilities related with teaching management.
- Member of the innovative teaching group HIPATIA (<https://hipatia.uvigo.es/>)

B.2. Research activity

[1] Research lines:

- Development of numerical models in the field of fluid dynamics
- Wave propagation and interaction between waves and coastal structures
- Numerical design of offshore devices and wave energy converters
- Development of the open-source code DualSPHysics (<http://www.dual.sphysics.org/>)

[2] Publications:

- 65 papers in journals of Science Citation Index (37 in Q1 journals) and 9 chapters of book.
- Editor of a book in 2007 and of actually in 2 international journals: Applied Ocean Research and Coastal Engineering Journal
- Reviewer in more than 50 different international indexed journals.

[3] Participation in projects:



- 35 R&D projects financed in public calls: 4 funded by Universidade de Vigo, 12 funded by Xunta de Galicia, 7 funded by Spanish Government, and 6 european projects;
 - i) Prevención de Riesgos de Inundaciones y Sequías en la Cuenca Internacional del Miño-Limia funded by “UE FEDER”, ii) MarRISK funded by “UE FEDER”, iii) IMDROFLOOD funded by “WaterWorks2014”, iv) DEMOWAVE funded by “Life2015”, v) ESCFLOWC funded by “Marinet2 2017”, vi) ESPHI-42350 funded by “European Project FP6-MOBILITY”,
 - Principal Investigator in the projects INOU12-03 (2012), NUMANTIA funded by Xunta de Galicia (2016-2019), Programa Oportunius – Apoio á excelencia (2016-2017), WELCOME (2017-2019) and SURVIWEC funded by Spanish Government (2021-2023)
 - Principal Investigator in the project with the private company SENER (2013-2014).
- [4]** Participation in conferences: +170 contributions in international conferences (37 oral presentations by A.J.C. Crespo and 7 invited lectures); 10 contributions in national conferences (3 presented by A.J.C. Crespo and 1 invited lecture).

B.3. Management activity

- Organisation of 11 international conferences (main organiser in 3).
- Member of 18 scientific committees.
- Member of 2 international steering or management committees (SPHERIC and WECANet).
- 6 different institutional responsibilities at Universidade de Vigo.

B.4. Awards

- Extraordinary Doctorate Award by Universidade de Vigo (2009).
- Academic Hardware Grant Nvidia awarded by NVIDIA Academic Research Programs (2015).
- Finalist of an ERC Starting Grant 2015 in the prestigious ERC Programme of the European Union within the EP8: PRODUCTS AND PROCESS ENGINEERING.

Part C. RELEVANT MERITS

C.1. Publications (last 10 journal papers)

- [1]** Mitsui J, Altomare C, Crespo AJC, Domínguez JM, Martínez-Estévez I, Suzuki T, Kubota S, Gómez-Gesteira M. 2023. DualSPHysics modelling to analyse the response of Tetrapods against solitary wave. *Coastal Engineering*, 183, 104315. doi:10.1016/j.coastaleng.2023.104315.
- [2]** Martínez-Estévez I, Tagliafierro B, El Rahi J, Domínguez JM, Crespo AJC, Troch P, Gómez-Gesteira M. 2023. Coupling an SPH-based solver with an FEA structural solver to simulate free surface flows interacting with flexible structures. *Computer Methods in Applied Mechanics and Engineering*, 410, 115989. doi:10.1016/j.cma.2023.115989.
- [3]** Martínez-Estévez I, Domínguez JM, Tagliafierro B, Canelas RB, García-Feal O, Crespo AJC, Gómez-Gesteira M. (2023). Coupling of an SPH-based solver with a multiphysics library. *Computer Physics Communications*, 283, 108581.
- [4]** Brito M, Bernardo F, Neves MG, Neves DRCB, Crespo AJC, Domínguez JM. (2022). Numerical Model of Constrained Wave Energy Hyperbaric Converter under Full-Scale Sea Wave Conditions. *Journal of Marine Science and Engineering*, 10(10), 1489.
- [5]** Tagliafierro B, Karimirad M, Martínez-Estévez I, Domínguez JM, Viccione G, Crespo AJC. (2022). Numerical Assessment of a Tension-Leg Platform Wind Turbine in Intermediate Water Using the Smoothed Particle Hydrodynamics Method. *Energies*, 15(11), 3993.
- [6]** Tagliafierro B, Martínez-Estévez I, Domínguez JM, Crespo AJC, Götteman M, Engström J, Gómez-Gesteira M. (2022). A numerical study of a taut-moored point-absorber wave energy converter with a linear power take-off system under extreme wave conditions. *Applied Energy*, 311, 118629.
- [7]** Capasso S, Tagliafierro B, Martínez-Estévez I, Domínguez JM, Crespo AJC, Viccione G. (2022). A DEM approach for simulating flexible beam elements with the Project Chrono core module in DualSPHysics. *Computational Particle Mechanics*, 9(5), 969-985.
- [8]** Domínguez JM, Fourtakas G, Altomare C, Canelas RB, Tafuni A, García-Feal O, Martínez-Estévez I, Mokos A, Vacondio R, Crespo AJC, Rogers BD, Stansby PK, Gómez-Gesteira M. (2022). DualSPHysics: from fluid dynamics to multiphysics problems. *Computational Particle Mechanics*, 9(5), 867-895.



[9] Lowe RJ, Altomare C, Buckley M, da Silva R, Hansen JE, Rijnsdorp D, Domínguez JM, Crespo AJC. (2022). Smoothed Particle Hydrodynamics simulations of reef surf zone processes driven by plunging irregular waves. *Ocean Modelling*, 171, 101945.

[10] English A, Domínguez JM, Vacondio R, Crespo AJC, Stansby PK, Lind SJ, Chiapponi L, Gómez-Gesteira M. (2022). Modified dynamic boundary conditions (mDBC) for general purpose smoothed particle hydrodynamics (SPH): application to tank sloshing, dam break and fish pass problems. *Computational Particle Mechanics*, 9(5), 911-925..

C.2. Research projects (last 10 years)

[1] Prevención de riesgos de inundaciones y sequías en la cuenca del Miño-Limia (0034_RISC_ML_6_E). EU FEDER: INTERREG-POCTEP. PI: Ramón Gómez Gesteira (Universidade de Vigo). 01/06/2017 - 31/12/2021. 449.821,87 €. Research team.

[2] MarRISK (0262_MARRISK_1_E). EU FEDER: INTERREG-POCTEP. PI: Ramón Gómez Gesteira (Universidade de Vigo). 01/06/2017 - 30/06/2021. 477.290,64 €. Research team.

[3] SURVIWEC: Survivability of Wave Energy Converters (PID2020-113245RB-I00). Ministerio de Ciencia e Innovación: Proyectos de I+D+i Retos 2020. PI: Alejandro J. C. Crespo (Universidade de Vigo). 01/09/2021-31/08/2024. 181.500 €. **Principal investigator.**

[4] WELCOME: Diseño numérico de dispositivos flotantes para aprovechamiento de energías de las olas: eficiencia y supervivencia (ENE2016-75074-C2-1-R). Ministerio de Economía y Competitividad: Retos 2016. PI: Alejandro J. C. Crespo (Universidade de Vigo). 30/12/2016-29/12/2019. 95.590 €. **Principal investigator.**

[5] NUMANTIA: Diseño numérico de cajones antirreflejantes (ED431F 2016/004). Xunta de Galicia: Xóvenes investigadores. PI: Alejandro J. C. Crespo (Universidade de Vigo). 01/01/2016-31/10/2019. 90.000 €. **Principal investigator.**

[6] IMDROFLOOD: Improving drought and flood early warning, forecasting and mitigation using real-time hydroclimatic indicators (PCIN-2015-243). European Commission EC under Horizon 2020: Water JPI - WaterWorks 2014. Acciones de Programación Conjunta Internacional 2015-2. PI: L. Gimeno Presa (Universidade de Vigo). 01/05/2016-30/04/2019. 100.000 €. Research team.

[7] DEMOWAVE: Demonstration of the efficiency & environmental impact of wave energy converters (WEC) in high energy coasts (LIFE14 CCM/ES/001209). European Commission: LIFE 2015. PI: Ángel Manuel Fernández Vilán (Universidade de Vigo). 01/10/2015-30/09/2018. 336.277 €. Research team.

[8] Programa Oportunius – Apoio á excelencia (2016CONVXGOPORTUNIUS). Xunta de Galicia. PI: A.J.C. Crespo (Universidade de Vigo). 01/01/2016-30/05/2017. 50.000 €. **Principal investigator.**

[9] Modelo SPH para el estudio del transporte de sedimentos inducido por las hélices de los barcos dentro de los puertos. Ministerio de Economía y Competitividad. PI: R. Gómez-Gesteira (Universidade de Vigo). 01/01/2013-31/12/2015. 76.000 €. Team member.

[10] Estudio de inundaciones y elaboración de mapas de riesgo para la provincial de Ourense mediante modelado numérico. Universidade de Vigo: INOU. PI: Alejandro J. C. Crespo (Universidade de Vigo). 01/01/2012-31/12/2012. 5.000 €. **Principal investigator.**

C.3. Contracts, technological or transfer merits (last 10 years)

- Contract with private company: “Desarrollo de simulaciones basadas en DualSPHysics y la integración del mismo en un entorno de diseño de dispositivos e infraestructuras marinas avanzadas”. COMPANY: Sener Ingeniería y Sistemas, S.A. 01/11/2013-30/6/2014. 22.542 €. **Principal investigator.**

- Co-founder of the spin-off of the Universidade de Vigo “Environmental Physics Technologies S.L.” (CIF: B-32454266).

- Organisation of Continuing Professional Development (CPD) courses in different institutions (universities and private companies): <https://dual.sphysics.org/index.php/training/>.



C.4. Patents

- Core developer of the open-source code named DualSPPhysics that is distributed under GPL license: <https://github.com/DualSPPhysics/DualSPPhysics>

C.5. Other publications (last 10 years)

- Editor in “Computer Physics Communications” (Q1) 2016-2023.
- Editor in “Applied Ocean Research” (Q1) since 2023.
- Editor of the Virtual Special Issue in Computer and Fluids in 2019.
- Editor of the Special Issue in Journal of Hydraulic Research in 2010.

C.6. Participation in international conferences

- +170 contributions in international conferences and 7 invited lectures:
 - 1) During RSME 2019, with the title “Smoothed Particle Hydrodynamics: A Lagrangian method for wave energy devices”, organised by Universidad de Cantabria in Santander, 04/02/2019.
 - 2) During II International Congress on Water: Floods and Droughts, with the title “DualSPPhysics: a numerical tool to study extreme floods and debris flows”, organised by Universidade de Vigo in Ourense, 27/10/2016.
 - 3) During 10a Jornadas de Hidráulica, Recursos Hídricos e Ambiente, with the title “SPH modelling in engineering: coastal protection and WECs design”, organised by Faculdade de Engenharia, Universidade do Porto (Portugal), 27/04/2016.
 - 4) During SPH Workshop at FHR, with the title “DualSPPhysics to real-life engineering problems”, organised by Flanders Hydraulic Research (Belgium), 07/02/2014.
 - 5) During Smoothed Particle Hydrodynamics (SPH) - Grand Challenges and State-of-the-art for Industrial Applications, with the title “SPH Simulation of Coastal Problems with GPUs”, organised by UK Meshless Methods Network in Manchester (United Kingdom), 10/10/2013.
 - 6) During 7th Subrata Chakrabarti International Conference on Fluid Structure Interaction, with the title “Smoothed Particle Hydrodynamics applied in fluid structure interaction”, organised byr Wessex Institute in Gran Canaria, 10/04/2013.
 - 7) During CCP12 Meshless + HPC Workshop, with the title “A massively parallel Smoothed Particle Hydrodynamics scheme using CPU-GPU clusters”, organised by Cardiff School of Engineering, 16/05/2012.

C.7. Reviewer and evaluation tasks

- Reviewer in 50 different international indexed journals.
- Member of 9 examination board of PhD exams (5 in Spain, 2 in Belgium and 2 in Portugal).
- Member of national evaluation commissions (ANEP) since 2015.

C.8. Organisation of international conferences (last 10 years)

- Invited session “VI International Conference on Particle-Based Methods”, Barcelona, (2019).
- Chair of “12th International SPHERIC Workshop”, Ourense (2017).
- LOC of “3rd DualSPPhysics Users Workshop”, Parma (2017).
- LOC of “International Symposium on Water 2016”, Ourense (2016).
- LOC of “2nd DualSPPhysics Users Workshop”, Manchester (2016).
- Chair of “2nd Iberian Workshop on Smoothed Particle Hydrodynamics”, Ourense, 2015.
- LOC of “1st DualSPPhysics Users Workshop”, Manchester (2015).
- Chair of “Iberian Workshop on Smoothed Particle Hydrodynamics”, Ourense (2013).

C.9. Memberships of international scientific societies

- Member of the Management Committee of [WECANet](#) EU COST action since 2018.
- Member of the scientific Spanish society [SEMNI](#) since 2017.
- Member of the Steering Committee of [SPHERIC](#) (supported by ERCOFTAC) since 2013.
- Member of the Scientific Committee in 17 international conferences.

C.10. Grants and scholarships

- Program “Ramón y Cajal” funded by Ministerio de Economía y Competitividad (2014-2019).
- Program “Juan de la Cierva” funded by Ministerio de Ciencia e Innovación (2012- 2014).
- Program “Isabel Barreto” funded by Xunta de Galicia (2010-2011).
- Program “María Barbeito” funded by Xunta de Galicia (2005-2008).