MINISTERIO DE CIENCIA E INNOVACIÓN

Cofinanciado por la Unión Europea

AGENCIA ESTATAL DE INVESTIGACIÓN

CV date	25/05/2022

Part A. PERSONAL INFORMATION

First name	Sergio		
Family name	Hoyas Calvo		
Gender (*)	Male	Birth date (dd/mm/yyyy)	
Social Security, Passport, ID number			
e-mail:	serhocal@mot.upv.es	URL Web	
Open Researcher and Contributor ID (ORCID) (*)		0000-0002-8458-7288	

(*) Mandatory

A.1. Current position

Position	Professor (catedrático) of Aerospace Engineering		
Initial date	14-12-2019		
Institution	Universitat Politécnica de Valéncia (UPVLC)		
Department/Center			
Country	Spain	Teleph. number	620945962
Keywords	Turbulence; Fluid Mechanics; Supercomputation		

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

Period	Position/Institution/Country/Interruption cause
2010-2019	Associate Professor (titular)/UPVLC/Spain/promotion
2008-2009	Lecturer (Contratado Doctor)/UPVLC/Spain/promotion
2007-2008	Assistant (Ayudante Doctor)/U. Valencia/Spain/
2005-2007	J. de la Cierva Fellowship/UP de Madrid/Spain
1999-2004	Lecturer/U. Castilla-La Mancha/Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Licenciado CC. Matemáticas	Universidad Complutense de Madrid/Spain	1999
Ph.D. in Applied Mathematics	Universidad Complutense de Madrid/Spain	2003

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

D. Sergio Hoyas Calvo was born in Madrid on February 10, 1975. He graduated in 1999 in Mathematical Sciences from the Complutense University of Madrid (UCM) and received his Ph.D. in Applied Mathematics from the same university in 2003. In December 2010, he was appointed associate professor of Aerospace Engineering. He obtained his full professorship in December 2019.

He is lecturing in the Master of Aerospace Engineering at the Universitat Politècnica de València (UPVLC). His research activity, after several years at the UPVLC institute CMT-Motores Térmicos, is now at the Instituto de Matemática Pura y Aplicada. In addition, since 2014 and by agreement with the UPV, he has collaborated with the international program of the Florida State University, Tallahassee, Florida as a Lecturer of Mathematics.

Previously, he has been PDI of the universities of Castilla-la Mancha (five years), Politécnica de Madrid (Juan de la Cierva Postdoctoral Fellow, two years), Valencia (Assistant Doctor, 18 months), and UPVLC (Contracted doctor, two years). He has three six-year research and three five-year teaching periods. During these years, he has been teaching in the areas of knowledge of Applied Mathematics, Fluid Mechanics, Computer Architecture, and Aerospace Engineering.

He is an expert in the modeling and simulation of physical systems. Apart from his main field of research, the numerical simulation of fluid dynamics, he has published research articles on Chemistry, Heat Transmission, and Biology. In this field, he has developed the BRECAN algorithm for the early detection of breast cancer. The company Ascires SL is commercially exploiting this algorithm.

Since 2001 Prof. Hoyas has published 71 Scopus-Indexed articles. He has ~2400 citations. One of his articles is an ISI Highly cited with ~750 citations. It is the most cited article in the prestigious journal Physics of Fluids in 2006. This year he has published a paper in the Journal **Physics Review Letters** where he proposes a new way of studying turbulent flows. The usefulness of this theory is shown by demonstrating mathematically for the first time a well-known property of wall-bounded flows: the existence of a logarithmic profile in the streamwise component of the velocity. In addition, he has published seven more articles with relative quality index, has participated in 40 national and international conferences, and has given three invited seminars.

Prof. Hoyas has supervised three Ph.D. thesis. He is currently supervising 4 Ph.D. theses, all related to fluid mechanics. He has supervised approximately 150 Batchelor and Master Thesis. The results of five of these theses have been published in scientific journals.

Currently, Dr. Hoyas has been the principal investigator of three FECYT projects (200k€) and three public projects evaluated by ANEP through an agreement with the Valencian Agency of Evaluation and Prospective. These have been funded by the UPV and the Generalitat Valenciana (GVA) for 60,000 €. He has participated since joining the university in 15 publicly funded research projects, including regional, national, three European projects, one ESA project, and one Consolider.

In technology transfer, Prof. Hoyas is a member of the advisory board of the company Zeleros SL, a company that wants to develop the fifth method of transport, the Hyperloop. He is also collaborating with Comet SL, a small enterprise in València, in a European Space Agency project and the simulation of drones using Computational Fluid Dynamics.

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

C.1. Publications *(see instructions)*

1. Eivazi, H., Le Clainche, S., Hoyas, S., Vinuesa, R. Towards extraction of orthogonal and parsimonious non-linear modes from turbulent flows (2022) Expert Systems with Applications, 202, art. no. 117038, DOI: 10.1016/j.eswa.2022.117038

2. Lazpita, E., Martínez-Sánchez, Á., Corrochano, A., Hoyas, S., Le Clainche, S., Vinuesa, R. On the generation and destruction mechanisms of arch vortices in urban fluid flows (2022) Physics of Fluids, 34 (5), art. no. 051702, DOI: 10.1063/5.0088305

3. Schmekel, D., Alcántara-Ávila, F., Hoyas, S., Vinuesa, R. Predicting Coherent Turbulent Structures via Deep Learning (2022) Frontiers in Physics, 10, art. no. 888832, .DOI: 10.3389/fphy.2022.888832

4 Escartí-Guillem, M.S., García-Raffi, L.M., Hoyas, S. URANS Analysis of a Launch Vehicle Aero-Acoustic Environment (2022) Applied Sciences (Switzerland), 12 (7), art. no. 3356, DOI: 10.3390/app12073356

5 Ramírez, F.N., Escarti-Guillem, M.S., García-Raffi, L.M., Hoyas, S. A study of the mesh effect on a rocket plume simulation (2022) Results in Engineering, 13, art. no. 100366, . Cited 1 time. DOI: 10.1016/j.rineng.2022.100366

6 Oberlack, M., Hoyas, S., Kraheberger, S.V., Alcántara-Ávila, F., Laux, J. Turbulence Statistics of Arbitrary Moments of Wall-Bounded Shear Flows: A Symmetry Approach (2022) Physical Review Letters, 128 (2), art. no. 024502, . Cited 5 times. DOI: 10.1103/PhysRevLett.128.024502

7. Hoyas, S., Oberlack, M., Alcántara-Ávila, F., Kraheberger, S.V., Laux, J. Wall turbulence at high friction Reynolds numbers (2022) Physical Review Fluids, 7 (1), art. no. 014602, . Cited 4 times. DOI: 10.1103/PhysRevFluids.7.014602

8. Lluesma, F., Arguedas, A., Hoyas, S., Sanchez, A., Vicen, J. Evacuated-Tube, High-Speed, Autonomous Maglev (Hyperloop) Transport System for Long-Distance Travel: An overview (2021) IEEE Electrification Magazine, 9 (4), pp. 67-73. DOI: 10.1109/MELE.2021.3115543

9. Amo-Navarro, J., Vinuesa, R., Conejero, J.A., Hoyas, S. Two-dimensional compact-finite-difference schemes for solving the bi-laplacian operator with homogeneous wall-normal derivatives (2021) Mathematics, 9 (19), art. no. 2508. DOI: 10.3390/math9192508

10 Alcántara-Ávila, F., Hoyas, S. Direct numerical simulation of thermal channel flow for medium–high Prandtl numbers up to Re_τ=2000 (2021) International Journal of Heat and Mass Transfer, 176, art. no. 121412, . Cited 5 times. DOI: 10.1016/j.ijheatmasstransfer.2021.121412
DOI: 10.1016/j.rineng.2020.100196

C.2. Congress

1	**Meeting**	74th Annual Meeting of the American Physical Society, Division of Fluid Dynamics				
	Title	Symmetry induced high-moment scaling laws of wall-bounded shear flows for arbitrary moments - validation using high Re_τ DNS and experimental data				
	ISBN		**Date**	21/11/21	**Place**	USA
	Authors	M. Oberlack, S. Hoyas et al				
2	**Meeting**	European Congress and Exposition on Noise Control Engineering (EuroNoise 2021)				
	Title	Application of metamaterials to control noise scattering during space vehicle lift-off				
	ISBN	978-989-53387-0-2	**Date**	27/10/21	**Place**	online
	Authors	Escartí-Guillem, Mara Salut; Hoyas S et al.				
3	**Meeting**	25th International Congress of Theoretical and Applied Mechanics				
	Title	Symmetry induced turbulent moment scaling laws of arbitrary order and its validation using channel flow DNS data at Re_tau=10000				
	ISBN		**Date**	23/08/21	**Place**	Italy
	Authors	M. Oberlack, S. Hoyas, S. Kraheberger, Francisco Álcantara-Avila.				
4	**Meeting**	25th International Congress of Theoretical and Applied Mechanics				
	Title	Turbulent channel flow at Re_tau=10000				
	ISBN		**Date**	23/08/21	**Place**	Italy
	Authors	S. Hoyas, M. Oberlack, S. Kraheberger, Francisco Álcantara-Avila.				
5	**Meeting**	1st International Conference on Ultra-High-Speed Transportation (Hyperloop)				
	Title	Overview of an evacuated-tube transport (hyperloop) system for long-distance travel				

	ISBN		**Date**	02/03/21	**Place**	Munich
	Authors	Lluesma-Rodríguez, Federico; Hoyas, S				
6	**Meeting**	72nd Annual Meeting of the American Physical Society, Division of Fluid Dynamics				
	Title	Turbulent channel flow at Re_tau=10000				
	ISBN		**Date**	21/11/19	**Place**	USA
	Authors	M. Oberlack, S. Hoyas, S. Kraheberger, Francisco Álcantara-Avila.				
7	**Meeting**	ERCOFTAC Workshop Direct and Large Eddy Simulation – DLES2019				
	Title	Thermal Structures in Turbulent Couette Flows by DNS				
	ISBN		**Date**	21/09/19	**Place**	Spain
	Authors	S. Hoyas, Francisco Álcantara-Avila.				

C.3. Research projects

<u>Spanish Projects</u>

1- TRANSFERENCIA DE CALOR EN FLUJOS DE PARED: CANALES Y CAPAS LIMITES
Funded by: AGENCIA ESTATAL DE INVESTIGACION, RTI2018-102256-B-I00-AR
Funding: 56.500€ From 01/01/2019 to 31/12/2021
Principal investigator **Sergio Hoyas**, participants: 4

2- CONVECCION FORZADA EN CANALES TURBULENTOS
Funded by Ministerio de Economía y Competitividad, ENE2015-71333-R
Funding: 46.500€ From 01/01/2015 to 31/12/2018
Principal investigator: **Sergio Hoyas**, , participants: 4

3- Título del proyecto/contrato Simulación CFD de chorros Diesel en inyección directa: la atomización primaria.
Funding by: Generalitat Valenciana
Contract number: PAID/2011/079
Importe : 18000€ From 01/01/2011 to 31/12/2012
Principal investigator: **Sergio Hoyas**,

4- Supercomputación y e-ciencia
Funded by: Ministerio de ciencia e innovación, CSD- REFERENCIA 2007 – 00050
Funding: 5.000.000€ From, 01/01/2007 to 1/12/2012
Principal investigator: Mateo Valero. Participants: ~40

<u>European projects:</u>

5- **Elecfilter,** UE Seventh framework, Cleansky initiative
EU FP7 JTI-CS-2012-1-SGO-02-040
Funding: 250.000€ From: 2012 to: 2013
Principal investigator: Francisco Payri. Participants: 14.

6- **CometNano**: Project, Technologies for Synthesis, Recycling, and Combustion of Metallic Nanoclusters as Future Transportation Fuels
UE Seventh framework Project
Funding: 1.800.000€ From: 2009 to 2011
Investigador/a Principal: Athanasios Konstandopoulos. Participants: 18

C.4. Contracts, technological or transfer merits

1- **Redlaunch:** Launch sound level reduction, European Space Agency
Funding: 75k€ From: 2019 to: 2021
Principal investigator: Lluis García-Raffi. Participants: 6

2- Aerodynamics of hyperloop-aeroloop systems
Funding: 38125 From 2018 to 2018
Investigador Principal: Sergio Hoyas, Participants: 4