

**IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.**

**Part A. PERSONAL INFORMATION**
**CV date**

20/01/2023

First name	CÉSAR		
Family name	HUETE RUIZ DE LIRA		
Gender (*)	MALE	Birth date	30/11/1984
ID number	XXXXXXXX		
e-mail	chuete@ing.uc3m.es	URL Web	
Open Researcher and Contributor ID (ORCID) (*)	0000-0002-XXXXXXXX		

(\*) Mandatory

**A.1. Current position**

Position	Associate Professor ( <i>Profesor Titular</i> )		
Initial date	26/02/2019		
Institution	Universidad Carlos III de Madrid (UC3M)		
Department/Center	Ingeniería Térmica y de Fluidos	Escuela Politécnica Superior	
Country	Spain	Teleph. number	91 624 8810
Key words	Fluid Mechanics, Combustion, Compressible Flow		

**A.2. Previous positions (research activity interruptions, indicate total months)**

Period	Position/Institution/Country/Interruption cause
2015-2019	Visiting / Assistant Prof. / Juan de la Cierva FPI at UC3M
2013-2015	Postdoctoral Scholar at Univ. California San Diego
2012-2013	Postdoctoral Scholar at UC3M
2008-2012	FPU Scholar at Univ. Castilla – La Mancha

**A.3. Education**

PhD, Licensed, Graduate	University/Country	Year
Doctorate	Univ. Nacional de Educación a Distancia	2012
Diploma in Advanced Studies	Univ. Nacional de Educación a Distancia	2009
Bachelor Industrial Eng. (5 years)	Univ. de Castilla-La Mancha	2007

(Include all the necessary rows)

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

César Huete received his 5-year degree in Mechanical Engineering at the University of Castilla-La Mancha (UCLM) in 2007. He earned his PhD at the same university in connection with UNED in 2012. The thesis, funded by the Ministry of Education through the **FPU-AP2007-02745** grant and supervised by Prof. Gustavo Wouchuk, was focused on the theoretical study of the interaction of shock waves with weak turbulent flows. After his PhD completion, he moved to University Carlos III de Madrid at the Thermal Engineering and Fluid Mechanics department, to work with Prof. Antonio L. Sánchez in the SCORE Consolider Research project. The research was there focused on the interaction of thin detonation waves with turbulent flows. In 2013, he moved to **University of California San Diego (UCSD) for two years** to work also with Prof. Forman A. Williams on problems involving the interaction of the detonations with small-scale turbulent flows, the effect of weak shocks on transonic mixing layers, and the ignition of reactive mixing layers by oblique shock impingement. He arrived at Spain thanks to a **Juan de la Cierva FPI-2013-16306** grant to create an independent research line on topics related to compressible flows applied to Combustion as well as High-Energy-Density-Physics, research lines that were firstly funded by Fundación Iberdrola España



and **Fundación BBVA-Red Leonardo**. Currently, his research line is mostly associated with hydrogen combustion and safety issues through projects earned by the Comunidad de Madrid (Interdisciplinary UC3M) and the Ministry of Science and Innovation (TED2021-129446B-C41).

As a result of his **Research Activity**, he has:

- published 27 articles in JCR journals (see C.1),
- given more than 30 oral talks in international congresses (see C.2)
- participated in 15 research projects, being the PI in 6 of them (see C.3)
- given 3 invited talks at UCLM (Spain), Univ. Marseille (France), McGill University (Canada) and he is now invited to give a summer lecture at Univ. Rochester (USA)
- been awarded with national and international grants and scientific awards. See list below:
  - 2019: Becas Leonardo a investigadores y creadores culturales, *Fundación BBVA*.
  - 2017/2018: Ayudas a la investigación en energía y medio ambiente, *Fund. Iberdrola*.
  - 2016/2018/2022: la UC3M, First-group for scientific production at UC3M
  - 2014: National Postdoctoral Fellowship, Juan de la Cierva-Formación FPI-2013-16306, Ministerio de Economía y Competitividad.
  - 2013 Excellency Award in Ph.D. 2011/2012, UNED, Facultad de Ciencias. Spain.
  - 2011: Fusion Science Center Award for Excellence in Poster Presentation, Fusion Science Center, University of Rochester. San Diego, CA.
  - 2009: Turbulent mixing and beyond for youth, 2 Int. Conference and Advance School: Turbulent Mixing and Beyond, Int. Centre of Theoretical Physics, ICTP. Trieste, Italy.
  - 2009: Award at First forum of young researchers at ETSII, UCLM. Ciudad Real.
  - 2008: National Fellowship FPU-AP2007-02745, Ministerio de Ciencia e Innovación.
  - 2006: National Fellowship Beca de Colaboración, Ministerio de Educación y Ciencia.

According to the Google Scholar, his work has been cited 500 times with a 14 h-index.

**Lecturing:** He accumulates more than 1300 hours of lecturing in different courses that include: Combustion, Fluid Mechanics, Hydraulic Machines and Engineering Fluid Mechanics, Aerothermochemistry, Explosion Dynamics, and Industrial Installations I, for the Master in Industrial Engineering, Master in Mathematical Engineering, Bachelor in Industrial Technology Engineering, Energy Engineering, Mechanical Engineering, and Industrial Electronics and Automation. From 2014-2022, he is an invited professor at UNED to teach Compressible Fluid Dynamics in the Master of Advanced Physics. He also worked as teaching assistant at Univ. California San Diego in 2014. He has directed more than 20 Bachelor/Master thesis and he is currently supervising 2 PhD students. In addition, he has been a jury member in 5 PhD thesis defenses at Univ. Rovira I Virgil (twice), Univ. Politécnica de Madrid, Univ. Castilla-La Mancha, and Univ. Paris-Saclay.

#### **Other activities:**

- Since 2015: Member of Evaluation Committee, ANECA, for ACREDITA and SIC (EURO-ACE and EURO-INF) certificate programs.
- 2018-2020: External evaluator of private/public projects and scholarships for DEVA.
- 2019: External evaluator for the Leading Fellows Programme, Evaluation of Postdocs Fellow Grants, H2020 - Marie Skłodowska-Curie.
- Since 2016, Member of the Commission for the Energy Engineering Bachelor.
- Since 2021: Deputy director of the Thermal and Fluid Mechanics Department.
- Since 2022: NATO-STO AVT-352 Working Group: "Measurement, Modelling and Prediction of Hypersonic Turbulence" Leading the task on shock-turbulence interaction in hypersonics.
- Since 2021: Member of the Hydrogen Europe Research society through UC3M partnership.



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

### C.1. Publications (10 most important. **In bold face** the corresponding author)

1. The stability of expanding reactive shocks in a van der Waals fluid, *Phys. Fluids*, 34, 046106, (2022). A. Calvo-Rivera, **C. Huete**, A.L. Velikovich
2. Thermochemical effects on hypersonic shock waves interacting with weak turbulence, *Phys. Fluids*, 33, 08611, (2021). **C. Huete**, A. Cuadra, J. Urzay, M. Vera
3. Stability of expanding accretion shocks for an arbitrary equation of state, *J. Fluid Mech.*, 927, A35, (2021). **C. Huete**, A.L. Velikovich, D. Martínez-Ruiz, A. Calvo-Rivera
4. Acoustic stability of non-adiabatic high-energy-density shocks, *Phys. Rev. Fluids*, 5, 113403(2020). **C. Huete**, F. Cobos-Campos, E. Abdikamalov, S. Bouquet
5. Effect of equivalence ratio fluctuations on planar detonation discontinuities, *J. Fluid Mech.*, 903, A30 1-39 (2020). A. Cuadra, **C. Huete**, M. Vera
6. The D'Yakov-Kontorovich instability in planar reactive shocks, *J. Fluid Mech.*, 879, 54–84 (2019). **C. Huete**, M. Vera.
7. Interaction of a planar reacting shock wave with an isotropic turbulent vorticity field, *Phys. Rev. E*, 93, 053104 (2017). **C. Huete**, T. Jin, D. Martínez-Ruiz, Kun Luo
8. Diffusion-flame ignition by shock-wave impingement on Hydrogen-Air a supersonic mixing layer, *J. Prop. Power*, 33, 256-263 (2017). **C. Huete**, A. L. Sanchez, F.A. Williams
9. Weak-Shock Int. with Transonic Laminar Mixing Layers of Fuels for High-Speed Prop., *AIAA J.*, 54, No. 3, 966-979 (2016). **C. Huete**\* J. Urzay, A. L. Sanchez, F.A. Williams.
10. Diffusion-flame ignition by shock-wave impingement on a supersonic mixing layer, *J. Fluid Mech.*, 784, 74–108 (2015). C. Huete, **A. L. Sanchez**, F.A. Williams, J. Urzay.

### C.2. Congress

#### Invited Talks

- 2020: Theory of planar detonations in non-perfect gaseous mixtures, McGill University, Montreal, Department of Mechanical Engineering, 20/11/2020.
- 2019: D'Yakov-Kontorovich instability in planar reactive shocks, Aix-Marseille Université, M2P2, 08/03/2019.
- 2023: On the stability of shock waves for arbitrary equations of state. University of Rochester, (summer 2023, planned)

#### Regular conferences:

- 25<sup>th</sup>, 27<sup>th</sup>, and 28<sup>th</sup> Int. Colloquium on the Dynamics of Explosions and Reactive Systems (ICDERS), Leeds (UK), Beijing (China) and Naples (Italy).
- 1<sup>st</sup> Spanish Fluid Mechanics Conference (SFMC 2022), Cádiz.
- 24<sup>th</sup> and 25<sup>th</sup> Int. Union of Theoretical and Applied Mechanics (ICTAM), Montreal (Canada) and Milan (Italy).
- 54<sup>th</sup>, 55<sup>th</sup>, 57<sup>th</sup>, 58<sup>th</sup>, 60<sup>th</sup>, AIAA Science and Technology Forum and Exposition, San Diego (CA), Grapevine (TX), virtual, and Washington (MA).
- 67<sup>th</sup>, 71<sup>st</sup>, and 73<sup>rd</sup>, DFD APS, San Francisco (CA), Atlanta (GA) and Chicago (IL)
- 50<sup>th</sup>, 51<sup>st</sup>, 62<sup>nd</sup>, 63<sup>rd</sup> DPP APS, Dallas (TX), Atlanta (GA), and Memphis (TE), Spokane (WA)
- 1<sup>st</sup> Colloquium of the Spanish Theor. & App. Mech. Society (STAMS 2019), Madrid.
- 11<sup>th</sup> and 12<sup>th</sup> European Fluid Mechanics Conference, Seville and Viena.
- 11<sup>th</sup> and 16<sup>th</sup> Int. Workshop on the Physics of Compressible Turbulent Mixing, Santa Fe, NM and Marseille, France.
- 2<sup>nd</sup> and 6<sup>th</sup> Int. Conf. & Advanced School: Turb. Mixing and Beyond, Trieste, Italy.
- 2014-spring and 2015-fall meeting of WSSCI, Caltech (CA) and Provo (UT).
- 4<sup>th</sup> SIAM Int. Conf. on Numerical Combustion, San Antonio (TX).
- 31<sup>st</sup> and 32<sup>nd</sup> Int. Workshop on Physics of High Energy Density in Matter, Austria.
- 17<sup>th</sup> Shock Compression and Condensed Matter, Chicago (CA).
- 38<sup>th</sup> Conference on Plasma Physics. EPS, Strasbourg, France.

### C.3. Research projects

1. Safe use of hydrogen for energetic applications  
 IP: **César Huete Ruiz de Lira** & Mario Sánchez 150.650,00 € (352.130€)  
 Ref. TED2021-129446B-C41 MICINN 01/12/2022-1/12/2024
2. Posicionamiento Estratégico de la Comunidad de Madrid.  
 IP: Mercedes Ballester (CIEMAT) 2.100.000 €  
 Ref. GREEN-H2 MICINN-CAM 01/01/2021- 31/09/2025
1. Study of detonation and explosion hazards in hydrogen-air mixture  
 IP: **César Huete Ruiz de Lira** & Victor Bayona 58.800 €  
 Ref. H2SAFE-CM-UC3M CAM-UC3M 01/01/2022-31/12/2023
2. Proyecto Excelencia del departamento de Ingeniería Térmica y de Fluidos  
 IP: **César Huete Ruiz de Lira** & Marcos Vera 104.206,80€  
 Ref. EPUC3M22 CAM-UC3M 01/01/2020-31/12/2022
3. Intelligent Decarbonized and Low Emissions Power Generation (IDEAL)  
 IP: Mario Sánchez-Sanz & Eduardo Fdez-Tarrazo 89.177,00€  
 Ref. PID2019-108592RB-C41 MICINN 01/06/2020-31/05/2023
4. Caracterización del Frente de Ablación en Fusión por Confinamiento Inercial  
 IP: **César Huete Ruiz de Lira** 38.000€  
 Fundación BBVA- Red Leonardo 01/10/2019-30/11/2021
5. Numerical simulations of shock-induced combustion phenomena  
 Pedro José Martínez Ferrer 500.000 horas de cálculo  
 Ref. FI-2019-1-0046 RES-2018 Tercer Periodo
6. Fusión por Confinamiento Inercial: inestabilidades hidrodinámicas  
 IP: **César Huete Ruiz de Lira** 20.000,00 €  
 Fundación Iberdrola España 01/09/2018-31/08/2019
7. Combustibles alternativos en condiciones de alta velocidad  
 IP: **César Huete Ruiz de Lira** 20.000,00 €  
 Fundación Iberdrola España 01/09/2017-31/08/2018
8. Efficient combustion of biofuels with application to portable power generation  
 IP: Mario Sánchez-Sanz & Eduardo Fernández Tarrazo 173.030,00 €  
 Ref. ENE2015-65852-C2-1-R MEIC 01/01/2016- 31/12/2019
9. High Fidelity Numerical Simulations of Shock-Induced Combustion Phenomena  
 IP: Pedro José Martínez Ferrer 500.000 horas de cálculo  
 Ref. FI-2017-3- RES-2017 Tercer Periodo
10. Sustainable Combustion Research (SCORE)  
 IP: Antonio Luis Sánchez Pérez 830.000,00 €  
 Ref. CSD2010-00011 MICINN 27/12/2010-26/12/2016
11. Fundamental Modeling of High-Speed and Turbulent Combustion  
 IP: Forman A. Williams N/A  
 Ref. FA9550-12-1-01389 AFOSR 01/08/2013-31/12/2015
12. Materia con alta densidad de energía en fusión por confinamiento inercial  
 IP: Antonio Roberto Piriz 231.113,00 €  
 Ref. ENE2009-09276 MICINN 01/01/2010-31/12/2011
13. Hidrodinámica de la Fusión Termonuclear por Confinamiento Inercial  
 IP: Gustavo Wouchuk Schmidt 140.000,00 €  
 Ref. PEII11-0056-1890 JCCM 01/04/11-01/04/13

### C.4. Contracts, technological or transfer merits