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Universidad Carlos III de Madrid,
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Updated, September 2017.

OSCAR FLORES, PhD.

EDUCATION

- March 2008 **PhD in engineering**, E.T.S.I. Aeronáuticos, U. Politécnica de Madrid.
PhD Thesis: “The dynamics of the outer region of wall-bounded turbulence”
Advisor: Javier Jiménez.
- Septiembre 2002 **Ingeniero Aeronáutico**, E.T.S.I. Aeronáuticos, U. Politécnica de Madrid.
MSc Thesis: “Design of a simulation of the wall region in a turbulent flow”.
Advisor: Rafael Gomez.

PROFOESSIONAL EXPERIENCE

- 2017-present **Associate Professor** at the Dept. of Bioengineering and Aerospace Eng.,
Universidad Carlos III de Madrid.
Serving as **Academic Assistant Director** since February 2015.
- 2011-2017 **Visiting Professor** at the Dept. of Bioengineering and Aerospace Eng., Uni-
versidad Carlos III de Madrid.
Served as **Vice-chair** of the Department from January 2012 to January 2013.
May - July 2016: Visiting scholar at the Dept. Mechanical and Aerospace
Engineering, University of California, San Diego.
March - April 2013: Visiting Scholar at the Dept. Mechanical Engineering,
University of Washington.
- 2008-2011 **Research Associate** at the Dept. Mechanical Engineering, University of Wa-
shington.
May 2010: Consultant for the National Oceanic and Atmospheric Administra-
tion, USA.
September 2010: Linné Flow visitor at the Linné Flow Center in KTH Royal
Institute for Technology, Stockholm (Sweden).
- 2002-2008 **Graduate Research Fellow**. E.T.S.I. Aeronáuticos, U. Politécnica de Ma-
drid.
2003-2008: Consultant for Englobe Technologies.
2003-2004: Translator of the book “Fluid Mechanics, 5th Edition”, by Frank
M. White. McGraw Hill Interamericana de España, Barcelona, Spain.
September 2006: Visiting Research Fellow. Department of Mechanical Engi-
neering. University of Texas at Austin.
August 2003: Visiting Research Fellow. Center for Turbulence Research. Stan-
ford University.

HONORS, AWARDS & FELLOWSHIPS

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Jun 2016	Scholarship “Jose Castillejo” CAS 15/00411, Spanish Ministry of Education (MECD).
Nov 2010	U.S. Geological Survey Director’s Award.
Nov 2008	Finalist of the ERCOFTAC Da Vinci Competition 2008.
2003-2008	PhD Scholarship from “Programa Nacional de Formación de Personal Investigador”. Spanish Ministry of Education (MECD).
2001-2002	Undergraduate Scholarship “Beca de colaboración de la U. Politécnica de Madrid”.

ARTICLES IN REFEREED JOURNALS

Times cited: 301, h-index=6 (data from WoS, May 24th 2017)

1. ALMAGRO, A, GARCÍA-VILLALBA, M. & FLORES, O. , 2017 “A numerical study of a variable-density low-speed turbulent mixing layer” *J. Fluid Mech.* Accepted.
2. MORICHE, M., FLORES, O. & GARCÍA-VILLALBA, M., 2017 “On the aerodynamic forces on heaving and pitching airfoils at low Reynolds number”. *J. Fluid Mech.* Accepted
3. FLORES, O., RILEY, J. & HORNER-DEVINE, A. 2017 “On the dynamics of turbulence near a free surface” *J. Fluid Mech.* 821, 248–265. doi:10.1017/jfm.2017.209.
Times cited: 0
4. MORICHE, M., FLORES, O. & GARCÍA-VILLALBA, M., 2016 “Three-dimensional instabilities in the wake of a flapping wing at low Reynolds number”. *Int. J. Heat and Fluid Flow*, 62, 44-55, 10.1016 / j.ijheatfluidflow.2016.06.015.
Times cited: 0
5. MARUGÁN-CRUZ, C., FLORES, O., SANTANTA, D. & GARCÍA-VILLALBA, M., 2016 “Heat transfer and thermal stresses in a circular tube with a non-uniform heat flux”. *Int. J. Heat and Mass Transfer* 96, 256-266.
Times cited: 0
6. ANTORANZ, A., GONZALO, A., GARCÍA-VILLALBA, M. & FLORES, O., 2015 “Numerical simulation of heat transfer in a pipe with asymmetric thermal boundary conditions”, 2015. *Int. J. Heat and Fluid Flow* 55, 45-51.
Times cited: 1
7. ETIEL-AMOR, G., ORLU, R. SCHLATTER, P. & FLORES, O. ,2015 “Hairpin vortices in turbulent boundary layers”. *Phys. Fluids.* 27 (2), 025108.
Times cited: 5
8. LOZANO-DURÁN, A, FLORES, O. & JIMÉNEZ, J, 2012 “Three dimensional structure of momentum transfer in turbulent channels”. *J. Fluid Mech.* 694, 100-130. **Times cited: 43**
9. FLORES, O. & RILEY, J. 2011 “Analysis of turbulence collapse in the stably stratified surface layer using direct numerical simulation”. *Boundary-Layer Meteorol.* 139, 2, 241–259. 10.1007/s10546-011-9588-2.
Times cited: 28

10. FLORES, O. & JIMÉNEZ, J. 2010 “Hierarchy of minimal flow units in the logarithmic layer”. *Phys. Fluids* **22**, 071704. **Times cited: 49**
11. FLORES, O., JIMÉNEZ, J. & DEL ÁLAMO, J.C., 2007 “Vorticity organization in the outer layer of turbulent channels with disturbed walls”. *J. Fluid Mech.* 591, 145–154. **Times cited: 28**
12. FLORES, O. & JIMÉNEZ, J., 2006 “Effect of wall-boundary disturbances on turbulent channel flows”. *J. Fluid Mech.* 566, 357–376. **Times cited: 58**
13. JIMÉNEZ J., DEL ÁLAMO, J.C. & FLORES, O., 2004 “The large-scale dynamics of near-wall turbulence”. *J. Fluid Mech.* 505, 179–199. **Times cited: 89**

CONFERENCE PAPERS AND TECHNICAL REPORTS

1. ARRANZ, G. & FLORES, O. 2016. “Thrust generation in heaving and flapping wings in forward flight”, 34th AIAA Applied Aerodynamics Conference, AIAA Aviation, (AIAA 2016-3556). <http://dx.doi.org/10.2514/6.2016-3556>
2. SASSUN, D., FLORES, O. & ORLANDI, P. 2016. “Analysis and comparison between rough channel and pipe flows”. *Journal of Physics: Conference Series*. **708**, 012011.
3. MORICHE, M., FLORES, O. & GARCIA-VILLALBA, M. 2014. “Generation of thrust and lift with airfoils in plunging and pitching motion”. *Journal of Physics: Conference Series*. **574**, 012163.
4. D’ADDIO, P., SASSUN, D., FLORES, O. & ORLANDI, P. 2014. “Influence of solid boundary conditions on the evolution of free and wall-bounded turbulent flows”. *Journal of Physics: Conference Series*. **506**, 012014.
5. ETIEL-AMOR, G., FLORES, O. & SCHLATTER, P. 2014. “Hairpin vortices in turbulent boundary layers”. *Journal of Physics: Conference Series*. **506**, 012008
6. FLORES, O., MARUGAN-CRUZ, C., SANTANA, D., & GARCIA-VILLALBA, M. 2014. “Thermal Stresses Analysis of a circular tube in a Central Receiver”. *Energy Procedia*, 49, 354-362.
7. FLORES, O., & JIMÉNEZ, J., 2010. “Log-layer dynamics in smooth and artificially-rough turbulent channels”. *IUTAM Symposium on The Physics of Wall-Bounded Turbulent Flows on Rough Walls*, Cambridge, UK, Julio 7-9, 2009. T.B. Nickels (Ed.). IUTAM Bookseries, Vol 22, 93-98.
8. FLORES, O. & JIMÉNEZ, J., 2004. “Effect of wall-boundary disturbances on turbulent channel flows”. *Advances in turbulence X*, CIMNE, 235-238.
9. FLORES, O., JIMÉNEZ, J. & TEMPLETON, J., 2003. “Rough wall channel analysis using suboptimal control theory”. *CTR Annual Research Briefs*, 413–424, Stanford University.
10. JIMÉNEZ, J., FLORES, O. & GARCÍA-VILLALBA, M. 2002. “Organization of autonomous wall turbulence”. *Advances in turbulence IX*, CIMNE, 824-828.

11. JIMÉNEZ, J., FLORES, O. & GARCÍA-VILLALBA, M. 2001. “The large scale organization of autonomous turbulent wall regions”. *CTR Annual Research Briefs*, Stanford, CA. 317-329.

INVITED LECTURES

1. “Three-dimensional instabilities in the wake of an infinite aspect ratio flapping wing at low Reynolds number”. Fluid Mechanics Seminars, MAE Department, UCSD, San Diego, CA, (US). May 2016.
2. “Direct Numerical Simulation of turbulent stably-stratified wall flows”. Workshop on Simulation of complex flows: large scale DNS and LES of gaseous and two-phase flows. ETSIA, U. Politécnica de Madrid (Spain). April 2012.
3. “Analysis of stratification effects on the atmospheric surface layer using DNS”. ETSIA, U. Politécnica de Madrid (Spain). September 2010.
4. “DNS of wall-bounded turbulence”. Universidad Carlos III de Madrid (Spain). September 2010.
5. “Analysis of stable stratification effects on the atmosphere using DNS”. Linné Flow Center in KTH, Stockholm (Sweden) September 2010.
6. “DNS of turbulent channels with stable stratification”. Northwest Research, Seattle, WA (US). June 2010.
7. “Analysis of turbulence collapse in stably stratified surface layers using direct numerical simulation”. NCAR, Mesoscale and Microscale Meteorology Division, Boulder, CO (US). June 2010.
8. “DNS of turbulent channels with stable stratification”. Fluid Mechanics Seminars, MAE Department, UCSD, San Diego, CA (US). April 2010.

PARTICIPATION IN CONFERENCES

1. A. GONZALO, G. ARRANZ, M. MORICHE, O. FLORES & M. GARCÍA-VILLALBA “A numerical study of low-aspect-ratio flapping-wings in forward flight”. ERCOFTAC Workshop on Direct and Large-Eddy Simulations, DLES11, **SW4**. Pisa, Italy. May 2017.
2. G. ARRANZ, M. MORICHE, M. UHLMANN, O. FLORES & M. GARCÍA-VILLALBA “The influence of the Reynolds number on the autorotation of Samaras”. ERCOFTAC Workshop on Direct and Large-Eddy Simulations, DLES11, **SW4**. Pisa, Italy. May 2017.
3. O. FLORES, A. GONZALO, M. GARCÍA-VILLALBA, L. ROSSINI, A. HSIAO, E. McVEIGH, A.M. KAHN & J.C DEL ÁLAMO “Patient-specific analysis of blood stasis in the left atrium”. 69th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **L15.1**, Portland, US. November 2016.

4. A. ALMAGRO, M. GARCÍA-VILLALBA, O. FLORES & A.L. SANCHEZ “DNS investigation of differential-diffusion effects on temporarily evolving turbulent diffusion flames”. 69th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **A17.4**, Portland, US. November 2016.
5. M. MORICHE, M. GARCÍA-VILLALBA, & O. FLORES “Decomposing the aerodynamic forces of low-Reynolds flapping airfoils”. 69th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **G6.3**, Portland, US. November 2016.
6. M. MORICHE, O. FLORES & M. GARCÍA-VILLALBA “Analysis of the aerodynamic forces on heaving and pitching airfoils at low Reynolds number”. European Fluid Mechanics Conference 11, **Aerodynamics 1**. Sevilla, Spain. September 2016.
7. A. RAIOLA, A. IANIRO, S. DISCETTI, M. MORICHE, O. FLORES & M. GARCÍA-VILLALBA “Flow over flapping airfoils: qualitative and quantitative comparison between experiments and simulations”. European Fluid Mechanics Conference 11, **Aerodynamics 1**. Sevilla, Spain. September 2016.
8. A. ALMAGRO, O. FLORES & M. GARCÍA-VILLALBA “The effect of fluid properties changing with temperature for a variable-density mixing layer”. European Fluid Mechanics Conference 11, **Turbulence 4**. Sevilla, Spain. September 2016.
9. G. ARRANZ & O. FLORES “From heaving to flapping: effect on thrust generation”. European Fluid Mechanics Conference 11, **Aerodynamics 5**. Sevilla, Spain. September 2016.
10. M. MORICHE, E. HERNANDEZ-HURTADO, O. FLORES & M. GARCÍA-VILLALBA “The flow around a flapping-wing Micro-Air-Vehicle in free flight”. European Fluid Mechanics Conference 11, **Aerodynamics 5**. Sevilla, Spain. September 2016.
11. A. GONZALO, O. FLORES & M. GARCÍA-VILLALBA “A numerical study of finite aspect ratio wings in flapping motion at low Reynolds number”. European Fluid Mechanics Conference 11, **Aerodynamics 5**. Sevilla, Spain. September 2016.
12. G. ARRANZ and O. FLORES. “Thrust generation in heaving and flapping wings in forward flight”. AIAA Aviation 2016. Washington, US. June 2016.
13. J.C. LASHERAS, J.C. DEL ALAMO, A. ALISEDA, A., O. FLORES & J. RILEY. “Aiding in the response to the largest marine oil spill disaster ever recorded in history: Flow rate estimation of the amount of oil discharged during the 2010 Deepwater Horizon accident in the Gulf of Mexico using statistical correlation algorithms”. Emil Hopfinger Colloquium, LEGI, Grenoble, France. May 2016.
14. A. ANTORANZ, A. GONZALO, O. FLORES & M. GARCÍA-VILLALBA. “Turbulent heat transfer in pipe flow with asymmetric thermal boundary conditions”. European Turbulence Modelling and Measurements 10, Marbella, Spain. September 2014.
15. A. ANTORANZ, A. GONZALO, O. FLORES & M. GARCÍA-VILLALBA. “Turbulent heat transfer in pipes with variable circumferential heat flux”. European Fluid Mechanics Conference 10, Technical University of Denmark, Lyngby, Denmark. September 2014.

16. M. MORICHE, O. FLORES & M. GARCÍA-VILLALBA. “Flapping Airfoil Simulations at Very Low Reynolds”. European Fluid Mechanics Conference 10, Technical University of Denmark, Lyngby, Denmark. September 2014.
17. A. ALMAGRO, O. FLORES & M. GARCÍA-VILLALBA. “Direct Numerical Simulation of a turbulent mixing layer with variable density”. European Fluid Mechanics Conference 10, Technical University of Denmark, Lyngby, Denmark. September 2014.
18. M. MORICHE, O. FLORES & M. GARCÍA-VILLALBA. “Generation of thrust and lift with airfoils in plunging and pitching motion”. 3rd International Conference on Mathematical Modelling in Physical Sciences (IC-MSQUARE 3), Madrid, Spain. August 2014.
19. J. RILEY, S. DE BRUYN KOPS & O. FLORES. “On the analogies between stratified turbulence, near free surface turbulence and thin layer turbulence”. Fundamental aspects of Geophysical Turbulence, Nagoya, Japan. March 2014.
20. G. ETIEL-AMOR, O. FLORES, R. ÖRLÜ, & P. SCHLATTER. “On the hairpin vortex conundrum”. Interdisciplinary Turbulence Initiative (iTi 2014), Bertinoro (FC), Italy. September 2014.
21. O. FLORES, M. GARCÍA-VILLALBA, C. MARUGÁN-CRUZ & D. SANTANA. “Thermal Stresses Analysis of a Circular Tube in Central Receiver”. Solar Paces, **poster**, Las Vegas, US. September 2013.
22. O. FLORES & M. GARCÍA-VILLALBA. “Effect of thermal boundary condition on wall-bounded, stably-stratified turbulence”. Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **G21.7**, San Diego, US. November 2012.
23. A. ABDILGHANIE, J. RILEY, O. FLORES & R. MOSER. “A novel methodology for simulating low-Mach number combustion”. Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **H26.1**, San Diego, US. November 2012.
24. J. RILEY, O. FLORES & A. HORNER-DEVINE. “On the dynamics of homogeneous turbulence near a stress-free surface”. International Congress of Theoretical and Applied Mechanics **FM09-021**, **invited lecture**. Beijing, China. August 2012.
25. O. FLORES & J. RILEY. “On the dynamics of homogeneous turbulence near a surface”. Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **M-1**, Baltimore, US. November 2011.
26. A. LOZANO-DURÁN, O. FLORES & J. JIMÉNEZ. “Three-dimensional structure of momentum transfer in turbulent channels”. Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **L-7**, Baltimore, US. November 2011.
27. O. FLORES & J. RILEY. “Energy balance in stably-stratified, wall-bounded turbulence.”. 7th International Symposium on Stratified Flows, Rome, Italy. August 2011.
28. O. FLORES, J. RILEY, N. MALAYA & R. MOSER. “Stable stratification in turbulent Ekman layers”. Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **HG-5**, Long Beach, US. November 2010.
29. J. RILEY, V. VASAN, O. FLORES & P.K. YEUNG. “On spectral energy transfer in strongly stratified flows”. Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **PS-2**, Minneapolis, US. November 2009.

30. O. FLORES & J. RILEY. “DNS of stably stratified open channel flow”. Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **BS-2**, Minneapolis, US. November 2009.
31. O. FLORES & J. JIMÉNEZ. “The effect of artificial roughness on the outer region of turbulent channels”. IUTAM Symposium on The Physics of Wall-Bounded Turbulent Flows on Rough Walls. Cambridge, England. July 2009.
32. O. FLORES & J. JIMÉNEZ. “The structures of the momentum transfer in turbulent channels”. Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **PA-8**, San Antonio, US. November 2008.
33. O. FLORES & J. JIMÉNEZ. “The minimal logarithmic region”. Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **AE-4**, Salt Lake City, US. November 2007.
34. O. FLORES & J. JIMÉNEZ. “Self-similar vortex clusters over rough walls”. Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **AL-9**, Tampa, US. November 2006.
35. O. FLORES & J. JIMÉNEZ. “Dynamics of turbulent structures in the log layer”. Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **LR-1**, Chicago, US. November 2005.
36. O. FLORES & J. JIMÉNEZ. “DNS of turbulent channel with simulated wall-roughness”. ITP meeting at the School of Aeronautics (UPM), Madrid, Spain, July 2005.
37. O. FLORES & J. JIMÉNEZ. “Effect of wall-boundary disturbances on turbulent channel flows”. X European Turbulence Conference, Trondheim, Norway. July 2004.
38. O. FLORES & J. JIMÉNEZ. “Effect of perturbed wall boundary conditions on turbulent channels”. Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, New Jersey, US. November 2003.
39. O. FLORES & J. JIMÉNEZ. “Large-scale dynamics of near-wall turbulence”. Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, Dallas, US. November 2002.
40. O. FLORES & J. JIMÉNEZ. “Organization of autonomous wall turbulence”. IX European Turbulence Conference, Southampton, England. July 2002.
41. J. JIMÉNEZ, O. FLORES & M. GARCÍA-VILLALBA. “The large scale organization of turbulent walls”, Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, San Diego, US. November 2001.

RESEARCH SUPPORT

Ongoing

1. Forward flight aerodynamics of a MAV with two pairs of flapping wings. DPI2016-76151-C2-2-R

Funding Agency: Spanish Ministry of Economy and Competitivity

Period: 2017- 2019

PI: **O. Flores** y M. García-Villalba (UC3M)

Aims: Optimize the kinematic parameters of a pair of flapping wings in different configurations (tandem, fwd/aft). The project is a collaborative project with the University of Malaga, and the methodology combines theory, experiments and simulations.

2. Investigación y desarrollo de una plataforma de computación distribuida aplicado al análisis de riesgos de liquidez mediante arquitecturas tipo "PIPELINES" (PALM PIPELINES)

Funding Agency: NFQ SOLUTIONS S.LFunding Agency.

Period: 2016-2017

PI: **O. Flores**

Aims: Development of a distributed computing platform, wit the be applied in financial environments.

3. COTURB: Coherent Structures in Wall Bounded Turbulence. ERC-2014-ADG-669505

Funding Agency: European Comission, H2020

Period: 2016- 2020

PI: J. Jiménez (UPM) and **O. Flores**

Aims: Using the DNS database of wall-bounded turbulent flows developed in the UPM during the last decade, this priject aims at the development of new low-order models to predict the statistical characteristics of these flows. The project is a collaboration with the School of Aeronautics at the UPM, and the role of the UC3M team is the experimental evaluation of the models proposed from DNS data.

4. Numerical and Experimental investigation of the unsteady aerodynamics of flapping wings. TRA2013-41103-P

Funding Agency: Spanish Ministry of Economy and Competitivity

Period: 2014- 2017

PI: M. García-Villalba (UC3M) and **O. Flores**

Aims: Understand the effect of the different kinematical parameters of wing flapping in the unsteady aerodynamic forces. The project proposes a mix of experiments and simulations, to explore a wide range of Reynolds numbers and kinematic configurations. The objective is to generate low-order aerodynamic models that can be used to design micro air vehicles (MAVs).

Completed (last 5 years)

5. Generación limpia de energía con cometas de tracción.

Funding Agency: Fundación BBVA

Period: 2015-2016

PI: G. Sanchez (UC3M)

Aims: To develop dynamical, structural and aerodynamical models for high altitude kites, used in wind power energy.

6. Servicios de asesoramiento en el área de cálculo mediante Mecánica de Fluidos Computacional (CFD).
 - Funding Agency: COMET INGENIERÍA S.L.
 - Period: 2014-2017
 - PI: P. Fajardo (UC3M)
 - Aims: To provide technical support to COMET INGENIERÍA in CFD modeling.

7. SCORE: Sustainable Combustion Research. 2010/00597/001.
 - Funding Agency: Spanish Ministry of Science and Innovation.
 - Period: 2010-2016
 - PI: A.L. Sánchez (UC3M-UCSD)
 - Aims: Development of advanced and sustainable combustion systems via the use and improvement of predictive tools, experimental techniques, as well as measurement methods and control.

8. Sistema de medida simultánea de flujos 3D y de transferencia de calor en pared en un tunel hidrodinámico
 - Funding Agency: Spanish Ministry of Economy, Industry and Competitiveness..
 - Period: 2013-2015
 - PI: J. Rodríguez
 - Aims: Design and acquisition of a water tunnel.

9. Unsteady Aerodynamics of Flapping Wings. TRA2012-37714
 - Funding Agency: Spanish Ministry of Economy and Competitivity.
 - Period: 2013-2014
 - PI: **O. Flores**
 - Aims: Improve our understanding and prediction capabilities of the flow dynamics of flapping wings at low Reynolds numbers. Characterize the effect of small asymmetries on the flapping motion of the wing, and evaluate their potential to implement control and manoeuvrability strategies for micro-air vehicles.

10. Computational Fluid Mechanics and Turbulence Modeling.
 - Funding Agency: Acciona Wind Power.
 - Period: 2012
 - PI: W. Coenen (UC3M).
 - Aims: Knowledge transfer from the UC3M to Acciona WindPower.

11. Collaborative research: Enabling Discovery in High Reynolds number Turbulence via Advance Tools for Petascale Simulation and Analysis. OCI - 0749209
 - Funding Agency: National Science Foundation, NSF.
 - Period: 2007-2012
 - PI: J. Riley (UW).

Aims: Development of highly parallel codes for turbulence simulation, with special emphasis in low-Mach number formulations of the Navier-Stokes equations.

Access to supercomputing centres (last 5 years)

1. Direct numerical simulation of flapping wings in forward flight
Network/Centre/Machine: - / Steinbuch Centre for Computing - KIT / ForHLR II.
Computing time: 500000 cpuh
Period: 06/2016 - 06/2017
PI: M. Uhlmann (KIT).
2. Direct numerical simulation of a three-dimensional diffusion flame embedded in a temporal mixing layer - CTS160006
Network/Centre/Machine: XSEDE / San Diego Supercomputer Center / comet.
Computing time: 864863 cpuh (coste equivalente \$29113.48)
Period: 04/2016 - 03/2017
PI: A. Sanchez (UCSD).
3. Direct Numerical Simulations of 3D flows over flapping wings - FI-2014-3-0015
Network/Centre/Machine: RES / Barcelona Supercomputer Center / marenostrom.
Computing time: 250000 cpuh
Period: 11/2014 - 03/2015
PI: M. García-Villalba (UC3M).
4. Numerical Simulation of Mixing Layers with variable density - FI-2014-3-0017
Network/Centre/Machine: RES / CesViMa / magerit.
Computing time: 300000 cpuh
Period: 11/2014 - 03/2015
PI: O. Flores.

MENTORING

PhD Students (completed)

1. M. Moriche. “Unsteady aerodynamics of flapping wings”, UC3M.
Co-directed with M. García-Villalba (UC3M). February 2017.

PhD Students (on-going)

2. A. Antoranz. “Heat transfer in turbulent flow in pipes”, UC3M.
Co-directed with M. García-Villalba (UC3M). Expected September 2017.

3. A. Almagro. “Direct numerical simulation of vaporisation and diffusion-controlled combustion of fuel sprays”, UC3M.
Co-directed with A. Sánchez & M. García-Villalba (UC3M). Expected December 2017.
4. A. Gonzalo. “A numerical study of the unsteady effects on external aerodynamics”, UC3M.
Co-directed with M. García-Villalba (UC3M). Expected 2018.
5. G. Arranz “Control and manoeuvrability of a flapping wing Micro Air Vehicle”, UC3M.
Co-directed with M. García-Villalba (UC3M). Expected 2020.

Master Students

1. A. Gonzalo. “Numerical simulation of a turbulent flow in a pipe with variable density”, UC3M.
Co-directed with M. García-Villalba (UC3M). Graduated September 2013.
2. C. Seisdedos. “Design and manufacturing of a demonstration hybrid rocket”, UC3M.
Co-directed with M. García-Villalba (UC3M). Graduated on June 2013.
3. R. de la Iglesia. “Calibration of a 6-axis load cell”, UC3M.
Graduated on May 2013.
4. S. Izquierdo. “Towards the numerical simulation of the filling process of the left ventricle of heart”, UC3M. Co-directed with J.C. del Álamo (UCSD) and J. Rodríguez (UC3M).
Graduated Nov 2010.

Bachelor Students

1. J. Gallego. “Analysis of the performance of a flexible winglet in the presence of gusts”, UC3M.
Graduated on June 2016.
2. C. Chazo. “Development of a Pitching Control for a Flapping Wing MAV”, UC3M.
Graduated on June 2016.
3. G. Arranz. “Development of an Unsteady Potential Model for a Flapping Wing MAV”, UC3M.
Graduated on September 2015.
4. R. Peña. “Development of an Aerodynamic model for a flexible kite for wind power generation”, UC3M.
Graduated on September 2015.
5. A. Martín. “Analysis of flow separation over aerodynamic airfoils”, UC3M.
Graduated September 2014.
6. A. Martín. “Analysis of the Effect of Gusts on an Array of Plates with Ground Effect”, UC3M.
Graduated June 2014.

TEACHING**Undergraduate Courses.**

-Aerodynamics (Bs. Aerospace Engineering, 3rd course, UC3M, in english).

Course 16/17.	Coordinator, lab instructor.	17h	Student survey: 4.5/5.
Course 15/16.	Coordinator, theory and lab. instructor.	36h.	Student survey: 4.5/5.
Course 14/15.	Coordinator, theory and lab. instructor.	79h.	Student survey: 4.6/5.
Course 13/14.	Coordinator, theory and lab. instructor.	121h.	Student survey: 4.6/5.
Course 12/13.	Coordinator, theory and lab. instructor.	85h.	Student survey: 4.8/5.

-Advanced Aerodynamics (Bs. Aerospace Engineering, 4th course, UC3M, in english).

Course 16/17.	Coordinator, theory and lab. instructor.	64h.	Student survey: 4.7/5.
Course 15/16.	Coordinator, theory and lab. instructor.	64h.	Student survey: 4.6/5.
Course 14/15.	Coordinator, theory and lab. instructor.	59h.	Student survey: 4.9/5.
Course 13/14.	Coordinator, theory and lab. instructor.	73h.	Student survey: 4.5/5.

-Stability and Integrity of Aerospace Struct. (Bs. Aerospace Engineering, 3rd course, UC3M, in english).

Course 12/13.	Theory and lab. instructor.	25h.	Student survey: 4.4/5.
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-Aerial Navigation, Transport and Airports (Bs. Aerospace Engineering, 3rd course, UC3M, in english).

Course 12/13.	Theory and lab. instructor.	9h.	Student survey: 4.7/5.
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-Fluid Mechanics Processes (Bs. Mechanical Engineering, 3rd course, UC3M, in spanish).

Course 11/12.	Coordinator and theory instructor.	80h.	Student survey: 4.2/5.
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Graduate Courses.

-Turbulence (Ms. in Industrial Mathematics, 1st course, UC3M/UPM/USC/UV, in spanish).

Course 16/17.	Theory instructor.	10h.
Course 15/16.	Theory instructor.	21h.
Course 14/15.	Theory instructor.	21h.

-Advanced Numerical Seminar (Ms. Industrial Mathematics, 2nd course, UC3M, in spanish).

Course 12/13.	Coordinator, and theory instructor.	15h.
Course 11/12.	Coordinator, and theory instructor.	15h.

-Modelling in Science and Industry II (Ms. Industrial Mathematics, 2nd course, UC3M, in english).

Course 12/13.	Theory instructor.	15h.
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-Numerical Methods for Differential Eqs. (Ms. Industrial Mathematics, 2nd course, UC3M, in english).

Course 11/12.	Theory instructor.	15h.
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-Fundamentals of Aeronautical Eng. (Ms. Aircraft System Integration, UC3M/AIRBUS, in english).

Edition 2012.	Theory instructor.	4h.	Student survey: -/5.
Edition 2013.	Theory instructor.	6h.	Student survey: 4.3/5.
Edition 2014.	Theory instructor.	20h.	Student survey: 3.9/5.
Edition 2015.	Theory instructor.	10h.	Student survey: 4.2/5.
Edition 2016.	Theory instructor.	2h.	Student survey: -/5.
Edition 2017.	Theory instructor.	10h.	Student survey: -/5.

SERVICE

Academic

2011-present **Member** of the Academic Commission of the Bachelor of Aerospace Engineering.

2014-2016 **Member** of the Academic Commission of the Master of Aeronautic Engineering.

Peer-Review

-**ANEP Reviewer**, since 2015.

-**Journal Referee** for the Journal of Fluid Mechanics, PLOS-ONE, Physics of Fluids among others.

Conference/Symposium Organization:

-Member of the scientific and local organization committee for the *JJ70* (Sep 2015).

-Member of the local arrangements committee for the *10th International ERCOFTAC Symposium on Engineering Turbulence Modeling and Measurements* (Sep 2014).

Outreach activities:

-Lecture at the high-school *IES Leonardo da Vinci-Majadahonda*, during the XI edition of the Science Week in Madrid (Nov 2011).

REFERENCES

- Professor Javier Jiménez. School of Aeronautics. Universidad Politécnica de Madrid. Pz. Cardenal Cisneros 3, 28040 Madrid, Spain. Phone: +34 913366341. Email: jimenez@torroja.dmt.upm.es.
- Professor James J. Riley. Department of Mechanical Engineering, University of Washington. 4000 15th Ave NE, Campus Box 352600, MEB room 132. Seattle, WA 98195-2600, USA. Phone: +01 (206) 543-5347. Email: rileyj@uw.edu .
- Professor Robert D. Moser. Mechanical Engineering Dept. University of Texas 1 University Station C2200. Austin, TX 78712-09292, USA. Phone: +01 (512) 471-0093. Email: rmoser@ices.utexas.edu.