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Updated, May 2021.

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.

PROFESSIONAL EXPERIENCE

2017-present **Associate Professor** at the Dept. of Bioengineering and Aerospace Eng., Universidad Carlos III de Madrid.

Feb. 2015 - Dec. 2020: Served as **Academic Assistant Director**.

2011-2017 **Visiting Professor** at the Dept. of Bioengineering and Aerospace Eng., Universidad Carlos III de Madrid.

Jan. 2012 - Jan. 2013: Served as **Vice-chair** of the Department.

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 Washington.

May 2010: Consultant for the National Oceanic and Atmospheric Administration, 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 Madrid.

2003-2008: Consultant for Englobe Technologies.

2003-2004: Translator of the book "Fluid Mechanics, 5^{th} Edition", by Frank M. White. McGraw Hill Interamericana de España, Barcelona, Spain.

September 2006: Visiting Research Fellow. Department of Mechanical Engineering. University of Texas at Austin.

August 2003: Visiting Research Fellow. Center for Turbulence Research. Stanford University.

HONORS, AWARDS & FELLOWSHIPS

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	Undergrad Scholarship "Beca de colaboración de la U. Politécnica de Madrid".

ARTICLES IN JCR JOURNALS

Times cited: 850, h-index=13 (data from WoS, Nov 19th 2021)

1. ARRANZ, G., MARTÍNEZ-MURIEL, C., FLORES, O. & GARCÍA-VILLALBA, M. 2022 "Fluid-structure interaction of multi-body systems: Methodology and applications". Accepted in *J. Fluids and Struct.*

2. JURADO, R., ARRANZ, G., FLORES, O. & GARCÍA-VILLALBA, M. 2022 "Numerical simulation of flow over flapping wings in tandem: wingspan effects". *Phys. Fluids.* 34, (1). https://doi.org/10.1063/5.0080376

3. ARRANZ, G., FLORES, O. & GARCÍA-VILLALBA, M. 2022 "Flow interaction of three-dimensional self-propelled flexible plates in tandem". *J Fluids Mech.* 931, A5. https://doi.org/10.1017/jfm.2021.918

4. GARCÍA-VILLALBA, M., ROSSINI, L. GONZALO, A., VIGNEAULT, D., MARTINEZ-LEGAZPI, P., DÚRAN, E., FLORES, O., BERMEJO, J., McVEIGH, E., KAHN, A.M., & DEL ÁLAMO, J.C. 2021. "Demonstration of Patient-Specific Simulations to Assess Left Atrial Appendage Thrombogenesis Risk".*Front. Physiol.*, 12. https://doi.org/10.3389/fphys.2021.596596 **Times cited: 3**

5. MORICHE, M., SEDKY, G., JONES, A., FLORES, O.& GARCÍA-VILLALBA, M. 2021 "Characterization of Aerodynamic Forces on Wings in Plunge Maneuvers". *AIAA J.* 59 (2), 736–747. https://doi.org/10.2514/1.J059689

6. MORICHE, M., GONZALO, A., FLORES, O.& GARCÍA-VILLALBA, M. 2021 "Three Dimensional Effects on Plunging Airfoils at Low Reynolds Numbers". *AIAA J.* 59 (1), 65–74. https://doi.org/10.2514/1.J058569 **Times cited: 1**

7. MARTÍNEZ-MURIEL, C. & FLORES, O. 2020 "Analysis of vortical gust impact on airfoils at low Reynolds number". *J Fluids and Struct.* 99, 103138. https://doi.org/10.1016/j.jfluidstructs.2020.103138 **Times cited: 1**

8. ARRANZ, G., FLORES, O. & GARCÍA-VILLALBA, M. 2020 "Three-dimensional effects on the aerodynamic performance of flapping wings in tandem configuration". *J Fluids and Struct.* 94, 102893. https://doi.org/10.1016/j.jfluidstructs.2020.102893 **Times cited: 5**

9. MORICHE, M., RAIOLA, M., DISCETTI, S. IANIRO, A., FLORES, O. & GARCÍA-VILLALBA, M. 2020 "Assessing aerodynamic force estimation with experiments and simulations of flapping-airfoil flows on the verge of three-dimensionality" *Proc. Inst. Mech. Eng., Part G: J. Aero. Eng.* 234, (2), 428–444.
https://doi.org/10.1177/0954410019867570 **Times cited: 4**

10. DELGADO-MONTERO, A., MARTINEZ-LEGAZPI, P., DESCO, M. M., RODRÍGUEZ-PÉREZ, D., DÍAZ-OTERO, F., ROSSINI, L., PÉREZ DEL VILLAR, C., RODRÍGUEZ-GONZÁLEZ, E., CHAZO, C., BENITO, Y., FLORES, O., ANTORANZ, J.C., FERNÁNDEZ-AVILÉS, F., DEL ÁLAMO, J.C., BERMEJO, J. 2020. "Blood Stasis Imaging Predicts Cerebral Microembolism during Acute Myocardial Infarction". *J. Am. Soc. Echocardiogr.* 33, (3), 389–398.
https://doi.org/10.1016/j.echo.2019.09.020. **Times cited: 2**

11. ALMAGRO, A., FLORES, O., VERA, M., LIÑÁN, A., SÁNCHEZ, A. L. & WILLIAMS, F. A. 2019 "Effects of differential diffusion on nonpremixed-flame temperature" *Proc. Comb. Inst.* 37, (2), 1757–1766.
https://doi.org/10.1016/j.proci.2018.06.176 **Times cited: 4**

12. MORICHE, M., HERNANDEZ-HURTADO, E., FLORES, O. & GARCÍA-VILLALBA, M. 2018 "Numerical simulation of the flow around a flapping-wing micro air vehicle in free flight". *Proc. Inst. Mech. Eng. G: J. Aerospace Eng.*
https://doi.org/10.1177/0954410018800161

13. ARRANZ, G., MORICHE, M., UHLMANN, M., FLORES, O. & GARCÍA-VILLALBA, M. 2018 "Kinematics of the auto-rotation of a model winged seed" *Bioinspir. Biomim.* 13 (3), 036011.
https://doi.org/10.1088/1748-3190/aab144 **Times cited: 9**

14. ANTORANZ, A., IANIRO, A., FLORES, O. & GARCÍA-VILLALVA, M. 2018 "Extended proper orthogonal decomposition of non-homogeneous thermal fields in a turbulent pipe flow" *Int. J. Heat and Mass Transfer*, 118, 1264-1275.
https://doi.org/10.1016/j.ijheatmasstransfer.2017.11.076. **Times cited: 19**

15. ARRANZ, G., GONZALO, A., UHLMANN, M., FLORES, O. & GARCÍA-VILLALBA, M. 2018 "A numerical study of the flow around a model winged seed in auto-rotation" *Flow, Turb. and Comb.* 101, (2), 477–497.
https://doi.org/10.1007/s10494-018-9945-z **Times cited: 7**

16. GONZALO, A., ARRANZ, G., MORICHE, M., GARCÍA-VILLALBA, M. & FLORES, O. 2018 "From flapping to heaving: A numerical study of wings in forward flight" *J Fluids and Struct.*, 83, 293–309.
https://doi.org/10.1016/j.jfluidstructs.2018.09.006 **Times cited: 5**

17. ALMAGRO, A., GARCÍA-VILLALBA, M. & FLORES, O. 2017 "A numerical study of a variable-density low-speed turbulent mixing layer" *J. Fluid Mech.* 830, 569-601.
https://doi.org/10.1017/jfm.2017.583. **Times cited: 16**

18. MORICHE, M., FLORES, O. & GARCÍA-VILLALBA, M., 2017 "On the aerodynamic forces on heaving and pitching airfoils at low Reynolds number". *J. Fluid Mech.* 828, 395-423.
https://doi.org/10.1017/jfm.2017.508 **Times cited: 30**

19. FLORES, O., RILEY, J. & HORNER-DEVINE, A. 2017 "On the dynamics of turbulence near a free surface" *J. Fluid Mech.* 821, 248–265.
https://doi:10.1017/jfm.2017.209. **Times cited: 6**

20. 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.
https://doi.org/10.1016/j.ijheatfluidflow.2016.06.015. **Times cited: 16**

21. 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.
https://doi.org/10.1016/j.ijheatmasstransfer.2016.01.035 **Times cited: 44**

22. 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.
https://doi.org/10.1016/j.ijheatfluidflow.2015.05.007 **Times cited: 12**

23. ETIEL-AMOR, G., ORLU, R. SCHLATTER, P. & FLORES, O. 2015 "Hairpin vortices in turbulent boundary layers". *Phys. Fluids.* 27 (2), 025108.
https://doi.org/10.1063/1.4907783 **Times cited: 42**

24. LOZANO-DURÁN, A, FLORES, O. & JIMÉNEZ, J, 2012 "Three dimensional structure of momentum transfer in turbulent channels". *J. Fluid Mech.* 694, 100-130.
https://doi.org/10.1017/jfm.2011.524 **Times cited: 137**

25. FLORES, O. & RILEY, J. 2011 "Analysis of turbulence collapse in the stably stratified surface layer using direct numerical simulation". *Boundary-Layer Meteorol.* 139, 241–259.
https://doi.org/10.1007/s10546-011-9588-2. **Times cited: 69**

26. FLORES, O. & JIMÉNEZ, J. 2010 "Hierarchy of minimal flow units in the logarithmic layer".*Phys. Fluids* 22, 071704.
https://doi.org/10.1017/S0022112007008506 **Times cited: 124**

27. 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.
https://doi/org/ **Times cited: 41**

28. FLORES, O. & JIMÉNEZ, J., 2006 "Effect of wall-boundary disturbances on turbulent channel flows". *J. Fluid Mech.* 566, 357–376.
https://doi.org/10.1017/S0022112006001534 **Times cited: 84**

29. JIMÉNEZ J., DEL ÁLAMO, J.C. & FLORES, O. 2004 "The large-scale dynamics of near-wall turbulence". *J. Fluid Mech.* 505, 179–199.
https://doi.org/10.1017/S0022112004008389 **Times cited: 134**

OTHER ARTICLES

30. PASTOR, R., VELA-MARTÍN, A. & FLORES. O. 2020. "Wall-bounded turbulence control: statistical characterisation of actions/states". *J. Phys.: Conf. Ser.*1522 012014.
https://doi.org/10.1088/1742-6596/1522/1/012014

31. ORTIZ-TARÍN, J.L, LEE, S., FLORES. O. & SARKAR, S. 2020. "Global modes and large-scale structures in an Ekman boundary layer". *J. Phys.: Conf. Ser.*1522 012011. https://doi.org/10.1088/1742-6596/1522/1/012011

32. FLORES, O., ROSSINI, L. GONZALO, A., VIGNEAULT, D., BERMEJO, J., KAHN, A.M., McVEIGH, E., GARCÍA-VILLALBA, M. & DEL ÁLAMO, J.C. 2020 "Evaluation of blood stasis in the left atrium using patient-specific Direct Numerical Simulations". In: García-Villalba, M., Kuerten, H., & Salvetti, M. V. (eds). Direct and Large Eddy Simulation XII. ERCOFTAC Series, vol 27. Springer, https://doi.org/10.1007/978-3-030-42822-8

33. ARRANZ, G., FLORES, O. & GARCÍA-VILLALBA, M. 2020 "Study of the Efficiency of Flapping and Heaving Wings in Tandem Configuration". In: García-Villalba, M., Kuerten, H., & Salvetti, M. V. (eds). Direct and Large Eddy Simulation XII. ERCOFTAC Series, vol 27. Springer, https://doi.org/10.1007/978-3-030-42822-8_39

34. ANTORANZ, A., FLORES, O. & GARCÍA-VILLALBA, M. 2020 "DNS of Turbulent Pipe Flow with Temperature-Dependent Fluid Properties Subject to Non-uniform External Heating". In: García-Villalba, M., Kuerten, H., & Salvetti, M. V. (eds). Direct and Large Eddy Simulation XII. DLES 2019. ERCOFTAC Series, vol 27. Springer, Cham. https://doi.org/10.1007/978-3-030-42822-8_30

35. MORICHE, M., FLORES, O., SEDKY, G., JONES, A.R. & GARCÍA-VILLALBA, M. 2020 "Comparison between experiments and simulations of fast transverse plunge maneuvers". AIAA Scitech 2020 Forum (AIAA 2020-0559). https://doi.org/10.2514/6.2020-0559

36. GÜEMES, A., VAQUERO, A., FLORES, O., DISCETTI, S., & IANIRO, A. 2019 "Identifying the Wall Signature of Large-Scale Motions with Extended POD". In: Orlü R., Talamelli A., Peinke J., Oberlack M. (eds) Progress in Turbulence VIII. iTi 2018. Springer Proceedings in Physics, vol 226. Springer, Cham. https://doi.org/10.1007/978-3-030-22196-6_12

37. ARRANZ, G., M. MORICHE, UHLMANN, M., FLORES, O. & GARCÍA-VILLALBA, M. 2019 "The Influence of the Reynolds Number on the Auto-Rotation of Samaras". In: Salvetti M., Armenio V., Fröhlich J., Geurts B., Kuerten H. (eds) Direct and Large-Eddy Simulation XI. ERCOFTAC Series, vol 25. Springer, Cham. https://doi.org/10.1007/978-3-030-04915-7_54

38. GONZALO, A., ARRANZ, G., MORICHE, M., FLORES, O. & GARCÍA-VILLALBA, M. 2019 "A Numerical Study of Low-Aspect-Ratio Flapping-Wings in Forward Flight". In: Salvetti M., Armenio V., Fröhlich J., Geurts B., Kuerten H. (eds) Direct and Large-Eddy Simulation XI. ERCOFTAC Series, vol 25. Springer, Cham https://doi.org/10.1007/978-3-030-04915-7_53

39. MORICHE, M., GONZALO, A., FLORES, O. & GARCÍA-VILLALBA, M. 2019 "Fast transverse maneuvers at low Reynolds numbers". AIAA Scitech 2019 Forum (AIAA 2019-0640). https://doi.org/10.2514/6.2019-0640

40. SANMIGUEL VILA, C. & FLORES, O. 2018 "Wall-based identification of coherent structures in wall-bounded turbulence". *J. Phys.: Conf. Ser.* 1001, 012007. http://doi.org/10.1088/1742-6596/1001/1/012007

41. FLORES, O. & RILEY, J. 2018 "Energy Balance in Stably-Stratified, Wall-Bounded Turbulence", in: Clercx H., Van Heijst G. (eds) Mixing and Dispersion in Flows Dominated by Rotation and Buoyancy. CISM International Centre for Mechanical Sciences (Courses and Lectures), vol 580. Springer, Cham.

42. M. GARCÍA-VILLALBA, L. ROSSINI, A. GONZALO, D. VIGNEAULT, A. M. KAHN, O. FLORES, E. McVEIGH, J.C. DEL ÁLAMO, 2018 "Patient-Specific Mapping of Left Atrial Thrombosis Risk by Computational Fluid Dynamics". *Circulation*, 138 (Suppl_1), A15017-A15017.

43. 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

44. SASSUN, D., FLORES, O. & ORLANDI, P. 2016. "Analysis and comparison between rough channel and pipe flows". *J. Phys.: Conf. Ser.* 708, 012011.

45. MORICHE, M., FLORES, O. & GARCIA-VILLALBA, M. 2015. "Generation of thrust and lift with airfoils in plunging and pitching motion". *J. Phys.: Conf. Ser.* 574, 012163.

46. 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". *J. Phys.: Conf. Ser.* 506, 012014.

47. ETIEL-AMOR, G., FLORES, O. & SCHLATTER, P. 2014. "Hairpin vortices in turbulent boundary layers". *J. Phys.: Conf. Ser.* 506, 012008

48. 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.

49. 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.

50. FLORES, O. & JIMÉNEZ, J., 2004. "Effect of wall-boundary disturbances on turbulent channel flows". *Advances in turbulence X*, CIMNE, 235-238.

51. FLORES, O., JIMÉNEZ, J. & TEMPLETON, J., 2003. "Rough wall channel analysis using suboptimal control theory". *CTR Annual Research Briefs*, 413–424, Stanford University.

52. JIMÉNEZ, J., FLORES, O. & GARCÍA-VILLALBA, M. 2002. "Organization of autonomous wall turbulence". *Advances in turbulence IX*, CIMNE, 824-828.

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

INVITED LECTURES

1. "Numerical simulation of left atrial flows: assessing risk of thromboembolism". International Workshop Mathematical Modelling in Hemodynamics. Universite Saint-Etienne (France). December 2021.

2. "Numerical simulations of cardiac flows: blood stasis in the left atrium". Institut für Hydromechanik (IfH), Karlsruhe Institute of Technology (Germany). February 2019.

3. "Simulación numérica directa de sámaras en autorrotación / Direct numerical simulation of samaras in autorrotation". Dept. Ing. Mecánica y Mecánica de Fluidos. Escuela de Ingenierías Industriales. Universidad de Málaga (Spain). April 2018.

4. "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.

5. "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.

6. "Analysis of stratification effects on the atmospheric surface layer using DNS". ETSIA, U. Politécnica de Madrid (Spain). September 2010.

7. "DNS of wall-bounded turbulence". Universidad Carlos III de Madrid (Spain). September 2010.

8. "Analysis of stable stratification effects on the atmosphere using DNS". Linné Flow Center in KTH, Stockholm (Sweden) September 2010.

9. "DNS of turbulent channels with stable stratification". Northwest Research, Seattle, WA (US). June 2010.

10. "Analysis of turbulence collapse in stably stratified surface layers using direct numerical simulation". NCAR, Mesoscale and Microscale Meteorology Division, Boulder, CO (US). June 2010.

11. "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, M. GARCÍA-VILLALBA. L. ROSSINI, E. DURAN, D. VIGNEAULT, P. MARTINEZ-LEGAZPI, O. FLORES, J. BERMEJO, E. McVEIGH, A.M. KAHN, & J.C. DEL ALAMO "Non-Newtonian Patient-specific Numerical Study of Left Atrial Hemodynamic". 74th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **E28.04**, Phoenix, US. November 2021.

2. O. FLORES, E. DURAN, A. GONZALO, M. GUERRERO, P. MARTINEZ-LEGAZPI, E. McVEIGH, A.M. KAHN, J. BERMEJO, M. GARCÍA-VILLALBA, & J.C. DEL ALAMO "On the correlation between Eulerian and Lagrangian Hemostasis Indices in the Left Atrium". 74th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **E28.07**, Phoenix, US. November 2021.

3. E. DURAN, M. GARCÍA-VILLALBA, P. MARTINEZ-LEGAZPI, A. GONZALO, O. FLORES, E. McVEIGH, A.M. KAHN, J. BERMEJO, & J.C. DEL ALAMO "Pulmonary vein flow split affects left atrial appendage stasis in patient-specific CFD simulations". 74th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **E28.08**, Phoenix, US. November 2021.

4. B. MAIDU, A. GONZALO, L. ROSSINI, D. VIGNEAULT, P. MARTINEZ-LEGAZPI, J. BERMEJO, O. FLORES, M. GARCÍA-VILLALBA, E. McVEIGH, A.M. KAHN, & J.C. DEL ALAMO "Inferring the left atrial appendage (LAA) hemodynamics from 4D CT contrast dynamics: reduced order models (ROMs) and physics informed neural networks (PINNs)". 74th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **H14.02**, Phoenix, US. November 2021.

5. C. CHAZO PAZ, O. FLORES, P. MARTINEZ-LEGAZPI, C. M. NGUYEN, C. SANTS MARTA, A.M. KAHN, J. BERMEJO & J.C. DEL ALAMO "All-in-one, physics-informed dealiasing method to regularize cardiac 4D flow MRI data". 74th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **H14.09**, Phoenix, US. November 2021.

6. E. DURAN, M. GARCÍA-VILLALBA. L. ROSSINI, A. GONZALO, D. VIGNEAULT, P. MARTINEZ-LEGAZPI, J. BERMEJO, E. McVEIGH, A.M. KAHN, J.C. DEL ALAMO, & O. FLORES "Effect of pulmonary vein inflow on patient-specific CFD prediction of left atrial blood stasis". 73rd Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **W07.02**, Chicago (virtual), US. November 2020.

7. A. GONZALO, M. GARCÍA-VILLALBA. L. ROSSINI, E. DURAN, D. VIGNEAULT, P. MARTINEZ-LEGAZPI, O. FLORES, J. BERMEJO, E. McVEIGH, A.M. KAHN, & J.C. DEL ALAMO "Non-newtonian Patient-specific Analysis of Left Atrial Blood Stasis". 73rd Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **W07.06**, Chicago (virtual), US. November 2020.

8. G. ARRANZ, O. FLORES, & M. GARCÍA-VILLALBA. "Development of an algorithm for the fluid-structure interaction of bioinspired problems with multi-body systems". 73rd Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **F12.06**, Chicago (virtual), US. November 2020.

9. C. MARTINEZ-MURIEL, R. CAVALLARO, R. BOMBARDIERI, O. FLORES, & M. GARCÍA-VILLALBA. "Comparison of numerical methods for 3D Fluid-Structure Interaction problems at low Reynolds numbers". 73rd Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **Q02.05**, Chicago (virtual), US. November 2020.

10. R. JURADO, G. ARRANZ, O. FLORES, & M. GARCÍA-VILLALBA. "Aspect ratio effects on the aerodynamic performance of flapping wings in tandem configuration". 73rd Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **S02.03**, Chicago (virtual), US. November 2020.

11. M. MORICHE, G. SEDKY, A. JONES, O. FLORES, & M. GARCÍA-VILLALBA. "Comparison between experiments and simulations of fast tranverse plunge maneuvers". AIAA Scitech 2020 Forum (AIAA 2020-0640). Florida, US. January 2020.

12. O. FLORES, R. PASTOR & A. VELA-MARTÍN. "Wall-bounded turbulence control using a Monte-Carlo approach". 72th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **E26.4**, Seattle, US. November 2019.

13. G. ARRANZ, O. FLORE &, M. GARCÍA-VILLALBA. "A numerical study of flapping wings in tandem configuration at low Reynolds number'. 72th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **S17.00007** , Seattle, US. November 2019.

14. G. ARRANZ, O. FLORES & M. GARCÍA-VILLALBA "Study of the efficiency of flapping and heaving wings in tandem configuration". ERCOFTAC Workshop on Direct and Large-Eddy Simulations, DLES12, **SW3**. Madrid, Spain, June 2019.

15. A. ANTORANZ, O. FLORES & M. GARCÍA-VILLALBA "DNS of turbulent pipe flow with temperature-dependent fluid properties subject to non-uniform external heating". ERCOFTAC Workshop on Direct and Large-Eddy Simulations, DLES12, **ST3**. Madrid, Spain, June 2019.

16. O. FLORES, L. ROSSINI, A. GONZALO, D. VIGNEAULT, A. KAHN, M. GARCÍA-VILLALBA, E. McVEIGH, J. DEL ALAMO. "Evaluation of blood- stasis in the left atrium using patient-specific direct numerical simulations". ERCOFTAC Workshop on Direct and Large-Eddy Simulations, DLES12, **SW3**. Madrid, Spain, June 2019.

17. M. MORICHE, A. GONZALO, O. FLORES, & M. GARCÍA-VILLALBA. "Fast transverse maneuvers at low Reynolds numbers". AIAA Scitech 2019 Forum (AIAA 2019-0640). San Diego, US. January 2019.

18. G. ARRANZ, A. GONZALO, M. MORICHE, O. FLORES, M. GARCÍA-VILLALBA, M. UHLMANN. "On the stabilization of the leading edge vortex of an auto-rotating winged seed". 71th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **A19.03**, Atlanta, US. November 2018.

19. O. FLORES, L. ROSSINI, A. GONZALO, D. VIGNEAULT, A. KAHN, M. GARCÍA-VILLALBA, E. McVEIGH, J. DEL ALAMO. "Evaluation of blood-stasis in the left atrium using patient-specific CFD ". 71th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **Q17.05**, Atlanta, US. November 2018.

20. M. GARCÍA-VILLALBA, L. ROSSINI, A. GONZALO, D. VIGNEAULT, A. M. KAHN, O. FLORES, E. McVEIGH, J.C. DEL ÁLAMO "Patient-Specific Mapping of Left Atrial Thrombosis Risk by Computational Fluid Dynamics". AHA Scientific Sessions 2018 , Abstract No. 15017. Chicago, US, November 2018.

21. O. FLORES & C. SAN MIGUEL "Wall-based identification of coherent structures in wall-bounded turbulence". SES 2018, 5th Annual technical meeting of the Society of Engineering Science. Madrid, October 2018. **invited**.

22. A. ANTORANZ, O. FLORES & M. GARCÍA-VILLALBA. "Temperature-dependent fluid properties in a turbulent pipe with circumferentially varying thermal boundary conditions". European Fluid Mechanics Conference 12, Vienna, Austria. September 2018.

23. G. ARRANZ, O. FLORES & M. GARCÍA-VILLALBA. "Characterization of the flow around an auto-rotating winged seed". European Fluid Mechanics Conference 12, Vienna, Austria. September 2018.

24. A. GÜEMES, A. VAQUERO, O. FLORES, S. DISCETTI & A. IANIRO. "Wall signature of large-scale motions in turbulent channel". iTi Conference on Turbulence, Darmstadt, Germany. September 2018.

25. O. FLORES & C. SAN MIGUEL "Identifying vertical velocity eddies from wall-pressure". 70th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **E26.4**, Denver, US. November 2017.

26. A. GONZALO, M. UHLMANN, M. GARCÍA-VILLALBA & O. FLORES "On the aerodynamic forces of flapping finite-wings in forward flight: a numerical study". 70th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **L18.6**, Denver, US. November 2017.

27. M. GARCÍA-VILLALBA, A. ANTORANZ, A. IANIRO & O. FLORES " Modal analysis of non-homogeneous thermal fields in a turbulent pipe flow using extended proper orthogonal decomposition". 70th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, **Q27.5**, Denver, US. November 2017.

28. G. ARRANZ, M. MORICHE, O. FLORES & M. GARCÍA-VILLALBA "Numerical simulation of the auto-rotation of a winged seed". Challenges in Nonlineal Systems: L.L. Bonilla 60th birthday, **poster**. UC3M. Leganés, Spain. July 2017.

29. M. MORICHE, E. HERNANDEZ-HURTADO, O. FLORES & M. GARCÍA-VILLALBA "Numerical simulation of the flow around a flapping-wing micro air vehicle in free flight". 7th European Conference for Aeronautics and Space Sciences, EUCASS. Milan, Italy. July 2017.

30. 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.

31. 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.

32. 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.

33. 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.

34. 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.

35. 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.

36. 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.

37. 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.

38. G. ARRANZ & O. FLORES "From heaving to flapping: effect on thrust generation". European Fluid Mechanics Conference 11, **Aerodynamics 5**. Sevilla, Spain. September 2016.

39. 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.

40. 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.

41. G. ARRANZ and O. FLORES. "Thrust generation in heaving and flapping wings in forward flight". AIAA Aviation 2016. Washington, US. June 2016.

42. 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.

43. M. MORICHE, O. FLORES & M. GARCÍA-VILLALBA. "Three-dimensional instabilities in the wake of a flapping wing at low Reynolds number". Int. Conference on Jets, Wajes and Separated flows (ICJWSF2015), Stockholm. June 2015.

44. 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.

45. 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.

46. 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.

47. 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.

48. 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.

49. 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.

50. G. ETIEL-AMOR, O. FLORES, R. ÖRLÜ, & P. SCHLATTER. "On the hairpin vortex conundrum". Interdisciplinary Turbulence Initiative (iTi 2014), Bertinoro (FC), Italy. September 2014.

51. 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.

52. 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.

53. 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.

54. 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.

55. 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.

56. 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.

57. O. FLORES & J. RILEY. "Energy balance in stably-stratified, wall-bounded turbulence.". 7th International Symposium on Stratified Flows, Rome, Italy. August 2011.

58. 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.

59. 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.

60. 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.

61. 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.

62. 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.

63. 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.

64. 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.

65. 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.

66. O. FLORES & J. JIMÉNEZ. "DNS of turbulent channel with simulated wall-roughness". ITP meeting at the School of Aeronautics (UPM), Madrid, Spain, July 2005.

67. O. FLORES & J. JIMÉNEZ. "Effect of wall-boundary disturbances on turbulent channel flows". X European Turbulence Conference, Trondheim, Norway. July 2004.

68. 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.

69. 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.

70. O. FLORES & J. JIMÉNEZ. "Organization of autonomous wall turbulence". IX European Turbulence Conference, Southampton, England. July 2002.

71. 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. Quantifying UncErtainty in Numerical simulations of CArdiac flows QUENCA,
   Funding Agency: Agencia Estatal de Investigación AEI.
   Period: 06/2020 - 05/2023
   PI: O. Flores and M. García-Villalba (UC3M)
   Aims: To apply Uncertainty Quantification methods to numerical simulations of cardiac flows. .

2. Personalisation of the risk of stroke via intracardiac flow analysis. PREFI-CM
   Funding Agency: Comunidad de Madrid
   Period: 2019 - 2021
   PI: J. Bermejo (HGUGM) y M. García-Villalba (UC3M)
   Aims: To combine medical imaging and CFD simulations to analyse the flow of blood in the human heart, and to evaluate the risk of stroke based on flow-derived indices.

3. 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- 2020

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.

4. 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.

Completed (last 5 years)

5. 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).

6. 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.

7. 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.

8. 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.

9. 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.

Access to supercomputing centres (last 2 years)

1. Numerical simulations of flow in the human left atrium with moving walls - IM-2020-2-0017

   Network/Centre/Machine: RES / / calendula.

   Computing time: 1.00 M cpuh

   Period: 7/2020 - 10/2020

   PI: **M. García-Villalba**.

2. DNS of collective motions of a pair of self-propelled flappers - IM-2020-1-0008, IM-2020-2-0005

   Network/Centre/Machine: RES / Universidad de Zaragoza / memento.

   Computing time: 1.25 M cpuh

   Period: 3/2020 - 10/2020

   PI: **O. Flores**.

3. Aerodynamic performance of flapping wings in tandem - IM-2019-3-0011

   Network/Centre/Machine: RES / Universidad de Valencia / tirant.

   Computing time: 600 K cpuh

   Period: 11/2019 - 3/2020

   PI: **O. Flores**.

4. Aerodynamic performance of flapping wings in tandem - IM-2019-3-0011

   Network/Centre/Machine: RES / Universidad de Valencia / tirant.

   Computing time: 600 K cpuh

   Period: 11/2019 - 3/2020

PI: **O. Flores**.

5. Numerical simulation of fast transverse maneuvers - FI-2019-1-0033
   Network/Centre/Machine: RES / Barcelona Supercomputer center/ marenostrum.
   Computing time: 600 K cpuh
   Period: 03/2019 - 6/2019
   PI: **M. García-Villalba**.

MENTORING

PhD Students (completed)

1. G. Arranz "Fluid structure interaction in bioinspired locomotion problems', UC3M.
   Co-directed with M. García-Villalba (UC3M). March 2021.

2. A. Gonzalo. "Aerodynamic forces and vortex structures of flapping wings in forward flight", UC3M.
   Co-directed with M. García-Villalba (UC3M). November 2018.

3. A. Almagro. "Direct numerical simulation of reactive and non-reactive mixing layers: turbulent flow analysis under the Low-Mach number formulation", UC3M.
   Co-directed with M. García-Villalba (UC3M). December 2017.

4. A. Antoranz. "A numerical study of turbulent heat transfer in pipes", UC3M.
   Co-directed with M. García-Villalba (UC3M). September 2017.
   Awarded "Premio Fundación SENER", to the best thesis in engineering during 2017.

5. M. Moriche. "A numerical study on the aerodynamic forces and the wake stability of flapping flight at low Reynolds number", UC3M.
   Co-directed with M. García-Villalba (UC3M). February 2017.

PhD Students (on-going)

6. C. Martínez. 'Numerical study of flow in the left heart', UC3M.
   Co-directed with M. García-Villalba (UC3M). Expected 2023.

7. M. Guerrero. 'Numerical study of flow in the left heart', UC3M.
   Co-directed with M. García-Villalba (UC3M). Expected 2023.

8. J. M. Catalán. "Unsteady aerodynamics of flapping-wing micro air vehicles', UC3M.
   Co-directed with M. García-Villalba (UC3M). Expected 2022.

9. C. Chazo "Intraventricular flow characterization and analysis from PC-MRI imaging", UC3M.
   Co-directed with P. Martinez-Legazpi and J. Bermejo (H. Gregorio Marañon). Expected 2021.

10. C. Martínez-Muriel "Numerical simulation of non-stationary flows in complex geometries", UC3M.
    Co-directed with M. García-Villalba (UC3M). Expected 2021.

Master Students (last 5 years)

1. C. Martínez. "Numerical modelling of corona discharge devices', UC3M.
   Graduated July 2021.

2. P. Murillo. "Evaluation of atrial function using reduced order models", UC3M.
   Graduated September 2019.

3. R. Pastor. "Analysis and control of turbulent skin friction using GPU-DNS", UC3M.
   Co-directed with A. Martín-Vela (UPM). Graduated June 2019.
   Awarded "Mejor TFM 2019 del Colegio Oficial de Ingenieros Aeronáuticos".

4. C. Martínez. "Analysis of vortical gusts in airfoils for Micro Air Vehicles", UC3M.
   Graduated February 2018.

5. A. Gonzalo. "Numerical simulation of a turbulent flow in a pipe with variable density", UC3M.
   Co-directed with M. García-Villalba (UC3M). Graduated September 2017.

Bachelor Students (last 5 years)

1. S. Muñoz. "Aerodynamic performance of airfoils encountering vortical gusts", UC3M.
   Co-directed with C. Martínez-Muriel (UC3M). Graduated on Sept 2021.

2. G.E. Buendia Vela. "Development of learning-based strategies for a flapping-wing Micro Air Vehicle", UC3M.
   Co-directed with D. Gonzalez (UC3M). Graduated on Sept 2020.

3. A. Martín Gil. "Skin friction control in wall-bounded turbulence", UC3M.
   Graduated on Sept 2020.

4. A. Martinez. "Scaling of corona discharge devices for aerospace applications", UC3M.
   Co-directed with H. Puego (Cedrion). Graduated on Sept 2020.

5. A. Martín Gil. "Skin friction control in wall-bounded turbulence", UC3M.
   Graduated on Sept 2020.

6. J. Roces. "Design of a control for a flapping wing MAV", UC3M.
   Graduated on June 2019.

7. M. García. "Preliminary design of the autopilot of a flapping wing MAV", UC3M.
   Graduated on June 2018.

8. D. Morón. "Design of flapping wing kinematics for trimmed flight", UC3M.
   Graduated on June 2017.

9. J. Gallego. "Analysis of the performance of a flexible winglet in the presence of gusts", UC3M.
   Graduated on June 2016.

10. C. Chazo. "Development of a Pitching Control for a Flapping Wing MAV", UC3M. Graduated on June 2016.

11. G. Arranz. "Development of an Unsteady Potential Model for a Flapping Wing MAV', UC3M.
Graduated on September 2015.

12. R. Peña. "Development of an Aerodynamic model for a flexible kite for wind power generation", UC3M.
Graduated on September 2015.

13. L. Amo. "Boundary layer mitigation by means of plasma actuators", UC3M.
Co-directed with Y. Babou. Graduated on September 2015.

14. R. Iglesa "Obtención experimental de la matriz experimental

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TEACHING **Undergraduate Courses.**

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

Course 20/21.	Coordinator, theory instructor.	113h.	Student survey: 4.7/5.
Course 19/20.	Coordinator, theory instructor.	51h.	Student survey: 4.5/5.
Course 18/19.	Coordinator, theory instructor.	67h.	Student survey: 4.8/5.
Course 16/17.	Coordinator, lab instructor.	17h.	Student survey: 4.4/5.
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.

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

Course 20/21.	Coordinator, theory instructor.	16h	Student survey: 4.6/5.
Course 19/20.	Coordinator, theory instructor.	31h	Student survey: 4.8/5.
Course 18/19.	Coordinator, theory instructor.	22h	Student survey: 4.6/5.
Course 17/18.	Coordinator, theory instructor.	15h.	Student survey: 4.5/5.
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.

-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.

-Fluid Mechanics Processes (Bs. Mechanical Engineering, 3rd course, UC3M, in spanish).

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

Graduate Courses.

-Computational Aerodynamics (Ms. in Aeronautics Engineering, 1st course, UC3M).

Course 17/18.	Theory instructor.	61h.	Student survey: 5.0/5.

-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.

-Numerical Methods for Differential Eqs. (Ms. Industrial Mathematics, 2nd course, UC3M, in english).

Course 11/12.	Theory instructor.	15h.

-Fundamentals of Aeronautical Eng. (Ms. Aircraft System Integration, UC3M/AIRBUS, in english).

Edition 2020.	Theory instructor.	10h.	Student survey: –/5.
Edition 2019.	Theory instructor.	10h.	Student survey: –/5.
Edition 2018.	Theory instructor.	10h.	Student survey: –/5.
Edition 2017.	Theory instructor.	10h.	Student survey: –/5.
Edition 2016.	Theory instructor.	2h.	Student survey: –/5.
Edition 2015.	Theory instructor.	10h.	Student survey: 4.2/5.
Edition 2014.	Theory instructor.	20h.	Student survey: 3.9/5.
Edition 2013.	Theory instructor.	6h.	Student survey: 4.3/5.
Edition 2012.	Theory instructor.	4h.	Student survey: –/5.

***SERVICE* Academic**

2011-2020 **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, AIAA Journal, among others.

Conference/Symposium Organization:

-Member of the scientific committee for the *12th ERCOCTAC Workshop on Direct and Large Eddy Simulation, DLES12* (June 2019).

-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:

-Finde Científico 2018 at Museo de la Ciencia y Tecnología (MUNCYT), Alcobendas (May 12th, 2018).

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