

PABLO FAJARDO, Ph. D.

CONTACT INFORMATION	Professor Dept. Bioingeniería e Ing. Aeroespacial. Universidad Carlos III de Madrid Av. de la Universidad, 30. 28911 Leganés, Spain.	Email: pfajardo@ing.uc3m.es Phone: +34916248239 ORCID: 0000-0002-0531-8021 <i>Last update: January 2024</i>
RESEARCH INTERESTS	Numerical methods, Plasma Propulsion, Experimental characterization of plasmas, CFD, Fluid-Structure Interaction, Aeroelasticity.	
EDUCATION	Ph.D. in Aeronautical Engineering, July 2012 Universidad Politécnica de Valencia, Spain PhD Thesis: <i>Methodology for the Numerical Characterization of a Radial Turbine under Steady and Pulsating Flow</i> Diploma Course in Fluid Mechanics (Master in Research), July 2008 von Karman Institute for Fluid Dynamics, Belgium Research Project: <i>Supersonic and High Pressure Plasma Testing</i> MSc/Bc in Aeronautical Engineering, July 2007 5 years program; ETSIA, U. Politécnica de Madrid, Spain Minor in Aerospace Vehicles	
PROFESSIONAL EXPERIENCE	Universidad Carlos III de Madrid, Leganés, Spain Deputy Vice-Dean for Faculty November 2023 to present Professor March 2022 to present Director of the M.Sc. in Aeronautical Engineering April 2014 to November 2023 First Deputy-Director of the School of Engineering May 2018 to November 2023 Associate Professor July 2017 to March 2022 Deputy-Director of the School of Engineering June 2014 to May 2018 Visiting Professor (Associate Professor Level) July 2013 to July 2017 Universidad Politécnica de Valencia, Valencia, Spain Researcher and Assistant Lecturer September 2008 to June 2013	
RESEARCH AND TEACHING MERITS	2 five-years teaching periods (quinquenios): 2009-2013; 2014-2018 2 six-years research periods: 2008-2013; 2014-2019 1 six-years knowledge transfer period: 2011-2016	

1. Villegas-Prados, D., Cruz, J., Wijnen, M., (...), Fajardo, P., Navarro-Cavallé, J. “Impact of propellant temperature on the emission regime of an externally wetted electrospray system using time-of-flight mass spectrometry”. *Acta Astronautica*. 213, 145-155. 2023.
DOI:
2. Poli, D., Bello-Benítez, E., Fajardo, P., Ahedo, E. “Time-dependent axial fluid model of the Hall thruster discharge and its plume”. *Journal of Physics D: Applied Physics*. 56 (41), 4152003 2023.
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3. Jiménez, P., Zhou, J., Navarro, J., Fajardo, P., Merino, M., Ahedo, E. “ Simulations of driven breathing modes of a magnetically shielded Hall thruster”. *Plasma Sources Science and Technology*. 32 (10), 105013 2023.
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4. Perales-Díaz, J., Domínguez-Vázquez, A., Fajardo, P., Ahedo, E. “ Analysis of a cusped helicon plasma thruster discharge”. *Plasma Sources Science and Technology*. 32 (7), 075011 2023.
DOI:
5. Marín-Cebrián, A., Domínguez-Vázquez, A., Fajardo, P., Ahedo, E. “ Kinetic plasma dynamics in a radial model of a Hall thruster with a curved magnetic field”. *Plasma Sources Science and Technology*. 31 (11), 115003 2022.
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6. Vinci, A.E., Mazouffre, S., Gómez, V., Fajardo, P., Navarro-Cavallé, J. “ Laser-induced fluorescence spectroscopy on xenon atoms and ions in the magnetic nozzle of a helicon plasma thruster”. *Plasma Sources Science and Technology*. 31 (9), 095007. 2022.
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7. Zhou, J., Domínguez-Vázquez, A., Fajardo, P., and Ahedo. “ Magnetized fluid electron model within a two-dimensional hybrid simulation code for electrodeless plasma thrusters”. *Plasma Sources Science and Technology*. 31 (4), 045021. 2022.
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8. Perales-Díaz, J., Domínguez-Vázquez, A., Fajardo, P., Ahedo, E., Faraji, F., Reza, M., and Andreussi, T. “ Hybrid plasma simulations of a magnetically shielded Hall thruster”. *Journal of Applied Physics*, 131 (10), 103302. 2022.
DOI: <https://doi.org/10.1063/5.0065220>
9. Cebrián, A. M., Domínguez-Vázquez, A., Fajardo, P., and Ahedo, E. “ Macroscopic plasma analysis from 1D-radial kinetic results of a Hall thruster discharge”.. *Plasma Sources Science and Technology*, 30 (11), 115011. 2021.
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10. Domínguez-Vázquez, A., , Cichocki, F., Merino, M., Fajardo, P., and Ahedo, E. “On heavy particle-wall interaction in axisymmetric plasma discharges”. *Plasma Sources Science and Technology*, 30(8), 085004. 2021.
DOI: 10.1088/1361-6595/ac1715
11. Cichocki, F., Domínguez-Vázquez, A., Merino, M., Fajardo, P., and Ahedo, E. “Three-dimensional neutralizer effects on a Hall-effect thruster near plume”. *Acta Astronautica*, 187, 498–510. 2021.
DOI: 10.1016/j.actaastro.2021.06.042
12. Güemes, A., Fajardo, P., and Raiola, M. “Experimental Assessment of RANS Models for Wind Load Estimation over Solar-Panel Arrays”. *Applied Sciences*, 11(6), 2496. 2021.
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13. Wijnen, M., Navarro-Cavallé, J. and Fajardo, P. “Mechanically amplified milli-Newton thrust balance for direct thrust measurements of electric thrusters for space propulsion”. *IEEE Transactions on Instrumentation and Measurement*, 70. 1–18. 2020.
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14. Merino, M., Fajardo, P., Giono, G., Ivchenko, N., Gudmundsson, J. T., Mazouffre, S., Loubère, D. and Dannenmayer, K. “Collisionless electron cooling in a plasma thruster plume: experimental validation of a kinetic model”. *Plasma Sources Science and Technology*, 29 (3), 035029. 2020.
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15. López-Núñez, E., Pérez-Quiles, M.J., Fajardo, P., and Hoyas, S. “Effect of the horizontal aspect ratio on thermocapillary convection stability in annular pool with surface heat dissipation”. *International Journal of Heat and Mass Transfer*, 148, 119140, 2020.
DOI:10.1016/j.ijheatmasstransfer.2019.119140
16. Zhou, J., Pérez-Grande, D., Fajardo, P., and Ahedo, E. “Numerical treatment of a magnetized electron fluid model within an electromagnetic plasma thruster simulation code”. *Plasma Sources Science and Technology*, 28 (11), 115004, 2019.
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17. Domínguez-Vázquez, A., Taccogna, F., Fajardo, P., and Ahedo, E. “Parametric study of the radial plasma-wall interaction in a Hall thruster”. *Journal of Physics D: Applied Physics*, 52 (47), 474003, 2019.
DOI: 10.1088/1361-6463/ab3c7b
18. Juste, G. L., Sánchez de León, L., López-Núñez, E., and Fajardo, P. “Sidewall effects on heat transfer in narrow backward facing step in transitional regime”. *Numerical Heat Transfer: Applications*, 76 (8), 628-647, 2019.
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19. Domínguez-Vázquez, A., Cichocki, F., Merino, M., Fajardo, P., and Ahedo, E. “Axisymmetric plasma plume characterization with 2D and 3D particle codes”. *Plasma Sources Science and Technology*, 27(10), 104009, 2018.
20. Juste, G. L., and Fajardo, P. “Influence of flow tree-dimensionality on the heat transfer of a narrow channel backward facing step flows”. *International Journal of Thermal Sciences*, 132, 234-248, 2018.
21. Navarro-Cavallé, J., Wijnen, M., Fajardo, P., and Ahedo, E. “Experimental characterization of a 1 kW helicon plasma thruster”. *Vacuum*, 149, 69-73, 2018.
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27. Hoyas, S., Fajardo, P., Gil, A., and Perez-Quiles, M. J. "Analysis of bifurcations in a Bènard-Marangoni problem: Gravitational effects". *International Journal of Heat and Mass Transfer*, 73, 33-41, 2014.
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38. Margot, X., Hoyas, S., Fajardo, P., and Patouna, S. "CFD study of needle motion influence on the spray conditions of single-hole injectors". *Atomization and Sprays*, 21(1), 2011.
39. Tancrez, M., Galindo, J., Guardiola, C., Fajardo, P., and Varnier, O. "Turbine adapted maps for turbocharger engine matching". *Experimental thermal and fluid science*, 35(1), 146-153, 2011.
40. Margot, X., Hoyas, S., Fajardo, P., and Patouna, S. "A moving mesh generation strategy for solving an injector internal flow problem". *Mathematical and Computer Modelling*, 52(7), 1143-1150, 2010.

41. Fajardo, P., Barahona, S., and Sanz-Andres, A. “Some Results of the Educational Experiment APIS (Cervantes Mission on Board ISS)”. *Microgravity Science and Technology*, 21(3), 247-255, 2009.

RESEARCH
PROJECTS

- *PROPULSION ELECTROMAGNETICA POR EFECTO HALL (HEEP)*. AGENCIA ESTATAL DE INVESTIGACION (AEI). PI: E. Ahedo and A. Domínguez. Grant number: PID2022-140035OB-I00. (Sep. 2023 - Aug. 2026). 103 k€
- *ELECTRON COOLING MODEL FOR SIMULATION OF EP INDUCED PLASMA INTERACTIONS WITH SATELLITES (ECOMODIS)*. Agencia Espacial Europea (ESA). PI: P. Fajardo. Grant number: 1000031815. (Apr. 2022 - Mar. 2024). 400 k€
- *Mini motor de plasma compacto para las aplicaciones del Nuevo Espacio*. AGENCIA ESTATAL DE INVESTIGACION (AEI). PI: P. Fajardo and E. Ahedo. Grant number: PID2019-108034RB-I00. (Dec. 2021 - Nov. 2023). 149.5 k€
- *Electric propulsion diagnostic for plasma thrusters (DTK)*. Funded by ESA TRP program (Contractor SENER). PI: J. Navarro. Grant number: 50C0015-400, (Mar 2021 - Sep 2022). 96 k€
- *Consortium for Hall Effect Orbital Propulsion System Phase 2 (CHEOPS MEDIUM)*. H2020 Program (European Commission). PI: E. Ahedo Grant number: 101004366, (Mar 2021 - Aug 2024). 270 k€
- *Consortium for Hall Effect Orbital Propulsion System Phase 2 (CHEOPS LOW)*. H2020 Program (European Commission). PI: P. Fajardo Grant number: 101004331 (Feb. 2021 - Jan. 2024). 170 k€
- *Advanced Space Propulsion for Innovative Realization of space Exploration (ASPIRE)*. H2020 Program (European Commission). PI: E. Ahedo Grant number: 101004366, (Jan. 2021 - Jun. 2023). 250 k€
- *Métodos avanzados de caracterización experimental de propulsores espaciales y su aplicación a la emisión electrostática en propulsores basados en fuentes de Líquidos Iónicos.*. Madrid Region. PI: P. Fajardo. Grant number: IND2020/TIC-17316, (Jan. 2021 - Jan 2024). 90 k€
- *Revolutionizing advanced electrodeless plasma thrusters for space transportation (ZARATHUSTRA)*. European Research Council, ERC-2020-STG,. PI: M. Merino. Grant number: 950466, (Jan. 2021 - Dec. 2025). 1.5 M€
- *Propulsión Espacial Eléctrica para Satélites en Órbita Terrestre (ESPEOS)*. AGENCIA ESTATAL DE INVESTIGACION (AEI). PI: P. Fajardo and M. Merino. Grant number: PID2019-108034RB-I00. (Jan. 2020 - Dec. 2022). 188 k€
- *HelIcon PlasmA Thruster for In-space Applications (HIPATIA)*. H2020 Programme - European Commission. PI: P. Fajardo. Grant number: 870542 (Jan. 2020- Dec. 2022). 455 k€
- *Simulación Numérica de la Turbulencia en Propulsión Espacial Eléctrica: Sinergias con Plasmas de Fusión (SIMTURB-CM-UC3M)*. Funded by Madrid Region. PI: P. Fajardo, J.M. Reynolds. (Jan. 2019- Dec. 2020). 60.000 €
- *Resolviendo el transporte anómalo en motores de plasma de efecto Hall mediante técnicas data-driven robustas de análisis modal (MARETERRA-CM-UC3M)*. Funded by Madrid Region. PI: M. Merino, F. Terragni. (Jan. 2019- Dec. 2020). 60.000 €
- *European Direct-Drive Architecture (EDDA)*. H2020 Programme - European Commission. PI: E. Ahedo. Grant number: 870470 (Dec. 2019- Dec. 2021). 100.000 €

- *Improvements in Helicon Antenna Thruster RF-Pasma Discharge Coupling for its Evolution towards Space Application.* Funded by ESA GSTP Program. PI: P. Fajardo. Contract number: RFP ESA RFP/3-15534/18/NL/KML/va, (Nov. 2018 - Apr. 2020). 100.000 €
- *Propulsión por plasma y fusión nuclear: innovando el transporte espacial.* PROMETEO-CM. Funded by Madrid Region. PI: E. Ahedo. Grant number: Y2018/NMT-4750, (2019-2021). 498.900 €
- *Millimeter wave Array at Room Temperature for INSTRUMENTS in Leo Altitude.* MARTINLARA-CM. Funded by Madrid Region. PI: E. Ahedo. Grant number: P2018/NMT-4333, (2019-2022). 165.589 €
- *Collaborative network for the development of educational nanosatellites in Europe.* Funded by EUROPEAN COMMISSION RESEARCH EXECUTIVE AGENCY. PI: M. Merino. Grant number: SOE2/P1/F0684, (Apr. 2018 - Sept. 2020). 232.875,01 €
- *Electromagnetic Thrusters for Space Exploration (PE3).* Funded by Spanish Ministry of Economy and Competitiveness. PI: P. Fajardo, E. Ahedo. Grant number: ESP2016-75887-P (2017-2019). 228.400 €
- *MagnetIc NOzzle thruster with elecTRon cyclOTron Resonance (MINOTOR).* H2020 Programme - European Commission. PI: M. Merino. Grant number: 730028 (Jan. 2017- Dec. 2019). 310.000 €
- *Consortium for Hall Effect Orbital Propulsion System (CHEOPS).* H2020 Programme - European Commission. PI: E. Ahedo. Grant number: 730135 (Jan. 2017- Jun. 2020). 360.000 €
- *Model and experimental validation of spacecraft thruster interactions for electric propulsion thrusters plume.* Funded by European Space Agency (Contract number: 4000116180/15/NL/PS). PI: E. Ahedo (03/2016-02/2018). 80.000 €
- *Plasma Space Propulsion: Simulations and Experiments.* Funded by Spanish Ministry of Economy and Competitiveness. PI: E. Ahedo, P. Fajardo. Grant number: ESP2013-41052-P (2014-2016). 242.000 €
- *Cámara de Ensayo de Propulsión Eléctrica.* Funded by Spanish Ministry of Economy and Competitiveness. PI: E. Ahedo, P. Fajardo. Grant number: UNC313-4E-1552 (2013-2015). 547.000 €
- *Low Earth Orbit Security With Enhanced Electric Propulsion (LEOSWEEP).* 7th Framework Programme of the European Union, PI: E. Ahedo. Grant number: 607457, (2013-2016) 164.724 €
- *Design Of Compressor Air Inlet Protection For Electrical ECS.* CLEAN SKY JOINT UNDERTAKING (UE). Oct. 2012 -April 2014. PI: V. Macian. 197000 €
- *LES methods for multiphase flow simulations (Metodos LES para la simulacion de chorros multifasicos).* Funded by Spanish Ministry of Science and Innovation. PI: J.M. Desantes (Jan. 2011-Dic. 2014). 179000 €
- *CleanSky CROR FEM-CFD Model for static aeroelastic analysis investigation.* Funded by Airbus Military (from UE programm). 2012.
- *PROYECTO MIURA: Analisis del desarrollo e implementacion de un sistema de guiado para proyectiles no guiados.* Funded by EVERIS AEROESPACIAL Y DEFENSA, S.L.U. (Spanish Government project). May 2013 - Feb. 2014. 40000 €

- *Cátedra UC3M-ISDEFE ESPACIO*. Funded by INGENIERÍA DE SISTEMAS PARA LA DEFENSA DE ESPAÑA, S.A, S.M.E, M.P. Jun. 2023-Jun. 2027. PI: P. Fajardo, L.E. García-Munõz (220 k€).
- *Electric Propulsion Diagnostics for Plasma Thrusters (DTK)*. Funded by European Space Agency. Mar. 2021-Sep. 2022. PI: J. Navarro (96 k€).
- *Simulation of mid-scale aerotool (MID-SCALE INNOVATIVE TOOLING ARCHITECTURE. STUDIES)*. (PEGASO). Funded by AIRBUS OPERATIONS, S.L. Jun. 2021-Dec. 2022. PI: J. Navarro (96 k€).
- *Cátedra UC3M-ISDEFE ESPACIO*. Funded by INGENIERÍA DE SISTEMAS PARA LA DEFENSA DE ESPAÑA, S.A, S.M.E, M.P. 2019-2023. PI: P. Fajardo (220 k€).
- *Apoyo a tareas de testeo de componentes del subsistema (RIS3-CAM)*. Funded by IENAI Space, Sep. 2020 - Apr. 2021. PI: P. Fajardo (3 k€).
- *Interlaboratory Test Activities in ESA and UC3M*. Funded by SENER Aeroespacial, S.A. May. 2019 - Nov. 2019. PI: J. Navarro (10 k€).
- *Faraday Probe for Helicon Plasma Thruster*. Funded by SENER, INGENIERIA Y SISTEMAS, S.A. Jul. 2018 - Oct. 2018. PI: J. Navarro (7.5 k€).
- *Convenio de colaboración para la creación de la cátedra UC3M- SENER Aeroespacial*. Funded by SENER, INGENIERIA Y SISTEMAS, S.A. Mar. 2018 - Mar. 2020. PI: E. Ahedo (60 k€).
- *Experimental campaign for the characterization and optimization of the HPT-05M Helicon Plasma Thruster prototype*. Funded by SENER Ingeniería y Sistemas. 2017. PI: J. Navarro (15 k€).
- *TOOLS*. Funded by AIRBUS OPERATIONS, S.L. Oct. 2017- Jun. 2019. PI: A. Ianiro, S. Discetti (81.5 k€).
- *CHARACTERISATION TESTS ON HELICON PLASMA THRUSTER*. Funded by AIRBUS SAS. Nov. 2016 - Apr. 2017. PI: P. Fajardo. (15 k€).
- *Development of an advanced axisymmetric model of the full plasma discharge in the Helicon Plasma Thruster*. Funded by AIRBUS SAS. Sep. 2016 - Aug. 2019. PI: E. Ahedo. (90 k€).
- *DEGASS-Desarrollo de sistemas embarcados de generación de gas inerte para aviones de tamaño medio y medio recorrido*. Funded by COMPAÑIA ESPAÑOLA DE SISTEMAS AERONAUTICOS S.A. Sep. 2016 - Mar. 2017. PI: P. Fajardo. (35 k€).
- *Convenio específico entre Ingeniería de Sistemas para la Defensa de España y la Universidad Carlos III de Madrid para el desarrollo de Trabajos de Prospectiva Tecnológica en el área Aeroespacial*. Funded by INGENIERÍA DE SISTEMAS PARA LA DEFENSA DE ESPAÑA, S.A. (ISDEFE). Mar. 2016 - Mar. 2018. PI: P. Fajardo. (80 k€).
- *Campaña experimental de caracterización y optimización del prototipo HPT-05 (Experimental Campaign of HPT-05 prototype)*. Funded by SENER, INGENIERIA Y SISTEMAS, S.A. Jun. 2016 - Aug. 2016. PI: P. Fajardo. (13.5 k€).
- *Design and Manufacturing of a Langmuir Probe for the use in RF Generated Plasmas*. Funded by SENER, INGENIERIA Y SISTEMAS, S.A. (project with ESA). Dec. 2015 - April 2016. PI: M. Merino. (12.5 k€).
- *10kW Hall-Effect Thruster Optimized for Space Transportation*. Funded by SNECMA (project with ESA). March 2014 - July 2014. PI: E. Ahedo. (15 k€).

- *Advisor in CFD projects.* Funded by COMET Ingeniería. Jun. 2014-May. 2017. PI: P.Fajardo. (15 k€).
- *Apoyo en la obtención de las características aerodinámicas de un seguidor solar.* Several projects on this topic both numerical and experimental. Funded by ATOS SPAIN, S.A.U and PV Hardware. Jul. 2013-Jul. 2014. PI: P.Fajardo. (20.4 k€).
- *Development Of A Methodology For Centrifugal Compressor Modelling By Means Of STARCCM+.* Funded by POWERTECH ENGINEERING S.R.L. Nov 2012 - July 2013. PI: F. Payri. (109.5 k€).
- *Aerodynamic characterization of a guided bomb (análisis de las características aerodinámicas y de estabilidad de un nuevo modelo de bomba guiada).* Funded by Embention s.l., 2010-2011. PI: F. Payri. (40 k€).
- *Proyecto de viabilidad para la fabricación de vehículos aéreos híbridos para el transporte de mercancías.* Funded by NEW TRANSPORT CONCEPT PROYECT, S.L., 2009. PI: F. Payri. (17.4 k€).
- *Projet De Recherche Sur Le Pompage Du Compresseur (Essais Metier).* Funded by PEUGEOT CITROEN AUTOMOBILES, S.A., Sep 2009-Jan 2010. PI: F. Payri. (120 k€).
- *Pulsating Flow in Turbochargers.* Funded by Peugeot Citroen Automobiles (PSA), 2009. PI: F. Payri. (65 k€).

REFEREED
PROCEEDINGS

1. Zhou, J., Taccogna, F., Fajardo, P., and Ahedo, E. "Performance analysis of alternative propellants for a helicon plasma thruster". Space Propulsion 2021, Estoril, Portugal, March 17-19, 2021. Conf. Proceedings, paper SP2020-191, available at <http://ep2.uc3m.es/> (2021)
2. Ruiz, M., Gomez, V., Fajardo, P., Navarro, J., Albertoni, R., Dickeli, G., ... and Hildebrand, N. "The HIPATIA project's initial development stages: setting the basis to bring the Helicon Plasma Thruster and its associated technologies to intermediate-high TRLs". Space Propulsion 2021, Estoril, Portugal, March 17-19, 2021. Conf. Proceedings, paper SP2020-421, available at <http://ep2.uc3m.es/> (2021)
3. Perrotín, T., Domínguez-Vázquez, A., Navarro-Cavallé, J., Fajardo, P., and Ahedo, E. "DESIGN AND PRELIMINARY STUDY OF A 200W CYLINDRICAL HALL THRUSTER". Space Propulsion 2021, Estoril, Portugal, March 17-19, 2021. Conf. Proceedings, paper SP2020-090, available at <http://ep2.uc3m.es/> (2021)
4. Perales-Díaz, J., Domínguez-Vázquez, A., Fajardo, P., Ahedo, E., Faraji, F., Reza, M., and Andreussi, T. "CHARACTERIZATION OF A 5kW-CLASS HALL THRUSTER VIA 2D HYBRID SIMULATIONS". Space Propulsion 2021, Estoril, Portugal, March 17-19, 2021. Conf. Proceedings, paper SP2020-391, available at <http://ep2.uc3m.es/> (2021)
5. Marín-Cebrián, A., Domínguez-Vázquez, A., Fajardo, P., and Ahedo, E. "RADIAL PARTICLE-IN-CELL SIMULATIONS OF A HALL THRUSTER DISCHARGE WITH DIFFERENT ANOMALOUS TRANSPORT MODELS". Space Propulsion 2021, Estoril, Portugal, March 17-19, 2021. Conf. Proceedings, paper SP2020-00306, available at <http://ep2.uc3m.es/> (2021)
6. Ruiz, M., Gomez, V., Fajardo, P., Navarro, J., Albertoni, R., Dickeli, G., ... and Hildebrand, N. "HIPATIA: A project for the development of the Helicon Plasma Thruster and its associated technologies to intermediate-high TRLs". 71st International Astronautical Congress (IAC)–The CyberSpace Edition. 2020. International Astronautical Federation.

7. J. M. Muñoz-Tejada, D. Morón, M. K. Verma, P. Fajardo, C. Verhoeven. “ENVIRONMENTAL ANALYSIS OF NANOROVERS IN A SWARM FOR LUNAR SCIENTIFIC MISSIONS”. 70th International Astronautical Congress. Washington D.C., United States. October 21st, 2019. International Astronautical Federation.
8. Ahedo, E., Fajardo, P., Merino, M., Navarro-Cavallé, J., Sánchez-Villar, A., Wijnen, M., and Zhou, J. “Helicon and ECR plasma sources for space propulsion: simulation and testing”. In 2019 International Conference on Electromagnetics in Advanced Applications (ICEAA) (pp. 0788-0793). IEEE. DOI: 10.1109/ICEAA.2019.8879300
9. J. Zhou, P. Jiménez, M. Merino, P. Fajardo and E. Ahedo. “Numerical Simulations of the Plasma Discharge in a Helicon Plasma Thruster”, 36th International Electric Propulsion Conference. Vienna, Austria. September 15-20th, 2019. Conf. Proceedings paper IEPC-2019-330, Electric Rocket Propulsion Soc., <https://erps.spacegrant.org/> (2019)
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29. D. Pérez-Grande, P. Fajardo, E. Ahedo. “Benchmarks for Magnetically Aligned Meshes in Electromagnetic Plasma Thruster Simulations”. IEPC, Kobe, Japan, 2015.
30. D. Pérez-Grande, P. Fajardo, E. Ahedo. “Evaluation of Erosion Reduction Mechanisms in Hall Effect Thrusters”. IEPC, Kobe, Japan, 2015.
31. P. Fajardo. “Research Activities in Aerospace at UC3M”. Congreso de Ingeniería Aeronáutica Invited Lecture. Madrid, 2014.
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39. Tiseira, A., Valencia, O., Fajardo, P., Chimeno, M., Hernández, L., Cid, E., López-Díez, J. “The use of new configuration airship for the desaturaton of the sky”. *8th International Airship Convention*. Bedford, England. 29 September to 3 October 2010. ISBN 0-9528578-7-1.

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2. P. Fajardo et al. “Avances en propulsión espacial por plasma en la UC3M”, Congreso de Ingeniería Espacial. Instituto de Ingeniería de España. Oct. 2020.
3. P. Fajardo. “Promoción de las carreras STEM y la ingeniería aeronáutica”, Colegio Oficial de Ingenieros Aeronáuticos de España, December 19th, 2019.
4. A. Domínguez, J. Zhou, Fajardo, E. Ahedo. “Simulation of Hall thruster performances with HYPHEN”, EPIC Workshop 2019, ESA-ESTEC, Noordwijk, The Netherlands, October 21-25th 2019
5. F. Cichocki, A. Domínguez-Vázquez, M. Merino, P. Fajardo, and E. Ahedo. “Simulation of Hall thruster 3D plumes with EP2PLUS”, EPIC Workshop 2019, ESA-ESTEC, Noordwijk, The Netherlands, October 21-25th 2019
6. J. Navarro-Cavallé, M. Wijnen, V. Gomez, P. Fajardo, E. Ahedo. “Experimental activities at the Electric propulsion and Plasmas Team (EP2-UC3M): an example of an intense testing campaign on the Helicon Plasma Thruster (HPT05M)”, EPIC Workshop 2019, ESA-ESTEC, Noordwijk, The Netherlands, October 21-25th 2019
7. M. Merino et al. “Synergies between space plasma propulsion and magnetic confinement plasma fusion”, XXXVII Reunión bienial de la Real Sociedad Española de Física. Zaragoza, July, 15-19th, 2019
8. J. Navarro-Cavallé, M. Wijnen, P. Fajardo, E. Ahedo, V. Gómez, A. Gimenez, M. Ruiz, “Development and Evolution of the Helicon Plasma Thruster Prototype (HPT) for in-Space Propulsion”, 8th European Conference for Aeronautics and Space Sciences. Madrid. July, 1-4th, 2019
9. A. Domínguez, J. Zhou, A. Sánchez-Villar, M. Merino, Fajardo, E. Ahedo, “HYPHEN: A simulation platform for space plasma thrusters”, 8th European Conference for Aeronautics and Space Sciences. Madrid. July, 1-4th, 2019
10. A. Domínguez, P. Fajardo, E. Ahedo, F. Taccogna. “Non-Maxwellian electron VDF features in a Hall thruster chamber”, ExB Workshop. Princeton, November, 1-2nd, 2018
11. A. Domínguez, D. Pérez-Grande, A. Sánchez-Villar, B. Tian, J. Zhou, P. Fajardo, M. Merino, E. Ahedo. “HYPHEN: A multi-thruster simulation platform”, EPIC Workshop. London, October 15-17th, 2018
12. A. Domínguez, P. Fajardo, E. Ahedo, F. Taccogna. “Non-Maxwellian electron VDF features in a Hall thruster chamber”, ExB Workshop, Princeton, November 1-2, 2018
13. M. Merino, F. Cichocki, E. Ahedo, J.M. Catalán, A. Domínguez-Vázquez, P. Fajardo. “Electron modeling in hybrid plasma thruster plume simulations”, SPINE meeting, ESA, October, 25-26th, 2018
14. M. Merino, J. Navarro, F. Cichocki, A. Domínguez-Vázquez, M. Wijnen, P. Fajardo, E. Ahedo. “Micro-Propulsion plasma plume measurement and simulation”, 2nd International Conference on Micropropulsion and CubeSats, Singapore, January 8-12th, 2018
15. P. Fajardo, M. Merino, E. Ahedo. “An advanced simulation code for Hall effect thrusters”. EPIC Workshop. Madrid, October 2017
16. Merino, M., Ahedo, E., and Fajardo, P., “Development of physical models of electron cooling in collisionless plasma thruster plumes”, 22nd SPINE Meeting and Workshop, SPIS/SPINE Community, ESA, 2016.

17. Domínguez, A., Cichocki, F., Pérez, D., Merino, M., Fajardo, P., and Ahedo, E., “Hybrid PIC-fluid simulation of plasma thrusters and their plumes”, VKI Lecture Series: Electric Propulsion Systems: from recent research developments to industrial space applications, No. STO-AVT-263, Von Karman Institute, Von Karman Institute, Belgium, 2016.
18. Cichocki, F., Domínguez, A., Pérez, D., Merino, M., Ahedo, E., and Fajardo, P., “Hybrid particle codes for electric propulsion”, 14th Spacecraft Charging Technology Conference, 2016.
19. Merino, M., Fajardo, P., Navarro, J., Chen, X., Babou, Y., and Ahedo, E., “Characteristics and capabilities of the new EP2 plasma propulsion laboratory”, Space Propulsion Conference 2016 , 2016.
20. Dominguez, A., Pérez, D., Fajardo, P., and Ahedo, E., “Development update on NOMADS: A versatile, multi.thruster plasma discharge simulation code”, Space Propulsion Conference 2016 , 2016.
21. P. Fajardo. “Research Activities in Aerospace at UC3M”. Invited. Madrid, 2014

REFEREE SERVICE **International journals**

- Applied Energy
- International Journal of Heat and Fluid Flow
- International Journal of Heat and Mass Transfer
- Engineering Applications of Computational Fluid Mechanics
- Applied Thermal Engineering
- Journal of Aerospace Engineering
- Aerospace Science & Technology
- Journal of Mechanical Engineering Science
- Acta Astronautica

Proyectos de investigación

- Agencia Nacional de Evaluación y Prospectiva (ANEP)

Titulaciones

- AQU Catalunya

STUDENT
ADVISING - PHD
LEVEL

- **Davide Poli**. Universidad Carlos III de Madrid. *2D Fluid modeling of HET*. Co-supervised with E. Ahedo. Expected graduation 2024.
- **David Villegas**. Universidad Carlos III de Madrid. *Micro-propulsión espacial escalable basada en emisión de líquidos iónicos*. Co-supervised with S. Correyero. Expected graduation 2024.
- **Tatiana Perrotin**. Universidad Carlos III de Madrid. *Design, simulation, and testing of a low-power Hall effect thruster*. Co-supervised with J. Navarro. Expected graduation 2024.
- **Victor Gómez**. Universidad Carlos III de Madrid. *Improvements in Helicon Antenna Thruster RF-Plasma Discharge Coupling for its Evolution towards Space Applications*. Co-supervised with E. Ahedo. Expected graduation 2024.
- **Mick Wijnen**. Universidad Carlos III de Madrid. *Experimental Characterization of Electric Propulsion Technologies*. Co-supervised with J. Navarro. 2023.

- **Jiewei Zhou.** Universidad Carlos III de Madrid. *Modeling and simulation of the plasma discharge in a radiofrequency thruster.* Co-supervised with E. Ahedo. April 2021.
- **Adrián Domínguez Vázquez.** Universidad Carlos III de Madrid. *Axisymmetric simulation codes for Hall effect thrusters and plasma plumes.* Co-supervised with E. Ahedo. May 2019.
- **Daniel Perez-Grande.** Universidad Carlos III de Madrid. *Fluid modeling and simulation of the electron population in Hall Effect Thrusters with complex magnetic topologies.* Co-supervised with E. Ahedo. June 2018.

STUDENT ADVISING - BSc & MSc LEVEL

- 12 Bachelor thesis at UC3M. 2013-2022.
- 13 Master thesis at UC3M. 2013-2022.
- 14 Final Year Projects in the Aeronautical Engineering (5 years degree) at Universidad Politécnica de Valencia. 2008-2013.

TEACHING EXPERIENCE

Universidad Carlos III de Madrid, Leganés, Spain

- Aerospace Propulsion. BSc Aerospace Eng. (3rd year). Winter semester 2013-2014.
- Helicopters and other aircrafts. BSc Aerospace Eng. (4th year). Fall semester 2013-2014, 2022-2023.
- Introduction to Flight Mechanics. BSc Aerospace Eng. (2nd year). Winter semester 2014-2015.
- Advanced Aircraft Design and Certification I (Finite Element Modeling). MSc Aeronautical Eng. (1st year). Fall semester 2014-2022.
- Advanced Aeroelasticity. MSc Aeronautical Eng. (1st year). Fall semester 2015-2024.
- Aeroelasticity. BSc Aeronautical Eng. (4th year). Fall semester 2014-2017, 2019-2024.
- Stability and Integrity of Aerospace Structures. BSc Aeronautical Eng. (3rd year). Fall semester 2014-2015.
- Aerospace Engineering Design - Structural Dynamics & Helicopter Design. BSc Aeronautical Eng. (4th year). Winter semester 2015-2018.
- Aerospace Engineering Design - Structural Dynamics. BSc Aeronautical Eng. (4th year). Winter semester 2018-2024.

Universidad Politécnica de Valencia, Valencia, Spain

- Aeroelasticity. Aeronautical Engineering - 5 years degree. (5th year). 2010-2011, 2011-2012, 2012-2013.
- Aerodynamics and Aeroelasticity. Aeronautical Engineering - 5 years degree. (5th year). 2010-2011, 2011-2012, 2012-2013.
- Aircrafts, Astronautics and Space Engineering. Aeronautical Engineering - 5 years degree. (4th year). 2008-2009, 2009-2010, 2012-2013.
- Space vehicles and missiles. Aeronautical Engineering - 5 years degree. (5th year). 2009-2010.
- Aerodynamics. Aeronautical Engineering - 5 years degree. (3th year). 2008-2009.

UNAQ - Universidad Aeronáutica en Queretaro, Queretaro, Mexico

- Procesos de diseño, desarrollo y certificación. MSc. Aerospace Eng. (3rd four-moth period). 2011-2012, 2012-2013, 2013-2014, 2014-2015, 2015-2016.
- Turbomachinery. MSc. Aerospace Eng. (4th four-moth period). 2011-2012, 2012-2013, 2013-2014.
- Structural Analysis. MSc. Aerospace Eng. (4th four-moth period). 2011-2012, 2013-2014.

COMPLEMENTARY **Universidad Carlos III de Madrid**, Madrid, Spain.

TEACHING

EXPERIENCE

Introduction to aerospace engineering (6 h/year). Master in Aircraft Systems Integration. 2015-2021.

Director of Master in Airframe Technology. Since 2018-today. About 10 hours per year.

Universidad Politécnica de Madrid, Madrid, Spain.

Vibro Acoustics Simulations in Aerospace. ATHENS Programme. March 2011.

TEACHING

MATERIALS

- *Aerospace Technology*. Aerospace Engineering Degree. Editorial Universitat Politècnica de València, 2013.

- *Transferencia de masa y energía: Ejercicios resueltos*. Aerospace Engineering Degree. Editorial Universitat Politècnica de València, 2014. ISBN: 978-84-9048-207-0.

MANAGEMENT

- *Framework agreement ISDEFE-UC3M*. Coordinator. Activities in fields of: Prospective Technology Studies (Aerospace), Teaching, and Research. Signed on 2015.

- *Cátedra Airbus-UC3M para estudios aeroespaciales*. Coordinator, Teaching, and Research. 2016-2020. 120 k€.