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Mario Merino Martínez

Academic positions

- 2018–present **Associate Professor (Profesor titular)**, *Universidad Carlos III de Madrid*, Escuela Politécnica Superior, Departamento de Bioingeniería e Ingeniería Aeroespacial.
- 2013–2018 **Assistant Professor (Profesor visitante)**, *Universidad Carlos III de Madrid*, Escuela Politécnica Superior, Departamento de Bioingeniería e Ingeniería Aeroespacial.
- 2010–2013 **Assistant researcher/teacher (Profesor ayudante)**, *Universidad Politécnica de Madrid*, Escuela Técnica Superior de Ingenieros Aeronáuticos (ETSIA), Departamento de Fundamentos Matemáticos de la Tecnología Aeronáutica.

Education

- 2010–2013 **PhD in Aerospace Engineering**, *Universidad Politécnica de Madrid*.
- Thesis: *Analysis of Magnetic Nozzles For Space Plasma Thrusters*. Awarded Cum Laude and the International PhD Thesis Mention by the Ministry of Education. Thesis advisor: Prof. Eduardo Ahedo.
- 2010–2012 **Postgraduate Master in Aerospace Engineering**, *Universidad Politécnica de Madrid*.
- 2004–2010 **Aerospace Engineering, Major in 'Aerospace Vehicles'**, *Universidad Politécnica de Madrid*, (5-year program, equivalent to BSc + MSc).
- **ERASMUS exchange year** at TU Delft, the Netherlands (academic year 2007/08).
- 2002–2004 **International Baccalaureate**, *I.E.S. Cardenal López de Mendoza*, Burgos, Spain.
- Grade: 41/45 (with Honors).

Academic awards and scholarships

Consejo Social UC3M, *Excellence Award (2021)*.

Celera Program, *Selected among the top 10 Spanish young professionals of the year*, <http://www.acelerame.org/> (2017).

Accesit award in the Actúa-UPM competition for entrepreneurship and creation of technology-based businesses, *for the business plan 'VECMAN, steerable magnetic nozzle'*, awarded by *Universidad Politécnica de Madrid (2015)*.

SENER Foundation special award to best Engineering PhD Thesis, awarded by *SENER Foundation (2014)*.

Universidad Politécnica de Madrid Outstanding PhD Thesis award, awarded by *Universidad Politécnica de Madrid (2014)*.

Electric Rocket Propulsion Society (ERPS) IEPC 2011 Best Paper Award, to the paper 'On electron inertia and current ambipolarity in Magnetic Nozzle models,' by E. Ahedo and M. Merino, IEPC-2011-050, awarded by ERPS (2011).

Second National Award on Outstanding Graduation in Aerospace Engineering, (Segundo Premio Extraordinario Fin de Carrera), awarded by the Ministry of Education, Spanish Government (2010).

First Prize in the "VII Pegasus-AIAA European Student Conference", awarded by the AIAA and PEGASUS association of European Aerospace Universities (2010).

Second Prize in the "IX National Archimedes Contest for Young Researchers", awarded by the Spanish Government (2010).

Young Aerospace Engineer of the Year Award, awarded by Aerospace Testing and EUCASS (2010).

EPS Best Poster at the ESCAMPIG XX Congress, awarded by the European Physical Society (7/2010).

Competitive scholarships awarded:

- 2014 **UC3M mobility grant**, Universidad Carlos III de Madrid, for research internship at UCLA, CA, USA (three months).
- 2012 **PhD scholarship 'Beca para la Formación de Profesorado Universitario' (FPU)**, Spanish Ministry of Education, scholarship granted; resigned to it in favor of my contract at Universidad Politécnica de Madrid in the same period.
- 2010 **Scholarship 'Beca de Colaboración'**, Spanish Ministry of Education, obtained during my last year of Aerospace Engineering studies at Universidad Politécnica de Madrid.
- 2009–2010 **Scholarship 'Beca de Colaboración'**, Universidad Politécnica de Madrid, involved teaching calculus and linear algebra courses as teaching assistant.
- 2004–2009 **Five consecutive Academic Excellence Grants**, Community of Madrid, obtained during my Aerospace Engineering studies at Universidad Politécnica de Madrid.

Research activity

Research group: Plasmas and Space Propulsion Team (EP2), <https://ep2.uc3m.es>.

Research interests: Plasma space propulsion, magnetic nozzles, helicon plasma thrusters, electron-cyclotron resonance thrusters, fluid and kinetic plasma models, expansion of magnetized and unmagnetized plasma plumes, electromagnetic waves in plasmas, numerical methods and analysis, space systems engineering, active space debris removal, nanosatellites, cubesats.

Research grants in competitive calls:

- 2021–2023 **COMIT: COmpact MIni plasma Thruster for New Space applications**, Agencia Estatal de Investigación, Proyectos I+D+i Pruebas de Concepto 2021, Grant number: PDC2021-120911-I00, (150 k€).
Principal Investigator: Eduardo Ahedo, Pablo Fajardo.
- 2021–2025 **ZARATHUSTRA: Revolutionizing advanced electrodeless plasma thrusters for space transportation**, supported by the European Research Council, ERC-2020-STG, Grant number: 950466, (1.5 M€).
Principal Investigator: Mario Merino.

- 2021–2024 **CHEOPS MEDIUM: Consortium for Hall Effect Orbital Propulsion System Phase 2, covering MEDIUM POWER needs**, supported by the H2020 Program (European Commission), Grant number: 101004226, (270 k€).
Principal Investigator: Eduardo Ahedo.
Project Coordinator: SAFRAN.
- 2021–2024 **CHEOPS LOW: Consortium for Hall Effect Orbital Propulsion System Phase 2, covering LOW POWER needs**, supported by the H2020 Program (European Commission), Grant number: 101004331, (170 k€).
Principal Investigator: Eduardo Ahedo.
Project Coordinator: SAFRAN.
- 2021–2023 **ASPIRE: Advanced Space Propulsion for Innovative Realization of space Exploration**, supported by the H2020 Program (European Commission), Grant number: 101004366, (250 k€).
Principal Investigator: Eduardo Ahedo.
Project Coordinator: SITAEL SPA.
- 2020–2022 **SPEOS: Electric Space Propulsion for Earth Orbit Satellites**, supported by the Ministry of Science and Innovation, National I+D plan, Spanish Government, Grant number: PID2019-108034RB-I00, (188.5 k€).
Principal Investigators: Pablo Fajardo, Mario Merino.
- 2020–2022 **MARETERRA: Resolviendo el transporte anómalo en motores de plasma de efecto Hall mediante técnicas data-driven robustas de análisis modal**, supported by the Community of Madrid, (60 k€).
Principal Investigator: Mario Merino, Filippo Terragni.
- 2020–2022 **SIMTURB: Simulación Numérica de la Turbulencia en Propulsión Espacial Eléctrica: Sinergias con Plasmas de Fusión**, supported by the Community of Madrid, (60 k€).
Principal Investigator: Pablo Fajardo, Jose Miguel Reynolds.
- 2020–2023 **HIPATIA: Hellcon Plasma Thruster for In-space Applications**, supported by the H2020 Program (European Commission), Grant number: 870542, (455 k€).
Principal Investigator: Pablo Fajardo.
Project Manager: SENER Aerospace (Spain).
- 2019–2021 **EDDA: European Direct-Drive Architecture**, supported by the H2020 Program (European Commission), Grant number: 870470, (100 k€).
Principal Investigator: Eduardo Ahedo.
Project Manager: Thales Alenia Space (France).
- 2019–2022 **MFOC, Madrid Flight on Chip**, supported by the Community of Madrid, Grant number: 49.520608.9.18, (332.4 k€).
Principal Investigator: Juan Llorens.
Project Manager: SENER Ingeniería y Sistemas.
- 2019–2021 **PROMETEO, Plasma Propulsion and Nuclear Fusion: innovating space transport**, supported by the Community of Madrid, Grant number: Y2018/NMT4750, (440.4 k€).
Principal Investigator: Eduardo Ahedo.
- 2019–2022 **MARTINLARA, Millimeter wave Array at Room Temperature for INstruments in Leo Altitude**, supported by the Community of Madrid, Grant number: P2018/NMT-4333, (165 k€).
Principal Investigator: Luis Enrique García.

- 2018–2021 **NanoStar, Collaborative network for the development of educational nanosatellites in Europe**, supported by the EU Interreg-SUDOE VB Program, Grant number: SOE2/P1/F0684, (310.5 k€).
Principal Investigator: Mario Merino.
Project Manager: Aersospace Valley (France).
- 2017–2020 **MINOTOR, Magnetic NOzzle thruster with electron cyclotron Resonance**, supported by the H2020 Program (European Commission), Grant number: 730028, (310 k€).
Principal Investigator: Mario Merino.
Project Manager: ONERA (France).
- 2017–2019 **PE3, Propulsores Electromagnéticos para la Exploración Espacial**, supported by the Ministry of Economy and Competitiveness, National I+D plan, Spanish Government, Grant number: ESP2016-75887-P, (228.4 k€).
Principal Investigators: Eduardo Ahedo, Pablo Fajardo.
- 2016–2020 **CHEOPS, Consortium for Hall Effect Orbital Propulsion System**, supported by the H2020 Program (European Commission), Grant number: 730135, (360 k€).
Principal Investigator: Eduardo Ahedo.
Project Manager: SAFRAN-Snecma (France).
- 2013–2015 **Cámara de Ensayo de Propulsión Eléctrica**, supported by the Ministry of Economy and Competitiveness, National program for scientific infrastructure and equipment, Spanish Government, Grant number: UNC313-4E-1552, (547.5 k€).
Principal Investigators: Eduardo Ahedo, Pablo Fajardo.
- 2013–2016 **Propulsión Espacial por Plasma: Simulación y Experimentación**, supported by the Ministry of Economy and Competitiveness, National I+D plan, Spanish Government, Grant number: ESP2013-41052-P, (242 k€).
Principal Investigators: Eduardo Ahedo, Pablo Fajardo.
- 2013–2016 **LEOSWEEP, improving Low Earth Orbit Security With Enhanced Electric Propulsion**, supported by the European 7th Framework Program (European Commission), Grant number: 607457, (165 k€).
Principal Investigator: Eduardo Ahedo.
Project Manager: SENER Ingeniería y Sistemas.
- 2010–2013 **Propulsión Espacial por Plasma**, supported by the Ministry of Economy and Competitiveness, National I+D plan, Spanish Government, Grant number: AYA2010-16699, (70 k€).
Principal Investigator: Eduardo Ahedo.
- 2008–2010 **HPH.com, Helicon Plasma Hydrazine COmbined Micro**, supported by the European 7th Framework Program (European Commission), Grant number: 218862, (96 k€).
Principal Investigator: Eduardo Ahedo.
Project Manager: Università degli Studi di Padova (Italy).

Research contracts:

- 2019–present **UC3M-ISDEFE Space Chair**, supported by ISDEFE Ingeniería de Sistemas para la Defensa de España, S.A., (220 k€).
Principal Investigator: Pablo Fajardo.
- 2018–2020 **Improvements in Helicon Antenna Thruster RF-Plasma Discharge Coupling for its Evolution towards Space Application**, supported by ESA GSTP Program, Grant number: RFP/3-15534/18/NL/KML/va, (100 k€).
Principal Investigator: Pablo Fajardo.

- 2018–present **UC3M-SENER Research Chair**, supported by *SENER Ingeniería y Sistemas*, (30 k€/year).
Principal Investigator: Eduardo Ahedo.
- 2018–2019 **Faraday Probe for Helicon Plasma Thruster**, supported by *ESA*, (7.5 k€).
Principal Investigator: Jaume Navarro.
Project Manager: *SENER Ingeniería y Sistemas*.
- 2017 **Experimental campaign for the characterization and optimization of the HPT-05M Helicon Plasma Thruster prototype**, supported by *SENER Ingeniería y Sistemas*, (15 k€).
Principal Investigator: Jaume Navarro.
- 2016–2019 **Development of an advanced axisymmetric model of the full plasma discharge in the Helicon Plasma Thruster**, supported by *Airbus Defence and Space (France)*, (90 k€).
Principal Investigator: Eduardo Ahedo.
- 2016–2018 **Technological prospective in the aerospace field**, supported by *ISDEFE S.A.*, (specific framework contract), (80 k€).
Principal Investigator: Pablo Fajardo.
- 2016–2018 **MODEX: Model and experimental validation of spacecraft thruster interactions for electric propulsion thrusters plume**, supported by *ESA*, Contract number: 4000116180/15/NL/PS, (80 k€).
Principal Investigator: Eduardo Ahedo.
Project Manager: *Airbus Defense and Space (France)*.
- 2016–2017 **Characterisation tests on Helicon Plasma Thruster**, supported by *Airbus Defence and Space (France)*, (15 k€).
Principal Investigator: Pablo Fajardo.
- 2016 **Characterisation tests on Helicon Plasma Thruster**, supported by *SENER*, (13.5 k€).
Principal Investigator: Pablo Fajardo.
- 2015–2016 **Design and manufacturing of a RFCLP Langmuir Probe for the use in RF Generated Plasmas**, supported by *ESA*, Contract number: 5001017118, (12.5 k€).
Principal Investigator: Mario Merino.
Project Manager: *SENER Ingeniería y Sistemas*.
- 2013–2015 **HPT, Helicon Plasma Thrusters for Space Missions**, supported by *ESA*, Contract number: 4000107292/12/NL/CO, (63.5 k€).
Principal Investigator: Eduardo Ahedo.
Project Manager: *SENER Ingeniería y Sistemas*.
After the conclusion of the project, activity was continued within a joint venture with *SENER* for the development, construction and testing of the **HPT05 Helicon Plasma Thruster prototype**.
- 2013–2014 **IBSIOD, Ion Beam Shepherd In-Orbit Demonstrator**, supported by *ESA*, Contract number: 4000109292/13/NL/MV, (8 k€).
Principal Investigator: Eduardo Ahedo.
Project Manager: *DEIMOS SPACE*.
- 2012–2013 **Plasma detachment mechanisms in propulsive magnetic nozzles**, supported by the *EOARD, USAF*, Contract number: FA8655-12-1-2043, (30 k€).
Principal Investigator: Eduardo Ahedo.
- 2010–2011 **Magnetic nozzles for plasma thrusters: acceleration, thrust, and detachment mechanisms**, supported by the *EOARD, USAF*, Contract number: FA8655-10-1-3085, (25 k€).
Principal Investigator: Eduardo Ahedo.

2010–2011 **Ion Beam Shepherd for Contactless Debris Removal**, supported by ESA, Contract number: 4000101447/10/NL/CBi, (12.5 k€).
Principal Investigator: Claudio Bombardelli.

Research internships abroad:

- 2018 **Beihang University, China**, *January (2 weeks)*, Research on improved plasma plume full-PIC boundary conditions for electrons, Prof. H. Tang research group.
- 2017 **Massachusetts Institute of Technology, USA**, *June-August (3 months)*, Theoretical study of plasma waves near the electron cyclotron resonance, at the Plasma Science and Fusion Center, Prof. P. Bonoli research group.
- 2014 **University of California Los Angeles, USA**, *June-August (3 months)*, Experimental plasma physics of cusp confinement for plasma space propulsion, at Prof. R. Wirz research group.
- 2012 **Stuttgart University, Germany**, *June-August (3 months)*, Experimental investigation of a high-power, applied-field Magneto-plasma-dynamic thruster, at Institute of Space Systems (IRS).

Direction of PhD theses:

- 2022–present **Kinetic modeling of plasma thruster plumes**, doctorand: Matteo Guaita, Universidad Carlos III de Madrid.
Thesis in progress.
- 2021–present **Magnetic arch electrodeless plasma thruster experimental investigation**, doctorand: Célian Boyé, Universidad Carlos III de Madrid.
Thesis in progress.
- 2021–present **Multi-fluid modeling and simulation of advanced electrodeless plasma thrusters**, doctorand: Diego García, Universidad Carlos III de Madrid.
Thesis in progress.
- 2020–present **Development and characterization of Data-driven fast plasma diagnostics for Hall thruster research**, doctorand: Davide Maddaloni, Universidad Carlos III de Madrid.
Thesis in progress.
- 2019–present **Modeling the wave-plasma interaction in space plasma thrusters**, doctorand: Pedro Jiménez, Universidad Carlos III de Madrid.
Thesis in progress.
- 2019–present **Design and construction of an electrodeless plasma thruster for space applications**, doctorand: Marco Inchingolo, Universidad Carlos III de Madrid.
Thesis in progress.
- 2019–present **Design and development of a μ -pulsed plasma thruster**, doctorand: Scherezade Barquero, Universidad Carlos III de Madrid.
Thesis in progress.
- 2016–2022 **Modeling the plasma discharge in an electron-cyclotron-resonance thruster**, doctorand: Álvaro Sánchez, Universidad Carlos III de Madrid.
Awarded *Cum Laude*; Ministry's International Mention.
- 2014–2017 **Analysis of the expansion of a plasma thruster plume into vacuum**, doctorand: Filippo Cichocki, Universidad Carlos III de Madrid.
Awarded: *Cum Laude*; Ministry's International Mention; and the UC3M Extraordinary PhD Thesis Award.

2013–2017 **Modeling of physical processes in radio-frequency plasmas**, doctorand: Bin Tian, Universidad Carlos III de Madrid.

Supervision of incoming visitors and students:

- 2020–present **Yonis Legrand**, *TU Delft & TU Eindhoven, The Netherlands*, 6 month MSc thesis internship under the ERASMUS+ placement program.
Work: Implementation of a tranverse model for a micro-PPT plasma thruster, Universidad Carlos III de Madrid.
- 2016–2017 **Min Li**, *Beihang University, China*, 6 month PhD research internship funded by Chinese Government scholarship.
Work: Particle-in-cell analysis of the electron demagnetization process in the far region of propulsive magnetic nozzles, Universidad Carlos III de Madrid.
- 2016–2017 **Javier Mauriño-Alperovich**, *Imperial College, UK*, 6 month MSc internship.
Work: Kinetic modeling of collisionless electron cooling in electric propulsion plasma plumes, Universidad Carlos III de Madrid.
- 2015–2016 **Mick Wijnen**, *TU Delft, The Netherlands*, 4 month internship and 6 month MSc thesis under the ERASMUS+ placement Program.
Work: Development of diagnostic system for EP test facility and characterization of a Helicon plasma thruster prototype, Universidad Carlos III de Madrid.
- 2016 **Aurélien Proux**, *ENSTA-ParisTECH, France*, 3 month MSc internship under the ERASMUS+ placement Program.
Work: Kinetic modeling of expanding plasma plumes into vacuum, Universidad Carlos III de Madrid.
- 2016 **Saul Rindt**, *TU Eindhoven, The Netherlands*, 3 month MSc internship under the ERASMUS+ placement Program.
Work: ECR plasma heating in space thrusters, Universidad Carlos III de Madrid.
- 2015 **Simon Peterschmitt**, *ENSTA-ParisTECH, France*, 3 month MSc internship.
Work: Toward a wave-plasma model of the electron-cyclotron resonance (ECR) plasma thruster, Universidad Carlos III de Madrid.

Publications in Peer-Reviewed Journals and Books

- 1 Ahedo, E. and Merino, M., "Two-dimensional supersonic plasma acceleration in a magnetic nozzle," *Physics of Plasmas*, Vol. 17, No. 7, 2010, pp. 073501.
- 2 Ahedo, E. and Merino, M., "On plasma detachment in propulsive magnetic nozzles," *Physics of Plasmas*, Vol. 18, No. 5, 2011, pp. 053504.
- 3 Merino, M. and Ahedo, E., "Simulation of plasma flows in divergent magnetic nozzles," *IEEE Transactions on Plasma Science*, Vol. 39, No. 11, 2011, pp. 2938–2939.
- 4 Ahedo, E. and Merino, M., "Two-dimensional plasma expansion in a magnetic nozzle: separation due to electron inertia," *Physics of Plasmas*, Vol. 19, No. 8, 2012, pp. 083501.
- 5 Bombardelli, C., Urrutxua, H., Merino, M., Ahedo, E., and Peláez, J., "Relative Dynamics and Control of an Ion Beam Shepherd Satellite," *Spaceflight mechanics 2012*, edited by J. V. McAdams, D. P. McKinley, M. M. Berry, and K. L. Jenkins, Vol. 143 of *Advances in the Astronautical Sciences*, Univelt, 2012, pp. 2145–2158.
- 6 Bombardelli, C., Urrutxua, H., Merino, M., Ahedo, E., and Peláez, J., "The ion beam shepherd: A new concept for asteroid deflection," *Acta Astronautica*, Vol. 90, No. 1, 2013, pp. 98 – 102.

- 7 Merino, M. and Ahedo, E., "Two-dimensional quasi-double-layers in two-electron-temperature, current-free plasmas," *Physics of Plasmas*, Vol. 20, No. 2, 2013, pp. 023502.
- 8 Merino, M., Ahedo, E., Bombardelli, C., Urrutxua, H., and Peláez, J., "Ion Beam Shepherd satellite for Space Debris Removal," *Progress in Propulsion Physics*, edited by L. T. DeLuca, C. Bonnal, O. J. Haidn, and S. M. Frolov, Vol. IV of *EUCASS Advances in Aerospace Sciences*, chap. 8, EDP Sciences, Les Ulis, France, 2013, pp. 789–802.
- 9 Merino, M. and Ahedo, E., "Plasma detachment in a propulsive magnetic nozzle via ion demagnetization," *Plasma Sources Science and Technology*, Vol. 23, No. 3, 2014, pp. 032001.
- 10 Merino, M. and Ahedo, E., "Influence of Electron and Ion Thermodynamics on the Magnetic Nozzle Plasma Expansion," *IEEE Transactions on Plasma Science*, Vol. 43, No. 1, Jan 2015, pp. 244–251.
- 11 Merino, M., Cichocki, F., and Ahedo, E., "A collisionless Plasma thruster plume expansion model," *Plasma Sources Science and Technology*, Vol. 24, No. 3, 2015, pp. 035006.
- 12 Alpatov, A., Cichocki, F., Fokov, A., Khoroshylov, S., Merino, M., and Zakrzhevskii, A., "Determination of the force transmitted by an ion thruster plasma plume to an orbital object," *Acta Astronautica*, Vol. 119, 2016, pp. 241–251.
- 13 Merino, M. and Ahedo, E., "Fully magnetized plasma flow in a magnetic nozzle," *Physics of Plasmas*, Vol. 23, No. 2, 2016, pp. 023506.
- 14 Merino, M. and Ahedo, E., "Effect of the plasma-induced magnetic field on a magnetic nozzle," *Plasma Sources Science and Technology*, Vol. 25, No. 4, 2016, pp. 045012.
- 15 Merino, M. and Ahedo, E., "Magnetic Nozzles for Space Plasma Thrusters," *Encyclopedia of Plasma Technology*, edited by J. L. Shohet, Vol. 2, Taylor and Francis, 2016, pp. 1329–1351.
- 16 Cichocki, F., Merino, M., Ahedo, E., Smirnova, M., Mingo, A., and Dobkevicius, M., "Electric Propulsion Subsystem Optimization for "Ion Beam Shepherd" Missions," *Journal of Propulsion and Power*, Vol. 33, No. 2, 2017, pp. 370–378.
- 17 Merino, M. and Ahedo, E., "Contactless steering of a plasma jet with a 3D magnetic nozzle," *Plasma Sources Science and Technology*, Vol. 26, No. 9, 2017, pp. 095001.
- 18 Cichocki, F., Domínguez-Vázquez, A., Merino, M., and Ahedo, E., "Hybrid 3D model for the interaction of plasma thruster plumes with nearby objects," *Plasma Sources Science and Technology*, Vol. 26, No. 12, 2017, pp. 125008.
- 19 Giono, G., Gudmundsson, J., Ivchenko, N., Mazouffre, S., Dannenmayer, K., Popelier, L., Loubere, D., Merino, M., and Olentsenko, G., "Non-Maxwellian Electron Energy Probability Functions in the plume of a SPT-100 Hall thruster," *Plasma Sources Science and Technology*, Vol. 27, No. 1, 2018, pp. 015006.
- 20 Cichocki, F., Merino, M., and Ahedo, E., "Spacecraft-plasma-debris interaction in an ion beam shepherd mission," *Acta Astronautica*, Vol. 146, 2018, pp. 216–227.
- 21 Merino, M., Mauriño, J., and Ahedo, E., "Kinetic electron model for plasma thruster plumes," *Plasma Sources Science and Technology*, Vol. 27, No. 3, 2018, pp. 035013.

- 22 Ramos, J., Merino, M., and Ahedo, E., "Three dimensional fluid-kinetic model of a magnetically guided plasma jet," *Physics of Plasmas*, Vol. 25, No. 6, 2018, pp. 061206.
- 23 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*, Vol. 27, No. 10, 2018, pp. 104009.
- 24 Tian, B., Merino, M., and Ahedo, E., "Two-dimensional plasma-wave interaction in an helicon plasma thruster with magnetic nozzle," *Plasma Sources Science and Technology*, Vol. 27, No. 11, 2018, pp. 114003.
- 25 Li, M., Merino, M., Ahedo, E., and Tang, H., "On electron boundary conditions in PIC plasma thruster plume simulations," *Plasma Sources Science and Technology*, Vol. 28, No. 03, 2019, pp. 034004.
- 26 Correyero, S., Merino, M., Elias, P.-Q., Jarrige, J., Packan, D., and Ahedo, E., "Characterization of diamagnetism inside an ECR thruster with a diamagnetic loop," *Physics of Plasmas*, Vol. 26, No. 5, 2019, pp. 053511.
- 27 Ahedo, E., Correyero, S., Navarro, J., and Merino, M., "Macroscopic and parametric study of a kinetic plasma expansion in a paraxial magnetic nozzle," *Plasma Sources Science and Technology*, Vol. 29, No. 4, 2020, pp. 045017.
- 28 Merino, M., Fajardo, P., Giono, G., Gudmundsson, J. T., Ivchenko, N., Mazouffre, S., Loubere, D., and Dannenmayer, K., "Collisionless electron cooling in a plasma thruster plume: experimental validation of a kinetic model," *Plasma Sources Science and Technology*, Vol. 29, No. 3, 2020, pp. 035029.
- 29 Cichocki, F., Merino, M., and Ahedo, E., "Three-dimensional geomagnetic field effects on a plasma thruster plume expansion," *Acta Astronautica*, Vol. 175, 2020, pp. 190 – 203.
- 30 Takahashi, K., Charles, C., Boswell, R. W., Takao, Y., Fruchtman, A., Navarro-Cavallé, J., and Merino, M., "Commentary: On helicon thrusters: Will they ever fly?" *Frontiers in Physics*, Vol. 8, 2020, pp. 277.
- 31 Kaganovich, I. D., Smolyakov, A., Raitses, Y., Ahedo, E., Mikellides, I. G., Jorns, B., Taccogna, F., Gueroult, R., Tsikata, S., Bourdon, A., Boeuf, J.-P., Keidar, M., Powis, A. T., Merino, M., Cappelli, M., Hara, K., Carlsson, J. A., Fisch, N. J., Chabert, P., Schweigert, I., Lafleur, T., Matyash, K., Khrabrov, A. V., Boswell, R. W., and Fruchtman, A., "Perspectives on Physics of ExB Discharges Relevant to Plasma Propulsion and Similar Technologies," *Physics of Plasmas*, Vol. 27, No. 12, 2020, pp. 120601.
- 32 Sánchez-Villar, A., Zhou, J., Merino, M., and Ahedo, E., "Coupled plasma transport and electromagnetic wave simulation of an ECR thruster," *Plasma Sources Science and Technology*, Vol. 30, No. 4, 2021, pp. 045005.
- 33 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*, Vol. 30, No. 8, aug 2021, pp. 085004.
- 34 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*, Vol. 187, 2021, pp. 498–510.

- 35 Perales-Díaz, J., Cichocki, F., Merino, M., and Ahedo, E., "Formation and neutralization of electric charge and current of an ion thruster plume," *Plasma Sources Science and Technology*, Vol. 30, No. 10, 2021, pp. 105023.
- 36 Merino, M., Nuez, J., and Ahedo, E., "Fluid-kinetic model of a propulsive magnetic nozzle," *Plasma Sources Science and Technology*, Vol. 30, No. 11, 2021, pp. 115006.
- 37 Jiménez, P., Merino, M., and Ahedo, E., "Wave propagation and absorption in a Helicon plasma thruster source and plume," *Plasma Sources Science and Technology*, accepted for publication.
- 38 Maddaloni, D., Domínguez-Vázquez, A., Merino, M., and Terragni, F., "Data-driven analysis of oscillations in Hall thruster simulations," *Plasma Sources Science and Technology*, submitted for publication.

Peer-reviewing activities:

Frequent peer-reviewer in *Physical Review Letters (APS)*, *Physics of Plasmas (AIP)*, *Plasma Sources Science and Technology (IOP)*, *IEEE Transaction on Plasma Science (IEEE)*, and *Journal of Physics D: Applied Physics (IOP)*.

Patents

- 1 Merino, M. and Ahedo, E., "Sistema sin partes móviles ni electrodos y procedimiento para vectorizar el empuje en motores espaciales de plasma," 2013, Spanish Patent Office, Patent no. ES2540167.
- 2 Merino, M., "Motor espacial de plasma sin electrodos con geometría en U," 2019, PCT patent, Spanish Patent Office, Patent no. ES2733773.

Open-source simulation codes

Codes are hosted on GitHub (<https://github.com/mariomerinomartinez>).

- 1 Mario Merino. DIMAGNO code: Divergent Magnetic Nozzle plasma flow solver, DOI: 10.5281/zenodo.1257295, 2017. doi:10.5281/zenodo.1257295.
- 2 Mario Merino. ANAKIN code: Aerospace eNginer's Assistant for Kinematics, Inertia and dyNamics, DOI: 10.5281/zenodo.2533336, 2018. doi:10.5281/zenodo.2533336.
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- 30 Inchingolo, M., Navarro-Cavallé, J., and Merino, M., "Design and Plume Characterization of a Low-Power Circular Waveguide Coupled ECR Thruster," *5th International Workshop on Micropropulsion and CubeSats*, Toulouse (online), 2021.

Invited talks

- 2020-01-20 **The future of electric space propulsion: modeling and testing of the next-generation of plasma thrusters**, *INP-EINSEIRB-MATMECA, Bordeaux, France*, Invited lecture.
- 2019-03-23 **Why curiosity will make us conquer space**, *TEDx Chamberí, Madrid*, (Por qué la curiosidad nos hará conquistar el espacio).
- 2018-07-20 **Kinetic electron response in a rarified plasma jet expanding into vacuum**, *ES-CAMPIG 2018 conference, Glasgow, UK*, invited lecture.
- 2018-06-11 **Teaching Innovation days. How should university education be in the XXI century?**, *Universidad Carlos III de Madrid*, round table.

- 2018-04-19 **Modeling and testing of space plasma thrusters at EP2 research group**, *FEUP, Universidade do Porto, Porto, Portugal*, invited seminar.
- 2018-01-03 **Magnetic nozzles and electrodeless plasma thrusters**, *Beihang University of Aeronautics and Astronautics, Beijing, China*, invited seminar.
- 2017-03-03 **Modeling magnetized plasma jets in electric propulsion**, *IPAIA 2017 International Workshop, CNR Bari, Italy*, invited talk.
- 2017-01-26 **Modeling the physics of plasma thruster plumes in electric propulsion**, *ESAC, ESA, Spain*, invited seminar.
- 2016-10-11 **Modeling the expansion of plasma thruster plumes in space**, *Southampton University, UK*, invited seminar.
- 2016-09-08 **Round table: “E-learning, distance education: the future of university?” (E-learning y educación a distancia, ¿el futuro de la universidad?)**, *part of the 2-day course “Las Tecnologías de la Información y la Comunicación en la Universidad del siglo XXI”*, organized by the NPO “La Facultad Invisible”, Universidad Internacional Menéndez Pelayo.
- 2016-05-26 **EP2 space plasma propulsion: codes and models**, *Ernst-Moritz-Arndt-Universität Greifswald, Germany*, invited seminar.
- 2015-07-30 **Modeling the expansion of magnetized plasma jets in electric propulsion**, *32nd ICPIG, Iași, Romania*, invited lecture.

Teaching activity

Aerospace engineering courses:

- 2021–present **Elective course “Advanced Space Propulsion”**, *MSc in Space Engineering (taught in English)*, Universidad Carlos III de Madrid.
- 2018–present **Fourth year course “Space Vehicles and Orbital Dynamics”**, *BSc in Aerospace Engineering (taught in English)*, Universidad Carlos III de Madrid.
- 2018–present **Second year course “Mechanics applied to Aerospace Engineering”**, *BSc in Aerospace Engineering (taught in English)*, Universidad Carlos III de Madrid.
- 2019–2020 **“Spacecraft Predesign”**, *MSc in Space Engineering (taught in English)*, Universidad Carlos III de Madrid.
- 2019–2020 **“Complements of Aerospace Engineering”**, *MSc in Space Engineering (taught in English)*, Universidad Carlos III de Madrid.
- 2018–2019 **Second year course “Modeling in Aerospace Engineering”**, *BSc in Aerospace Engineering (taught in English)*, Universidad Carlos III de Madrid.
- 2014–2018 **“Space Systems Design”**, *MSc in Aeronautical Engineering (taught in English)*, Universidad Carlos III de Madrid.
- 2014–2018 **“Astrodynamics and Atmospheric Flight Dynamics”**, *MSc in Aeronautical Engineering (taught in English)*, Universidad Carlos III de Madrid.
- 2014–2018 **Second year course “Introduction to Flight Mechanics”**, *BSc in Aerospace Engineering (taught in English)*, Universidad Carlos III de Madrid.
- 2014–2017 **Fourth year course “Rocket propulsion”**, *BSc in Aerospace Engineering (taught in English)*, Universidad Carlos III de Madrid.

- 2014–2016 **Fourth year course “Aerospace Propulsion Complements I”**, *BSc in Aerospace Engineering (taught in English)*, Universidad Carlos III de Madrid.
- 2013–2015 **Third year course “Aerospace Propulsion”**, *BSc in Aerospace Engineering (taught in English)*, Universidad Carlos III de Madrid.
- 2013–2014 **Fourth year course “Space Systems”**, *BSc in Aerospace Engineering (taught in English)*, Universidad Carlos III de Madrid.
- 2012–2013 **First year course “Linear Algebra” (Matemáticas I)**, *BSc in Aerospace Engineering*, Universidad Politécnica de Madrid.
- 2010–2013 **First year course “Computer Programming” (Informática)**, *BSc in Aerospace Engineering*, Universidad Politécnica de Madrid.
- 2008–2010 **Collaboration in Teaching activities as a student.**
Problem solving teaching duties in the first year courses “General Mathematics” (Matemáticas Generales) and “Infinitesimal Calculus” (Cálculo Infinitesimal) of the former Aerospace Engineering 5-year Program at Universidad Politécnica de Madrid

Online courses:

- 2015–present **MOOC course “The Conquest of Space: space exploration and rocket science”**, *at the EdX online platform (taught in English)*, Universidad Carlos III de Madrid, <https://www.edx.org/school/uc3mx>.

Other courses and seminars:

- 2019-11 **Course on flight dynamics for many-satellite space missions**, *at INTA (Instituto Nacional de Técnica Aeroespacial)*, one-week course.
- 2018-12 **Orbital mechanics for Flight Dynamics software operators**, *at INTA (Instituto Nacional de Técnica Aeroespacial)*, one-week course.
- 2017-10 **Magnetic nozzles for electric propulsion**, *EPIC lecture series at CDTI, Madrid*, European Strategic Research Cluster EPIC.
- 2016-07 **One-week course “Rock the air, conquer space”**, *including lectures on the fundamentals of rocketry and water-rocket construction and launching*, in collaboration with the BEST association, Universidad Carlos III de Madrid.
- 2015-10 **Organization of a one-week introductory course to Python programming in Aerospace engineering**, in collaboration with the AeroPython association, Universidad Carlos III de Madrid.
- 2014–present **Introductory seminar on LaTeX and LyX**, *two-hour seminars, taught in 2014-02-15 and 2015-02-19*, Universidad Carlos III de Madrid.
- 2014-04-03 **Seminar on Electric Propulsion**, *invited talk by the student association of Aeronautics and Space*, Universidad Carlos III de Madrid.
- 2011-05-19 **Seminar on Magnetic nozzles for Plasma Propulsion**, *seminar imparted within the seminar program of the fluid dynamics department*, Universidad Politécnica de Madrid.
- 2011-03-04 **Introduction to Fortran**, *four-hour seminar*, Universidad Politécnica de Madrid.

Direction of BSc and MSc theses:

- 2021 **MSc Aeronautical Engineering Thesis**, *Design of the AOCS system of a 6U satellite for Earth and Space observation*, Rodrigo Santos García, Universidad Carlos III de Madrid.

- 2021 **MSc Aeronautical Engineering Thesis**, *Development and implementation of a DKE space simulator for cubesat missions*, Alicia Miró Moncho, Universidad Carlos III de Madrid.
- 2021 **MSc Aeronautical Engineering Thesis**, *Spacecraft simulations with a combined attitude control system: inertial morphing and RWS*, Alberto Rodríguez Amor, Universidad Carlos III de Madrid.
- 2021 **MSc Aeronautical Engineering Thesis**, *Analysis and design of a propulsion system structure with the finite element method*, Sara Miralles Méndez, Universidad Carlos III de Madrid, carried out at Capgemini Engineering.
- 2021 **BSc Aerospace Engineering Thesis**, *Nonlinear data analysis applied to plasma space propulsion*, Clara Puerto Sánchez, Universidad Carlos III de Madrid.
- 2020 **BSc Aerospace Engineering Thesis**, *Analysis of Orbital Relay Stations for orbital energy accumulation*, Juan José García Ortiz, Universidad Carlos III de Madrid.
- 2020 **BSc Aerospace Engineering Thesis**, *Design and Development of a μ -PPT thrust balance*, Andrés Cabello López, Universidad Carlos III de Madrid.
- 2020 **MSc Aerospace Engineering Thesis**, *Kalman Filter for precise AOCS control*, Javier Gómez del Pulgar Vázquez, Universidad Carlos III de Madrid, carried out at SENER Aeroespacial.
- 2020 **MSc Aeronautical Engineering Thesis**, *Helicon Plasma Thruster Full Wave Simulations*, Pedro José Jiménez Jiménez, Universidad Carlos III de Madrid.
- 2019 **MSc Aeronautical Engineering Thesis**, *Design of a space mission with Model-Based Systems Engineering tools*, Laura González Llamazares, Universidad Carlos III de Madrid.
- 2019 **BSc Aerospace Engineering Thesis**, *Cross-section database generation for hybrid PIC/fluid plasma codes*, Antonio Castillo Sauca, Universidad Carlos III de Madrid.
- 2018 **MSc Aeronautical Engineering Thesis**, *Fluid-kinetic modeling of propulsive magnetic nozzles*, Judit del Pino Nuez Deniz, Universidad Carlos III de Madrid.
- 2018 **MSc Aeronautical Engineering Thesis**, *Advanced simulation of the complete electric propulsion system associated to the Hall-effect Thruster in EcosimPro*, Jorge Ruiz Torralba, Universidad Carlos III de Madrid, carried out at EA.
- 2018 **MSc Aeronautical Engineering Thesis**, *Preliminary Design and Analysis of the Thermal Architecture for the SMILE Satellite Payload Module*, Lorena del Amo Martín, Universidad Carlos III de Madrid, carried out at Airbus.
- 2018 **BSc Aerospace Engineering Thesis**, *Viability and considerations of the electronic components of an observation satellite's PDU orbiting in LEO*, Paloma Maestro Redondo, Universidad Carlos III de Madrid, carried out at Airbus.
- 2018 **BSc Aerospace Engineering Thesis**, *Two-dimensional finite difference code for wave-plasma interaction problems in electric thrusters*, Pedro José Jiménez Jiménez, Universidad Carlos III de Madrid.
- 2018 **BSc Aerospace Engineering Thesis**, *Design and analysis of a micropropulsion thruster*, Adrián Rubio García, Universidad Carlos III de Madrid.
- 2018 **BSc Aerospace Engineering Thesis**, *Evaluation and comparison of atmospheric models for space applications*, Elena Odriozola Olavarria, Universidad Carlos III de Madrid, carried out at GMV.
- 2017 **BSc Aerospace Engineering Thesis**, *Characterization and improvement of a hybrid chemical rocket*, Lara Cristina Sánchez Hernández, Universidad Carlos III de Madrid.

- 2017 **BSc Aerospace Engineering Thesis**, *Implementation and characterization of an open-source plasma plume code*, Pablo Moreno de Santos, Universidad Carlos III de Madrid.
- 2017 **BSc Aerospace Engineering Thesis**, *Development of a SW suite for space missions analysis*, Jorge Alonso Rosell, Universidad Carlos III de Madrid, carried out at GMV.
- 2016 **MSc Aeronautical Engineering Thesis**, *CAMSO integration in Eurofighter program*, Cristina Briongos Méndez, Universidad Carlos III de Madrid, carried out at Airbus.
- 2016 **BSc Aerospace Engineering Thesis**, *Design and construction of an upgraded hybrid rocket*, Sara Esteban Corchado, Universidad Carlos III de Madrid.
- 2016 **BSc Aerospace Engineering Thesis**, *Analysis of an orbit control strategy for LEO satellites based on ground track deviation monitoring*, Francisco Javier Hernández Castro, Universidad Carlos III de Madrid, carried out at GMV.
- 2015 **BSc Aerospace Engineering Thesis**, *Design and implementation of an Eyassat command and control center*, Daniel Expósito Jiménez, Universidad Carlos III de Madrid.
- 2014 **BSc Aerospace Engineering Thesis**, *Design of a Helicon Plasma Thruster prototype*, Santiago Casado Pérez, Universidad Carlos III de Madrid.

Teaching innovation projects:

- 2020–2021 **Flipped-classroom transformation of the course**, *Mechanics Applied to Aerospace Engineering*, Universidad Carlos III de Madrid.
- 2019–2020 **Development of YouTube videotutorials**, *Mechanics Applied to Aerospace Engineering*, Universidad Carlos III de Madrid.
- 2018–2019 **Step-by-step videos with Problem-solving**, *Mechanics Applied to Aerospace Engineering*, Universidad Carlos III de Madrid.
- 2016–2017 **Learning and evaluation by means of the design, building, and testing of water rockets**, *Rocket Motors BSc course in Aerospace Engineering*, Universidad Carlos III de Madrid.

Courses and Workshops attended

- 2020-01 **Direction of academic teams**, *Universidad Carlos III de Madrid*, (duration: 6 hours).
- 2020-01 **How to submit your research data to an open-access repository**, *Universidad Carlos III de Madrid*, (duration: 3 hours).
- 2019-01-17 **Design and application of the Flipped classroom model**, *Universidad Carlos III de Madrid*, (duration: 6 hours).
- 2018-09 **Open Source Cubesat Workshop**, *European Space Astronomy Centre (ESAC)*, Villanueva de la Cañada, Madrid (duration: 2 day).
- 2018-06 **Workshop: New teaching models, new student competences**, *Vicerrectorado de Estrategia y Educación Digital UC3M*, Getafe, Madrid (duration: 1 day).
- 2017-03 **International Workshop on Ion Propulsion and accelerator industrial applications**, *Consiglio Nazionale delle Ricerche*, Bari, Italy (duration: 2 day).
- 2016-12 **Course on teaching development**, *Universidad Carlos III de Madrid*, Leganés, Madrid (duration: 10 h).
- 2016-11 **7th Research and technology days on Space Systems Design & Engineering**, *Airbus Safran Launchers and Airbus DS*, Paris, France (duration: 2 day).
Workshop on Multidisciplinary Optimization & Concurrent Engineering.

- 2016-07 **AIAA Workshop on Hall-effect thruster electron anomalous transport**, *AIAA*, Salt Lake City, Utah (duration: 1 day).
- 2015 **Course on Entrepreneurship and creation of technology-based businesses 'Actúa-UPM'**, *Universidad Politécnica de Madrid*, Madrid, Spain (duration: 40 h).
- 2014-05 **Oerlikon's Vacuum technique technical days**, *Oerlikon, Leybold Vacuum*, Madrid (duration: 1 day).
- 2013-08 **Workshop: Quo vadis, Europa?**, *Universidad Internacional Menéndez Pelayo*, Santander, Spain (duration: 1 week).
- 2013-04 **Establishing and achieving work objectives**, *Instituto de Ciencias de la Educación, Universidad Politécnica de Madrid*, Madrid, Spain (duration: 2 days).
- 2013-03 **Galaxies and Cosmology**, *Coursera online course*, imparted by CalTech (duration 1 month).
- 2012-12 **Quantum Mechanics and Quantum Computation**, *Coursera online course*, imparted by U. Berkeley (duration 1 month).
- 2012-03 **SPIS (Spacecraft-Plasma Interaction System) software training course**, *ESTEC-ESA*, Noordwijk, The Netherlands (duration: 1 week).
- 2012-03 **Course on Time Management**, *Instituto de Ciencias de la Educación, Universidad Politécnica de Madrid*, Madrid, Spain (duration: 2 days).
- 2011-08 **Europe and Global Government (Global Economy)**, taught by Josep Borrell, at *Universidad Internacional Menéndez Pelayo*, Santander, Spain (duration: 1 week).
- 2010-2011 **Course on Initial Teaching Education**, *Instituto de Ciencias de la Educación, Universidad Politécnica de Madrid*, Madrid, Spain (4 ECTS).
- 2010-08 **Summer School "Blas Cabrera" on Research, Teaching and Innovation**, *Universidad Internacional Menéndez Pelayo*, Santander, Spain (duration: 1 week).
- 2010-04 **EcosimPro Software training course**, *Escuela Técnica Superior de Ingenieros Aeronáuticos / Empresarios Agrupados*, Madrid, Spain (duration: 1 week).
- 2010-03 **ATHENS Course "The PIV method in Fluid Mechanics"**, *ATHENS Program, Czech Technical University*, Prague, Czech Republic (duration: 1 week).
- 2009-11 **ATHENS Course "Nanotechnologies"**, *ATHENS Program, École Nationale Supérieure des Techniques Avancées, ParisTech*, París, France (duration: 1 week).
- 2008-11 **Workshop on Satellite Navigation**, *Escuela Técnica Superior de Ingenieros Aeronáuticos / GMV*, Madrid, Spain (duration: 10 days).
- 2007-08 **CVA Summer School on the preparation of future European launch vehicles**, *Community of Ariane Cities (CVA) / Fachhochschule Heilbronn*, Heilbronn, Germany (duration: 1 month).

Dissemination activity

- 2021-11 **Space plasma thrusters: the future**, *Madrid Week of Science*, Universidad Carlos III de Madrid.
- 2021-09 **Discover the future of plasma rockets for space travel**, *European Researchers Night*, Universidad Carlos III de Madrid.
- 2020-11 **Learning Scientific Computing with Julia**, *Madrid Week of Science*, Universidad Carlos III de Madrid.

- 2019-11 **When the sky falls on our heads: building a cloud chamber**, *Madrid Week of Science*, Universidad Carlos III de Madrid.
- 2019-11 **How do Satellites Communicate?**, *Madrid Week of Science*, Universidad Carlos III de Madrid.
- 2019-10 **Space plasma propulsion: Science, or science-fiction?**, *European Researchers Night*, Universidad Carlos III de Madrid.
- 2018-11 **How to listen to a satellite**, *Madrid Week of Science*, Universidad Carlos III de Madrid.
- 2018-06-29 **Guest speaker in the 1h-podcast 'The future of plasma space propulsion'**, *El Gato de Hubble*, Radio GUL.
- 2018–2019 **Founder and coordinator of the dissemination association "Esto No Es Una Charla"**, which presents and discusses science/technology topics once a month in Madrid, <http://estonoesunacharla.com/>, <https://twitter.com/NoEsUnaCharla>.
- 2017-11 **Listening to satellites**, *Madrid Week of Science*, Universidad Carlos III de Madrid.
- 2016-11 **Build and launch your own water rocket**, *Madrid Week of Science*, Universidad Carlos III de Madrid.

Languages

English	Proficient	<i>Cambridge Certificate in Advanced English (2001)</i> <i>High degree from the National "Escuela Oficial de Idiomas" (2004)</i>
German	Intermediate level	<i>Universidad Politécnica de Madrid, German B2 language course (2012)</i> <i>Intermediate II degree from the National "Escuela Oficial de Idiomas" (2013)</i>
Italian	Intermediate level	<i>Merimée-De Sebastian course, National "Escuela Oficial de Idiomas" (2008)</i>
French	Intermediate level	

Miscellanea

- 2020–2021 **Head of the university-industry Research Chair UC3M-SENER (St3llar laboratory)**, dedicated to the development of novel avionics for space systems, <https://st3llar.uc3m.es/>.
- 2020–present **Author in The Conversation**, a network of not-for-profit media outlets that publish news stories on the Internet that are written by academics and researchers, under a Creative Commons, <https://theconversation.com/>. My articles have received more than 23k reads.
- 2020–present **Review Editor for Advanced Space Propulsion in Journal: Frontiers in Space Technologies**, *Frontiers Publishing*.
- 2019–present **Steering Committee of the Specialized Group in Plasma Physics of the Spanish Royal Physics Society (RSEF)**.
- 2017–2019 **Member of the Celera Program third generation**, for entrepreneurship and personal development, <http://www.acelerame.org/>.
admitted into this competitive program in 2017
- 2016–present **Permanent representative**, in the Academic Commission for the Aerospace Engineering Bachelor program at UC3M.
- 2014–present **Co-founder of 'La Facultad Invisible'**, non-profit NGO for the improvement of Spanish higher education, <http://lafacultadinvisible.com>.
 - Coordinator of the Architecture and Engineering branch of the association (2014–2015).

- Coordinator of the organizing committee for the First Congress of 'La Facultad Invisible', which took place the 13th of June at the 'Circulo de Bellas Artes' of Madrid (June 2015).