Manuel Sanjurjo Rivo

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Education

2005–2009 **PhD in Aerospace Engineering**, *Universidad Politécnica de Madrid*, Escuela Técnica Superior de Ingenieros Aernáuticos,
Thesis: *Self-balanced Bare Electrodynamic Tethers. Space Debris Mitigation and other Applications*. Cum laude. International PhD Mention
Research internships at University of Colorado at Boulder (US) and Observatoire de la Côte d'Azur (France).
PhD scholarships: "Formación de personal investigador" (FPI) from Spanish Government, and UPM Research Program .

1998–2004 **Aeronautical Engineering**, *Universidad Politécnica de Madrid*,
Master Thesis: *Optimización de trayectorias interplanetarias de bajo empuje* with honors.

Experience

Academic positions

2019– **Associate Professor**, *Universidad Carlos III de Madrid*, Escuela Politécnica Superior.
Departamento de Bioingeniería e Ingeniería Aeroespacial.
Direction of Master Program in Space Engineering

2011–2019 **Visiting Professor**, *Universidad Carlos III de Madrid*, Escuela Politécnica Superior.
Departamento de Bioingeniería e Ingeniería Aeroespacial.
Academic Secretary of the Department. 2012-2018
Teaching Coordinator of Online Courses at UC3M. 2017-2020

Professional positions

2009–2011 **Project Engineer**, *GMV S.A.*, Business Unit AST.
Department Mission Analysis.
Participant in DO-IT (Design of Interplanetary Trajectories)
Responsible in RT-Lander (Radio Tracking of a Landed Spacecraft: Determination of the Spacecraft Position and Planet's Ephemeris and Orientation in Space)

Scholarships and others

2008–2009 **Member of Back-up Flight Dynamics Team**, *ESA's mission European Student Moon Orbiter (ESMO)*.

2004–2005 **"Beca de Colaboración" at UPM**, *Departamento de Física Aplicada*, Spanish Ministry of Education.

2002–2004 **Deputy director**, *Residence hall "San Juan Evangelista"*.

Teaching Activity

Aerospace Engineering Courses

2019– **Attitude Dynamics and Guidance, Navigation and Control**, *MSc in Space Engineering*, (Taught in English), Universidad Carlos III de Madrid.

2019– **Orbital Dynamics**, *MSc in Space Engineering*, (Taught in English), Universidad Carlos III de Madrid.

2019– **Advanced Flight Mechanics**, *MSc in Aerospace Engineering*, (Taught in English), Universidad Carlos III de Madrid.

2016– **Multi-disciplinary Optimisation**, *MSc in Industrial Mathematics*, (Taught in Spanish), Universidad Politécnica de Madrid.

2014–2018 **Astrodynamics and Atmospheric Flight Dynamics**, *MSc in Aeronautical Engineering*, (Taught in English), Universidad Carlos III de Madrid.

2014–2017 **Space Systems Design**, *MSc in Aeronautical Engineering*, (Taught in English), Universidad Carlos III de Madrid.

2013–2018 **Advanced Flight Mechanics**, *BSc in Aerospace Engineering*, (Taught in English), Universidad Carlos III de Madrid.

2014–2015 **Aerospace vehicles: Complement II**, *BSc in Aerospace Engineering. 4 th course*, (Taught in English), Universidad Carlos III de Madrid.

2012–2015 **Flight Mechanics**, *BSc in Aerospace Engineering. 3 rd course*, (Taught in English), Universidad Carlos III de Madrid.

2011–2014 **Introduction to Flight Mechanics**, *BSc in Aerospace Engineering. 2 nd course*, (Taught in English), Universidad Carlos III de Madrid.

2008–2009 **Mecánica**, *BSc in Aerospace Engineering. 2 nd course*, Universidad Politécnica de Madrid.

Elective Courses

2016– **Introduction to Astronomy**, *Offered to Engineering Degrees at EPS (Escuela Politécnica Superior)*, (Taught in English), Universidad Carlos III de Madrid.

2015– **The Conquest of Space: Space Exploration and Rocket Science**, *Offered to Engineering Degrees at EPS (Escuela Politécnica Superior)*, (Taught in English), Universidad Carlos III de Madrid.

2012–2015 **La conquista del espacio**, *Offered to Engineering Degrees at EPS (Escuela Politécnica Superior)*, Universidad Carlos III de Madrid.

Online courses

2015– **"The Conquest of Space: space exploration and rocket scienc"**, *MOOC*, EdX online platform (in English), Universidad Carlos III de Madrid.
`https://www.edx.org/school/uc3mx`

Supervision of BSc and MSc Theses (last 5 years)

2021 **Jorge Martínez Castillo**, *Development of a Methodology for Orbit Classification in Terms of Collision Risk*, BSc Aerospace Engineering Thesis, Universidad Carlos III de Madrid.
Results presented in AIAA Astrodynamics Specialist Conference (2021)

2021 **Jorge Martínez Garrido**, *Lambert's Problem Algorithms*, BSc Aerospace Engineering Thesis, Universidad Carlos III de Madrid.
Results presented in 8th ICATT (2021)

2021 **Juan García Bonilla**, *Multi-Objective Low-Thrust Trajectory Optimizer For Close Proximity Operations Around Minor Bodies*, BSc Aerospace Engineering Thesis, Universidad Carlos III de Madrid.
Results presented in IAC 2021

2019 **Javier Sanz Lobo**, *Design of a Failure Detection Isolation and Recovery System for Cubesats*, MSc Aeronautic Engineering Thesis, Universidad Carlos III de Madrid.
Results presented in 8th Eucass (2019)

2019 **Claudio Fernández de Heredia Pérez de Zabalza**, *Trajectory Optimization in the Circular Restricted Three Body Problem*, BSc Aeronautic Engineering Thesis, Universidad Carlos III de Madrid.

2019 **Jose Medinilla**, *Trajectory Optimization in the Circular Restricted Three Body Problem*, BSc Aeronautic Engineering Thesis, Universidad Carlos III de Madrid.
In collaboration with ESA-ESTEC

2018 **Rubén Vega Astorga**, *Analysis of Rendezvous in Non-Keplerian Orbits*, MSc Aeronautic Engineering Thesis, Universidad Carlos III de Madrid.
Results presented in 7th ICATT (2018)

2018 **Andrés Marco García**, *Earth-Moon Low-Energy Trajectory Generation*, MSc Aeronautic Engineering Thesis, Universidad Carlos III de Madrid.

2018 **Carmen Velarde López de Ayala**, *Development of a Modular Mission Analysis Framework for De-Orbiting Performance Analysis*, MSc Aeronautic Engineering Thesis, Universidad Carlos III de Madrid.

2018 **Daniel Sánchez-Biezma Zarco**, *Design of an Attitude Control System for a High Altitude Platform*, BSc Aerospace Engineering Thesis, Universidad Carlos III de Madrid.

2018 **Alberto Ghidini Linares**, *Logistics Analysis of a In-Situ Resource Utilisation Mission to the Moon*, BSc Aerospace Engineering Thesis, Universidad Carlos III de Madrid.

2018 **José Carlos García Mateas**, *Impulsive and Low-Trust Optimal Trajectories for Asteroid Mining*, BSc Aerospace Engineering Thesis, Universidad Carlos III de Madrid.
Results presented in 7th ICATT (2018)

2018 **David Tomás Gaitán Rodríguez**, *Optimal low-thrust collision avoidance manoeuvres*, BSc Aerospace Engineering Thesis, Universidad Carlos III de Madrid.

2018 **Xunqueira Ézara Nogueira**, *Preliminary Design of a Low-Cost Mission to Test Biological Survival in an Earth Re-entry*, BSc Aerospace Engineering Thesis, Universidad Carlos III de Madrid.

2018 **Isaac Ramses Buitrago Ramos**, *Simulation and Pre-design of a Controlled Superpressure Balloon*, BSc Aerospace Engineering Thesis, Universidad Carlos III de Madrid.

2017 **Nereida Agüera López**, *Trajectory Analysis of a Cubesat Lunar Mission*, MSc Aeronautic Engineering Thesis, Universidad Carlos III de Madrid.

2017 **Juan García Redondo**, *Optimal Attitude Control for Electric Propulsion Orbit Raising*, MSc Aeronautic Engineering Thesis, Universidad Carlos III de Madrid.

2017 **Pablo Moral Maroto**, *Free launch and transfer opportunities to Mars*, MSc Aeronautic Engineering Thesis, Universidad Carlos III de Madrid.
Follow-up publication:
Moral, P., Centuori, S., and Sanjurjo-Rivo, M., "Ballistic captures and transfer opportunities for a mission to Mars", 68th International Astronautical Congress 2017, IAC-17, C-1-7-5, PaperID: 40094

2017 **Nuria Labeaga Martínez**, *3D Printing in the Moon Village*, BSc Aerospace Engineering Thesis, Universidad Carlos III de Madrid.
Follow-up publication:
Labeaga-Martínez, N., M. Sanjurjo-Rivo, J. Díaz-Álvarez, and J. Martínez-Frías. "Additive manufacturing for a Moon village." Procedia Manufacturing 13 (2017): 794-801.

2017 **Carlos Laborda Serrano**, *Trajectory Optimisation for Asteroid Mining*, BSc Aerospace Engineering Thesis, Universidad Carlos III de Madrid.

2017 **Jesús Perales Díaz**, *Computation of Collision Probability in Geostationary Orbit*, BSc Aerospace Engineering Thesis, Universidad Carlos III de Madrid.

2017 **Manuel Guillermo Asensio López**, *Dynamic Modelling, Simulation, and Control of an Atmospheric Balloon Platform*, BSc Aerospace Engineering Thesis, Universidad Carlos III de Madrid.

2017 **Carlos Álvaro Arroyo Parejo**, *Low-Thrust Collision Avoidance Maneuvers*, BSc Aerospace Engineering Thesis, Universidad Carlos III de Madrid.

Other courses and seminars

2019 **"Flight Dynamics for Multi-satellite Missions"**, *(in Spanish)*, for Isdefe personnel at INTA facilities, Fundación Universidad Carlos III de Madrid.
Lectures on the fundamentals of constellations and relative motion

2018 **"Orbital Mechanics for Operator of Satellite Flight Dynamics Systems"**, *(in Spanish)*, for Isdefe personnel at INTA facilities, Fundación Universidad Carlos III de Madrid.
Lectures on the fundamentals of Astrodynamics

2018 **"General Aspects of Space Science and Technology"**, *(in Spanish)*, online for Instituto Politécnico Nacional, Centro de Desarrollo Aeroespacial, México.

2017 **"Rock the air, conquer space"**, *BEST (Board of European Students of Technology) course*, Universidad Carlos III de Madrid,
Lectures on the fundamentals of rocketry and water-rocket construction and launching.

Teaching innovation projects

2017–2020 **"Blended Learning in Advanced Flight Mechanics"**, *course: Advanced Flight Mechanics*, Universidad Carlos III de Madrid.

2016–17 **"Space Mission Design Contest with GMAT"**, *course: Astrodynamics and Atmospheric Flight Dynamics*, Universidad Carlos III de Madrid.

Research Experience and Activity

Research Projects

2020–2023 **Combined Heuristic and Statistical Methodologies Applied to Manoeuvre Detection in the SST Observation Correlation Process**, *Funded by European Space Agency*, Contract No. 4000129944/20/D/MB (90 k€).
Principal Investigator: Manuel Sanjurjo-Rivo

2019–2022 **E.T.PACK: Electrodynamic Tether Technology for Passive Consumable-less Deorbit Kit**, *Funded by European Commission Research Executive Agency*, Grant number:GA-828902, (469 k€).
Principal Investigator:Gonzalo Sánchez
Project Manager:UC3M

2019–22 **MadridFlightOnChip**, *Funded by Comunidad Autónoma de Madrid*, Grant number:HUBS 2018, (197 k€).
Principal Investigator:Eduardo Ahedo

2018–21 **Advanced observation correlation and orbit determination methods for the buildup and maintenance of a catalogue of space objects**, *Funded by "Ayudas destinadas a la realización de doctorados industriales" (Comunidad Autónoma de Madrid)*, Grant number:IND2017/TIC-7700, (84 k€).
Principal Investigator:Manuel Sanjurjo-Rivo

2019–20 **MARTINLARA-CM. Millimeter wave Array at Room Temperature for INstruments in Leo Altitude Radio Astronomy**, *Funded by Comunidad Autónoma de Madrid*, Grant number:S2018/NMT-4333, (54 k€).
Principal Investigator:Eduardo Ahedo

2018–2020 **NanoStar, Collaborative network for the development of educational nanosatellites in Europe**, *Funded by EU Interreg-SUDOE VB Program (European Commission)*, Grant number:SOE2/P1/F0684, (310.5 k€).
Principal Investigator:Mario Merino
Project Manager:Aersospace Valley (France)

2015–18 **Analysis and optimization of aircraft trajectories under the effects of meteorological uncertainties**, *Funded by Plan Estatal de Investigación (Ministerio de Economía, Industria y Competitividad)*, Grant number:TRA2014-58413-C2-2-R, (66.5 k€).
Principal Investigators:Manuel Soler, Manuel Sanjurjo-Rivo

2016–18 **TBO-MET: Meteorological Uncertainty Management for Trajectory Based Operations**, *Funded by European Commission*, Grant number:GA-699294-TBO-MET, (107.5 k€).
Principal Investigators:Manuel Soler

2014–16 **Stochastic Optimal Control towards Enhanced Predictability of four-dimensional Trajectories using Weather Ensemble Prediction Forecasts**, *Funded by SESAR Network (European Commission)*, Funding: (34.5 k€).
Principal Investigators:Manuel Soler

2015–16 **Clean energy generation with traction kites**, *Funded by Fundación BBVA*, Grant number: IN[15]_TIC_ING_0313, (39.7 k€).
Principal Investigators:Gonzalo Sánchez Arriaga

2014 **Dynamic analysis, advanced orbital propagation and complex space systems simulation**, *Funded by Plan Estatal de Investigación (Ministerio de Economía, Industria y Competitividad)*, Grant number:ESP2013-41634-P.
Principal Investigator:Jesús Peláez Álvarez

2011–13 **Dynamic Simulation of Complex Space Systems**, *Funded by Plan Estatal de Investigación (Ministerio de Economía, Industria y Competitividad)*, Grant number:AYA2010-18796, (152.5 k€).
Principal Investigator:Jesús Peláez Álvarez

2008 **Dynamics and Stability of Tethered Satellites at Lagrangian Points**, *Funded by European Space Agency*, Grant number: ARIADNA ID: 07/4201, (25 k€).
Principal Investigators:Jesús Peláez Álvarez

2005–08 **Dynamics of orbital rise / descent of satellites by means of electrodynamic space tethers**, *Funded by Plan Estatal de Investigación (Ministerio de Economía, Industria y Competitividad)*, Grant number:ESP2004-04376.
Principal Investigator:Jesús Peláez Álvarez

Research Contracts

2019–2020 **Uncertainty Propagation Meeting Space Debris Needs**, *Funded by European Space Agency*, Contract No. 4000126151/18/D/SR (300 k€).
Principal Investigator: Joaquín Míguez.
Project Manager: UC3M

2016–2019 **Technological prospective in the aerospace field**, *Funded by ISDEFE S.A.*, Specific framework contract (80 k€).
Principal Investigator: Pablo Fajardo

2017 **Service Contract for supporting BR&T-E in the development of advanced Digital Aviation services**, *Funded by Boeing Research and Technology Europe, S.L.U.*, Funding: (7 k€).
Principal Investigator:Manuel Soler

2017 **Procesamiento y análisis de datos característicos de una aeronave remotamente pilotada (RPAS)**, *Funded by Soticol Robotic Systems*, Funding: (3.7 k€).
Principal Investigators:Manuel Soler, Manuel Sanjurjo-Rivo

2015 **Service Contract for supporting BR&T-E in the development of advanced Digital Aviation services**, *Funded by Boeing Research and Technology Europe, S.L.U.*, Funding: (17 k€).
Principal Investigators:Manuel Soler, Manuel Sanjurjo-Rivo

Peer-reviewing activities:

2016–2020 **Associate Editor Proceedings of the Institution of Mechanical Engineers, Part G: Journal of Aerospace Engineering (JAERO)**.

2020– **Topics Board Advisor for the journal Aerospace**.

Peer-reviewer , *Journal of Guidance, Control, and Dynamics (JGCD), Acta Astronautica, Astrophysics and Space Science (ASTR),* , among others.

PhD thesis direction

2015–2020 **David Morante González**, *Hybrid Multi-objective Trajectory Optimization of Low-Thrust Space Mission Design*, Direction.
Doctorate with Honors

2018– **Alejandro Pastor Rodríguez**, *Advanced observation correlation and orbit determination methods for the buildup and maintenance of a catalogue of space objects*, Direction.
In progress

2020– **Pelayo Peñarroya Rodríguez**, *Robust Adaptive Autonomous System for Minor Bodies Landing*, ESR European Trainee Network Stardust-R, Direction.
In progress

2020– **Thomas Frakhaug**, *Optimal Close-Operation Trajectories in Non-Conventional Dynamical Environments*.
In progress

2020– **Guillermo Escribano Blázquez**, *Automatic Maneuver Detection in the SST Observation Correlation Process*, ESA Network Partner Initiative Program, Direction.
In progress

2019– **Eduardo Andrés Endériz**, *A pilot/dispatcher support tool based on the enhanced provision of thunderstorm forecasts considering its inherent uncertainty*, Co-direction.
In progress

2015–2019 **Daniel González Arribas**, *Stochastic Optimal Control towards Enhanced Predictability of four-dimensional Trajectories using Weather Ensemble Prediction Forecasts*, Co-direction.
Doctorate with Honors

Publications in Peer-Reviewed Journals

[1] Eduardo Andrés, Daniel González-Arribas, Manuel Soler, Maryam Kamgarpour, and Manuel Sanjurjo-Rivo. "Informed scenario-based RRT for aircraft trajectory planning under ensemble forecasting of thunderstorms". In: *Transportation Research Part C: Emerging Technologies* 129 (2021), p. 103232.

[2] David Morante, Manuel Sanjurjo Rivo, and Manuel Soler. "A Survey on Low-Thrust Trajectory Optimization Approaches". In: *Aerospace* 8.3 (2021), p. 88.

[3] Alejandro Pastor, Manuel Sanjurjo-Rivo, and Diego Escobar. "Initial orbit determination methods for track-to-track association". In: *Advances in Space Research* 68.7 (2021), pp. 2677–2694.

[4] David Morante, Manuel Sanjurjo-Rivo, Manuel Soler, and José Manuel Sánchez-Pérez. "Hybrid multi-objective orbit-raising optimization with operational constraints". In: *Acta Astronautica* 175 (2020), pp. 447–461. ISSN: 0094-5765. DOI: 10.1016/j.actaastro.2020.05.022.

[5] Manuel Soler, Daniel González-Arribas, Manuel Sanjurjo-Rivo, Javier Garcıa-Heras, Daniel Sacher, Ulrike Gelhardt, Jürgen Lang, Thomas Hauf, and Juan Simarro. "Infuence of atmospheric uncertainty, convective indicators, and cost-index on the leveled aircraft trajectory optimization problem". In: *Transportation Research Part C: Emerging Technologies* 120 (2020), p. 102784.

[6] Daniel González-Arribas, Manuel Soler, Manuel Sanjurjo-Rivo, Maryam Kamgarpour, and Juan Simarro. "Robust aircraft trajectory planning under uncertain convective environments with optimal control and rapidly developing thunderstorms". In: *Aerospace Science and Technology* 89 (2019), pp. 445–459.

[7] G Sánchez-Arriaga, A Pastor-Rodríguez, M Sanjurjo-Rivo, and R Schmehl. "A Lagrangian Flight Simulator for Airborne Wind Energy Systems". In: *Applied Mathematical Modelling. Online* (2019). DOI: 10.1016/j.apm.2018.12.016.

[8] Daniel González-Arribas, Manuel Soler, Javier López-Leonés, Enrique Casado, and Manuel Sanjurjo-Rivo. "Automated optimal flight planning based on the aircraft intent description language". In: *Proceedings of the Institution of Mechanical Engineers, Part G: Journal of Aerospace Engineering* (2018). DOI: 10.1177/0954410017751990.

[9] David Morante, Manuel Sanjurjo Rivo, and Manuel Soler. "Multi-Objective Low-Thrust Interplanetary Trajectory Optimization Based on Generalized Logarithmic Spirals". In: *Journal of Guidance, Control, and Dynamics* (2018), pp. 1–15. DOI: 10.2514/1.G003702.

[10] Daniel González-Arribas, Manuel Soler, and Manuel Sanjurjo-Rivo. "Robust Aircraft Trajectory Planning Under Wind Uncertainty Using Optimal Control". In: *Journal of Guidance, Control, and Dynamics* 41.3 (2017), pp. 673–688. DOI: 10.2514/1.G002928.

[11] A Pastor-Rodríguez, G Sánchez-Arriaga, and M Sanjurjo-Rivo. "Modeling and Stability Analysis of Tethered Kites at High Altitudes". In: *Journal of Guidance, Control, and Dynamics* 40.8 (2017), pp. 1892–1901. DOI: 10.2514/1.G002550.

[12] Hodei Urrutxua, Manuel Sanjurjo-Rivo, and Jesús Peláez. "Dromo propagator revisited". In: *Celestial Mechanics and Dynamical Astronomy* 124.1 (2016), pp. 1–31. DOI: 10.1007/s10569-015-9647-y.

[13] Javier Roa, Manuel Sanjurjo-Rivo, and Jesús Peláez. "Singularities in Dromo formulation. Analysis of deep flybys". In: *Advances in Space Research* 56.3 (2015), pp. 569–581. DOI: 10.1016/j.asr.2015.03.019.

[14] M Sanjurjo-Rivo, Gonzalo Sánchez-Arriaga, and J Pelaez. "Efficient computation of current collection in bare electrodynamic tethers in and beyond OML regime". In: *Journal of Aerospace Engineering* 28.6 (2014), p. 04014144. DOI: 10.1061/(ASCE)AS.1943-5525.0000479.

[15] Manuel Sanjurjo-Rivo, DJ Scheeres, and J Peláez. "Jovian Capture of a Spacecraft with a Self-Balanced Electrodynamic Bare Tether". In: *Journal of Spacecraft and Rockets* 51.5 (2014), pp. 1401–1412. DOI: 10.2514/1.A32550.

[16] Jesús Peláez, Martin Lara, Claudio Bombardelli, FR Lucas, M Sanjurjo-Rivo, D Curreli, EC Lorenzini, and DJ Scheeres. "Periodic orbits of a Hill-tether problem originated from collinear points". In: *Journal of Guidance, Control, and Dynamics* 35.1 (2012), pp. 222–233. DOI: 10.2514/1.53097.

[17] Jesús Peláez Álvarez, Claudio Bombardelli, M Lara, Fernando R Lucas, Manuel Sanjurjo Rivo, D Curreli, Enrico C Lorenzini, and D Scheeres. "Dynamic stabilization of L2 periodic orbits using attitude-orbit coupling effects". In: *Journal of Aerospace Engineering* 4.1 (2012), pp. 73–81.

[18] Manuel Sanjurjo-Rivo and J Peláez. "Energy Analysis of Bare Electrodynamic Tethers". In: *Journal of Propulsion and Power* 27.1 (2011), pp. 246–256. DOI: 10.2514/1.48168.

[19] Claudio Bombardelli, Jesus Pelaez, and Manuel Sanjurjo. "Asymptotic solution for the current profile of passive bare electrodynamic tethers". In: *Journal of Propulsion and Power* 26.6 (2010), pp. 1291–1304. DOI: 10.2514/1.46808.

[20] Davide Curreli, Enrico C Lorenzini, Claudio Bombardelli, Manuel Sanjurjo-Rivo, Jesus Pelaez, Daniel Scheeres, and Martin Lara. "Three-body dynamics and self-powering of an electrodynamic tether in a plasmasphere". In: *Journal of propulsion and power* 26.3 (2010), pp. 385–393. DOI: 10.2514/1.46848.

[21] J Peláez and M Sanjurjo. "Generator regime of self-balanced electrodynamic bare tethers". In: *Journal of Spacecraft and Rockets* 43.6 (2006), pp. 1359–1369. DOI: 10.2514/1.20471.

Publications in Book Chapters

[1] Daniel González-Arribas, Manuel Sanjurjo-Rivo, and Manuel Soler. "Multiobjective Optimisation of Aircraft Trajectories Under Wind Uncertainty Using GPU Parallelism and Genetic Algorithms". In: *Evolutionary and Deterministic Methods for Design Optimization and Control With Applications to Industrial and Societal Problems*. Springer, 2019, pp. 453–466.

Selected Publications in Conference Proceedings (last 5 years)

[1] E Andrés, M Kamgarpour, M Soler, M Sanjurjo-Rivo, and D González-Arribas. "RRT*-Based Algorithm for Trajectory Planning Considering Probabilistic Weather Forecasts". In: *Air Traffic Management and Systems IV: Selected Papers of the 6th ENRI International Workshop on ATM/CNS (EIWAC2019)*. Vol. 731. Springer Nature. 2021, p. 245.

[2] Benjamin Bastida Virgili, Jorge Bravo Aguado, Alejandro Cano, Diego Escobar, Stijn S Lemmens, Javier López Santiago, Alberto López Yela, Pablo Martınez Olmos, Klaus Merz, Joaquın Mıguez Arenas, et al. "Uncertainty Propagation Meeting Space Debris Needs". In: *8th European Conference on Space Debris*. 2021.

[3] A. Pastor, D. Escobar, M. Sanjurjo, and A. Agueda. "Correlation Techniques for Catalogue Build-Up and Maintenance with Radar and Optical Survey Measurements". In: *First International Orbital Debris Conference, held 9-12 December, 2019 in Sugar Land, Texas. LPI Contribution No. 2109*. Vol. 2109. Dec. 2019, p. 6098.

[4] Alejandro Pastor, Diego Escobar, Ignacio Carrera-Calvo, Manuel Sanjurjo-Rivo, and Alberto Águeda. "Challenges, strategies and methodologies to build-up and maintain space objects catalogues". In: *8th European Conference for Aeronautics and Space Sciences*. 2019.

[5] Alejandro Pastor, Diego Escobar, Manuel Sanjurjo, and Alberto Águeda. "Data processing methods for catalogue build-up and maintenance". In: *1st NEO and Debris Detection Conference*. 2019.

[6] Alejandro Pastor, Diego Escobar, Manuel Sanjurjo-Rivo, and Alberto Águeda. "Object Detection Methods for Optical Survey Measurements". In: *Advanced Maui Optical and Space Surveillance Technologies Conference*. 2019, p. 6.

[7] Manuel Sanjurjo-Rivo. "Detection and Orbit Determination of Tethered Satellite Systems". In: *Proceedings of the 6th International Conference on Tethers in Space, Madrid, Spain*. 2019, p. 74.

[8] Najmeh Keshtkar, Manuel Sanjurjo-Rivo, Alexander Poznyak, and Sajjad Keshtkar. "Modeling and Simulation of Flexible Tethered Satellite System". In: *2018 15th International Conference on Electrical Engineering, Computing Science and Automatic Control (CCE)*. IEEE. 2018, pp. 1–4.

[9] David Morante, Juan Carlos García Mateas, Manuel Sanjurjo-Rivo, and Manuel Soler. "MOLTO-IT: A Multi-Objective Low-Thrust Optimization Tool for Interplanetary Trajectories". In: *7th International Conference on n Astrodynamics Tools and Techniques (ICATT)*. DLR Oberpfaffenhofen, Germany, 2018.

[10] David Morante, Manuel Sanjurjo-Rivo, and Manuel Soler. "MOLTO-OR: A Multi-Objective Low-Thrust Optimization Tool for Orbit Raising". In: *7th International Conference on n Astrodynamics Tools and Techniques (ICATT)*. DLR Oberpfaffenhofen, Germany, 2018.

[11] Alejandro Pastor-Rodríguez, Diego Escobar, Manuel Sanjurjo-Rivo, and Alberto Águeda. "Correlation techniques to build-up and maintain space objects catalogues". In: *7th International Conference on n Astrodynamics Tools and Techniques (ICATT)*. DLR Oberpfaffenhofen, Germany, 2018.

[12] M Sanjurjo-Rivo, G. Sánchez-Arriaga, P. Fajardo, and R. Pulido. "Misiones y tecnologías de eliminación activa de desechos espaciales". In: *VI Congreso Nacional de I+D en Seguridad y Defensa*. Ministerio de Defensa, 2018.

[13] Rubén Vega Astorga, David Morante, Manuel Sanjurjo-Rivo, and Manuel Soler. "Analysis of a Rendezvous Mission in Non-Keplerian Orbit using Electric Propulsion". In: *7th International Conference on n Astrodynamics Tools and Techniques (ICATT)*. DLR Oberpfaffenhofen, Germany, 2018.

[14] Daniel González-Arribas, Daniel Hentzen, Manuel Sanjurjo-Rivo, Manuel Soler, and Maryam Kamgarpour. "Optimal Aircraft Trajectory Planning in the Presence of Stochastic Convective Weather Cells". In: *17th AIAA Aviation Technology, Integration, and Operations Conference*. 2017, p. 3431.

[15] Pablo Machuca, Daniel González-Arribas, David Morante-González, Manuel Sanjurjo Rivo, and Manuel Soler Arnedo. "Robust Optimization of Descent Trajectories on Irregular-Shaped Bodies in the Presence of Uncertainty". In: *AIAA/AAS Astrodynamics Specialist Conference*. 2017, AAS 17–698.

[16] J Sánchez Mayorga, R. Dıez Brezmes, M Sanjurjo-Rivo, P Fajardo, R Pulido Puerto, and D. Mosquera Benitez. "Plataformas suborbitales para despliegues logısticos o accion del Estado". In: *V Congreso Nacional de I+D en Seguridad y Defensa*. Ministerio de Defensa, 2017.

[17] Gonzalo Sánchez-Arriaga, Alejandro Pastor-Rodríguez, Manolo García-Villalba, M Sanjurjo-Rivo, R Borobia-Moreno, and R Schmehl. "Kite flight simulators based on minimal coordinate formulations". In: *AWEC2017 Airborne Wind Energy Conference, Breisgau, Germany*. 2017.

[18] Manuel Sanjurjo Rivo, Mario Merino, Filippo Cichocki, Xin Chen, David Morante, Daniel Pérez Grande, Gonzalo Sánchez Arriaga, Manuel Soler, and Eduardo Ahedo. "The Conquest of Space: un curso MOOC y SPOC en ingeniería aeroespacial". In: *Actas de la Jornada de MOOCs en Español en EMOOCs. EMOOCs-ES 2017*. 2017, pp. 91–97.

Languages

Spanish	Mother tongue
English	Proficient
French	Intermediate level
Galician	Mother tongue

Other

Member of Institute Gregorio Millán Barbany for Modelling and Simulation in Fluodynamics, Nanoscience and Industrial Mathematics,
Universidad Carlos III de Madrid
`http://portal.uc3m.es/portal/page/portal/instituto_univ_gregorio_millan_barbany`

Member of University Institute for Gender Studies
Universidad Carlos III de Madrid
`https://www.uc3m.es/ss/Satellite/UC3MInstitucional/es/PortadaMiniSiteC/1371228526230/`