

PERSONAL INFORMATION

First Name Elisa Maria
Last Name Alessi

Date of birth 19 April 1981
E-mail Address elisamaria.alessi@cnr.it

EDUCATION

- 09/2007 – 10/2010 **Ph.D. cum laude in Applied Mathematics**, funded by a Marie Curie fellowship
 Universitat de Barcelona (Spain)
 “The Role and Usage of Libration Point Orbits in the Earth-Moon System”
Supervisors: Prof. G. Gómez and J.J. Masdemont
- 10/2005 – 07/2007 **M.Sc. in Applied Mathematics (Diploma d’Estudis Avançats)**,
 Universitat de Barcelona (Spain)
 “Numerical approximation of invariant tori”, Prof. À. Jorba
 “Leaving and reaching the Moon from a libration point orbit”, Prof. G. Gómez
- 10/1999 – 03/2005 **M.Sc. in Physics (Laurea V.O.)**
 Università degli Studi di Padova (Italy)
 “Low-energy transfers in the Elliptic Restricted Three-Body Problem”
Supervisor: Dr. S. Casotto
- 09/2003 – 04/2004 **Visiting student**, University of California Los Angeles (U.S.A.)

EXPERIENCE

- 01/01/2023 **Senior Researcher** (Primo Ricercatore or Ricercatore II livello), IMATI-CNR
- 27/12/2018 – 31/12/2022 **Researcher** (Ricercatore III livello a Tempo Indeterminato)
 Istituto di Matematica Applicata e Tecnologie Informatiche “E. Magenes”, Milan,
 Consiglio Nazionale delle Ricerche (Italy)
Dynamical systems theory and numerical methods applied to the motion of artificial and natural bodies in the Solar System
- 08/2022 **Visiting Researcher at University of Helsinki** (Finland). Host: Prof. M. Granvik.
- 09/2016 – 12/2018 **Fixed-term Researcher**, funded by the ReDSHIFT H2020 project
 Istituto di Fisica Applicata “Nello Carrara”, Sesto Fiorentino, CNR (Italy)
Space debris dynamics: special emphasis on the design of passive end-of-life disposal trajectories, perturbation modeling and effects
Supervisor: Dr. A. Rossi
- 08/2018 & 11/2018 **Visiting Researcher at Khalifa University of Science and Technology**
 Abu Dhabi (United Arab Emirates). Host: Prof. E. Fantino.
- 12/2015 & 03/2021 **Maternity Leave**, 5 months
- 12/2012 – 08/2016 **Research Fellow (Assegnista di Ricerca)**, funded by the SPARC EU project
 IFAC-CNR (Italy)
Space debris and asteroids dynamics: end-of-life disposal trajectories, environmental analysis, impact dynamics on rocky bodies
Supervisor: Dr. A. Rossi
- 07/2013 – 08/2013 **Visiting Researcher at IMCCE**
 IMCCE – Laboratoire d’astronomie de Lille (France). Host: Dr. F. Deleflie.
- 11/2010 – 12/2012 **Research Fellow (Assegnista di Ricerca)**, funded by ASI
 Department of Mathematics, Università di Pisa (Italy)
Orbit determination for the radioscience experiment of the BepiColombo mission
Supervisor: Prof. A. Milani Comparetti
- 09/2007 – 10/2010 **Early Stage Researcher, AstroNet – Marie Curie RTN**
 Institut d’Estudis Espacials de Catalunya, Barcelona (Spain)
Dynamical systems tools applied to astrodynamics, numerical integration methods and their application to Solar System dynamics
- 10/2009 – 01/2010 **Trainee at the European Space Operations Center (ESA-ESOC)**
 Mission analysis for the Laplace mission, Darmstadt (Germany)

Academic Duties

- 2024 – Member of the Faculty Board of the joint Ph.D. program in Applied Mathematics, University Milano Bicocca, University of Pavia and INdAM.
Responsible of the course in Celestial Mechanics (2026-2027, I semester)
- 2024 – Annual lectures on Space Situational Awareness
M.Sc. in Space Systems Engineering
ISAE SUPAERO, Toulouse (France).
- 2021 Mentor for the M.Sc. Program in Aerospace Engineering,
Universidad Carlos III de Madrid (Spain).
- 2012 – 2015 Teaching Assistant in Spacecraft Orbital Dynamics and Control
M.Sc. in Aerospace Engineering
Alma Mater Studiorum – Università di Bologna (Italy).

Supervision of MSc thesis, Ph.D. thesis

- P. Cavailles, “Optimizing Earth-to-Moon and Return Transfers using Hybrid Propulsion”, University of Toulouse (France), co-supervision with Prof. S. Lizy-Destrez and Dr. E. Canalias, cofunded by Thales Alenia Space, 2025 –.
- M. Bolis, “Cislunar orbit dynamics and application to cislunar space situational awareness”, Politecnico di Milano (Italy), Ph.D., Department of Aerospace Sciences and Technologies, co-supervision with Prof. C. Colombo, 2023 –.
- M.S. Minhea, “Network-Based Representation and Analysis of Rubble-Pile Asteroids Dynamics”, Politecnico di Milano (Italy), Master of Science in Space Engineering, Department of Aerospace Sciences and Technologies, co-supervision with Prof. F. Ferrari, 2024-2025.
- S. Molli, “Planetary and lunar navigation systems based on smallsat constellations”, Industrial Ph.D. funded by CNR and CONFINDUSTRIA (XXXVI ciclo), in collaboration with Argotec s.r.l. and Sapienza Università di Roma, Department of Mechanical and Aerospace Engineering, 2020-2023.
- M. Lo Iacono, “Parametric design for Earth to Sun-Earth L_2 halo transfers in the circular restricted three body problem”, Politecnico di Milano (Italy), Department of Aerospace Sciences and Technologies, Master of Science in Space Engineering, co-supervision with Prof. C. Colombo, 2022-2023.
- E. Arikan, “Transfer trajectory and operational orbit selection for Earth-Moon L_2 near rectilinear halo orbits through invariant manifolds”, Politecnico di Milano (Italy), Department of Aerospace Sciences and Technologies, Master of Science in Space Engineering, co-supervision with Prof. C. Colombo, 2022-2023.
- V. Mariani, “Reentry from Libration Point Orbits: trajectory design and ground uncertainty”, University of Pisa (Italy), Department of Mathematics, Master of Science in Mathematics, co-supervision with Prof. G. Tommei, 2020-2021.
- T. Talu, “Investigation on a doubly-averaged model for the Molniya satellite orbits”, University of Pisa (Italy), Department of Mathematics, Master of Science in Mathematics, co-supervision with Prof. G. Tommei, 2019-2020.
- M. Nicoli, “First Order Analytical Solution for Distant Retrograde Orbits in the CR3BP”, Politecnico di Milano (Italy), Department of Aerospace Sciences and Technologies, Master of Science in Space Engineering, co-supervision with Prof. C. Colombo, 2018-2019.

Languages

- Italian* mother tongue.
- English & Spanish* excellent command of spoken and written language.
- French & Catalan* basic knowledge.

HONORS & AWARDS

- Member of the **Science Team of the LUMIO mission**, Italian Space Agency, 2024-2027.
- Member of the **Italian delegation of the Inter-Agency Space Debris Committee** (IADC), WG2, 2019–.
- **ERC Starting Grant 2019**: panel score A after step 2 of the evaluation process, not retained for funding due to budget limitations.

- **Convener of the session “Meteor streams dynamics”, National Congress of Planetary Science**, Pescara, Italy, February 3-7, 2025.
- **Convener of the session “Satellite mega-constellations: problems and opportunities”, national conference “towards a national capability of Space Surveillance”**, Bologna, October 6-7, 2022.
- **Member of the scientific committee of the International Workshop on Key Topics in Orbit Propagation Applied to Space Situational Awareness (KePASSA)**, 2022, 2024.
- **Chair of the organizing and scientific committees of the international workshop on Co-orbital Motion (COOMOT)**, hybrid format, Milan, March 28-30, 2022 and COOMOT2, March 18-20, 2024.

- **Member of the Editorial Board of Astrophysics and Space Science – Springer**, 2023–2026.
- **Member of the Editorial Board of Scientific Reports – Nature**, 2022–.
- **Member of the Editorial Board of Advances in Computational Science and Engineering – AIMS**, 2022–.
- **Member of the Editorial Board of Universe – Space Science section**, 2020–2022.
- **Editor for Frontiers**, open-access platform. Editor and ideator of the research topic entitled “The Earth–Moon system as a dynamical laboratory”, 2017–2019.

- **National Academic Qualification as Associate Professor** – aeronautic, aerospace and naval engineering (Abilitazione Scientifica Nazionale – Settore Concorsuale 09/A1 – II Fascia), 28/07/2017.

- Daquin, Rosengren, Alessi, Deleflie, Valsecchi and Rossi, *Celest. Mech. Dyn. Astron.* (2016) nominated by Springer Nature as **one of the 180 groundbreaking articles that could help change the world**, 2017. **Featured in Nature** 561, 24-26 (2018).
- **Best presentation award** at IAC-10, IAC-11, 1st IAA Conference on DYNAMICS AND CONTROL OF SPACE SYSTEMS 2012, IAC-13, IAC-17, IAC-19, 9th European Conference on Space Debris.

- **Asteroid (78309) 2002 PV65** designed “Alessielisa”, 2014.

- **Founding member of SpaceDyS s.r.l.**, spin-off from the University of Pisa (Italy), 2011.

- **Marie Curie Early Stage Researcher Grant**: Marie Curie Research Training Network MCRTN FP6 CT-2006-03515 – the Astrodynamics Network “AstroNet”, 2007–2010.
- **Ph.D. with European Mention** from the University of Barcelona (Spain), 2010.
- **Sponsorship by ESA** to attend the International Astronautical Conference IAC-08, 2008.
- **Membership**: International Astronomical Union, Società Italiana di Meccanica Celeste e Astrodinamica, DANCE-NET: dinamica, atractores y no linealidad, caos y estabilidad.

PARTICIPATION IN RESEARCH PROJECTS

- 2025 – **LunPAN**, ESA.
Co-responsible for the mission analysis, pre-phase A.
- 2022 – 2024 **Radiation Environment Monitor for Energetic Cosmic rays (REMEC) mission**, ESA. - B1.
- 2022 – 2023 **HEliospheric pioNeer for sOlar and interplanetary threats defeNce (HENON) mission**, ESA. Scientific advisor for the mission analysis for SpaceDyS s.r.l., phases A - B.
- 2020 – 2022 **Moto co-orbitale e regimi a tre corpi nel Sistema Solare**,
Fondazione Cariplo, Promozione dell'attrattività e competitività dei ricercatori su strumenti dell'European Research Council: sottomisura Rafforzamento. Principal Investigator.
- 2016 – 2019 **ReDSHIFT: Revolutionary Design of Spacecraft through Holistic Integration of Future Technologies**, European Commission H2020-PROTEC-2015,
PROTEC-1-2015 - Passive means to reduce the impact of Space Debris.
Technical coordinator in WP3 "Dynamics" and WP6 "Software" for the CNR unit.
- 2016 – 2018 **Environmental aspects of passive de-orbiting devices**, ESA. Researcher.
- 2015 – 2016 **Improved NEO Data Processing Capabilities (P2-NEO-II)**, ESA. Researcher.
- 2013 – 2015 **Disposal strategies analysis for MEO orbits**, ESA/GSP. Researcher.
- 2013 – 2015 **Fragmentation consequence analysis for LEO and GEO orbits**, ESA/GSP. Researcher.
- 2013 – 2014 **End-of-life disposal concepts for Lagrange-Point and Highly Elliptical Orbit Missions**, ESA/GSP. Technical coordinator for the SpaceDyS unit.
- 2012 – 2014 **SPARC: Space Awareness for Critical Infrastructure**, European Union-Cips. Researcher.
- 2009 – 2014 **Mercury Orbiter Radioscience Experiment (MORE)**, ASI. Researcher.
- 2006 – 2011 **Métodos locales y globales en Sistemas Dinámicos. Aplicaciones**,
Ministerio de Educación y Ciencia (Spain). Researcher.
- 2009 – 2010 **Dinámica, atractores y no linealidad: caos y estabilidad**,
Ministerio de Ciencia e Innovación (Spain). Researcher.
- 2007 – 2010 **The Astrodynamics Network "AstroNet"**,
Marie Curie Research Training Network: MCRTN FP6 CT-2006-03515. Researcher.
- 2007 – 2008 **Efficient Usage of Self Validated Integrators for Space Applications**,
ESA – The Advanced Concept Team. Ariadna Study 20783/07/NL/CB. Researcher.

INVITED TALKS

- Symposium lecture: "On the Arnold diffusion mechanism in Medium Earth Orbit", SIAM Conference on Applications on Dynamical Systems, Denver, U.S.A., 11-15/5/2025.
- Public talk "Un cielo da bollino nero" together with Prof. Roberto Ragazzoni, INAF President, at the event entitled "Notte nera", Asiago, Italy, 14/8/2024.
- Conference talk: "Natural eccentricity growth in Medium Earth Orbit due to the lunar perturbation as an Arnold diffusion process", 13th International Conference on Nonlinear Mathematics and Physics, NoLineal 2023, Barcelona, Spain, 23-26/6/2023.
- Conference talk: "Collision risk in space and current strategies", 7th Games and Decisions in Risk and Reliability Workshop, Madrid, Spain, 24-26/5/2023.
- Conference talk: "On the synergy between planetary sciences and space engineering in the study and exploitation of natural routes", XVIII Congresso Nazionale di Scienze Planetarie, Perugia, Italy, 8/2/2023.
- Conference talk: "Natural perturbations as allies for space debris mitigation and long-term sustainability: the case of the solar radiation pressure - oblateness coupled effect", 2nd International Stardust Conference, online, 8/11/2022.
- Workshop talk: "Criticality of space missions and orbital regions in the medium and long term", Verso una capacità nazionale di Sorveglianza dello Spazio, Bologna, 6-7/10/2022.
- Workshop talk: "A natural perturbation treatment of the Molniya orbital behavior, based on the TLE data set", KePASSA, Logroño (Spain), 22-24/06/2022.
- Conference talk: "The solar radiation pressure - oblateness coupled perturbation as an enabler for passive end-of-life solutions and long-term sustainability", XX Brazilian Colloquium on Orbital Dynamics, online, 09/12/2021.
- Conference talk: "Resonant dynamics of the coupled effect of solar radiation pressure and Earth's oblateness: modeling and exploitation for space debris mitigation", 2nd Online Conference on Nonlinear Dynamics and Complexity, 05/10/2021.

- Public talk at the event entitled “The Marie Skłodowska-Curie Alumni Association Italy Chapter and Italian Universities meet industrial and non-academic partners - Life outside academia”, online, 20/05/2021.
- Research seminar: “Passive End-of-Life Solutions for Low Earth Orbits”, Royal Melbourne Institute of Technology, Melbourne (Australia), 09/10/2017.
- Conference talk: “Dynamical mapping of the LEO region for passive disposal design”, International Astronautical Congress, Adelaide (Australia), 26/09/2017.
- Conference talk: “On the semi-analytical formulation for the third-body perturbation at the boundary of the sphere of influence”, KePASSA, ESTEC, Noordwijk (Netherlands), 26/07/2017.
- Workshop talk: “Earth’s reentry solutions for LPO missions: design and application”, CCT ORB, CNES, Toulouse (France), 04/07/2017.
- Conference talk: “Resonant Dynamics in the LEO Regions”, Barcelona Mathematical Days, Societat Catalana de Matemàtiques, Barcelona (Spain), 28/04/2017.
- Lecture at international advanced school: “Environmental Criticality of LEO Objects”, Third STARDUST Training School, Santander (Spain), 09/07/2015.
- Research seminar: “End-of-Life Disposal Concepts for Libration Point Orbit & Highly Elliptical Orbit Missions”, Observatoire de Paris (France), 13/01/2014.
- Research seminar: “Orbit determination and parameter estimation for the Radio Science Experiment of the BepiColombo mission to Mercury”, Universitat de Barcelona (Spain), 07/03/2012.
- Public lecture: “Alla scoperta di Mercurio”, Planetario di Padova (Italy), 28/10/2011.
- Research seminar: “On the dynamics in the neighborhood of the collinear points in the CR3BP”, Università degli Studi di Milano (Italy), 26/09/2011.
- Research seminar: “On the dynamics in the neighborhood of the collinear points in the CR3BP”, Università degli Studi di Pisa (Italy), 07/12/2010.
- Research seminar: “LEO–Lissajous transfers in the Earth-Moon system and refinement to JPL ephemerides”, Universitat de Barcelona (Spain), 07/04/2010.
- Public lecture: “Caos nel Sistema Solare”, Gabinetto di Lettura e Società di Incoraggiamento, Padova (Italy), 05/03/2010.
- Research seminar: “Gravitational Capture at Callisto”, Universitat de Barcelona (Spain), 10/02/2010.
- Lecture at international advanced school: “Numerical Integration Methods Applied to Astrodynamics and Astronomy”, First AstroNet Training School, Barcelona (Spain), 17/09/2008.

PUBLICATIONS

h-index: 14 (WoS), 18 (Scopus), 24 (Google Scholar)

Peer-Review

- E. Arikan, E.M. Alessi, C. Colombo, “Transfer trajectory and operational orbit selection for Earth-Moon L2 Near Rectilinear Halo Orbits through invariant manifolds”, under review (2025).
- E.M. Alessi, M.H. Moreira Morais, “On the modeling and exploitation of co-orbital dynamics”, *Astrophysics and Space Science* 370 (2025), 94.
- S. Cicalò, E.M. Alessi, et al., “Mission Analysis for the HENON CubeSat Mission to a Large Sun- Earth Distant Retrograde Orbit”, *Astrophysics and Space Science* 370 (2025), 83.
- F. Cortese, S. Di Ruzza, E.M. Alessi, “A statistical sparse jump model for automatic identification of dynamical transitions in the co-orbital regime”, *Nonlinear Dynamics* (2025).
- R. Jedicke, E.M. Alessi, N. Wiedner, M. Ghosal, E. B. Bierhaus, M. Granvik, M., “The steady state population of Earth’s minimoons of lunar provenance”, *Icarus* 438 (2025), 116587.
- M. Rossetti, et al., “Characterization of a fragmentation in Highly Elliptical Orbit via optical multi-observatory survey strategy”, *Aerospace* 123 (2025), 181.
- M. Bolis, E.M. Alessi, C. Colombo, “Mission analysis for the Radiation Environment Monitor for Energetic Cosmic rays (REMEC) mission”, *Acta Astronautica* 230 (2025), 65-78.
- E.M. Alessi, I. Baldomà, M. Giralt, M. Guardia, A. Pousse, “On the role of the fast oscillations in the secular dynamics of the lunar coplanar perturbation on Galileo satellites”, *Communications in Nonlinear Science and Numerical Simulation* 142 (2025), 108498.
- E.M. Alessi, I. Baldomà, M. Giralt, M. Guardia, “On the Arnold diffusion mechanism in Medium Earth”, *Journal of Nonlinear Science* 35 (2025), 8.
- G. Ciacci, A. Barucci, S. Di Ruzza, E.M. Alessi, “Asteroid co-orbital motion classification based on Machine

- Learning”, *Monthly Notices of the Royal Astronomical Society* 527 (2024), 6439-6454.
- E. Fantino, et al., “End-to-end trajectory concept for close exploration of Saturn’s Inner Large Moons ”, *Communications in Nonlinear Science and Numerical Simulation* 126 (2023), 107458.
 - M. Lombini, et al., “Solar Ultraviolet Light Collector for Germicidal Irradiation on the Moon”, *Scientific Reports* 8 (2023), 8326.
 - F. Ferrari, E.M. Alessi, “A new method for identifying dynamical transitions in rubble-pile asteroid scenarios”, *Astronomy & Astrophysics* 672 (2023), A35.
 - S. Molli, D. Durante, G. Boscagli, G. Cascioli, P. Racioppa, E.M. Alessi, S. Simonetti, L. Vigna, L. Iess, “Design and performance of a Martian autonomous navigation system based on a smallsat constellation”, *Acta Astronautica*, 203 (2023), 112-124.
 - S. Di Ruzza, A. Pousse, E.M. Alessi, “On the co-orbital asteroids in the solar system: medium-term timescale analysis of the quasi-coplanar objects”, *Icarus*, 390 (2023), 115330.
 - S. Huang, C. Colombo, E.M. Alessi, Y. Wang, Z. Hou, “Low-Thrust de-orbiting from Low Earth Orbit through natural perturbations”, *Acta Astronautica*, 195 (2022), 145-162.
 - A. Rossi, E. Vellutini, E.M. Alessi, G. Schettino, V. Ruch, J.C. Dolado Perez, “Environmental Index for fragmentation impact and environment evolution analysis”, *Journal of Space Safety Engineering*, 9 (2022), 269-273.
 - A. Pousse, E.M. Alessi, “Revisiting the averaged problem in the case of mean-motion resonances of the Restricted Three-Body Problem. Global Rigorous Treatment and Application to the co-orbital motion”, *Nonlinear Dynamics*, 479 (2022), 959-985.
 - T. Talu, E.M. Alessi, G. Tommei, “On the dominant lunisolar perturbations for the long-term eccentricity variation: the case of Molniya satellite orbits”, *Universe*, 7 (2021), 482.
 - J. Daquin, E.M. Alessi, J. O’Leary, A. Lemaitre, A. Buzzoni, “Dynamical properties of the Molniya satellite constellation: long-term evolution of the semi-major axis”, *Nonlinear Dynamics*, 105 (2021), 2081-2103.
 - A. Petit, A. Rossi, E.M. Alessi, “Assessment of the collision risk for satellites in different configurations of large constellations”, *Advances in Space Research*, 67 (2021), 4177-4192.
 - F. Salazar, A. Alkhaja, E. Fantino, E.M. Alessi, “Science orbits in the Saturn-Enceladus circular restricted three-body problem with oblate primaries”, *Acta Astronautica*, 180 (2021), 398-416.
 - E.M. Alessi, A. Buzzoni, J. Daquin, A. Carbognani, G. Tommei, “Dynamical properties of the Molniya satellite constellation: long-term evolution of orbital eccentricity”, *Acta Astronautica*, 179 (2021), 659-669.
 - F. Salazar, E. Fantino, E.M. Alessi, “Observational properties of low-energy orbits around icy moons”, *Acta Astronautica*, 178 (2021), 743-756.
 - I. Gkolias, E.M. Alessi, C. Colombo, “Dynamical taxonomy of the coupled solar radiation pressure and oblateness effect and analytical deorbiting configurations”, *Celestial Mechanics and Dynamical Astronomy*, 132 (2020), 55.
 - A. Buzzoni, J. Guichard, E.M. Alessi, G. Altavilla, A. Figer, A. Carbognani, G. Tommei, “Spectrophotometric and dynamical properties of the Soviet/Russian Constellation of Molniya Satellites”, *Journal of Space Safety Engineering*, 73 (2020), 255-261.
 - E. Fantino, F. Salazar, E.M. Alessi, “Design and performance of low-energy orbits for the exploration of Enceladus”, *Communications in Nonlinear Science and Numerical Simulation*, 90 (2020), 105393.
 - A. Rossi, E.M. Alessi, G. Schettino, V. Schaus, G.B. Valsecchi, “How an aware usage of the long-term dynamics can improve the long-term situation in the LEO region”, *Acta Astronautica*, 174 (2020), 159–165.
 - E.M. Alessi, C. Colombo, A. Rossi, “Phase space description of the dynamics due to the coupled effect of the planetary oblateness and the solar radiation pressure perturbations”, *Celestial Mechanics and Dynamical Astronomy*, 131:43 (2019).
 - E.M. Alessi, J. Masdemont, A. Rossi, “Editorial: The Earth–Moon System as a Dynamical Laboratory”, *Frontiers in Astronomy and Space Sciences*, 6:43 (2019).
 - G. Schettino, E.M. Alessi, A. Rossi, G.B. Valsecchi, “A frequency portrait of Low Earth Orbits”, *Celestial Mechanics and Dynamical Astronomy*, 131:35 (2019).
 - G. Schettino, E.M. Alessi, A. Rossi, G.B. Valsecchi, “Exploiting dynamical perturbations for the end-of-life disposal of spacecraft in LEO”, *Astronomy and Computing*, 27 (2019), 1–10.
 - V. Schaus, E.M. Alessi, G. Schettino, A. Rossi, E. Stoll, “On the practical exploitation of perturbative effects in low Earth orbit for space debris mitigation”, *Advances in Space Research*, 63 (2019), 1979–1991.
 - E.M. Alessi, G. Tommei, I. Holbrough, G. Beck, “Dynamical uncertainty and demisability occurrence for the atmospheric reentry of SOHO”, *Advances in Space Research*, 62 (2018), 3033–3047.

- A. Rossi, et al., “ReDSHIFT: a global approach to space debris mitigation”, *Aerospace*, 5 (2018), 64.
- E.M. Alessi, G. Schettino, A. Rossi, G.B. Valsecchi, “Natural Highways for End-of-Life Solutions in the LEO Region”, *Celestial Mechanics and Dynamical Astronomy*, 130 (2018), 34.
- G.B. Valsecchi, E.M. Alessi, A. Rossi, “Cartography of the b -plane of a close encounter. I. Semimajor axes of post-encounter orbits”, *Celestial Mechanics and Dynamical Astronomy*, 130 (2018), 8.
- E.M. Alessi, G. Schettino, A. Rossi, G.B. Valsecchi, “Solar radiation pressure resonances in Low Earth Orbits”, *Monthly Notices of the Royal Astronomical Society*, 473 (2018), 2407–2414.
- C. Bombardelli, E.M. Alessi, A. Rossi, G.B. Valsecchi, “Environmental effect of space debris repositioning”, *Advances in Space Research* 60 (2017), 28–37.
- A.J. Rosengren, J. Daquin, E.M. Alessi, K. Tsiganis, F. Deleflie, A. Rossi, G.B. Valsecchi, “Galileo disposal strategy: stability, chaos and predictability”, *Monthly Notices of the Royal Astronomical Society* 464 (2016), 4063–4073.
- E.M. Alessi, F. Deleflie, A.J. Rosengren, A. Rossi, G.B. Valsecchi, J. Daquin, K. Merz, “A Numerical Investigation on the Eccentricity Growth of GNSS Disposal Orbits”, *Celestial Mechanics and Dynamical Astronomy* 125 (2016), 71–90.
- J. Daquin, A.J. Rosengren, E.M. Alessi, F. Deleflie, G.B. Valsecchi, A. Rossi, “The dynamical structure of the MEO region: long-term stability, chaos, and transport”, *Celestial Mechanics and Dynamical Astronomy* 124 (2016), 335–366.
- S. Cicalò, G. Schettino, S. Di Ruzza, E.M. Alessi, G. Tommei, “The BepiColombo MORE gravimetry and rotation experiments with the ORBIT14 software”, *Monthly Notices of the Royal Astronomical Society* 457 (2016), 1507–1521.
- G.B. Valsecchi, E.M. Alessi, A. Rossi, “An analytical solution for the swing-by problem”, *Celestial Mechanics and Dynamical Astronomy* 123 (2015), 151–166.
- E.M. Alessi, J.P. Sánchez Cuartielles, “Semi-analytical Approach for Distant Encounters in the Spatial Circular Restricted Three-Body Problem”, *Journal of Guidance Control and Dynamics* 39 (2015), 351–359.
- A. Rossi, G.B. Valsecchi, E.M. Alessi, “The Criticality of Spacecraft Index”, *Advances in Space Research* 56 (2015), 449–460.
- E.M. Alessi, “The Reentry to Earth as a Valuable Option at the End-of-Life of Libration Point Orbit Missions”, *Advances in Space Research* 55 (2015), 2914–2930.
- A.J. Rosengren, E.M. Alessi, A. Rossi, G.B. Valsecchi, “Chaos in navigation satellite orbits caused by the perturbed motion of the Moon”, *Monthly Notices of the Royal Astronomical Society* 449 (2015), 3522–3526.
- A. Rossi, G.B. Valsecchi, E.M. Alessi, “Ranking in-orbit fragmentations and space objects”, *Proceedings of the International Astronomical Union – Symposium* 310, 9 (2014), 118–125.
- C. Colombo, E.M. Alessi, W. van der Weg, S. Soldini, F. Letizia, M. Vetrignano, M. Vasile, A. Rossi, M. Landgraf, “End-of-life disposal trajectories for libration point and highly elliptical orbit missions”, *Acta Astronautica* 110 (2014), 298–312.
- G.B. Valsecchi, E.M. Alessi, A. Rossi, “The geometry of impacts on a synchronous planetary satellite”, *Celestial Mechanics and Dynamical Astronomy* 119 (2014), 257–270.
- E.M. Alessi, A. Rossi, G.B. Valsecchi, L. Anselmo, C. Pardini, C. Colombo, H.G. Lewis, J. Daquin, F. Deleflie, M. Vasile, F. Zuiani, K. Merz, “Effectiveness of GNSS Disposal Strategies”, *Acta Astronautica* 99 (2014), 292–302.
- E.M. Alessi, G. Gómez, J.J. Masdemont, “A Methodology for the Computation of Constrained Orbits and its Application to the Design of Solar System Trajectories”, *Journal of the Astronautical Sciences*, 59 (2012), 477–501.
- P. Pergola, E.M. Alessi, “Libration Point Orbits Characterisation in the Earth-Moon System”, *Monthly Notices of the Royal Astronomical Society*, 426 (2012), 1212–1222.
- E.M. Alessi, S. Cicalò, A. Milani, G. Tommei, “Desaturation Manoeuvres and Precise Orbit Determination for the BepiColombo Mission”, *Monthly Notices of the Royal Astronomical Society* 423 (2012), 2270–2278.
- E.M. Alessi, P. Pergola, “Two options for the Callisto’s exploration”, *Acta Astronautica* 72 (2012), 185–197.
- E.M. Alessi, G. Gómez, J.J. Masdemont, “Further Advances on Low – Energy Lunar Impact Dynamics”, *Communications in Nonlinear Science and Numerical Simulation* 17 (2012), 854–866.
- E.M. Alessi, “The Role and Usage of Libration Point Orbits in the Earth – Moon System”, Ph.D. Dissertation, Universitat de Barcelona (2010).
- E.M. Alessi, G. Gómez, J.J. Masdemont, “Low-energy transfers in the Earth–Moon system”, *Nonlinear Science and Complexity – Vol. II*, Springer (2010), 107–114.
- E.M. Alessi, G. Gómez, J.J. Masdemont, “A Motivating Exploration on Lunar Craters and Low-Energy

Dynamics in the Earth–Moon System”, *Celestial Mechanics and Dynamical Astronomy* 107 (2010), 187–207.

- E.M. Alessi, G. Gómez, J.J. Masdemont, “Two-manoevres transfers between LEOs and Lissajous orbits in the Earth–Moon system”, *Advances in Space Research* 45 (2010), 1276–1291.
- E.M. Alessi, G. Gómez, J.J. Masdemont, “Leaving the Moon by means of invariant manifolds of libration point orbits”, *Communications in Nonlinear Science and Numerical Simulation* 14 (2009), 4153–4167.

Conference Proceedings

- E.M. Alessi, “On the Sun-driven long-lasting temporary capture in the Earth–Moon system”, *International Astronautical Congress IAC-25* (2025).
- M. Bolis, E.M. Alessi, C. Colombo, “End-of-life disposal design for Near-Rectilinear Halo Orbits”, *International Astronautical Congress IAC-25* (2025).
- M. Bolis, E.M. Alessi, C. Colombo, “Mission design techniques for satellites operating in Low-Lunar Orbits”, *International Astronautical Congress IAC-25* (2025).
- J. Hulsman, E.M. Alessi, et al., “Comprehensive Study of the Lunar Energetic Particle Environment with LunPAN”, *39th International Cosmic Ray Conference* (2025).
- E.M. Alessi, I. Baldomá, M. Giralt, M. Guardia, “On the Arnold diffusion mechanism in MEO: a summary”, *9th European Conference on Space Debris* (2025).
- E.M. Alessi, A. Rossi, “On the dynamical evolution of a fragmentation in the Molniya regime”, *9th European Conference on Space Debris* (2025).
- M. Bolis, E.M. Alessi, C. Colombo, “End-of-life disposal parametric analysis in cislunar space: Earth–Moon L2 escape no-return trajectories”, *9th European Conference on Space Debris* (2025).
- E.M. Alessi, A. Rossi, “Orbital evolution of a Molniya fragmentation”, *International Astronautical Congress IAC-24* (2024).
- G. Ciacci, et al. “AI for Photonics and Photonics for AI”, *2024 Italian Conference on Optics and Photonics (ICOP)* (2024), 1-4,
- M. Bolis, E.M. Alessi, C. Colombo, “Long-term evolution of orbits in cislunar space: characterisation and stability analysis”, *International Astronautical Congress IAC-24* (2024).
- L. Provinciali, et al., “HEliospheric pioNeer for sOlar and interplanetary threats defeNce (HENON) mission: Space weather monitoring and forecasting”, *International Astronautical Congress IAC-23* (2023).
- R. Filgas, et al., “Deep space mission REMEC for GCR monitoring”, *International Astronautical Congress IAC-23* (2023).
- E.M. Alessi, A. Pousse, S. Di Ruzza, “Averaged theory applied to the co-orbital motion of real asteroids in the solar system in the medium-term timescale”, *European Planetary Science Congress* (2022).
- F. Ferrari, E.M. Alessi, “Dynamical transitions in the N-body granular problem to identify breakup limits of rubble-pile asteroids”, *European Planetary Science Congress* (2022).
- S. Molli, L. Iess, E.M. Alessi, D. Durante, S. Simonetti, A. Sesta, “Martian user positioning via a semi-autonomous smallsat constellation”, *44th COSPAR Scientific Assembly* (2022).
- E.M. Alessi, “A natural perturbation treatment of the Molniya orbital behavior, based on the TLE data set”, *KePASSA2022* (2022).
- A. Pousse, M. Giralt, I. Baldomá, M. Guardia, E.M. Alessi, “An Arnold diffusion mechanism for the Galileo satellites”, *KePASSA2022* (2022).
- B.M. Burhani, F. Solano, E. Fantino, R. Flores, M. Sanjurjo-Rivo, E.M. Alessi, “A Novel Trajectory Concept for a Mission to the Inner Large Moons of Saturn”, *LPI Contributions 2686* (2022).
- A. Pousse, E.M. Alessi, “A stable heliocentric disposal strategy for LPO missions, inspired by the natural co-orbital motion of Saturn’s moons”, *International Astronautical Congress IAC-21* (2021).
- A. Rossi, E. Vellutini, E.M. Alessi, G. Schettino, V. Ruch, J.C. Dolado Perez, “Environmental Index for fragmentation impact and environment evolution analysis”, *International Astronautical Congress IAC-21* (2021).
- B.M. Burhani, A. Alkhaja, E. Fantino, R. Flores, E.M. Alessi, “A low-thrust lunar tour of the moons of Saturn”, *International Astronautical Congress IAC-21* (2021).
- S. Molli, D. Durante, G. Cascioli, S. Proietti, P. Racioppa, S. Simonetti, E.M. Alessi, L. Iess, “Performance analysis of a martian polar navigation system”, *International Astronautical Congress IAC-21* (2021).
- A. Alkhajaa, F. Salazar, E. Fantino, E.M. Alessi, A. Al Khateebe, “J2-perturbed low-energy orbits around Enceladus”, *International Astronautical Congress IAC-20* (2020).
- G. Tommei, E.M. Alessi, “Studying a direct re-entry from a Sun–Earth Libration Point Orbit: can ground

- uncertainty be kept under control?”, *First International Orbital Debris Conference* (2019).
- A. Rossi, E.M. Alessi, V. Schaus, “Assessing the effectiveness of resonant corridors in passive debris disposal”, *First International Orbital Debris Conference* (2019).
 - A. Petit, E.M. Alessi, A. Rossi, “Low-thrust strategies and implications in the perspective of space debris mitigation for large constellations”, *First International Orbital Debris Conference* (2019).
 - A. Buzzoni, et al., “Towards a Physical Characterization of the Soviet/Russian Constellation of Molniya Satellites”, *First International Orbital Debris Conference* (2019).
 - L. Dimare, et al., “In-orbit fragmentation characterization and parent bodies identification by means of orbital distances”, *First International Orbital Debris Conference* (2019).
 - E.M. Alessi, I. Gkolias, C. Colombo, “Time characterization of the coupled solar radiation pressure-planetary oblateness dynamics”, *International Astronautical Congress IAC-19* (2019).
 - A. Rossi, E.M. Alessi, et al., “How an aware usage of the long-term dynamics can improve the long-term situation in the LEO region”, *International Astronautical Congress IAC-19* (2019).
 - A. Petit, A. Rossi, E.M. Alessi, “Collision risk assessment for the proposed large constellations”, *International Astronautical Congress IAC-19* (2019).
 - F. Salazar, E. Fantino, E.M. Alessi, “Characterization of low-energy orbits for the exploration of planetary systems”, *International Astronautical Congress IAC-19* (2019).
 - A. Rossi, E.M. Alessi, et al., “The H2020 ReDSHIFT project: a successful European effort towards space debris mitigation”, *International Astronautical Congress IAC-19* (2019).
 - C. Colombo, et al., “ReDSHIFT disposal module for the design of end-of-life disposal trajectories for LEO to GEO missions”, *International Astronautical Congress IAC-19* (2019).
 - R. Popova, et al., “The path to establishing an effective framework for space debris remediation on the basis of mitigation: legal proposals resulting from the technical results of the ReDSHIFT project”, *International Astronautical Congress IAC-19* (2019).
 - A. Petit, A. Rossi, E.M. Alessi, “Risk of collision for satellites in different configurations of mega constellations”, *International Workshop on Satellite Constellations and Formation Flying* (2019).
 - S. Huang, C. Colombo, E.M. Alessi, “Trade-off study on large constellation de-orbiting using low-thrust and de-orbiting balloons”, *International Workshop on Satellite Constellations and Formation Flying* (2019).
 - E. Fantino, E.M. Alessi, J. Pelàez, “Connecting low-energy orbits in the Saturn system”, *Australian Aerospace Congress* (2019).
 - S. Huang, C. Colombo, E.M. Alessi, Z. Hou, “Large constellation de-orbiting with low-thrust propulsion”, *AAS/AIAA Space Flight Mechanics Meeting, Ka'anapali, Hawaii* (2019).
 - R. Neves, J.-P. Sánchez, C. Colombo, E.M. Alessi, “Analytical and semi-analytical approaches to the third-body perturbation in nearly co-orbital regimes”, *International Astronautical Congress IAC-18* (2018).
 - E.M. Alessi, C. Colombo, “Dynamical system description of the solar radiation pressure and J_2 phase space for end-of-life design and frozen orbit design”, *International Astronautical Congress IAC-18* (2018).
 - A. Rossi, et al., “Results from the H2020 ReDSHIFT project: a global approach to space debris mitigation”, *International Astronautical Congress IAC-18* (2018).
 - E.M. Alessi, G. Schettino, A. Rossi, G.B. Valsecchi, “Dynamical mapping of the LEO region for passive disposal design”, *International Astronautical Congress IAC-17* (2017).
 - G. Schettino, E.M. Alessi, A. Rossi, G.B. Valsecchi, “Characterization of Low Earth Orbit dynamics by perturbation frequency analysis”, *International Astronautical Congress IAC-17* (2017).
 - E.M. Alessi, G. Tommei, I. Holbrough, G.Beck, “On the reentry design for the SOHO mission”, *7th European Conference on Space Debris* (2017).
 - E.M. Alessi, G. Schettino, A. Rossi, G.B. Valsecchi, “LEO mapping for passive dynamical disposal”, *7th European Conference on Space Debris* (2017).
 - A. Rossi, E.M. Alessi, et al., “A quantitative evaluation of the environmental impact of the mega constellations”, *7th European Conference on Space Debris* (2017).
 - A. Rossi, E.M. Alessi, et al., “MEO dynamics and GNSS disposal strategies”, *7th European Conference on Space Debris* (2017).
 - A. Rossi, E.M. Alessi, et al., “The H2020 Project ReDSHIFT”, *7th European Conference on Space Debris* (2017).
 - A. Rossi, E.M. Alessi, et al., “The effect of the GNSS disposal strategies on the long-term evolution of the MEO region”, *International Astronautical Congress IAC-16* (2016).
 - C. Colombo, E.M. Alessi, et al., “Characterisation of the dynamical structure of the circumterrestrial space for passive debris mitigation”, *International Astronautical Congress IAC-16* (2016).
 - F. Deleflie, J. Daquin, E.M. Alessi, et al., “Long term evolution of the eccentricity in the MEO region: ex-

- traction of the most significant terms from the potential expression”, *AIAA/AAS Astrodynamics Specialist Conference, Long Beach, California* (2016).
- A.J. Rosengren, J. Daquin, E.M. Alessi, G.B. Valsecchi, A. Rossi, F. Deleflie, “Galileo disposal strategy: resonance, chaos, and stability”, *25th International Symposium on Space Flight Dynamics ISSFD2015* (2015).
 - J.P. Sánchez Cuartielles, C. Colombo, E.M. Alessi, “Semi-analytical perturbative approach to third body resonant trajectories”, *International Astronautical Congress IAC-15* (2015).
 - F. Deleflie, J. Daquin, E.M. Alessi, A. Rossi, “Long term evolution of the eccentricity in the MEO region: semi-analytical and analytical approach”, *AAS/AIAA Astrodynamics Specialist Conference, Vail, Colorado* (2015) AAS 15-798.
 - A.J. Rosengren, E.M. Alessi, A. Rossi, G.B. Valsecchi, “Dynamical instabilities in Medium Earth Orbits: chaos induced by overlapping lunar resonances”, *AAS/AIAA Space Flight Mechanics Meeting, Williamsburg, Virginia* (2015) AAS 15-435.
 - E.M. Alessi, J.P. Sánchez Cuartielles, “MOID-increasing disposal strategies for LPO missions”, *International Astronautical Congress IAC-14* (2014).
 - A. Rossi, G.B. Valsecchi, E.M. Alessi, “An evaluation index for the ranking of LEO objects”, *International Astronautical Congress IAC-14* (2014).
 - E.M. Alessi, C. Colombo, M. Landgraf, “Re-entry disposal analysis for libration point orbit missions”, *24th International Symposium on Space Flight Dynamics ISSFD2014* (2014).
 - C. Colombo, F. Letizia, S. Soldini, H.G. Lewis, E.M. Alessi, A. Rossi, M. Vetrivano, W. van der Weg, M. Vasile, M. Landgraf, “End-of-life disposal trajectories for libration point and highly elliptical orbit missions”, *2nd IAA Conference on DYNAMICS AND CONTROL OF SPACE SYSTEMS* (2014).
 - C. Colombo, F. Letizia, E.M. Alessi, M. Landgraf, “End-of-life Earth re-entry for highly elliptical orbits: the INTEGRAL mission”, *AAS/AIAA Space Flight Mechanics Meeting, Santa Fe, New Mexico* (2014) AAS 14-156.
 - E.M. Alessi, C. Colombo, J.P. Sánchez Cuartielles, “Out-of-plane extension of resonant encounters for escape and capture”, *International Astronautical Congress IAC-13* (2013).
 - E.M. Alessi, A. Rossi, G. Valsecchi, L. Anselmo, C. Pardini, C. Colombo, H.G. Lewis, F. Deleflie, M. Vasile, K. Merz, “Effectiveness of GNSS disposal strategies”, *International Astronautical Congress IAC-13* (2013).
 - J.P. Sánchez Cuartielles, E.M. Alessi, D. García Yáñez, C.R. McInnes, “Earth resonant gravity assists for asteroid retrieval missions”, *International Astronautical Congress IAC-13* (2013).
 - C. Colombo, H.G. Lewis, F. Letizia, E.M. Alessi, A. Rossi, L. Dimare, M. Vasile, M. Vetrivano, W. van der Weg, C. McInnes, M. Landgraf, “End-of-life disposal trajectories for libration point and highly elliptical orbit missions”, *International Astronautical Congress IAC-13* (2013).
 - F. Deleflie, A. Bourgoïn, E.M. Alessi, J. Daquin, A. Vienne, V. Morand, D. Hautesseres, A. Rossi, M. Fouchard, “Exploration of the structure of the web of the commensurabilities within the MEO and GTO regions”, *AAS/AIAA Astrodynamics Specialist Conference 2013, Hilton Head, South Carolina* (2013) AAS 13-778.
 - C. Colombo, E.M. Alessi, M. Landgraf, “End-of-life disposal of spacecraft in highly elliptical orbits by means of luni-solar perturbations and Moon resonances”, *Proceedings of Sixth European Conference on Space Debris* (2013).
 - J.P. Sánchez, D. García Yáñez, E.M. Alessi, C.R. McInnes, “Gravitational Capture Opportunities for Asteroid Retrieval Missions”, *Proceedings of International Astronautical Conference IAC-12* (2012).
 - E.M. Alessi, S. Cicalò, A. Milani, “Accelerometer Data Handling for the BepiColombo Orbit Determination”, *Advances in the Astronautical Sciences* 145 (2012) AAS 12-309, 1st IAA Conference on DYNAMICS AND CONTROL OF SPACE SYSTEMS.
 - P. Pergola, E.M. Alessi, “Libration Point Orbits Characterization in the Earth–Moon System for Scientific Applications”, *Advances in the Astronautical Sciences* 145 (2012) AAS 12-332, 1st IAA Conference on DYNAMICS AND CONTROL OF SPACE SYSTEMS.
 - E.M. Alessi, S. Cicalò, A. Milani, G. Tommei, “Desaturation maneuvers and precise orbit determination for the BepiColombo mission”, *Proceedings of International Astronautical Conference IAC-11* (2011).
 - E.M. Alessi, P. Pergola, “Strategy to achieve gravitational capture at Callisto”, *Proceedings of International Astronautical Conference IAC-10* (2010).
 - E.M. Alessi, G. Gómez, J.J. Masdemont, “Transfer orbits in the Earth–Moon system and refinement to JPL ephemerides”, *Proceedings of the 21st International Symposium on Space Flight Dynamics ISSFD2009* (2009).

- E.M. Alessi, A. Farrés, A. Vieiro, À. Jorba, C. Simó, “Jet transport and applications to NEOs”, *Proceedings of the 1st IAA Planetary Defense Conference: Protecting Earth from Asteroids* (2009).
- E.M. Alessi, G. Gómez, J.J. Masdemont, “LEO–Lissajous transfers in the Earth–Moon system”, *Proceedings of International Astronautical Conference IAC-08* (2008).
- E.M. Alessi, G. Gómez, J.J. Masdemont, “Leaving and reaching the Moon from a libration point orbit”, *Proceedings in Applied Mathematics and Mechanics* 7 (2008), 1030911–1030912.