

David Rodríguez Martínez

Research Scientist & Junior Professor | Space Robotics

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Date of birth: October 3, 1990

Nationality: Spanish



10-SEC SUMMARY

I am a Beatriz Galindo Junior Professor in the Department of Systems Engineering and Automation of the University of Malaga, Spain. I am a member of the Space Robotics Lab, where we conduct research at the intersection of robotics, advanced sensing and mechanical design, machine intelligence, and space. My research revolves around the study of innovative autonomous navigation approaches and mobility solutions for robots deployed in extreme environments, pioneering works in faster lunar locomotion and single-photon vision for robotics. Over the past decade I have founded initiatives and led research projects in academic institutions and public organizations based in Europe, USA, and Japan, raising over 1.1M EUR in research and personal grants.

EDUCATION



PhD in Planetary Robotics | April '17 - September '20

Tohoku University Sendai, Japan

Advisor: Prof. Kazuya Yoshida

Co-Advisor: Michel Van Winnendael (ESA/ESTEC)



MSc. in Space Studies | September '15 - September '16

International Space University, Strasbourg, France

Graduated *cum laude* (highest grade of the 2016 class)



MSc & BSc in Mechanical and Structural Engineering | September '08 - May '15

Carlos III University, Madrid Spain

Graduated *summa cum laude* in final master's thesis.

PROFESSIONAL EXPERIENCE



Beatriz Galindo Junior Professor @Space Robotics Lab, Dept. of Systems Engineering and Automation, University of Malaga

Malaga, Spain | December '24 - Present



Research Scientist (postdoc) @Advanced Quantum Architecture (AQUA) Lab, EPFL

Lausanne, Switzerland | April '23 - October '24

- Research on single-photon vision for robotics operating in visually degraded environments.



Principal Scientist @eSpace - EPFL Space Center

Lausanne, Switzerland | September '22 - April '23

- Founder and Director of the [Lunar Hub](#).
- Responsible for the hub's R&D strategy and implementation

Research Scientist & Engineer @eSpace - EPFL Space Center

Lausanne, Switzerland | October '20 - September '22

- Support to the center's lunar research Initiative strategy & implementation.
- Project Manager for EPFL of the Active Debris Removal/ In-Orbit Servicing – ADRIOS ESA-ClearSpace Project.
- Support to a variety of projects in space sustainability, robotics, space transportation technologies, atmospheric science, AgriTech, and radio astronomy.
- Coordinator of students' interdisciplinary projects (>200 students)
- Supervision of >15 master's student projects.



Research Group Lead @Space Robotics Lab, Tohoku University

Sendai, Japan | April '18 - September '20

- Founder and principal investigator of the High-Speed Exploration Rover Group made up of 2 PhD students, 4 Master's students, and 2 exchange students.
- PI: High-speed lunar exploration.
- Development of Explorer-1 (EX1), the lab's first fast-moving lunar rover prototype.

PhD Candidate @Space Robotics Lab, Tohoku University

Sendai, Japan | April '17 - September '20

- Study of the effects associated with faster (> 1m/s) ground mobility in reduced-gravity, unstructured, and dynamic environments.
- Locomotion, terramechanics, and motion control architecture for lunar rovers.



NPI Researcher (PhD) @European Space Agency (ESTEC/ESA)

Katwijk, The Netherlands | April '18 - September '20

Planetary Robotics Lab | Automation and Robotics Section | TEC-MMA
Mechatronics & Optics Division



Visiting Scientist (PhD) @German Aerospace Center (DLR)

Munich, Germany | October '18 - November '18

Robotics and Mechatronics Center (RMC) | Institute of System Dynamics and Control

- Test campaign director: effects of speed on the locomotor performance of mobile robots over planetary simulants (olivine sands and calcite silts).



Mechanical Engineer Trainee @European Space Agency (ESTEC/ESA)

Katwijk, The Netherlands | June '16 - September '16

Mechanical Engineering Department

- Static and dynamic finite element analysis and topology optimization of E/O satellites and nanosatellite structures



Research Scholar (MSc) @West Virginia University

WV, United States | September '14 - March '15

- Application to a pre-design tool of analytical models for the impact of composite panels.

OTHER ACADEMIC ACTIVITIES

- Founder and current chair of the [HERMES International Working Group](#) (“Heterogeneous MultiRobot Cooperation for Exploration and Science in Extreme Environments”) (2021 - Present)
 - Workshops held at [ICRA2023](#) and [ICRA2024](#).
- See [Teaching Activities](#).
- Coordinator of EPFL’s student interdisciplinary team [Xplore](#) (2020 - 2023) [>100 students]
- Overall Coordinator of student initiatives at EPFL Space Center (2020 - 2023) [>200 students]

TEACHING ACTIVITIES

2026	University of Málaga Labs for (GIERM209) “Fundamentals of Control” part of the Bachelor’s degree in Electronic, Robotics, and Mechatronics Engineering (60 students)
2025 - 2026	University of Málaga Labs for (GIDIDP311) “Product Electronics & Automation” part of the Bachelor’s degree in Industrial Design and Product Development Engineering (71 students)
2025 - 2026	International Space University Invited lecturer for the Master’s in Space Studies. Lecture series on Introduction to Space Robotics.
2025	University of Málaga Labs for (GIOI206) “Automatic Control” part of the Bachelor’s degree in Industrial Organization Engineering (30 students)
2023 - 2024	EPFL Director & Main Lecturer of ENG-411 “Concurrent Engineering of Space Missions” part of the Master’s Minor in Space Technologies (15 students)
2023 - 2024	EPFL Director & Main Lecturer of EE-584 “Spacecraft Design & Systems Engineering” part of the Master’s Major in Electrical and Electronics Engineering, Minor in Space Technologies, and Minor in Systems Engineering (40 students)
2022	Spaceonova Invited instructor to the Space Robotics Training Programme, “Introduction to lunar rovers mobility”

ACADEMIC HONORS, GRANTS AND AWARDS

2026	European Space Agency (ESA) Pilot Study Grant (PI) “Single-photon imaging to Explore the Moon” 01/2/2026 - 31/12/2026 [20k EUR]
2025	Spanish Ministry of Science, Innovation, & Universities’ “Proyectos de Generación de Conocimiento 2024” program (Research Team) “Hybrid Intelligence for Space Robotics: Merging Classical and Learned Methods for Interpretable GNC (INSIGHT)” 01/10/2025 - 31/09/2028 [105k EUR]
2025	European Space Agency (ESA) Discovery Programme Co-funding Grant (PI) “ECHO2: End-to-End Control for Handling Operations in Orbit” 01/10/2025 - 31/09/2027 [140k EUR]
2024	Spanish Ministry of Science, Innovation, & Universities’ Beatriz Galindo Junior Fellowship (PI) 01/12/2024 - 30/11/2028 [200k EUR]
2024	Andalusian Regional Ministry of University, Research and Innovation Postdoctoral Grant (PI) [waived] [135k EUR]

- 2024 **Armasuisse Science & Technology (S+T) Program Grant, Federal Department of Defense, Civil Protection and Sport (DDPS)** (PI) "Monocular SPAD camera for enhanced vision in complex and uncertain environments" 01/04/2024 - 31/12/2024 [96k CHF, ~100k EUR]
- 2024 **Armasuisse Science & Technology (S+T) Program Grant, Federal Department of Defense, Civil Protection and Sport (DDPS)** (PI) "Quantum LiDAR for NLOS applications" 01/03/2024 - 15/11/2024 [82k CHF, ~86k EUR]
- 2023 **Armasuisse Science & Technology (S+T) Program Grant, Federal Department of Defense, Civil Protection and Sport (DDPS)** (Project Coordinator) "Pre-study on SPAD-based LiDAR Direct Time-of-flight (DToF) for occluded perception." 01/04/2023 - 31/12/2023 [35k CHF, ~37k EUR]
- 2022 **Armasuisse Science & Technology (S+T) Program Grant, Federal Department of Defense, Civil Protection and Sport (DDPS)** (PI) "DRAGONFLY - A 1 Mpx SPAD camera with real-time on-chip computation for space applications." 1/11/2022 - 31/12/2023 [131k CHF; ~140k EUR]
- 2021 **European Space Agency (ESA) FLPP ITT** (PM) "Fund New European Space Transportation Solutions (NESTS)" granted as part of a consortium led by Ariane Group.
- 2019 **Best paper award** in the mobile robotics for ground applications track at the 15th ISTVS Conference held in Prague, Czech Republic, for the paper "The effects of increasing velocity on the tractive performance of planetary rovers."
- 2018 **ESA's Networking-Partnering Initiative (NPI) Research Programme Grant** (PI) "Study, analysis and development of a high-speed locomotive system for an improved-mobility lunar prospecting rover," first ever NPI association between ESA and a non-member state university.
- 2018 **Tohoku University Graduate School of Engineering GPMech Funding Award (機械科学技術国際共同大学院プログラム)** for the promotion of international research collaborations. [600k JPY/year + international mobility expenses; ~12.5k EUR]
- 2017 **Monbukagakusho ("MEXT") Scholarship Recipient (文部科学省奨学金)** given by Ministry of Education, Culture, Sports, Science, and Technology of Japan. Embassy recommendation. [1.8M JPY/year for the whole duration of doctoral studies; ~50k EUR]
- 2016 **European Space Agency (ESA) Sponsorship** to attend the International Space University Master's in Space Studies. [16k EUR]
- 2008 **National Scholarship from the Ministry of Education, Culture and Sport of Spain.** Full payment of the first-year university tuition.

TECHNOLOGY TRANSFER / INNOVATION PROJECTS



2025 UMA | PI | Co-Funded by ESA and Sirin Orbital Systems AG as part of **"ECHO2: End-to-End Control for Handling Operations in Orbit."**



2025 UMA | Research Team Member | Funded by ESA EXPRO **"Path planning for reconfigurable rovers using multi-resolution maps."**



2022 EPFL | Project Manager | Funded by ESA [4000131315120/DILG] **"ADRIOS ClearSpace Service Phase 1B/2"** in collaboration with ClearSpace SA



2021 EPFL | Project Manager | Funded by ESA-FLPP **"NESTS: New European Space Transportation Solutions"** in collaboration with Ariane Group



2021 EPFL | Project Manager | Funded by Innosuisse [44145.1 IP-ICT] **"Capture system concept validation"** in collaboration with ClearSpace SA



2020 EPFL | Project Manager | Funded by Innosuisse [38398.1 IP-ICT] **"Relative navigation technologies for Failed Satellite Removal"** in collaboration with ClearSpace SA

SEMINARS, INVITED TALKS, AND OUTREACH

- 2026 Feb 19 Keynote speaker at the Small Satellites & Services International Forum (SSSIF 2026) "Autonomous inspection, diagnose and repair of space structures using robots."
- 2024 Sep 19 Invited speaker at the Moonshot & Off-Earth Habitats Symposium organized by Delft University of Technology (TUDelft): "No roads, no boundaries: the challenges of autonomous lunar exploration."
- 2024 Sep 17 Seminar at the University of Bern: "Exploring the extremes: from faster to quantum-driven robot navigation on the Moon." Invited by Dr. Valentin Bickel from the Center for Space & Habitability (CSH)
- 2024 May 17 Seminar at the University of Tokyo: "Robotic exploration of other planets and moons: towards faster, more capable rovers." Invited by the Space Propulsion Laboratory of Prof. Hiroyuki Koizumi.
- 2024 Mar 13 Speaker at the European Robotics Forum (ERF'24) Workshop on Pushing the Limits for Space Robotics. Organized by the euRobotics TC on Space Robotics.
- 2024 Jan 15 Seminar at the University of Zurich: "Quantum vision for extreme robotics." Invited by the Robotics Perception Group of Prof. Davide Scaramuzza.
- 2023 Jun 02 Keynote speaker at the ICRA '23 Workshop on Heterogeneous Multi-Robot Cooperation for Exploration and Science in Extreme Environments (HERMES), "Efficient exploration: exploring farther and faster," London, UK
- 2023 Apr 20 Invited speaker at the Space Resources Week: "Design of a lunar reconnaissance drone for exploration and mapping of extreme, hardly accessible locations," Luxembourg.

- 2022 Dec 15 Invited speaker at the [“Italy and Switzerland: Together in Space”](#) event organized by the Embassy of Italy in Bern
- 2022 Dec 12 Invited speaker eSpace Seminars: [“Lunar Hub: a venture to explore the extreme and the uncharted”](#)
- 2022 Nov 30 Seminar at the University of Luxembourg: “eSpace Lunar Hub: a venture to explore the extreme and the uncharted.” Invited by the SnT’s SpaceR group of Prof. Miguel A. Olivares-Mendez
- 2021 Sep 08 Invited speaker at eSpace Seminars: [“EPFL involvement in MVA Payload Project first mission to the Moon”](#)
- 2018 Jan 01 Digital speaker part of the [“50 Global Innovators”](#) track at the Space Tech Summit held in San Mateo, CA.

ORGANIZATION OF INTERNATIONAL CONFERENCES AND WORKSHOPS

- [1] [1st Workshop on Perceptual Challenges for Planetary Exploration](#), Member of the Organizing Committee, IEEE International Conference on Robotics and Automation (ICRA), June 5, 2025, Vienna, Austria.
- [2] [Workshop on Intelligent Space Robotics and Systems](#), Member of the Organizing Committee, IEEE International Conference on Robotics and Automation (ICRA), June 5, 2025, Vienna, Austria.
- [3] [2nd International Conference on Space Robotics \(iSpaRo’25\)](#), Member of the Program Committee (PC), December 1 - 4, 2025, Sendai, Japan.
- [4] [1 Doctoral Workshop on Space Robotics](#), Member of the Organizing Committee, Jun. 25 - 27, 2025, Málaga, Spain.
- [5] [Special session on Space Autonomy](#), Member of the Organizing Committee, 2024 IEEE International Conference on Automation Science and Engineering (CASE), Aug. 28 - Sep. 1, 2024, Bari, Italy.
- [6] [1st International Conference on Space Robotics \(iSpaRo’24\)](#), Conference Co-chair & Member of the Organizing Committee, July 24 - 26, 2024, Luxembourg
- [7] [2nd International HERMES Workshop: Multi-robot Sensing & Perception](#), Chair of the Organizing Committee, 2024 IEEE International Conference on Robotics and Automation (ICRA). May 13, 2024, Yokohama, Japan
- [8] [Pushing the Limits of Space Robotics Workshop](#), Member of the Organizing Committee, ERF 2024 | European Robotics Forum 2024, March 13 - 15, 2024, Rimini, Italy
- [9] [1st International Workshop on Heterogeneous Multi-Robot Cooperation for Exploration and Science in Extreme Environments \(HERMES\)](#), Chair of the Organizing Committee, IEEE International Conference on Robotics and Automation (ICRA), June 2, 2023, London, UK.

EDITORIAL BOARDS AND REVIEWER

- 2025 Associate Editor for the [2nd International Conference on Space Robotics \(iSpaRo\) 2025](#)
- 2024 Associate Editor for the [1st International Conference on Space Robotics \(iSpaRo\) 2024](#)
- 2023 Guest Editor for the Journal of Intelligent & Robotic Systems (JINT) special issue on ["Robotics for exploration and science in extreme environments"](#)

I am actively reviewing papers for the following journals and conferences: Journal of Terramechanics (since 2019), Journal of Intelligent & Robotics Systems (since 2023), IEEE Robotics & Automation Letter (RA-L, since 2025), International Journal of Intelligent Robotics and Applications (since 2025), IEEE International Conference on Robotics and Automation (ICRA, since 2024), International Society of Terrain-Vehicle Systems (ISTVS, since 2019), and International Conference on Space Robotics (iSpaRo, since 2023).

TECHNICAL COMMITTEES AND WORKING GROUPS



IEEE Robotics and Automation Society

- Member of the TC on Space Robotics since 2023
- Member of the TC on Multi-Robot Systems since 2023
- Member of the TC on Computer & Robot Vision since 2024



euRobotics Topic Groups

- Member of the TG on Space Robotics since 2023
- Member of the TG on Perception since 2023
- Member of the TG on Autonomous Navigation since 2023
- Member of the TG on Marine Robotics since 2024

STUDENT SUPERVISION

Master's Theses

- [1] Fall 2025 Ziqi Gao, "Advancing single photon perception for orbital robotics," co-supervised by Dr. Andrew Price and Dr. Mathieu Salzmann (EPFL's Computer Vision Lab).
- [2] Spring 2024 Noah Lugon-Moulin, "In-Situ Slip Estimation for Improved Lunar Rover Localization," co-supervised by Prof. Jean-Paul Kneib (EPFL Space Center), Arno Rogg (NASA Ames) and Terry Fong (NASA Ames).
- [3] Spring 2023 Iacopo Sprenger (*now Embedded Android Engineer at Almer Technologies*), "Realtime on-chip computing for space applications," co-supervised by Prof. Andrea Guerrieri and Prof. Theo Kluter (Processor Architecture Lab, EPFL)
- [4] Spring 2023 Thomas Manteaux (*now System Engineer at ONWARD*), "Path planning for lunar rovers: An Artificial Potential Field-based algorithm for the path planning of a walking lunar rover," co-supervised with Prof. Raj Thilak Rajan (SensorAI Lab, Delft University of Technology)

- [5] Fall 2022 Romeo Tonasso (*now Space System Engineer at OHB*), "Feasibility analysis & preliminary design of a Lunar Reconnaissance Drone Service Station," co-supervised with Prof. Jean-Paul Kneib, Prof. Colin Jones, and invited Prof. Hiroyuki Koizumi (Space Propulsion Laboratory, University of Tokyo)
- [6] Spring 2022 Vincent Pozsgay (*now Space Propulsion Engineer at Exotrail*), "[Feasibility analysis and preliminary design of a Lunar Reconnaissance Drone.](#)" co-supervised with Prof. Jean-Paul Kneib, Prof. Colin Jones, and invited Prof. Hiroyuki Koizumi (Space Propulsion Laboratory, University of Tokyo)
- [7] Fall 2019 Kazuki Nakagoshi, "Testbed development for high-speed single-wheel performance testing on uneven terrains," co-supervised with Prof. Kazuya Yoshida (Space Robotics Lab, Tohoku University)
- [8] Fall 2019 Takato Kawada, "High-level strategies for high-speed lunar navigation," co-supervised with Prof. Kazuya Yoshida (Space Robotics Lab, Tohoku University)

Master's Semester Projects

- [1] Spring 2024 Joachim Despature, "Camera egomotion estimation under complex visual fields," Semester Project at EPFL AQUA Lab
- [2] Spring 2024 Marie Ethvignot, "Peering behind dust storms on Mars with single photon cameras," Semester Project at EPFL AQUA Lab
- [3] Spring 2024 Sylvain Beuret, "Monocular visual inertial odometry of a fast-moving planetary rover," Semester Project at EPFL AQUA Lab
- [4] Spring 2024 Tom Rathjens, "Single-photon camera integration on a 2-wheel self-balancing mobile robot," Minor in Space Technologies Project at EPFL AQUA Lab
- [5] Spring 2024 Théodore Allegre, "Single-photon camera integration with Single Board Computer," Semester Project at EPFL AQUA Lab
- [6] Spring 2024 Nathan Benavides, "Learning agile navigation across lunar-like environments with a 2-wheel self-balancing robot," Minor in Space Technologies Project at EPFL AQUA Lab
- [7] Spring 2024 Matthias Kockisch, "Single-photon imaging simulator in NVIDIA Omniverse," Semester project at EPFL AQUA Lab
- [8] Fall 2022 Daniel Tataru (*now Simulation Engineer at Dufour Aerospace*), "Control of the Lunar Reconnaissance Drone flight profile in Gazebo," Semester Project at EPFL Space Center (eSpace)
- [9] Fall 2022 Hippolyte Rauch, "Simulation of the Lunar Reconnaissance Drone flight profile in Gazebo," Semester Project at EPFL Space Center (eSpace)
- [10] Fall 2022 Koki Kimura, "Rover locomotion subsystem design for fast extraterrestrial mobility," Semester Project at EPFL Space Center (eSpace)

- [11] Fall 2022 Robin Bonny (*now PhD in Space Research & Physics at the University of Bern*), "Development of the on-board computer for a lunar payload," Semester Project at EPFL Space Center (eSpace) co-supervised with Minglo Wu and Prof. Edoardo Charbon (EPFL AQUA - Advanced Quantum Architecture Laboratory)
- [12] Spring 2022 Julien Moreau, "[Mechanical design of the optical unit and structural subsystem for a lunar camera](#)," Semester Project at EPFL Space Center (eSpace)
- [13] Spring 2022 Arion Zimmermann, "[Space Localisation](#)," Semester Project at EPFL Space Center (eSpace) co-supervised with Sitian Li and Prof. Andreas Peter Burg (EPFL TCL - Telecommunications Circuits Laboratory)
- [14] Fall 2021 Clément Vincent (*now Mechanical Design Engineer at Flyability*), "Lunar Payload Design : Definition of a lunar camera payload system architecture," Semester Project at EPFL Space Center (eSpace)
- [15] Fall 2021 Vincent Dor (*now Test Engineer at Space Research & Planetary Sciences, University of Bern*), "[EL3 Polar Explorer: Radio Antenna Payload Pre-phase A Study](#)," Minor in Space Technologies Project at EPFL Space Center (eSpace)
- [16] Fall 2021 Erik Uythoven (*now Mechanical Engineer at APCO*), "[Preliminary design of a lunar reconnaissance drone](#)," Semester Project at EPFL Space Center (eSpace)
- [17] Fall 2021 Thomas Pfeiffer (*now Engineer at Airbus D&S*), "[Preliminary design of a lunar reconnaissance drone](#)," Semester Project at EPFL Space Center (eSpace)
- [18] Spring 2021 Aurelien Balice-Debbas (*now Data Scientist at Cartier*), "GrowBotHub: Organization & Systems Engineering," Semester Project at EPFL Space Center (eSpace)
- [19] Spring 2021 Thomas Manteaux (*now System Engineer at ONWARD*), "Critical analysis of the Systems Engineering approach for a short-term space project," Semester Project at EPFL Space Center (eSpace)
- [20] Spring 2021 Dimitri Hollosi (*now Project Manager at KSAT*), "System Engineering of a Small Radio Telescope," Minor in Space Technologies Project at EPFL Space Center (eSpace)
- [21] Spring 2021 Hadrien Sprumont (*now Robotics Research Engineer at Soft Kinetic Group*), "[Polar rover mission: Preliminary concept study](#)," Semester Project at EPFL Space Center (eSpace)

Exchange Students

- Spring 2025 Giovanni Mastroiocco (Master student at Politecnico di Bari) "Thermal-based SLAM," co-supervised by Prof. Carlos Pérez del Pulgar at University of Málaga.
- Spring 2025 Giacomo Franchini (PhD student at Politecnico di Torino), "RGB-D-T imaging for localization in underground environments," co-supervised by Prof. Carlos Pérez del Pulgar at University of Málaga.

Fall 2019 Alan Allart (*now Aerospace Guidance & Control Engineer at ArianeGroup*), "Development of Embedded Systems for a High-Speed Lunar Exploration Rover Prototype," co-supervised by Prof. Kazuya Yoshida at Tohoku University

Interns

Spring 2026 Juan De Dios Alfaro López (Master student in Mechatronics Engineering) "4D reconstruction of orbital components for autonomous inspection," University of Málaga.

Spring 2026 Arturo Ríos Pérez (Bachelor student in Robotics) "Orbital inspection ground testbench design," Universidad de Málaga

Spring 2026 Alfonso Martínez Petersen (Bachelor student in Industrial Engineering) "Feature identification in unconventional images," University of Málaga.

Spring 2025 Juan Trave Medina (Bachelor student in Computer Science) "SPAD-based 6D pose estimation in orbit," University of Málaga.

Spring 2025 Elías Saez (Master student in Robotics), "Dexterous manipulation without markers," University of Málaga.

MEDIA COVERAGE

- [1] [*"Málaga hub: el laboratorio de robótica espacial de la UMA."*](#) Canal Málaga, 12/Junio/2025 [TV show]
- [2] [*"La UMA logra cinco ayudas 'Beatriz Galindo' para fichar a nuevos investigadores."*](#) Málaga Hoy (Europa Press), 17/Junio/2024 [article]
- [3] [*"A leading expert in space robotics tests a lunar rover in the Tottori Sand Dunes."*](#) (Original title: 宇宙ロボット工学の第一人者 鳥取砂丘で月面探査車の走行実験) NHK News Web, 14/Nov/2023 [article, in Japanese]
- [4] [*"Students design lunar water-prospecting missions for the Concurrent Engineering Challenge 2022!"*](#) European Space Agency (ESA) Academy, 23/May/2022 [article]
- [5] [*"Ocho españoles investigarán en Japón desastres, alimentación y robótica."*](#) La Vanguardia, 30/03/2017 [newspaper article]



LICENSES AND CERTIFICATIONS



Concurrent Design Study Facilitator
ESA Concurrent Engineering Challenge 2021



Agile Project Management Foundation Certification
APMG International, Oct 2021, Credential ID: 09795868-01-LBYK



STK Certified Foundation Certification
Ansys [previously Analytical Graphics Inc (AGI)], Nov 2015

OPEN SCIENCE CONTRIBUTIONS

Software

The following repositories have been made openly available under MIT license.

- [1] Explorer 1 (EX1) rover source code and design files [2020]
 - *High-level control software*
 - *NavMast control software*
 - *Low-level control software*
 - *Design files*



Datasets

- [1] SPICE-HL3 Single-Photon, Inertial, and Stereo Camera dataset for Exploration of High-Latitude Lunar Landscapes, [URL](#) [2025]

PUBLICATIONS

Phd Thesis

- [1] **Rodríguez-Martínez, D.**, *High-Speed Lunar Exploration: Design and Evaluation of Wheeled Locomotion System for a Fast-Moving Rover*, Tohoku University, ID No. B7TD9113. Advisor: Prof. Kazuya Yoshida; Co-Advisor: Michel Van Winnendael (ESA/ESTEC); Reviewers: Prof. Yasuhida Hirata and Prof. Hiroshi Takahashi; July 15, 2020.

Journals

- [2] **Rodríguez-Martínez, D.**, Yoshida, K., *High-speed lunar rovers*. ROOM: The Space Journal, 2(12), 54-56, 2017.
- [3] **Rodríguez-Martínez, D.**, Van Winnendael, M., Yoshida, K., *High-speed mobility in planetary surfaces: a technical review*. Journal of Field Robotics, 36(8), 1436-1455, 2019.
- [4] **Rodríguez-Martínez, D.**, Uno, K., Sawa, K., Uda, M., Kudo, G., Hernan Diaz, G., Umemura, A., Santra, S., Yoshida, K., *Enabling Faster Locomotion of Planetary Rovers with a Mechanically-Hybrid Suspension*. IEEE Robotics and Automation Letters (RA-L), 9(1), 619-626, Jan 2024 (also presented at ICRA 2024)
- [5] Romeo, T., Tataru, D., Rauch, H., Pozsgay, V., Pfeiffer, T., Uythoven, E., **Rodríguez-Martínez, D.**, *A lunar reconnaissance drone for cooperative exploration and high-resolution mapping of extreme locations*, Acta Astronautica, 218, 1-17, May 2024.
- [6] **Rodríguez-Martínez, D.**, van der Meer, D., Song, J., Bera, A., Pérez-del-Pulgar, C.J., Olivares-Mendez, M.A., *SPICE-HL3: Single-Photon, Inertial, and Stereo Camera dataset for Exploration of High-Latitude Lunar Landscapes*. Sci Data (2026)

Conferences

- [7] Illiffe, P., Kaethler, S., Xu, E., Jonathan, S., **Rodríguez-Martínez, D.**, Jones, W., Christensen, J., Rocha de Oliveira, M., King, A., Vikner, M., Punch, O., Bartos, A., Chagas, M., Russitano Lanza, M., Shanthini, K.,

Medepalli, A., Kaspar, K., Hedima, R., Ochanda, N., Zhang, W., *Planetary protection and the search for life on the icy moons of the Solar System: A technology roadmap*. 67th IAC, Guadalajara, Mexico, 2016.

- [8] **Rodríguez-Martínez, D.**, Buse, F., Van Winnendael, M., Yoshida, K., *The effects of increasing velocity on the tractive performance of planetary rovers (best conference paper award)*. 15th ISTVS Conference, Prague, Czech Republic, 2019.
- [9] Nakagoshi, K., **Rodríguez-Martínez, D.**, Yoshida, K., *A new single-wheel test bed for fast-moving planetary robots*. Aerospace Europe Conference, Bordeaux, France, 2020.
- [10] Pfeiffer, T., Uythoven, K., **Rodríguez-Martínez, D.**, Koizumi, H., Kneib, J-P., *Feasibility study and preliminary design of a lunar reconnaissance drone*. Lunar Surface Innovation Consortium (LSIC) Spring Meeting, Laurel, MD, 2022. (virtual)
- [11] Pozsgay, V., **Rodríguez-Martínez, D.**, Kneib, J-P., *A lunar reconnaissance drone mission concept for mapping and characterizing polar regions*. Lunar Polar Volatiles Conference (LPVC) Boulder, CO, 2022. (virtual)
- [12] **Rodríguez-Martínez, D.**, Pfeiffer, T., Uythoven, E., Pozsgay, V., Tonasso, R., David, E., Kneib, J-P., *Design of a lunar reconnaissance drone for exploration and mapping of extreme, hardly accessible locations*. Space Resources Week, Luxembourg, 2023.
- [13] Sawa, K., Uno, K., Kudo, G., Yoshida, K., **Rodríguez-Martínez, D.**, *Development and experimental evaluation of a suspension mechanism for a high-speed lunar rover*, The Robotics and Mechatronics Conference (ROBOMECH), Nagoya, Japan, 2023.
- [14] Guerrieri, A., **Rodríguez-Martínez, D.**, Charbon, E., *A Dynamically Reconfigurable Single Board Computer for High-Dynamic Range Space Cameras*, IEEE International Conference on Space Mission Challenges for Information Technology (SMC-IT), Mountain View, CA, 2024.
- [15] Manteaux, T., **Rodríguez-Martínez, D.**, Thilak Rajan, R., *RAPF: Efficient path planning for lunar microrovers*, 1st International Space Robotics Conference (iSpaRo), Luxembourg, 2024.
- [16] Pérez del Pulgar, C. and **Rodríguez-Martínez, D.**, *The role of robotics in planetary exploration, contributions from the University of Málaga*, Europlanet Science Congress - Division for Planetary Sciences Joint Meeting (EPSC-DPS 2025), Helsinki, Finland, 2025
- [17] Pérez del Pulgar, C. and **Rodríguez-Martínez, D.**, *The role of robotics in planetary exploration, contributions from the University of Málaga*, VIII Congreso de Ciencias Planetarias (CPES-8), Málaga, Spain, 2025
- [18] **Rodríguez-Martínez, D.** and Pérez del Pulgar, C., *Fast vision in the dark: a case for single-photon imaging in planetary navigation*, 18th Symposium on Advanced Space Technologies in Robotics and Automation (ASTRA), Leiden, Netherlands, 2025.

Technical Reports

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