

## Roberto Aguilar

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### Education

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#### **2022—2027 (expected) PhD Planetary Sciences - Lunar and Planetary Lab, University of Arizona**

- Research direction: retrieving subsurface properties of [debris-covered glaciers on Earth and Mars](#)
- MRO SHARAD Team Member producing and delivering clutter simulations to the NASA PDS
- Leading the development of a drone-based radar sounder with application on planetary analogs
- GPA: 4.0 (course requirements and comprehensive exam completed)

#### **2018—2020 MSc Space Systems and Engineering - Skoltech (Summa cum laude)**

#### **(concurrently) MSc Traffic Control Systems and Navigation - Moscow Inst. of Physics and Tech.**

- Thesis topic: Deep-learning-based lake ice detection using ESA Sentinel-1 SAR data
  - Visiting student at the Photogrammetry and Remote Sensing lab, **ETH Zurich**
- Internship at WiseTechnique: developed an automated landing guidance system for small aircraft using Computer Vision

#### **2011—2015 BSc Computer Science - University of Costa Rica**

- T.A.: Operating systems and Compilers & Automata lectures
- Founding member of the Aerospace Engineering Group of the university (rocketry club)

### Professional experience

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#### **September 2017—May 2022 Aerialytics SRL [www.aerialytics.ai](http://www.aerialytics.ai)**

Co-founder / GIS Specialist

- Led geospatial projects on extensive agricultural fields, including mapping, inventorying, and monitoring using drone photogrammetry, multispectral satellite imagery, and AI platforms.
- Integrated drone mapping with spraying drones (DJI Agras and Hylio) for precision operations in extensive agricultural fields, optimizing application time and reducing water usage.
- Mentored four interns (two undergraduate and two technical high school students) in field visits for drone surveys and data processing with Agisoft and QGIS
- Awarded 1st place in the acceleration program *Programa de Innovación Tecnológica (PITs) 2020* from the University of Costa Rica with the project [Suelo Fertil](#)

#### **June 2015—September 2017. Hewlett Packard Enterprise (R&D Center)**

Embedded Software Engineer II / Scrum Master

- Developed a low-level feature for the Aruba Networking Operating System in C/C++
- Participated in different testing phases of the application: unit, integration, and system
- Received an *excellent* evaluation in the annual review for 2 years consecutively

#### **August 2015—December 2015. University of Costa Rica**

Lecturer (course: Information Systems Design)

#### **October 2010—December 2010. Ad Astra Rocket Company**

Electronics Technician (High school internship)

### Funding sources

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**2024—2027** NASA FINESST (Planetary Sciences) “Searching for the oldest mid-latitude ice on Mars”

### Awards

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**April 2025** College of Science Galileo Circle Scholarship

**March 2025** LPL nominee for the College of Science Graduate Student Scholarship Award

**June 2018** Skoltech President Scholarship

**March 2018** 1st place in the workshop *International Space Exploration Forum 2* organized by JAXA

### Awards & Travel Grants

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**August 2024** Best of SAGEEP + travel grant provided by HydroGEOPHYSICS (\$1,500)

**May 2024** Mars Student Travel Award by the Mars Science Office at JPL (\$1,500)

**March 2024** Lunar and Planetary Lab Curson Travel Award (\$1,000)

**February 2024** Graduate Professional and Student Council Travel Award (\$1,000)

## Fieldwork experience

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Sourdough Rock Glacier, AK (2023). Galena Creek Rock Glacier, WY (2022, 2023, 2024). Steindalsbreen Glacier, Norway (2023). Juneau Icefield, AK (2024). Channeled Scablands, WA (2024).

## Scientific Publications [Google Scholar](#)

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- T.M. Meng, B.S. Tober, **R. Aguilar**, M.F. Daniel, R.A. Jacobo-Bojorquez, S. Nerozzi, J. W. Holt. *Effects of rock glacier dynamics on surface morphology and deformation*. JGR Earth Surface 2025
- T.M. Meng, **R. Aguilar**, M.S. Christoffersen, E.I. Petersen, C.F. Larsen, J.S. Levy, and J.W. Holt. *Photogrammetric Monitoring of Rock Glacier Motion Using High-Resolution Cross-Platform Datasets: Formation Age Estimation and Modern Thinning Rates*. Remote Sensing, 2023.
- **R. Aguilar\***, M. Tom\*, P. Imhof, S. Leinss, E. Baltasvias, K. Schindler, *Lake Ice Detection from Sentinel-1 SAR with Deep Learning*, ISPRS Annals 2020: [GitHub](#). \* Equal contribution.
- V. Mosin, **R. Aguilar**, A. Platonov, A. Vasiliev, A. Kedrov, A. Ivanov, *Remote Sensing and Machine Learning for Tree Detection and Classification in Forestry Applications*. ERS19 SPIE Remote Sensing, Strasbourg, France, 2019 [GitHub](#)

## Conference Abstracts (listing only abstracts as first-author)

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- **R. Aguilar**, T. M. Meng, M. S. Christoffersen, S. Nerozzi, J. W. Holt. Revealing Ice Age Sequences in Mars-Analog Glaciers with Drone-Based Sounding Radar and Photogrammetry. LPSC 2025, #1693
- **R. Aguilar**, T. M. Meng, M. S. Christoffersen, S. Nerozzi, J. W. Holt. Subsurface Investigations of Debris-Covered Glaciers as Mars Analogs with Drone-Based Ground Penetrating Radar. EPSC 2024.
- **R. Aguilar**, S. Nerozzi, M.S. Christoffersen, and J.W. Holt. New insights on internal layering of Martian mid-latitude glaciers with SHARAD, Mars Polar 2024, #6064
- **R. Aguilar**, T. M. Meng, M. S. Christoffersen, S. Nerozzi, J. W. Holt. Retrieving Subsurface Properties of Mars-analog Glaciers with Drone-based GPR. Proceedings of the Symposium for the Application of Geophysics for Environmental and Engineering Problems, SAGEEP 2024.
- **R. Aguilar**, S. Nerozzi, M.S. Christoffersen, E. Quartini, and J.W. Holt. Investigating Englacial Debris Bands on Mars with SHARAD, Using High Resolution Clutter Simulations and Slope Resolvability Analysis, LPSC 2024, #2479

## Public Outreach

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- Science outreach on space exploration for elementary and high school students in Costa Rica and Tucson (Spanish and English). Topics: operating planetary missions (landers, rovers, drones, orbiters), future robotic and human missions, habitability, resource utilization.
- Completed the LPI Planetary ReaCH workshop (outreach at the Boys & Girls Club of Tucson)

## Press Releases

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- One Costa Ricans Path to Success in the Space Industry and Startup [thecostaricanews.com](http://thecostaricanews.com)
- The story of Roberto Aguilar [crhoy.com](http://crhoy.com)
- Rocketry club University of Costa Rica [yinv.ucr.ac.cr](http://yinv.ucr.ac.cr)

## Voluntary work

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**2024 - 2025** National Museum of Costa Rica. Advisor on ground penetrating radar (GPR) and drone photogrammetry data analysis for geo-archaeology in pre-Columbian sites

**2016 – 2018** National Point of Contact, Space Generation Advisory Council

**2015 - 2016** Mentor of robotics at Intel ClubHouse (Cedes Don Bosco High School)

**2010 – 2017** Member of the Central American Association of Aeronautics and Space

## Languages

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English (Professional Proficiency), Spanish (Native language), Russian (Intermediate), French (Basic)

## Hobbies

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Hiking, biking (actively riding on The Tucson Loop), diving (PADI Open Water)