

Roberto Aguilar

Address: Lunar and Planetary Laboratory, University of Arizona, Tucson, AZ. roberto@lpl.arizona.edu

Education

2022—2027 (expected) Ph.D. 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
- GPA: 4.0 (course requirements completed)

2018—2020 M.Sc Space Systems and Engineering - Skoltech (Summa cum laude)

(concurrently) M.Sc 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 a real-time runway detection and distance-to-landing calculation system for small aircraft using deep learning and computer vision (Yolo & OpenCV)

2011—2015 B.Sc: 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

September 2017—May 2022 Aerialytics SRL www.aerialytics.ai

Co-founder / GIS Specialist

- Managed projects on extensive agricultural fields including mapping, inventorying, and monitoring using drone photogrammetry, multispectral satellite imagery, and AI platforms.
- Awarded 1st place (\$10,000) in the acceleration program *Programa de Innovación Tecnológica (PITs)* in July 2020 from 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)

Fieldwork experience

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).

Funding sources

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

Awards & Travel Grants

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)

June 2018 Skoltech President Scholarship for scientific achievements (\$500)

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

Training & Certifications

September 2023	University of Bergen Summer school on cryospheric monitoring and palaeoenvironmental reconstructions
April 2022	INCAE Business School Costa Rica Executive Program for small and medium businesses (SME) acceleration
July 2018	Bauman Moscow State Technical University Intl. Summer Space School on Space Development: Theory & Practice Space DTP
September 2016	TRIPOLI Rocketry Association Level 1 and 2 certifications for High Power Rockets in the Black Rock Desert, NV
May 2016	Korea Aerospace Research Institute KARI International Space Training (Approach: Earth Observation satellite systems)

Peer-reviewed Scientific Publications and Conference Abstracts [Google Scholar](#)

- **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**, 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
- 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 15, no. 19 (January 2023).
- M. Tom*, **R. Aguilar***, P. Imhof, S. Leinss, E. Baltsavias, 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, September 2019 [GitHub](#)

Public Outreach

- Virtual presentation for elementary and high school students in Costa Rica on solar system topics
- Science outreach in Elementary Schools in Tucson via CommunityShare

Press Releases

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

Voluntary work

- 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
 - [Ditsö](#): prototyped an embedded system of a nanolab for proposed experiment in the ISS
 - [Daedalus](#): organized atmospheric balloon launches for promoting space projects in Costa Rica [video](#)

Languages

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

Hobbies

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