



# Mario Alexander Sucerquia Areiza

## Curriculum Vitae

### Personal Information

Name Mario Alexander Sucerquia Areiza  
Date of Birth April 22, 1983  
Nationality Colombian  
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h-index 11 (Google Scholar, April 2025)  
Professional Affiliation Institut de Planétologie et d'Astrophysique de Grenoble (IPAG), Université Grenoble Alpes, Grenoble (UGA), France

### Professional Profile

Astrophysicist specialised in planetary dynamics, exomoons, and ring systems. Experienced in high-performance N-body simulations (e.g., REBOUND), photometric modeling, and orbital evolution in multi-body systems. Skilled communicator and educator with international teaching and research experience. Passionate about bridging theory, simulation, and observation to understand planetary system architecture.

### Education

- 2019 **Ph.D. in Physics**, *Universidad de Antioquia*, Medellín, Colombia.  
Thesis: *Adventures in Pandora's Land: Evolution, behavior and detection of moons and rings around close-in exoplanets.*  
Advisor: Prof. Jorge I. Zuluaga
- 2016 **M.Sc. in Physics**, *Universidad de Antioquia*, Medellín, Colombia.  
Advisor: Prof. Jorge I. Zuluaga

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2012 **B.Sc. in Physics**, *Universidad de Antioquia*, Medellín, Colombia.  
Advisor: Prof. Jorge I. Zuluaga

## Experience

### Postdoctoral Positions

- 2024–2027 **Postdoctoral Researcher**, *European Research Council (ERC), Stellar-MADE project, Université Grenoble Alpes*, Grenoble, France.
- 2021–2024 **Postdoctoral Fellowship**, *FONDECYT Fellow, Universidad Adolfo Ibáñez*, Viña del Mar, Chile.
- 2019–2021 **Postdoctoral Researcher**, *Iniciativa Científica Milenio (‘ICM’) via Millennium Nucleus for Planetary Formation, Universidad de Valparaíso*, Valparaíso, Chile.

### Teaching Experience

- 2019–2023 **Adjunct Faculty**, *Universidad de Valparaíso*, Valparaíso, Chile.  
Lecturer in astronomy at undergraduate and graduate level. Courses taught:
- Young Stellar Encounters (MSc/PhD level)
  - Thesis co-supervisor: Constanza Magdalena Ureta Sandoval  
*Dynamic characterization of detached moons in the neighboring regions of close-in exoplanets: Kepler-1625b I*
- 2012–2023 **Adjunct Faculty**, *Universidad de Antioquia*, Medellín, Colombia.  
Taught courses in physics, computing and planetary sciences. Courses include:
- Classical Mechanics, Algorithms and Programming, Biophysics Lab
  - Planetary Science, Python for Economics, Field Physics
  - Thesis supervisor: Ana María Agudelo  
*Capturing an Atmosphere – Could rocky planets around mature stars retain primordial volatiles?*
- 2012–2019 **High School Teacher**, *Instituto Musical Diego Echavarría*, Medellín, Colombia.  
Physics and mathematics instruction for grades 9–11.

## Complementary Formation

- 2023 Diploma in 4.0 Technologies, *Universidad de Antioquia*, Colombia.
- 2014 II La Serena School of Data Science, *La Serena*, Chile.

## Refereed Publications

Total: 21 peer-reviewed publications (9 as first author, 4 as second author).

### First-author Publications

- 2025 Volatile enrichment in low-mass planets: Signatures of past planetary disruption?. Accepted to *A&A*.

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- 2025 Extreme exomoons in WASP-49 Ab: dynamics and detectability. *A&A*, 694, L8.
- 2024 The missing rings around Solar System moons. *A&A*, A74.
- 2024 Alpha Centauri: Disc Dynamics, Planet Stability & Detectability. *Universe*, 10 (2), 64.
- 2022 Cronomoons: origin, dynamics, and light-curve features of ringed exomoons. *MNRAS*, 512 (1), 1032–1044.
- 2020 Scattered light may reveal the existence of ringed exoplanets. *MNRAS*.
- 2020 Can close-in giant exoplanets preserve detectable moons? *MNRAS*, 492 (3), 3499–3508.
- 2019 Ploonets: formation, evolution, and detectability of tidally detached exomoons. *MNRAS*, 489 (2), 2313–2322.
- 2017 Anomalous light curves of young tilted exorings. *MNRAS Letters*, 472 (1), L120–L124.

## Second-author Publications

- 2025 Orbital Decay of the Shortest-Period Hot Jupiter, TOI-2109b: Tidal Constraints and Transit-Timing Analysis. Accepted to *ApJ*.
- 2022 The bright side of the light curve: A general photometric model of non-transiting exorings. *Astronomy and Computing*, 40, 100623.
- 2021 The impact of tidal friction evolution on the orbital decay of ultra-short period planets. *MNRAS*, 506 (2), 2247–2259.
- 2018 Towards a theoretical determination of the geographical probability distribution of meteoroid impacts on Earth. *MNRAS*, 1970–1983.

## Co-authored Publications

- 2025 Ionized envelopes and shock structure around accreting planets. Accepted to *ApJ*.
- 2025 A general polarimetric model for transiting and non-transiting ringed exoplanets. *A&A*.
- 2020 Dust trapping around Lagrangian points in protoplanetary disks. *A&A*, 642, A224.
- 2019 Can we predict the impact conditions of metre-sized meteoroids? *MNRAS Letters*, 486 (1), 69–73.
- 2018 A General Method for Assessing the Origin of Interstellar Small Bodies: The Case of 1I/2017 U1 ('Oumuamua). *The Astronomical Journal*, 155 (6), 236–251.
- 2017 The effect of close-in giant planets' evolution on tidal-induced migration of exomoons. *MNRAS*, 471 (3), 3019–3027.
- 2016 Spin-orbit evolution of the GJ 667C system: the effect of composition and other planets' perturbations. *MNRAS*, 463 (2), 1592–1604.
- 2015 A Novel Method for Identifying Exoplanetary Rings. *ApJ Letters*, 803, L14.

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## Submitted Manuscripts

- 2024 Circumbinary planets in triple stellar systems: I. Dynamics and orbital stability. Submitted to *A&A*.
- 2025 Two warm Earth-sized exoplanets and an Earth-sized candidate in the M5V–M6V binary system TOI-2267. Submitted to *A&A*.

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## Observing proposals

- 2024 **Co-investigator**, *First glimpse into the obliquity of M-dwarf hot Jupiter systems*, Submitted.
- 2023 **Co-investigator**, *High-resolution spectroscopic follow-up of periodic outbursting YSOs*, Accepted.

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## Peer Review Contributions

### Journal Reviewer

Icarus (since 2025)

Astronomy & Astrophysics (since 2020)

Monthly Notices of the Royal Astronomical Society Letters

The Planetary Science Journal

Journal of Geophysical Research

Universe

### Project Evaluator

- 2025 **Evaluator**, *FONDECYT Iniciación Project (ANID)*., Chile..  
FONDECYT – Chile (Regular & Iniciación, 2022, 2023, 2024, 2025)  
MINCIENCIAS – Colombia (CTeI del SGR, Misión de Sabios 2019)  
Escuela Politécnica Nacional – Ecuador (PIIT-12)

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## Reviewer in Evaluation Committees

- 2025 **Thesis Evaluation Committee - Undergraduate**, *Impact of Jupiter-like Rogue Planets on Circumstellar Disks.*, Universidad Técnica Federico Santa María, CHILE. Academic program: Astronomy., Student: Patricio Yessin Andrés Messen Fuentes. Type of work: Undergraduate thesis.

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## Conferences and Workshops

### Invited Talks and Organising Committee

- 2025 XIV Friend of Friend Meeting, Córdoba, Argentina – Invited Talk.
- 2025 III Stellar–MADE Winter Meeting, Villard-de-Lans, France – LOC + Talk.
- 2020 X Taller de Ciencias Planetarias, Punta del Este, Uruguay – Plenary Talk and Poster.

### Contributed Talks and Posters

- 2024 XII Taller de Ciencias Planetarias, Rio de Janeiro, Brazil – Talk.  
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- 2024 I FARGO Workshop, Santiago de Chile – Talk.
- 2022 XI Taller de Ciencias Planetarias, San Juan, Argentina – Talk.
- 2018 Workshop Diversis Mundi, Santiago de Chile – Two Posters.
- 2016 IAU Latin America Regional Meeting, Cartagena – Poster and Talk.
- 2012 II Congreso Internacional de Astrobiología, Medellín – Talk.

### Participant – Schools and Training

- 2015 37th ISYA, Tegucigalpa, Honduras.
- 2013 PASI, Universidad del Valle, Guatemala.
- 2009 V Escuela Colombiana de Astrofísica, Bogotá.
- 2005 IV Simposio Internacional de Astrofísica Computacional, UIS, Colombia.

### Awards and Distinctions

- 2019 **Magna Cum Laude** distinction for doctoral thesis, Universidad de Antioquia.
- 2016 **Honourable Mention: Sobresaliente** for Master's research, Universidad de Antioquia.
- 2014 **Graduate Scholarship – Estudiante Instructor**, Universidad de Antioquia. Awarded for academic excellence and teaching assistance.

### Computer Skills

|                  |                                             |
|------------------|---------------------------------------------|
| Languages        | Python, C/C++, Java, IDL/GDL, Matlab/Octave |
| Scientific tools | REBOUND, PHANTOM, IRAF, Matplotlib, LaTeX   |
| Data & ML        | PySpark, Scikit-learn                       |
| Hardware/IoT     | Arduino (IoT)                               |
| Platforms        | Linux, Microsoft Office/OpenOffice          |
| Other tools      | Blockchain (conceptual level)               |

### Books

- 2021 Manual Inclusivo para la Enseñanza de la Formación Planetaria - Coauthor.
- 2023 20 tazas de astronomía planetaria - Coauthor (Ed. Catalonia. In press).

### Radio

- 2021 Podcast "Astrocafé" para el programa "Café Negro de la Radio Valentín Letelier". Valparaíso

### Recent Outreach Talks

- 2024 Mimas, un océano secreto. Planetario de Medellín, Colombia.
- 2022 Ploonets, Chronomoons, and Other Astro -'pata -physical Solutions. IPAG, France, Colombia, Chile

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- 2022 Chronomoons: Satellites with Rings? Parque Explora, Colombia.
- 2022 The Right to Darkness. Astronomy Day, Chile.
- 2021 And When is the Ring? Colombia.
- 2021 Adventures in Pandora's Kingdom, University of Valparaíso, Chile.
- 2020 What Do Exoplanets with Rings and Cheshire, the Cat from Alice in Wonderland, Have in Common? Colombia.
- 2020 NEAs: The Good, The Bad, and The Susanoo. Asteroid Day, Chile.
- 2020 Are We Like Them? Chile.
- 2020 Ploonets: When Moons Become Wanderers, *Astrochela*. Chile
- 2019 S-Exoplanets. University of Antioquia.

## Languages

|         |                       |                             |
|---------|-----------------------|-----------------------------|
| Spanish | <b>Native</b>         |                             |
| English | <b>Fluent (B2–C1)</b> | <i>Conferences, writing</i> |
| Italian | <b>Intermediate</b>   | <i>Conversational</i>       |
| French  | <b>Basic</b>          | <i>Currently learning</i>   |

## References

### Prof. Matías Montesinos

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 Universidad Técnica Federico Santa María  
 Santiago de Chile, Chile  
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### Prof. Nicolás Cuello

Professor, Institut de Planétologie et  
 d'Astrophysique  
 Université Grenoble Alpes  
 Saint-Martin-d'Hères, France  
[nicolas.cuello@univ-grenoble-alpes.fr](mailto:nicolas.cuello@univ-grenoble-alpes.fr)

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