# Elvis Aguero

*MSc. in Applied Mathematics*

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## Education

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| 2024- | **PhD, Fluids and Thermal Sciences**, *Brown University*, Providence, RI. |
| 2020-2024 | **B.Sc., Engineering Physics**, *Universidade Federal da integração Latino-Americana (UNILA)*, Foz do Iguaçu, Brazil. GPA: 3.8/4.0. Summa cum Laude. |
| 2017–2019 | **M. Sc., Applied Maths**, *Instituto de Matemática Pura e Aplicada*, Rio de Janeiro, Brazil. GPA: 3.6/4.0. Advisor: André Nachbin |

## Scientific Work

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| 2022 | E. A. Aguero, L. Alventosa, D. M. Harris, and C. A. Galeano-Rios. **Impact of a rigid sphere onto an elastic membrane**, *Proceedings of the Royal Society A*, https://doi.org/10.1098/rspa.2022.0340 . |

## Experience

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| 2017-2024 | **Olympiad Organizer and Trainer**, *OMAPA*, Asunción, Paraguay (Remote). |
| | ○ Author of more than 200 math problems for the Paraguayan National Math Olympiad, as well as international math competitions. |
| | ○ Instructor for the Young Talents Program, where the best students from the National Olympiad receive mathematical and scientific training for international competitions. |
| 2024 | **Summer Intern**, *CERN*, Geneva, Switzerland ⚲. |
| | ○ Worked in the department of software for experimental physics at CERN (EP-SFT), where we used Julia to leverage open-source, large-scale workflows to enable postprocessing to run at scale. |
| 2023 | **Scanning Electron Microscope Lab Assistant**, *UNILA*, Foz do Iguaçu, Brazil ⚲. |
| | ○ Provided administrative assistance and prepared samples for material characterization for the Scanning Electron Microscope under the guidance of Prof. Rodrigo Basso |
| 2020-2023 | **Academic Consultant**, *Piensa Paraguay*, Ciudad del Este, Paraguay ⚲. |
| | ○ Designed the math curriculum and devised the structure and maintenance of a database with more than 1000 math problems in MongoDB. Piensa is a local startup which offers math, robotics and programming courses for students aged $7 - 17$. |
| 2019 | **Project Intern**, *Parque Tecnológico Itaipu*, Hernandarias, Paraguay ⚲. |
| | ○ Implemented a support vector machine algorithm in MATLAB for classification of faulty high-voltage circuit breakers. |

## Talks, Teaching and other events

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| 2024 | Contributed talk at the Annual Meeting of the American Physical Society Division of Fluid DynamicsBrazil-China Joint Mathematical Meeting. |
| 2024 | **7th Summer School in Advanced Experimental Physics** organized by the Brazilian Center for Research in Phyics (Acceptance Rate: $\approx 15\%$). Using Ferromagnetic rosonance, magnetron sputtering and x-ray reflectivity, we grew thin bilayer films of ferromagnetic materials to study energy dissipation in the form of coheren angular momenta and spin current. |
| 2023 | Contributed talk at the Brazil-China Joint Mathematical Meeting. |
| 2021-2022 | Teaching assistant of Numerical Calculus and Physics II at UNILA. |
| 2021 | Speaker at the Paraguayan Mathematical Congress. |
| 2021 | Speaker at the series of talks "Hugo Checo, creando redes". **Best speaker award**. |
| 2019 | Teaching assistant of Functional analysis in the summer school at IMPA. |

## Programming Languages

**Experienced**

- Julia: Scientific Computing, OOP.
- MATLAB: Scientific Computing, OOP, Parallel computing, GPU-accelerated algorithms.
- Python: Scientific Computing, OOP, and ML programming with Pytorch/JAX.
- Git, Github: Remote and local version control, contributed to a number of open-source projects.

**Familiar**

- C++: OOP, Basic Scientific Computing.
- Java, JS, Google Apps Script, SQL, MongoDB, Google Sheets, Access, LabView, R, bash, HTML, Scilab.

## Fellowships and Awards

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| 2017 | CNPQ Scholarship for M.Sc. Studies at IMPA. |
| 2017 | **Prize "Domingo Martinez de Irala"**: Order of merit Medal, Asunción, Paraguay. |
| 2015, 2016 | **International Math Olympiad**: Bronze Medals (2015, 2016). |
| 2015, 2016 | **IberoAmerican Math Olympiad**: Honorific Mention (2015), Bronze Medal (2016). |
| 2011-2016 | **Paraguayan Math Olympiad**: Gold Medals (2013, 2015, 2016) and Silver Medals (2011, 2012, 2014). |
| 2016 | **Distinguished Citizen of Ciudad del Este Medal**. |

## Volunteer Work and Outreach

**2017- Present** **Math Olympiads Coordinator, Jury member, Team Leader**, *OMAPA*.

- Part of the Paraguayan delegation as organizer in numerous International Olympiads, such as the Cyberspace Mathematical Competition (2020), IberoAmerican Olympiad (2021), and the International Mathematical Olympiad (2022), which was held in Oslo, Norway.
- Part of the jury committee at the XXXII Cono Sur Olympiad (2021), organized by Paraguay. Graded problems of all countries, and created problems for the contest.

**2022-2023** **Engineering Physics Student Council**, *UNILA*.

**2019-2022** **Board member, Teaching Staff**, *Mathura*.

- Board member of Mathura, an NGO which gives free Maths and Spanish classes to underserved high school students in their pursuit to undergraduate studies. Also, part of the math teaching staff of Mathura.

**2019-2021** **Volunteer Data Analyst**, *ReAcción Paraguay*.

- ReAcción is a non-profit NGO that uses civic education and grassroots mobilization to demand accountability from government in the education sector.
- Used Python and Apps Script to analyze thousand of public contracts, comparing public expenditure of central and local institutions before and after the covid-19 outbreak. A couple of articles (in Spanish) were made based on our findings: https://reaccion.org.py/publicaciones/#investigaciones
- Gave seminars to the public to raise awareness on the importance of open data, and worked on a project to automate the process of contract data analysis in our country.

## Languages

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| Spanish | CEFR C2 | Portuguese | CEFR C2 |
| English | CEFR C1 | French | CEFR A1 |

## Other Activities

- Problem solving: My ProjectEuler account is percentile $0.4\%$ among all problem solvers.
- When I'm not solving problems, I am usually playing some chess on Lichess!.
- When I'm not playing chess, I am usually running or playing football.