

# Mario Román

Mathematics and Computer Science student

## Contact

Mario Román García  
+34 693 833838  
[mromang08@gmail.com](mailto:mromang08@gmail.com)  
[m42.github.io](https://m42.github.io)  
[linkedin:mario-roman](https://linkedin:mario-roman)

## Languages

Spanish  
English  
Italian

## Programming

Experience in **Haskell** and the proof assistants **Coq** and **Agda**; object-oriented programming and scripting in **Ruby**; and imperative programming in **C++**.

## Software

Technical knowledge of **Gnu/Linux**. Experienced user of **Emacs** and **LaTeX**.

## Education

- 2013-2017 Bachelor degree in **Mathematics** [University of Granada, Spain](#)  
*Emphasis in abstract algebra.* Grade Point Average: 9.55/10.
- Calculus
  - Geometry, linear algebra
  - Numerical methods
  - Probability
  - Algebra
  - Analysis and measure theory
  - Topology
  - Non-euclidean geometry
  - Algebraic topology
  - Galois theory
  - Mathematical modelling
  - Statistical inference
  - Curves and surfaces
  - Differential equations
  - Number theory, cryptography
  - Computational algebra
  - Modern algebra
  - Logic, discrete mathematics
- 2013-2017 Bachelor degree in **Computer Science** [University of Granada, Spain](#)  
*Emphasis in computation.* Grade Point Average: 9.35/10
- C++ Programming
  - System administration
  - Electronics
  - Computer architecture
  - Operative systems
  - Algorithms
  - Data structures
  - Object-oriented programming
  - Computability theory
  - Automata and languages
  - Software engineering
  - Information theory
  - Functional programming
  - Databases
  - Computer graphics
  - Artificial intelligence
  - Metaheuristics
  - Advanced functional prog.
- 2015-2017 **Courses and conferences**  
Attended:
- [School on Univalent Mathematics - Birmingham](#), on Univalent foundations.
  - [EUTypes Summer School](#), on Homotopy type theory, Agda and Coq.
  - [Seminar on Affine group schemes](#), Hopf algebras and algebroids.
  - [ESSLLI-Barcelona](#), on Logic, Languages and Computation.
  - [Lambda World](#), on functional programming.
  - [OrientaMat - LaTeX course](#), as **teaching assistant**.
- 2008-2012 **Estalmat** [University of Granada, Spain](#)  
A project to detect and stimulate the precocious mathematical talent.

## Mathematical projects

- 2017-2018 **Category theory and  $\lambda$ -calculus** [Bachelor's thesis \(in progress\)](#)  
*Advisor: Prof. Pedro A. García-Sánchez.*  
Bachelor thesis on the relationship between type theories and categorical logic. Martin-Löf type theories are regarded as the internal language of locally closed cartesian categories and presented as a foundation of mathematics. Agda and Coq are used to prove theorems in Homotopy type theory.
- 2016-2017 **Koszul pairs and their applications** [unpublished](#)  
Research grant. Working with the Algebra Department on Homology theory from a categorical perspective.

## Computer science projects

- 2016-Now **Mikrokosmos** [github.com/M42/mikrokosmos](https://github.com/M42/mikrokosmos)  
Hackage: [hackage.haskell.org/package/mikrokosmos](https://hackage.haskell.org/package/mikrokosmos)  
An didactic free software  $\lambda$ -calculus interpreter written in Haskell supporting multiple evaluation strategies and exemplifying the Curry-Howard isomorphism.
- 2014-2015 **GranaSAT Client** [github.com/M42/granasatClient](https://github.com/M42/granasatClient)  
Git repository: [github.com/M42/granasatClient](https://github.com/M42/granasatClient)  
Software for a satellite student experiment for the European Space Agency BEXUS campaign.

A complete portfolio can be found at [m42.github.io](https://m42.github.io).

## Publications

- 2016 **A comparison of implementations of basic evolutionary algorithm operations in different languages**  
DOI: 10.1109/CEC.2016.7743980  
Conference: [IEEE Congress on Evolutionary Computation \(CEC\)](#)

## Awards & Grants

- 2017-2018 **Collaboration Grant** [Algebra department, University of Granada](#)  
By virtue of which I can develop my **bachelor's thesis**, I administer the department servers and I develop **didactic material** and assist in the teaching of the course "**Logic and Programming**".
- 2015-2016 **Erasmus+ Grant** [University of Milan](#)  
Exchange student at the [University of Milan](#) for a year. Studying at the [department of computer science](#).
- 2012-2013 **International Mathematical Olympiad (IMO)** [Argentina](#)  
National *Gold & Silver Medals* and [international Honourable mention](#).

## Interests

I am passionate about **logic**, **abstract algebra**, **category theory** and their applications to **functional programming**. Since I program with dependently typed languages such as Coq and Agda, I have become increasingly more interested in type-theoretical foundations of mathematics, categorical logic and **topos theory**.

I am actively involved in the **divulgarion of mathematics** and computer science at a university level. I weekly organize mathematics and computer-science talks at my university; where I have been able to develop teaching skills and a deeper understanding of mathematics.

- 2014-Now **LibreIM** [libreim.github.io/](https://libreim.github.io/)  
Founder and coordinator of a [community](#) of Math&CS students. I am the main contributor to our [blog](#) and the organizer of weekly [seminars](#) where I have lectured about [Haskell](#), [Category theory](#) and [Type theory](#), among other topics.
- 2002-2012 **School of Music** [Granada, Spain](#)  
Foundational and professional level. Specialization in violin, music theory and composition.