

# Master Degree in Mathematics University of Verona

<http://www.univr.it/mathematics>

Department (of excellence) of Computer Science

2020/2021

# Why mathematics?

## Professional environments requiring strong mathematics skills:

- Life sciences, biology, health and medicine.
- Computer science in general, and HPC (High Performance Computing) and big data in particular (we have a cluster), example.
- Physics at all scales and engineering sciences. Material science.
- Social sciences, in the broadest sense. Development of complex systems or modelling and data analysis.
- Finance, insurance.

# Modelling Week 2016, Verona

PhD Modelling Week, September 4-11, 2016 - Verona (Italy)



- Home
- Topics
- Schedule
- Dates and accommodations
- Registration and fees payment
- Archivalists
- Organizing Committee and collaborators
- Sponsors

#### Home

Between September 4 and 11 2016, the joint **Department of Mathematics** of the Universities of Trento and Verona and the **Department of Computer Science** of the University of Verona organize a Modelling Week for PhD students. The event will take place at the Department of Computer Science and will gather PhD students in Mathematical Sciences from different European countries together with visiting supervisors and representatives from industry. The objective is to provide PhD students with a rich and stimulating environment for research and industrial cooperation partners, and to foster a multidisciplinary culture in the solution of real-world relevant industrial problems.

The event will be organized by the **Department of Mathematics** of the University of Verona, together with the **Department of Computer Science** of the University of Verona, and the **Department of Mathematics** of the University of Trento. The event will be organized by the **Department of Mathematics** of the University of Verona, together with the **Department of Computer Science** of the University of Verona, and the **Department of Mathematics** of the University of Trento.

#### Projects

##### 1) Simulation of Particle Accelerator Cavities (Instructor: Dr. Carlo De Falco, Milan Politecnico)

Particle accelerators, such as the LHC at CERN, are fundamental particles up to the speed of light requiring them to propagate through electromagnetic fields. Radio frequency cavities are responsible for the acceleration of the beams. The fields created within these cavities are well modelled by the geometry of the cavity itself. In order to model it, it is necessary to solve Maxwell's equations. For this reason the instructor does a specific introduction, combined with practical exercises on finite and semi-infinite domains. The student will be able to model the geometry of the cavity and solve the problem. The student will be able to model the geometry of the cavity and solve the problem. The student will be able to model the geometry of the cavity and solve the problem.

##### 2) Stress analysis and optimization methods for the banking/robotics sector. Instructors: Dr. Luca Di Piero, University of Verona, in collaboration with IASOS Ltd (Dr. Michele Donatelli, and in collaboration with Dr. Ben Pascoe)



ECMI modelling week  
2021, Saint-Petersburg,  
Russia

ECMI modelling week  
2022, Verona

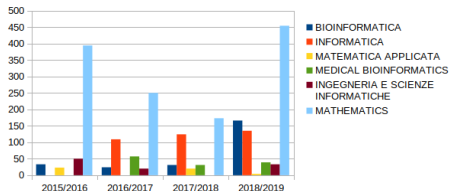
# Why in English?

- The official language of science is **English**
- More opportunities for **studying/research/job** both in Italy and abroad
- CLIL: English as mandatory teaching language in high school classes (C1 level required)
- Highly qualified international teaching staff

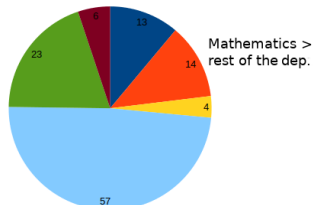
# Leaders in internationalization

## Department of Computer Science (Verona)

Crediti ottenuti all'estero da Studenti ERASMUS+ OUTGOING  
Credits earned abroad by ERASMUS+ OUTGOING Students  
(valori assoluti / absolute values)



Studenti ERASMUS+ OUTGOING 2015-2019  
ERASMUS+ OUTGOING Students 2015-2019



Mathematics	year	VR	NorthEast	Italy
Percentage of graduates with at least 12 ECTS abroad	2018	29.41	24.19	18.96
	2017	45.45	23.83	15.61
	2016	35.71	22.60	14.83
Percentage of students who obtained the Bachelor abroad	2018	29.03	5.69	4.50
	2017	23.53	5.73	5.02
	2016	18.75	4.35	5.26

## Internships (some examples, also abroad with Erasmus+)

- Chiara, 2016, Google Summer of Code
- Cristiano, 2016, European Space Agency SOCIS
- Chiara, 2014, Camera di Commercio, Verona
- Andrea, 2014, Fairmat (software house and financial mathematics)
- Isacco, 2014, Aleph Energy (models for energy markets)
- Alessandro, 2014, Cattolica Insurance
- Cristina, 2013/14, Erasmus and internship, University of Innsbruck (Austria)
- Sara, 2011, French Institute of Petroleum, Paris (France)
- Gregorio, 2014, Enginsoft (Computer Aided Engineering)
- Elisa, 2012, Zamperla (roller coasters design), Vicenza
- Martina, 2013, Atraki (traffic flow modeling), Verona

# Job opportunities: alumni

- Fabio 2019, PhD in Mathematics, Universities of **Trento and Verona**
- Mauro, 2018, post-doc Technische Universität **München**
- Mirko 2017, PhD, **Innsbruck**
- Valentina 2017, PhD in Bioengineering, **Politecnico di Torino**
- Matteo 2017, PhD, **Nice**
- Emanuele 2017, Ernst & Young, Milano
- Greta 2016, Unicredit, Milano
- Giulia 2016, post-doc, **Nantes**
- Chiara 2015, Research Fellow, **CNR-IMATI, Pavia**
- Gregorio 2015 Generali, **Treviso**
- Giulia 2015, KPMG, Verona
- Marcella 2014, permanent researcher at **Inria Saclay and École Polytechnique** in France
- Simone, 2014, research associate, DAMTP & Fitzwilliam Museum, **University of Cambridge**
- Davide, 2013, researcher at the Technologies of Vision research unit of the **Fondazione Bruno Kessler in Trento**
- Elena, 2014, post-doc at the **Department of Civil Environmental and Mechanical Engineering** of the University of Trento
- Giulia, 2013, assistant professor in mathematical analysis at **Politecnico di Milano**
- Marcello, 2013, analyst, Panrhema (financial advice), Milan
- Silvia, Andrea, . . . , 2012, high school teachers
- <http://www.univr.it/mathematics/alumni-ae>

# Curricula

## Common **foundational courses**

- Differential geometry
- Functional analysis
- Analytical mechanics
- Algebra



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  - Mathematical logic
  - Mathematics teaching and workshop
  - Mathematical methods for computer science
  - Physics Education Laboratory

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- **Curriculum Applied Mathematics - core courses**
  - Data fitting and reconstruction
  - Foundations of data analysis
  - Statistical learning
  - Stochastic calculus
  - Numerical modeling and Optimization

## Elective courses: main tracks and tutors

- **Education** (foundations, modern physics, physics education laboratory, PF24, geology, teaching): **Sisto Baldo**

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- I. seminar and mini courses delivered by international faculties
  - II. courses from other masters in Verona (partially in Italian)
  - III. courses in agreement with University of Trento
  - IV. courses within Erasmus+ mobility program



## Further activities

- 1 semester (or 2) of mobility experience abroad (Erasmus+ & UniVR Worldwide programs)  
Presentation of agreements to students: **December/January**  
Deadline for first semester abroad: **June/July**  
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- **NEW: 30 ECTS + final project in Grenoble (France): joint degree (starting in 2020/21, selected students)**

# Information

- **Web page**

<http://www.univr.it/mathematics>

- **Email**

master.math@ateneo.univr.it or marco.caliari@univr.it

- **Associazione Alumni Matematica Verona**

<https://www.univr.it/it/i-nostri-servizi/servizi-per-laureati>