



Department of Mathematics  
University of Rome Tor Vergata



MatMod@TOV  
Excellence Project 2023-2027  
NEWSLETTER  
N°4 October 2024 – December 2024



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# Presentation

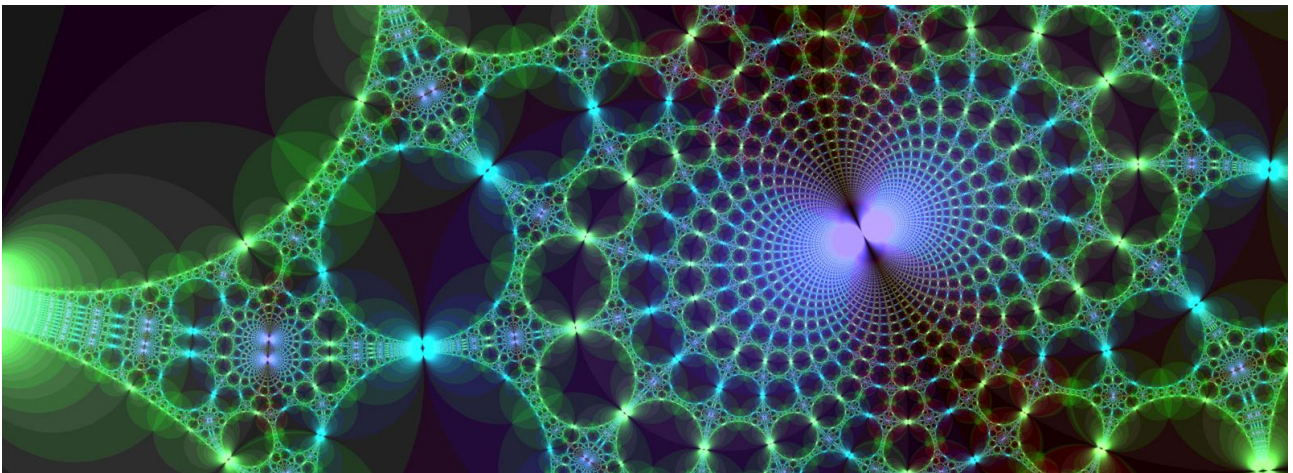
The Department of Mathematics of the University of Rome Tor Vergata is distinguished by first class research, often motivated by applications from theoretical physics, astronomy, aerospace, finance, technology and medical science, a high-level educational system, and the organization of events in the context of the so-called third mission of the University. For details we refer to the Department's website: <https://www.mat.uniroma2.it/index.php>

The Department aims to increase its leading role in research, math education and math culture. The recently awarded national Excellence Project 2023-2027, denoted by MatMod@TOV, offers the opportunity to face new challenges, and its main objectives are:

- foster new collaborations between staff members on advanced research themes
- hire excellent staff members, able to participate in multiple research projects
- stimulate the interaction with excellent math groups, both in public research institutions and industry, and transform the Department into a strategic asset for the development of highly advanced mathematics and its application to specific problems
- increase the international visibility of the Department
- improve the Master and PhD Programs in Mathematics
- intensify the spreading of Math Culture

See the web page of the project MatMod@TOV: <https://www.mat.uniroma2.it/progetto/>

# Recruitment



The MIUR Excellence Grant (CUP E83C23000330006, 2023-2027), awarded by the Mathematics Department of the University of Rome Tor Vergata (project MatMod@TOV), provides funds for Assistant and Associate Professorships as well as for Postdoc Positions.

All details at <https://www.mat.uniroma2.it/progetto/recruitment.php>

## Professorships

We congratulate:

- Prof. Jonathan Ben Artzi, winner of the Associate Professor position in Mathematical Analysis (Gruppo Scientifico Disciplinare 01/MATH-03 – Settore Scientifico Disciplinare MATH-03/A);
- Prof. Eleonora Di Nezza, winner of the Full Professor position in Geometry (Gruppo Scientifico Disciplinare 01/MATH-02 – Settore Scientifico Disciplinare MATH-02/B).

## Postdoc positions

The following Postdoc position selection procedures are in progress:

- 1 (one year) Postdoc position (Assegni di Ricerca - I Fascia) in Mathematical Analysis (Gruppo Scientifico Disciplinare 01/MATH-03 – Settore Scientifico Disciplinare MATH-03/A) – Title: “Analisi geometrica e problemi ellittici differenziali in geometria e fisica”;
- 1 (one year) Postdoc position (Assegni di Ricerca - II Fascia) in Mathematical Analysis (Gruppo Scientifico Disciplinare 01/MATH-03 – Settore Scientifico Disciplinare MATH-03/A) – Title: “Algebre di operatori e teoria quantistica dei campi conformi”;
- 1 (one year) Postdoc position (Assegni di Ricerca - II Fascia) in Mathematical Analysis (Gruppo Scientifico Disciplinare 01/MATH-03 – Settore Scientifico Disciplinare MATH-03/B) – Title: “Geometria dei campi aleatori e applicazioni”.

See <https://pica.cineca.it/uniroma2/>

We also congratulate:

- Dr. Veronica Danesi, winner of the (two years) Postdoc position (Assegni di Ricerca - III Fascia) in Mathematical Analysis (Gruppo Scientifico Disciplinare 01/MATH-03 – Settore Scientifico Disciplinare MATH-03/A) – Title: “Stabilità e problemi inversi nello studio di sistemi dinamici e modelli climatici”.

# Research



## Research Topics

During the period October 2024 – December 2024, MatMod@TOV organized a series of seminar talks/collaborations about the following main research topics:

- 1) Dynamical Systems and Statistical Physics
- 2) Quantum Field Theory and Quantum Information Theory
- 3) Mathematical Modelling and PDE's
- 4) Topological Data Analysis
- 5) Algebraic Geometry and Applications
- 6) Mathematical Modelling in Celestial Mechanics and Space Applications
- 7) Mathematical Modelling, Probability, Statistics and Machine Learning
- 8) Mathematical Modelling and Numerical Analysis
- 9) Mathematical Modelling and Climate Change

This is a partial list of the invited speakers/collaborators during the period: G. A. García (University “Nacional de La Plata”), F. Caucci (University of Rome “Tor Vergata”), E. Macrì (University “Paris-Saclay”), T. Guillard (University “Paris-Saclay”), S. Pappalardi (University of Cologne), V. Assenza (IMPA), T. Sano (Kobe University), L. Hoyer (RWTH Aachen University), A. Moreau (University “Paris-Saclay”), S. Molcho (University of Rome “Sapienza”), F. Leoni (University of Rome “Sapienza”), A. Doubova (University of Sevilla), D. Ulmer (University of Arizona), P. Cosentino (University of Rome “Tor Vergata”), F. Fagioli (University of Rome “Tor Vergata”), M. Moraschini (University of Bologna), A. Tortorella (University of Salerno), L. Provenzano (University of Rome “Tor Vergata”), J. Alper (University of Washington), F. Malizia (University of Rome “Tor Vergata”), S. Le Fourn (University of “Grenoble Alpes”), C. Malin (Max-Planck Institute Bonn), O. Ceyhan (University of Luxembourg), D. Ranganathan (University of Cambridge), F. Cipriani (Politecnico di Milano), N. Idrissi (University “Paris Cité”), F. Landoli (University of Calabria), M. Ramzi (Universität Münster), P. Antonini (University of “Salento”), K. Rejzner (University of New York).



(cf. also <https://www.mat.uniroma2.it/seminari-new2.php?inizio=0&pagina=1>)

## Conferences and Workshops

MatMod@TOV is funding a wide activity of conferences/workshops/advanced lecture series/schools. Recent and planned events are listed below.

- **Workshop: Computational aspects of complex networks**  
Date: December 6<sup>th</sup>, 2024  
Place: Department of Mathematics, University of Rome “Tor Vergata”  
**Organizers:** D. Bertaccini, A. Clementi, C. Manni, M. Mazza (University of Rome “Tor Vergata”),  
[https://www.mat.uniroma2.it/progetto/Events\\_pages/2024/Cacn2024/page-cacn2024.php](https://www.mat.uniroma2.it/progetto/Events_pages/2024/Cacn2024/page-cacn2024.php)
- **Workshop (INdAM): Far Methods for Isogeometric Analysis**  
Date: May 5<sup>th</sup>-9<sup>th</sup> 2025  
Place: National Institute of High Mathematics (INdAM) “Francesco Severi”  
**Organizers:** M. Mazza & H. Speleers (University of Rome “Tor Vergata”), M. Montardini (University of Pavia), <https://www.mat.uniroma2.it/~speleers/indam2025/>
- **Workshop (INdAM): Mathematical Perspectives in Scientific Modeling**  
Date: May 28<sup>th</sup>-30<sup>th</sup> 2025  
Place: Department of Mathematics and Villa Mondragone “Tor Vergata”  
**Organizers:** F. Bracci, C. Manni, D. Marinucci, A. Porretta (University of Rome “Tor Vergata”),  
[https://www.mat.uniroma2.it/progetto/Events\\_pages/2025/Maps2025/page-maps2025.php](https://www.mat.uniroma2.it/progetto/Events_pages/2025/Maps2025/page-maps2025.php)

## RoMaDS

(Rome Center on Mathematics for Modeling and Data Sciences)

Recently founded by MatMod@TOV project, the aim of the center is to contribute to the development of mathematical research in the field of modeling and data science through the organization of seminars, conferences and doctoral courses (<https://www.mat.uniroma2.it/~rds/events.php>).

Even more important is the possibility of establishing a permanent forum for the interaction between mathematical research and actual applications. In particular, the interdisciplinary nature of the center allows the creation of stable interactions between those involved in mathematical techniques of data analysis in different departments of the University. At the same time, our goal is to foster interactions with other research centers and even outside the strictly academic sphere.

<https://www.mat.uniroma2.it/~rds/about.php>

## High level teaching activities



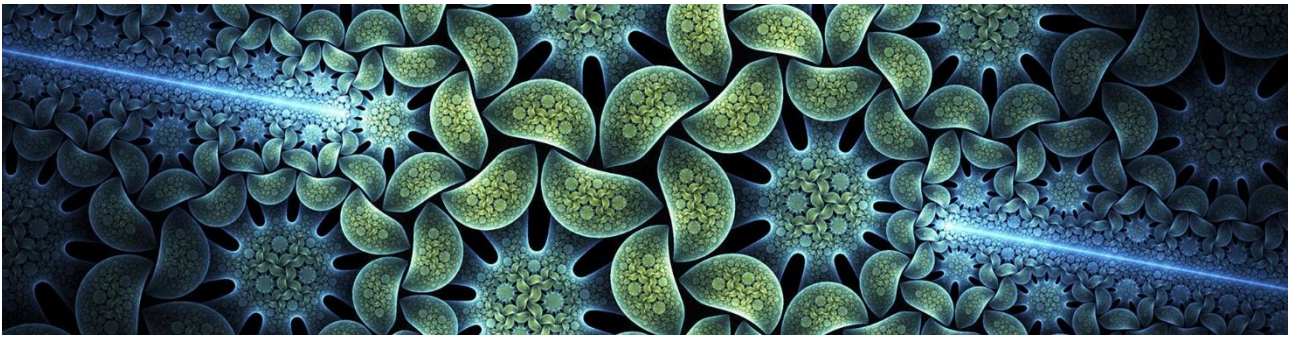
### Grants and Curriculum of Excellence

- MatMod@TOV 2023-2027 funded 3 degree prizes, for an amount of 2000 € each, for Master's graduates in Pure and Applied Mathematics at Tor Vergata from July 2023 to June 2024. The award is aimed at Master's theses satisfying at least one of the following conditions: a significantly original result; an efficient implementation and/or a particularly significant numerical experimentation; a clear and in-depth presentation of highly significant results.

The competition is now over and the following Master's graduates have been awarded:

1. Gabriele Bolli: "Convergenza all'equilibrio per equazioni di Fokker-Planck non locali e applicazioni al problema di Schrödinger di campo medio";
  2. Lucia Celli: "Teoremi del limite centrale quantitativi per variabili aleatorie a valori in uno spazio di Hilbert";
  3. Fabrizio Tomeo: "Asymptotic behavior of solutions of Fokker-Planck equations and convergence in mean-field law of consensus-based optimization methods".
- Student Tiziano Bigazzi successfully completed the first year of the Curriculum of Excellence and is now enrolled in the second year.  
Furthermore, students Valentina Altamura, Marco Cotugno De Palma, Mattia D'Andrea, Lorenzo Fiorito, Andrea Padellini and Federico Papa, at the end of their Math Master studies, have successfully obtained the certificate of the Curriculum of Excellence.

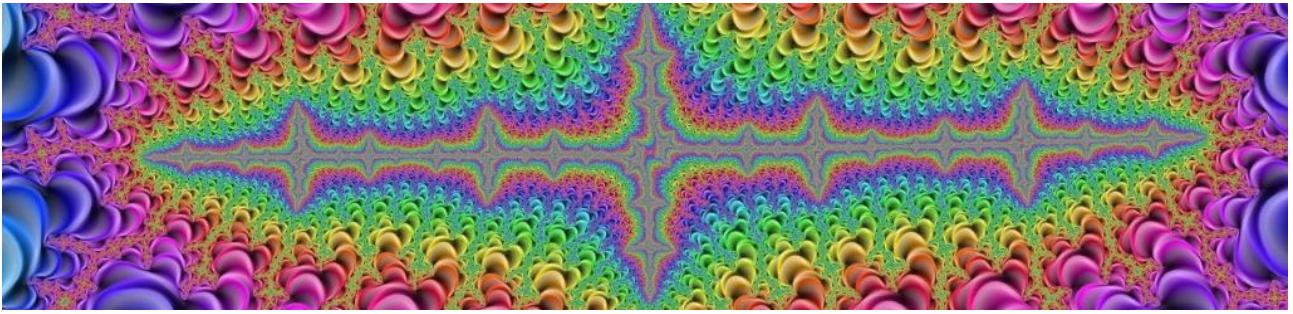
## Third mission



- In December 2024, the first cycle of the PFI60cfu and PFI30cfu teaching qualification courses has been completed. The months of October and November were dedicated to internships in schools and activities coordinated by the coordinating tutors.
- The Department has contributed to various orientation initiatives organized and coordinated by the University: the Next Generation Orientation - Tor Vergata courses, which are held in schools, and orientation activities at the University's premises aimed at students interested in receiving information on university courses. The Department organizes additional transversal skills and orientation (PCTO) courses in schools.
- Activities for the schools with Liceo Matematico and coordinated by our Department have resumed. In particular, on 25 November, the Liceo Matematico Day was held, in collaboration with the UMI Group of Licei Matematici, with a competition for students on Kahoot, based on questions proposed by the schools.  
On 26 November, a meeting was held at the Liceo Russell between the schools coordinated by our department, with seminars held by teachers and dedicated to logic and the introduction of AI in school curricula.  
On 27 November the National Network of Licei Matematici was set up, with the aim of create a liaison structure between the member school institutes, in order to encourage and support the implementation of the Liceo Matematico Project. Various institutes coordinated by the Department participate in the network.



# General Activities



MatMod@TOV is also meant to fund renovations of rooms/laboratories of the Department, acquisition of modern equipment, research books, etc.

- During the period from October to December 2024, the Department of Mathematics renovated and newly furnished 6 research offices to meet the needs of research fellows and PhD students. Research office numbers: 0110, 0112, 1111, 1215, 1216, 1217.