TOR VERGATA
UNIVERSITÀ DEGLI STUDI DI ROMA

Department of Mathematics
University of Rome Tor Vergata

MatMod@TOV
Excellence Project 2023-2027
NEWSLETTER
N°2 November 2023 – April 2024

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Presentation

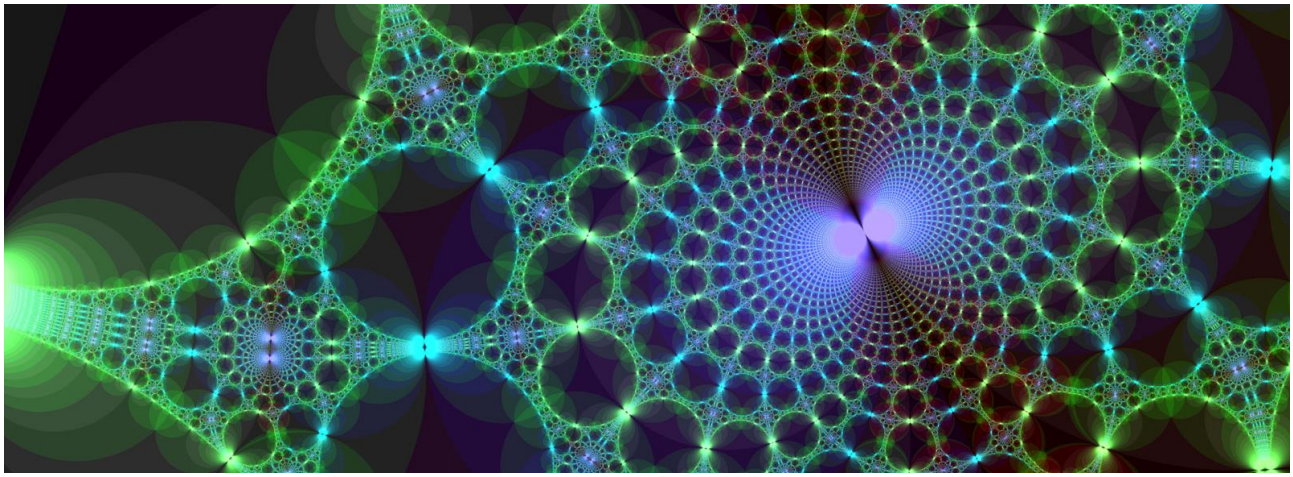
The Department of Mathematics of the University of Rome Tor Vergata is distinguished by first class research, often motivated by applications from theoretical physics, astronomy, aerospace, finance, technology and medical science, a high level educational system, and the organization of events in the 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 MathMod@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

Call of interest

The Department of Mathematics of the University of Rome Tor Vergata welcomes expressions of interest for academic openings at Associate and/or Full Professor level from any field in Mathematics covered through a "direct call" procedure.

The Direct Calls program of the Italian Ministry of University and Research (MUR), provides opportunities to fund academic positions for scientists and scholars who have been working abroad with an equivalent position for at least three years, or for recipients of grants for Programs of Excellence funded by the European Research Council or Italian Ministry of University and Research (for instance ERC grants).

Since the present action will be open for the period 2023-2026, also candidates who do not meet the requirements for being eligible for a Direct Call yet, but will do before 2026, are encouraged to apply.

Early career candidates can express their interest to be hired as tenure track Researchers (Italian RTDB/RTT), since the Department of Mathematics is aiming to open such positions as well.

Successful candidates will be expected to actively contribute to the department's academic program, its strategy and governance, as well as to provide scientific leadership and to apply to national and international research funding schemes.

Applications must be submitted electronically filling the following form:
https://forms.office.com/e/wrXb5tEwpj

The Department of Mathematics is committed to increasing the gender balance of its faculty and particularly welcomes applications from women mathematicians.

More information can be found at https://www.mat.uniroma2.it/progetto/recruitment.php

Postdoc positions

The following Postdoc positions selection procedures are in progress:

• 1 (two years) Postdoc position (Assegni di Ricerca - II Fascia) in Mathematical Analysis (Settore concorsuali 01/A3 - Settore Scientifico Disciplinare MAT/05) – Title: “Elliptic differential problems in physics and geometry”.

• 1 (two years) Postdoc position (Assegni di Ricerca - III Fascia) in Mathematical Analysis (Settore concorsuali 01/A3 - Settore Scientifico Disciplinare MAT/05) – Title: “Geometric flows and applications”.

• 1 (two years) Postdoc position (Assegni di Ricerca - I Fascia) in Mathematical Analysis (Settore concorsuali 01/A3 - Settore Scientifico Disciplinare MAT/05) – Title: “Equazioni alle derivate parziali in dinamiche di popolazioni e modelli di campo medio”.

• 1 (two years) Postdoc position (Assegni di Ricerca - I Fascia) in Geometry (Settore concorsuale 01/A2 - Settore Scientifico Disciplinare MAT/03) – Title: “Geometria algebrica”.

• 1 (one year) Postdoc position (Assegni di Ricerca - I Fascia) in Complementary Mathematics (Settore concorsuale 01/A1 - Settore Scientifico Disciplinare MAT/04) – Title: “Francesco Maurolico e lo sviluppo della matematica del XVI secolo”.

• 1 (two years) Postdoc position (Assegni di Ricerca - III Fascia) in Probability (Settore Scientifico Disciplinare MAT/06, Settore Concorsuale 01/A3) – Title: “Geometria dei campi aleatori ed applicazioni”.

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

We also congratulate:

• Dr. Ahmed Yekta Ökten, winner of the (two years) Postdoc position (Assegni di Ricerca - I Fascia) in Geometry (Settore concorsuale 01/A2 - Settore Scientifico Disciplinare MAT/03) – Title: “Several complex variables and holomorphic dynamics”.

• Dr. Luca Francone, winner of the (two years) Postdoc position (Assegni di Ricerca - I Fascia) in Algebra (Settore concorsuale 01/A2 - Settore Scientifico Disciplinare MAT/02) – Title: “Metodi algebrici, combinatori e geometrici in teoria delle rappresentazioni”.

• Dr. Yaofeng Su, winner of the (two-years) Postdoc position (Assegni di Ricerca - IV Fascia) in Mathematical Physics (Settore concorsuale 01/A4-Settore Scientifico Disciplinare MAT/07) – Title: “Proprietà statistiche dei Sistemi dinamici”.

• Dr. Andrea Adriani, Dr. Corentin Fierobe, Dr. Filippo Fagioli, Dr. Matteo Quattropani, winners of the four (two-years) Postdoc positions (Assegni di Ricerca - III Fascia) in Algebra, Geometry, Mathematical Analysis, Probability and Mathematical Statistics, Mathematical Physics, Numerical Analysis (Settori concorsuali 01/A2-01/A3-01/A4-01/A5 - Settore Scientifico Disciplinare MAT/02-MAT/03-MAT/05-MAT/06-MAT/07-MAT/08) – Title: “Modelli matematici a Tor Vergata MatMod@ToV”.

Research

Research Topics

During the period November 2023 – April 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: L. Apolloni (University of Leeds), S. Baranzini (University of Torino), G. Barkeley (University of Harvard), M. Barton (BC Applied Math.), A.M. Benini (University of Parma), P. Bielavsky (U.C. Louvain), L. Bruni Bruno (University of Padova), K. Buzzard (Imperial College), D. Castorina (University of Napoli "Federico II"), S. Chemla (University Sorbonne-Paris Cité), A. Clarke (UPC Barcelona), F. van Doorn (University of Bonn), M. Costa Cesari (University of Bologna), C.J. Fewster (University of York), C. Hohlweg (UQ Montréal), W. De Graaf (University of Trento), G. Landi (University of Trieste), G. Marasingha (University of Exeter), L. Martinazzi (University of Rome "Sapienza"), E. Masut (University of Padova), A. Michael (University of Magdeburg), F. Neumann (University of Pavia), P. Majer (University of Pisa), T.K. Nguyen (North Carolina State University), M. Nolasco (University of L' Aquila), F.A.E. Nuccio (University Jean Monnet Saint-Etienne), R. Pagaria (University of Bologna), G. Piacenza (IEC Lorrain-Nancy), F. Pratali (University Sorbonne-Paris Nord), V. Reiner (University of Minnesota), A. Scagliotti (TU München), D. Scarcella (UPC Barcelona), V. Schleis (University of Tübingen-Bonn), P. Souplet (University

Sorbonne-Paris Nord & CNRS), R. Verch (University of Leipzig), L. Weng (University of Rome “Tor Vergata”), (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 events are listed below.

- **Workshop: Stability in Hamiltonian Dynamics and Beyond**
  Date: February 1 th-2 th, 2024
  Place: Aula Urbano VIII, "Argiletum" - University of Rome "Tre"
  Organizers: PRIN 2022 “Stability in Hamiltonian Dynamics and Beyond”, Units Rome "Tre" and Rome "Tor Vergata".
  https://65a508eeb80a5.site123.me/events-1

- **Workshop: Computer-verified proofs: 48 hours in Rome**
  Date: January 24 th-26 th, 2024
  Place: Department of Mathematics, University of Rome “Tor Vergata”
  Organizers: O. Butterley, R. Greenblatt, Y. Tanimoto (University of Rome “Tor Vergata”), F. van Doorn (University of Bonn), M. Lenci (University of Bologna), R. Brasca (University Paris Cité), K. Buzzard (Imperial College), G. Marasingha (University of Exeter), F.A.E. Nuccio (University Jean Monnet Saint-Etienne);
  https://www.mat.uniroma2.it/butterley/formalisation/

- **Workshop: New trends and challenges in optimization theory applied to space engineering**
  Date: December 13 th-15 th, 2023
  Place: Auditorium GSSI
  Organizers: L. Mazzini (Thales Alenia Space), C. Mendico (University of Rome “Tor Vergata”), A. Pajewski, A. Scaricamazza (Gran Sasso Tech);
  https://www.gransassotech.org/en/new-trends-and-challenges-in-optimization-theory-applied-to-space-engineering/

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 coursers (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

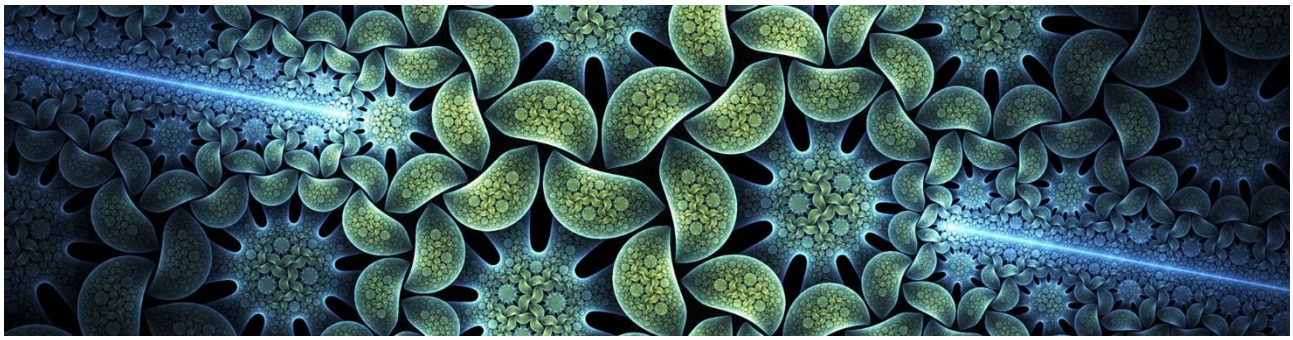
High level teaching activities

Grants and Curriculum of Excellence

- MATH@TOV provides funds for students enrolled in the Master's Curriculum of Excellence in Pure and Applied Mathematics at Tor Vergata. During the 2023/2024 academic year, Tiziano BIGAZZI has been admitted to the Curriculum of Excellence program.

- Furthermore, students Valentina ALTAMURA, Marco COTUGNO DE PALMA, Mattia D'ANDREA, Lorenzo FIORITO, Andrea PADELLINI and Federico PAPA have successfully completed the first year of the Curriculum of Excellence and are now enrolled in the second year. In particular, Andrea PADELLINI has been funded by MatMod@Tov for attending the conference Algebra Days in Caen 2024: Algebraic aspects of configuration spaces and moduli spaces (March 18-20).

Third mission



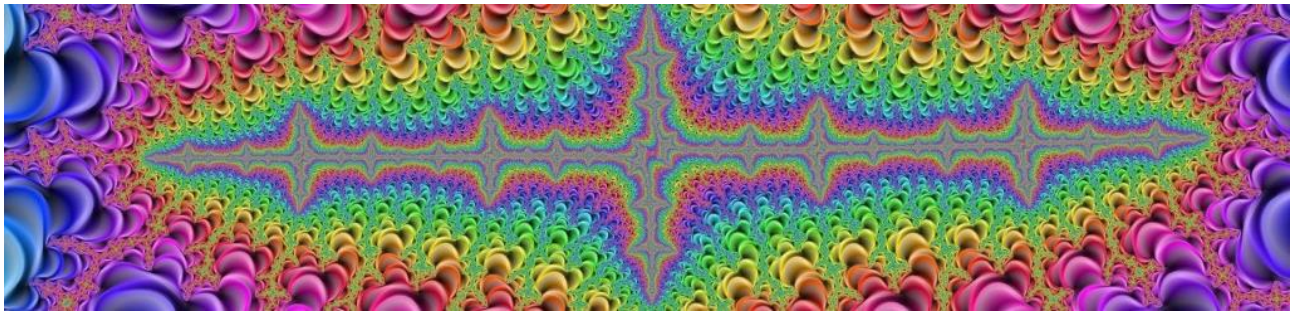
- Thirteen courses for soft skills and orientation (PCTO) were implemented with seven different schools and 370 students.

- Two teacher training courses were organized, one for primary schools (15 and 20 March) and one for secondary schools (27 March and 10 April).

- “Liceo Matematico“ activities continued in 6 schools and approximately 40 classes. The teachers of the different routes shared and compared the activities carried out in a collegial meeting held on 27 April 2024 at the Liceo Gullace Talotta in Rome. The three institutes that will start activities with the students in the 2024-2025 school year were also involved in the meeting.

- Four PhD students were involved in the testing of teaching experiences in several schools, actively involving in-service teaching.

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 November 2023 – April 2024, the Mathematics Department carried out a series of major technical updates to the departmental infrastructure:

- Supply of hardware devices following the "IT Call 2024"

- Supply and installation of up-down blackboard and lighting in conference Room 2001