



Department of Mathematics
University of Rome Tor Vergata



MATH@TOV
Excellence Project 2018-2022
NEWSLETTER
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Due to the Covid-19 emergency some scheduled activities have been suspended/postponed.
We will promptly report about these activities in the next newsletters.

Presentation

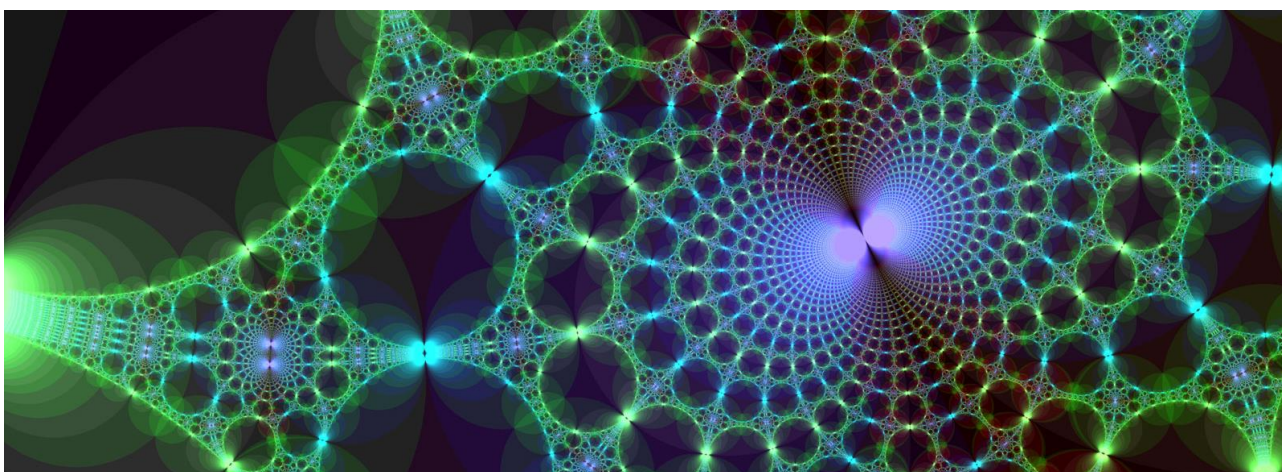
The Department of Mathematics of the University of Rome Tor Vergata is distinguished by first class research, often motivated by applications from theoretical physics, astronomy, aerospace, finance, technology and medical science, a high level educational system, and the organization of events in the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

The Department aims to increase its leading role in research, math education and math culture. The recently awarded national Excellence Project 2018-2022, denoted by MATH@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 MATH@TOV: <http://www.mat.uniroma2.it/Progetto/>

Recruitment



The MIUR Excellence Grant (CUP E83C18000100006, 2018-2022), awarded by the Mathematics Department of the University of Rome Tor Vergata (project MATH@TOV), provides funds for Assistant and Associate Professorships as well as for Postdoc Positions.

Professorships

- The following “Tenure-Track” Assistant Professorships (RTD-B) selection procedure is in progress:
 - 1 position in Algebra (Settore concorsuale 01/A2 - Settore Scientifico Disciplinare MAT/02)

http://web.uniroma2.it/module/name/Content/newlang/italiano/action/showpage/navpath/CON/content_id/91408/section_id/6206

The position is for three years and, after evaluation, can be converted in tenured Associate Professorship; it will be awarded through a public competition. Applicants must have at least three years of experience after PhD completion, and an already established research record. Selection procedures are in progress. More information will appear soon on

<http://www.mat.uniroma2.it/Progetto/recruitment.php>

Postdoc positions

The following Postdoc positions selection procedures are in progress:

- 1 (one-year) Postdoc position (Assegni di Ricerca - II Fascia) in Geometry (Settore concorsuale 01/A3 - Settore Scientifico Disciplinare MAT/03) – Title: “Semigrappi di Funzioni Olomorfe”
- 1 (one-year) Postdoc position (Assegni di Ricerca - III Fascia) in Mathematical Analysis (Settore concorsuale 01/A3 - Settore Scientifico Disciplinare MAT/05) – Title: “Problemi differenziali non lineari e Analisi geometrica in Geometria e Fisica”
- 1 (one-year) Postdoc position (Assegni di Ricerca - III Fascia) in Mathematical Analysis (Settore concorsuale 01/A3 - Settore Scientifico Disciplinare MAT/05) – Title: “Algebre di Operatori e Teoria Quantistica dei Campi”

See <http://concorsionline.uniroma2.it>

We also congratulate:

- Dr. Liangjun Weng, winner of the (one-year) Postdoc position (Assegni di Ricerca - II Fascia) in Mathematical Analysis (Settore concorsuale 01/A3 - Settore Scientifico Disciplinare MAT/05) – Title: “Analisi Geometrica in problemi differenziali della Geometria e della Fisica”
- Dr. Tiziano Gaudio, winner of the (one-year) Postdoc position (Assegni di Ricerca - II Fascia) in Mathematical Analysis (Settore concorsuale 01/A3 - Settore Scientifico Disciplinare MAT/05) – Title: “Operator algebras with applications to quantum field theory”
- Dr. Mara Volpi, winner of the (one-year) Postdoc position (Assegni di Ricerca - III Fascia) in Mathematical Physics (Settore concorsuale 01/A4 - Settore Scientifico Disciplinare MAT/07) – Title: “New Computational Challenges in Applied Mathematics”
- Dr. Adrian Perez Bustamante, winner of the (one-year) Postdoc position (Assegni di Ricerca - III Fascia) in Mathematical Physics (Settore concorsuale 01/A4 - Settore Scientifico Disciplinare MAT/07) – Title: “Soluzioni quasi-periodiche di sistemi dissipativi e loro domini di analiticità”
- Cecilia Albana Buccellato, winner of the (six-months) scholarship in History of Science (Settore concorsuale 01/A1 - Settore Scientifico Disciplinare MAT/04) – Title: “Proprietà fisiche e fluidodinamiche dei rostri della battaglia delle Egadi”

Research



Thematic Semesters

During the period January 2021 - December 2021, MATH@TOV organized a thematic semester with a series of seminar talks on the following main areas (cf. also <http://www.mat.uniroma2.it/Progetto/short-visit.php>):

Operator Algebras and Quantum Field Theory

- Among others, we mention the talks of V. Morinelli (University of Rome “Tor Vergata”), B. Wegener (University of Rome “Tor Vergata”), A. Stottmeister (University of Hannover), L. Panebianco (University of Rome “Tor Vergata”), N. Pinamonti (University of Genova), D. Buchholz (University of Goettingen), L. Zsido (University of Rome “Tor Vergata”), F. Cipriani (Politecnico di Milano), N. Pinamonti (University of Genova), D. Guido (University of Rome “Tor Vergata”), M.S. Adamo (University of Rome “La Sapienza”), L. Giorgetti (University of Rome “Tor Vergata”).

Holomorphic dynamics and geometry of complex manifolds and spaces, and their interplay

- Among others, we mention the talks of O. Roth (University of Wuerzburg), A. Aleman (Lund University), A. Baranov (St. Peterburg State University), A. Bufetov (CNRS Marseille), P. Mozolyako (St. Peterburg State University), M. Calzi (University of Milano), A. Monguzzi (University of Milano-Bicocca), W. Zwonek (Jagiellonian University), L. Kosinski (Jagiellonian University), M. Abate (University of Pisa), D. Girela (University of Malaga), S. Mongodi (Politecnico di Milano), A. Nicolau (UAB Barcelona), D. Betsakos (Aristotle University of Thessaloniki), A. Dayan (Washington University at St. Louis), I. Chalendar (University Paris-Eiffel), A.M. Benini (University of Parma), H. Gaussier (University of Grenoble Alpes).

Mathematical techniques for Earth and Space Science

- Among others, we mention the talks of L. Valvo (University of Rome “Tor Vergata”), T. Vartolomei (University of Rome “Tor Vergata”), D. Serra (University of Pisa), M. Saillenfest (IMCCE, Observatoire de Paris), M. Sansottera (University of Milano), C. Bellettini (University College London), F.C. Chittaro (University of Toulon), S. Ferraz Mello (University of Sao Paulo), S. Pasquali (Lund University), L. D’Elia (University of Rome “Tor Vergata”), J. Hulshof (Vrije Universiteit Amsterdam), E. Bozzo (University of Udine).

- Mini-series of seminars on topological data analysis: S. Vignola (University of Genova), A. Troiani (University of Padova), N. Otter (University of California at Los Angeles).

PDE's of Liouville type in Physics and Geometry

- Among others, we mention the talks of A. Pluda (University of Pisa), L. Martinazzi (University of Padova), J. Bellazzini (University of Pisa), W. Ao (Wuhan University), M. Ahmedou (Geißen University), M. Santilli (University of Augsburg), M. Caponigro (University of Rome “Tor Vergata”), L. Jeanjean (Bourgogne Franche-Comté), R. Ghezzi (University of Rome “Tor Vergata”), A. Jevnikar (University of Udine), M. Nolasco (University of L’Aquila), S. Secchi (University of Milano-Bicocca), G. Molica Bisci (University of Urbino), F. Palmurella (ETH Zurich), R. Soriano-Lopez (Universidad Carlos III Madrid), T.K. Nguyen (North Carolina State University), N. Gigli (SISSA Trieste).

Algebraic Geometry

- Among others, we mention the talks of T. Kobayashi (University of Tokio), J. Bassi (University of Rome “Tor Vergata”), R. Fringuelli (University of Rome “Tor Vergata”), R. Miranda (Colorado State University), C. Onorati (University of Rome “Tor Vergata”), D. Agostini (Max Planck IMS Leipzig), L. Pertusi (University of Milano), M. D’Adderio (Université Libre Bruxelles).

Numerical analysis - aeronautic and aerospace design

- Among others, we mention the talk of F. Calabrò (Università Federico II Napoli).

Probability theory and statistics - data analysis in cosmology

- Among others, we mention the talk of E. Persichetti (Florida Atlantic University).

Conferences and Workshops

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

- **Seminal interactions between mathematics and physics. II**
Date: September 28th - October 1th 2021
Organizers: F. Ciolli, C. de Concini, A. De Sole, S. Doplicher, G. Gallavotti, A. Giuliani, G. Jona-Lasinio, R. Longo, G. Morsella, C. Procesi, A. Pizzo, G. Ruzzi
<https://sites.google.com/view/sibmp2-lincei2020/home>
- **Algebraic Combinatorics and Mathematical Physics**
Date: January 13th and 14th 2022
Organizer: F. Brenti
<http://www.mat.uniroma2.it/progetto/Eventi/2022/Acamp/acamp.php>
- **Dynamic programming methods in aerospace engineering**
Date: tba
Organizers: P. Cannarsa, L. Mazzini (Thales)

Complex Analysis Seminars

The seminars are online. We use the Teams platform.

Link: <https://sites.google.com/view/complex-analysis-seminar/home-page>

Organizers:

Filippo Bracci (University of Rome "Tor Vergata")

Marco Peloso (University "Statale di Milano")

Nicola Arcozzi (University of Bologna)

Publications

Publications realized, within the excellence Department project MATH@TOV, by members of the Department and their co-authors are listed in the web-page

<http://www.mat.uniroma2.it/Progetto/publications.php>

High level teaching activities



PhD Courses – Advanced Lecture Series

MATH@TOV is funding a wide activity of Ph.D. courses/advanced lecture series

- **An introduction to Liouville Equations with Applications**
D. Bartolucci (University of Rome "Tor Vergata"), D. Ruiz (University of Granada),
R. Soriano-Lopez (University of Granada), A. Jevnikar (University of Udine).
Period: November 8 - December 2, 2021
<https://www.mat.uniroma2.it/~bartoluc/Liouville2122.html>
- **Some elements of the mathematics for Climate System**
V. Lucarini (University of Reading, UK)
Period: November 18 - November 25, 2021
<http://www.mat.uniroma2.it/~dott/Lucarini.pdf>
- **Pluripotential theory in Kähler geometry**
E. Di Nezza (École Polytechnique, Paris)
Period: December 21, 2021 - January 10, 2022
<http://www.mat.uniroma2.it/~dott/DiNezza-2021.pdf>
- **Isogeny based cryptography**
L. De Feo (IBM Research Europe)
Period: February 14 - February 19, 2022
http://www.mat.uniroma2.it/dottorato/Docs/DE_FEO.pdf
- **Topics on Bridgeland stability conditions**
E. Macrì (Laboratoire de mathématique d'Orsay)
Period: February 21 - March 3, 2022
- **Cohomological aspects of non abelian Hodge theory for curves in positive characteristic**
M.A. de Cataldo (Stony Brook, USA)
Period: March 7 – March 18, 2022
<http://www.mat.uniroma2.it/dottorato/Docs/deCataldo.pdf>

- **Mean field games**
D. Gomes (KAUST)
Period: tba

Grants and Curriculum of Excellence

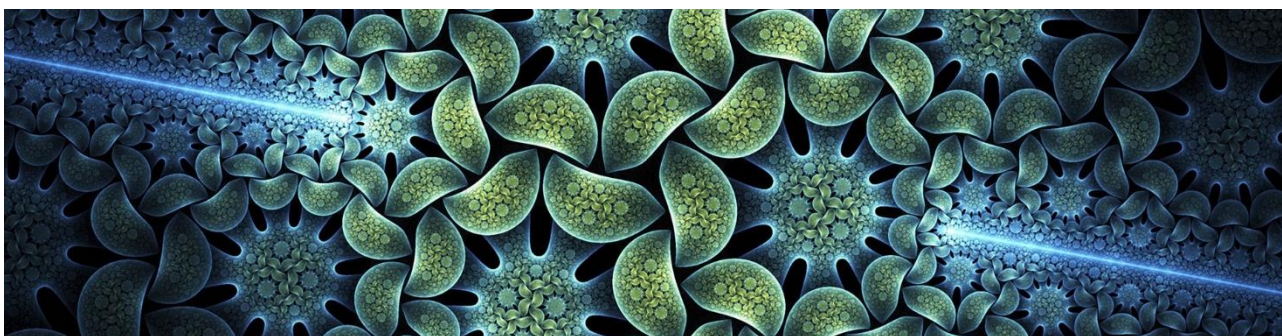
1) MATH@TOV funded 5 degree prizes, for an amount of 2,000 euros each, for master's graduates in Pure and Applied Mathematics at Tor Vergata from July 2020 to April 2021. The award was aimed at master's theses satisfying at least one of the following conditions: a significantly original result; an efficient 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:

- Giulia CATALINI: "Asymptotics for Volterra type stochastic volatility models in a multi-factor setup"
- Dennis DELL'ARA: "Random hyperplanes and classification of Gaussian mixtures"
- Giacomo GIORGIO: "Chaos expansion under a Q-Wiener noise"
- Marco LIOI: "Stime di Carleman per equazioni paraboliche degeneri e applicazione a problemi inversi per modelli climatologici"
- Riccardo MALANDRUCCOLO: "Quasi interpolanti spline cubiche C^2 su triangolazioni arbitrarie"

2) As part of the activities of MATH@TOV, the Department of Mathematics has provided grants for a maximum amount of 400 euros each for the attendance of the "Junior Math Days SISSA 2021", a winter school at the International School of Advanced Studies (SISSA) of Trieste from 20 to 22 December 2021. The contributions were reserved for students enrolled in the Master's Curriculum of Excellence in Pure and Applied Mathematics at Tor Vergata. The students Francesco MALIZIA and Arianna VICARI obtained the funding.

Third mission



A network consisting of 10 secondary schools was set up, coordinated by the Istituto Comprensivo 'Fontanile Anagnino' of Rome; this network submitted to the Ministry a project entitled 'National Indications 10 years later: to each his own time and way of learning', in partnership with the Department of Mathematics participated. The project was financed within the public notice of 20.10.2021 of the Department for Human, Financial and Instrumental Resources for the financing of activities to strengthen logical-mathematical competences in the first cycle of education.

In addition, the Istituto Comprensivo "Marcello Mastroianni", located in Rome, Via Orvieto n. 45, has implemented in three sections the experimentation of reinforcement activities supervised by Benedetto Scoppola, Francesca Tovenà and Daniele Pasquazi.

With regard to secondary schools, several courses for Transversal Skills and Orientation were implemented in agreement with various schools.

As in previous years, training activities for teachers involved in the Liceo Matematico were resumed: in this context, the Department extended the number of institutes involved, signing a memorandum of understanding with the Istituto Tecnico Industriale Statale - Liceo Scientifico Opzione Scienze Applicate 'Giancarlo Vallauri' in Velletri.

Coordination of the Liceo Matematico at regional and national level also continued.

Organized in collaboration with "Centro Studi di Antichità Matematica Filosofia", the "Macroarea di Scienze FF.MM.NN." hosted the presentation of the book:

"La Rivoluzione dimenticata. Il pensiero scientifico greco e la scienza moderna",
meeting with the author Prof. Lucio Russo, October 06 2021

<https://www.mat.uniroma2.it/rivoluzione.php>