Department of Mathematics

University of Rome Tor Vergata

MATH@TOV

Excellence Project 2018-2022

NEWSLETTER

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Presentation

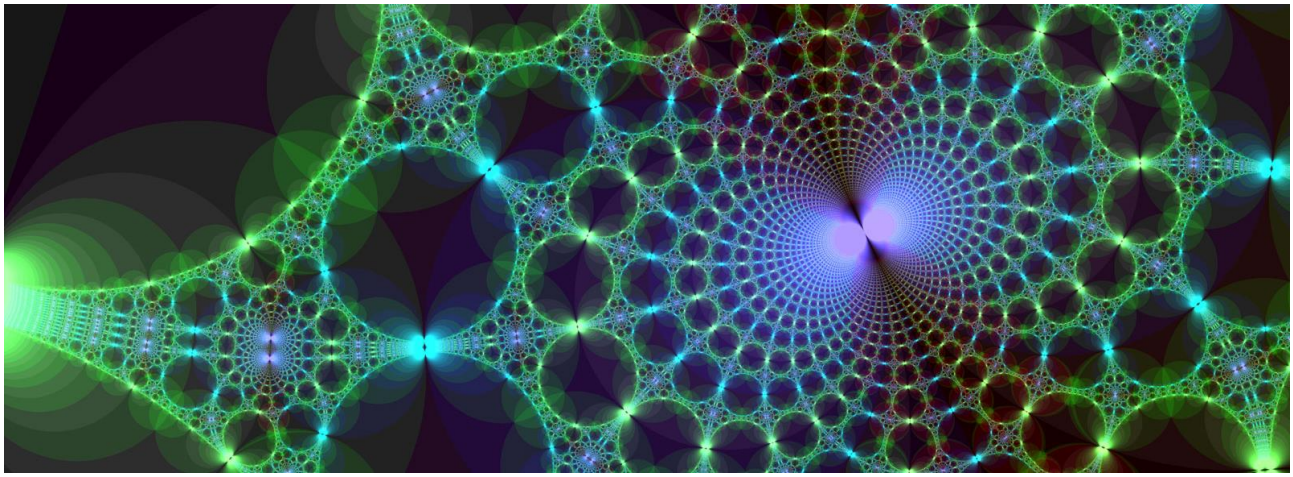
The Department of Mathematics of the University of Rome Tor Vergata is distinguished by first class research, often motivated by applications from theoretical physics, astronomy, aerospace, finance, technology and medical science, a high level educational system, and the organization of events in the context of the so-called third mission of the University. For details we refer to the Department's website, 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 projectMATH@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 2 “Tenure-Track” Assistant Professorships (RTD-B) selection procedures are in progress:

- 1 position in Probability and Mathematical Statistics (Settore concorsuale 01/A3-Settore Scientifico Disciplinare MAT/06)

  http://web.uniroma2.it/module/name/Content/newlang/italiano/action/showpage/navpath/CON/content_id/79316/section_id/6206

- 1 position in Mathematical Physics (Settore concorsuale 01/A4-Settore Scientifico Disciplinare MAT/07)

  http://web.uniroma2.it/module/name/Content/newlang/italiano/action/showpage/navpath/CON/content_id/79317/section_id/6206

Both positions are for three years and, after evaluation, can be converted in tenured Associate Professorships; they 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

We also congratulate:

• Prof. Sebastiano Carpi, winner of the Associate Professor position in Mathematical Analysis (Settore concorsuale 01/A3 - Settore Scientifico Disciplinare MAT/05);

• Prof. Marco Caponigro, winner of the Associate Professor position in Mathematical Analysis (Settore concorsuale 01/A3 - Settore Scientifico Disciplinare MAT/05).

Although not funded by the Excellence project, we welcome to the Department of Mathematics:

- Prof. Giulio Codogni, winner of the “Tenure-Track” Assistant Professorships (RTD-B) in Algebraic Geometry (Settore concorsuale 01/A3 - Settore Scientifico Disciplinare MAT/03);
- Prof. Roberta Ghezzi, winner of the “Tenure-Track” Assistant Professorships (RTD-B) in Mathematical Analysis (Settore concorsuale 01/A3 - Settore Scientifico Disciplinare MAT/05).

Research

Thematic Semesters

During the period April 2019 - December 2019, 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 I. Penkov (Jacobs University Bremen), Y. Navoi (University of Sydney, Australia), M. Mueger (Nijmegen, Holland), Y. Naqvi (University of Sydney, Australia), P. Grossman (University of Sydney, Australia), A. Garcia (Universidad Nacional de La Plata), C. D. Jäkel (University of São Paulo), M. Demers (Fairfield University), J. Tener (Australian National University), F. Radulescu (University of Rome "Tor Vergata"), F. Arici (Leiden University), D. Cadamuro (Leipzig University), D. Ueltschi (University of Warwick), K. Beanland (Washington and Lee University), A. Maffei (University of Pisa), C.A. Finocchiaro (University of Catania), R. Fioresi (University of Bologna), M. Boos (RHUR Universität, Bochum), K. Zaynulli (University of Ottawa).

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

- Among others, we mention the talks of Y. Kozitsky (Lublin, Polonia), G. Bharali (Indian Institute of Science), G. Popescu (University of Texas at San Antonio), E. Wold (University of Oslo), H. Samuelsson (University of Göteborg), E. Bedford (Stony Brook).

Mathematical techniques for Earth and Space Science

- Among others, we mention the talks of G. Polenta (A.S.I. Italian Space Agency), A. Boscaggin (University of Turin), C.Q. Cheng (University of Nanjing, China), L. Valvo (C. P. T. Luminy), A. Bach (Technisches Universität, Munich), C. Gales (University A.I. Cuza, Iasi, Romania), C. Efthymiopoulos (Academy of Athens and University of Padova), A. Marigonda (University of Verona), T. Scarinci (University of Vienna), G. Tinetti (University College London), W. Cheng (University of Nanjing), A. Fathi (Georgia Institute of Technology), I. Melbourne (Warwick University), D. Souza (Federal University of Pernambuco), M. Tanzi (University of Victoria), Alexander Ioffe (Technion).

PDE's of Liouville type in Physics and Geometry

- Among others, we mention the talks of C. Bandle (University of Basel), M. Del Pino (University of Bath), C. Mercuri (Swansea University), N. Gigli (S.I.S.S.A.), J. Xiong (Beijing Normal University), Y.Hu (University of Texas at San Antonio), A. Farina (University Picardie - Amiens), Hugo Tavares (University of Lisboa).

Algebraic Geometry

- Among others, we mention the talks of M. A. de Cataldo (Stony Brook), C. Camere (University of Genova), G. Marzo (University of Rome "Tor Vergata"), A. Sarti (University of Poitiers), S. Boissere (University of Poitiers), B. Bolognese (University of Sheffield).

Numerical analysis - aeronautic and aerospace design.

- Among others we mention the talks of M. Benzi (S.N.S. Pisa), M. S. Floater (University of Oslo), R. T. Farouki (University of California Davis), Y. J. Zhang (Carnegie Mellon).

Probability theory and statistics - data analysis in cosmology

- Among others we mention the talks of A. Lerario (SISSA, Trieste), J. Franchi (I.R.M.A. Strasbourg), M. Franchi (University of Rome "Sapienza"), A. Caponera(University of Rome "Sapienza"), V. Bally (University of Paris-Est), V. Cammarota (University of Rome "Sapienza"), Yen-Chi Chen (University of Washington, Seattle), Ian Sloan (University of New South Wales).

Conferences and Workshops

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

1) **Workshop – "Holomorphic Functions, Complex Manifolds and CR Geometry**
   Link: https://sites.google.com/view/mauro2019/
   Venue and Period: Dipartimento di Matematica Roma Tor Vergata, Italia 24-25/10/2019

   Speakers: Chiara Boiti (Ferrara), Ciro Ciliberto (Tor Vergata), Judith Brinkschulte (Leipzig), Denny Hill (Sony Brook), Antonio Lotta (Bari), Stefano Marini (Parma), Egmont Porten (Mid Sweden University), Giuseppe Tomassini (SNS, PISA).

   Scientific and Organising Commitee: Filippo Bracci, Giuseppe Pareschi, Costantino Medori

2) **Workshop -"A Representation Theory Summit (ARTS) in Rome"**
   Link: https://sites.google.com/view/representation-theory-in-rome/speakers
   Venue and Period: University of Rome "Tor Vergata",Via Lucullo, Rome, Italy, 15-16/11/2019

   Speakers: Maria Chlouveraki(Université Paris-Saclay), Olivier Dudas (Université Paris Diderot), Peter Fiebig (Univ. Erlangen), David Hernandez (Institut de Mathématiques de Jussieu-Paris Rive Gauche), Gunter Malle (Univ. Kaiserslauten), Carolina Vallejo (Universidad Aut. de Madrid).

   Scientific and Organising Commitee: Fabio Gavarini, Eugenio Giannelli, Martina Lanini

3) **Workshop – "INdAM Workshop: Geometric Challenges in Isogeometric Analysis"**
Link: https://www.mat.uniroma2.it/~speleers/indam2020/
Venue and Period: INDAM ROMA, Italia 27-31/01/2020

Speakers: Tor Dokken (SINTEF, Norvegia), Bert Jüttler (Johannes Kepler University, Austria), Jorg Peters (University of Florida, Stati Uniti), Xiaoping Qian (University of Wisconsin-Madison, Stati Uniti), Ulrich Reif (TU Darmstadt, Germania), Giancarlo Sangalli (Università degli Studi di Pavia, Italia), Tayana Sorokina (Towson University, Stati Uniti), Jessica Zhang (Carnegie Mellon University, Stati Uniti)

Scientific and Organising Commitee: Carla Manni, Hendrik Speleers

Joint seminars series A.S.I. – Mathematics Department

The Department of Mathematics and the Italian Space Agency organizes a joint seminar series in the frame of Excellence Project. The first seminars of this series are scheduled for 9 January 2020.
http://www.mat.uniroma2.it/Progetto/seminars.php

Publications

Publications realized, within the excellence Department project MATH@TOV, by members of the Department and their co-authors during the first year of the project have been listed in the web-page http://www.mat.uniroma2.it/Progetto/publications.php

High level teaching activities

Degree prizes

- MATH@TOV funded 10 degree prizes, for an amount of 2,000.00 euros each, for master's graduates in Pure and Applied Mathematics at Tor Vergata from July 2018 to May 2019. 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:

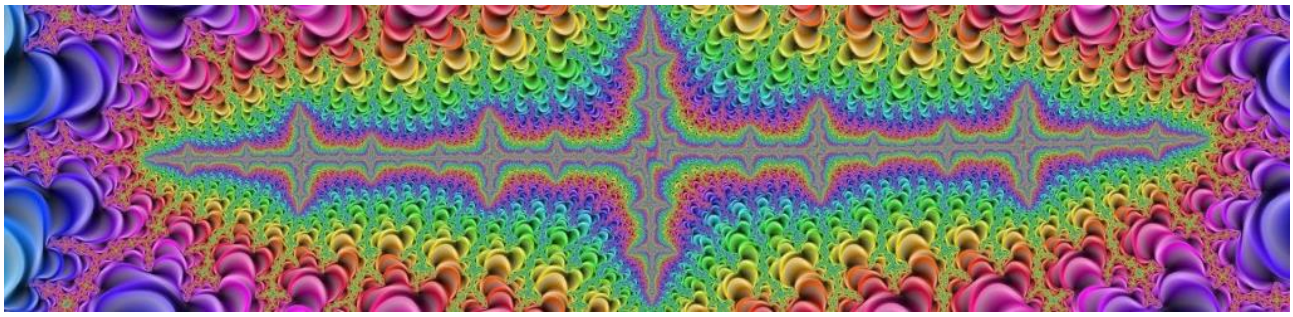
Miriana CELLUPICA: "Volterra type stochastic volatility models: Large Deviation estimates"
Piero DEIDDA: "Householder-type matrix algebras in displacement decompositions"
Rita MASTROIANNI: "Dinamica di un problema planetario con correzioni relativistiche"
Cristian MENDICO: "Long time behavior of first order Mean Field Games on Euclidean space"
Nicola Antonio NODARGI: "Homogenization of cohesive fracture"

PhD School in Mathematics - Courses

Special courses for the Ph.D. School in Mathematics, to be held in the period October 2019 - February 2020, organized within the excellence Department project MATH@TOV are the following:

- Prof. M. Bozejko (University of Wroclaw)
  - "Introduction to non-commutative(quantum) probability with applications"
- Prof. G. Orlando (TU Munich)
  - "An introduction to the theory of Cartesian currents and applications"
- Prof. K. Zaynullin (University of Ottawa)
  - "Introduction to non-commutative(quantum) probability with applications"
- Prof. S. Sandon (University of Strasbourg)
  - "An introduction to the theory of Cartesian currents and applications"
- Prof. G. Peccati (University of Luxemburg)
  - "Gaussian Analysis and Limit Theorems"

General Activities



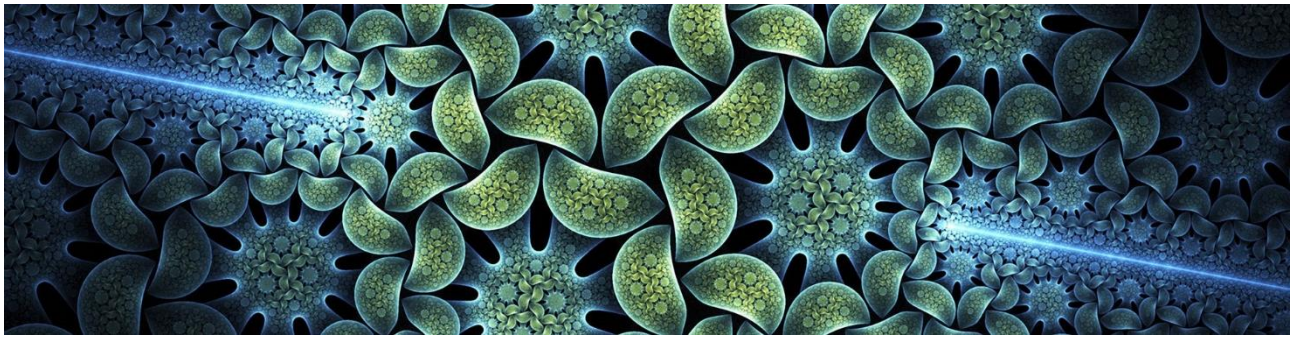
MATH@TOV is also meant to fund renovations of rooms/laboratories of the Department, acquisition of modern equipment, research books, etc. The list below covers some of the activities in the first year of the project.

- The new server NAS will allow users to save enormous quantities of data to be processed by the new servers dedicated to computational applications. The largest of such servers (the Super Dome Flex HPE, equipped with 8 CPU, 18 core each) is now accessible to the users.

- 21 computers Dell OptiPlex 7470 All-In-One CTO have been bought. They will be positioned in a didactics computer science lab of Data Analysis and Parallel Computing in February.

- Two *Mathematica License Manager* have been installed in the computer lab. Therefore, it will be possible to install *Mathematica* (11.3 and 12.0) on any computer connected to the web (even temporarily) using an IP address of the department.

Third mission



- At the University of Rome Tor Vergata and the Landi High School in Velletri, the first 4 modules of the Urbi et Orbi internship took place, involving students and teachers from schools in the zone. The internship also allows other schools to participate remotely: any school (or district) can participate online in team competitions and organize lessons on their own. The internship consists of 6 modules of 9 hours. The training activities are carried out by Emanuele Callegari, Giambattista Marini, Antonio Rapagnetta, Roberto Tauraso.

- From 4th to 6th October 2019 the fourth edition of the Autumn School in Mathematics and Science didactics was held in San Martino in Cimino, aimed at teachers in service of the secondary school. The school, organized by Daniele Pasquazi and Francesca Tovena, saw the participation of 50 teachers. The training activities were carried out by selected teachers.

- Two teachings of Master's Degree Course in Pure and Applied Mathematics were included in the PF24 training course for access to teaching for the academic year 2019/2020.
  The possibility of doing an internship in schools was offered to students of the Master's Degree in Pure and Applied Mathematics interested in training in mathematics teaching.

- The training courses for teachers in collaboration with the Accademia dei Lincei, called "Con la mente e con le mani" and "Curriculum verticale", have started. The activities involve Daniele Pasquazi, Benedetto Scoppola, Francesca Tovena.

- Within the Scientific Degree Plan, the activities for students and teachers of the Liceo Matematico, related to the current school year, have begun. In coordination with the University, further initiatives are also being carried out for interested students from various schools, both at Tor Vergata and within the schools.