Department of Mathematics

University of Rome Tor Vergata

MATH@TOV

Excellence Project 2018-2022

NEWSLETTER

N°8 - January–March 2020

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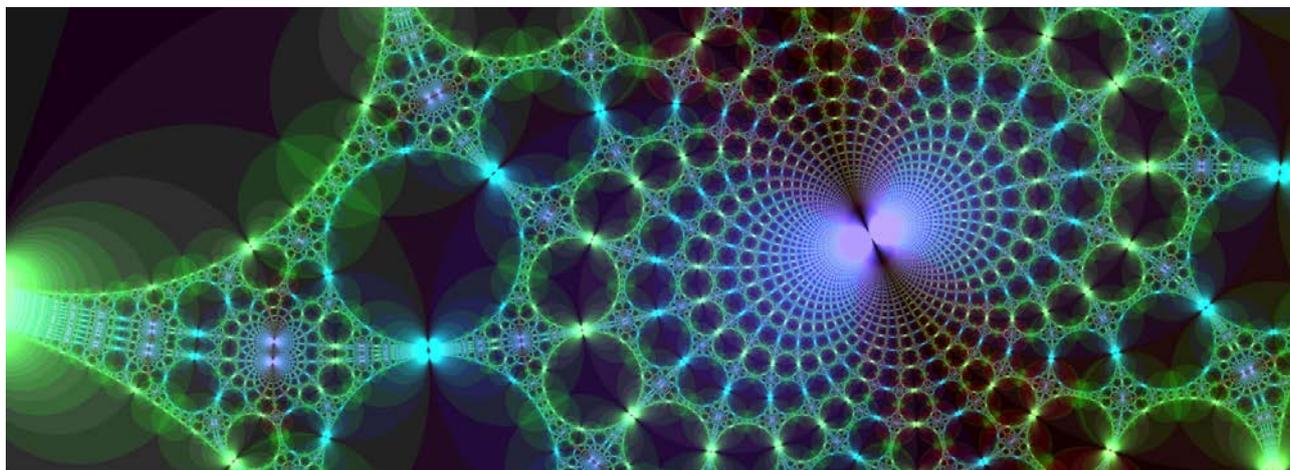
The MIUR Excellence Grant (CUP E83C18000100006, 2018-2022), awarded to the Mathematics Department of the University of Rome Tor Vergata (project MATH@TOV), provides funds for Assistant and Associate Professorships as well as for Postdoc Positions.

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

Postdoc positions

We congratulate with:

• Dr. Alexander Puetz, winner of the (one-year) Postdoc position (Assegni di Ricerca - III Fascia) in Algebra (Settore concorsuale 01/A2 - Settore Scientifico Disciplinare MAT/02);

• Dr. Lorenzo Valvo, winner of the (one-year) Postdoc position (Assegni di Ricerca - III Fascia) in Mathematical Physics (Settore concorsuale 01/A4 - Settore Scientifico Disciplinare MAT/07).

Research

Thematic Semesters

During the period October 2019 - March 2020, 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), M. Reineke (RUHR Universität, Bochum), Y. Kawahigashi (University of Tokyo).

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), F. Larusson (Adelaide).

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), R. Ruggiero (P.U.C. - Rio de Janeiro), V. Barutello (University of Turin), A. Procacci (Belo Horizonte), B. Pelloni (Heriot-Watt University, UK).

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), M. Mayer (University of Rome "Tor Vergata"), M.J. Esteban (Université de Paris-Dauphine).

Algebraic Geometry

- Among others, we mention the talks of M. A. de Cataldo (Stony Brook), R. Schwartz (Brown University), A. L. Knutsen (University of Bergen, Norway).

Numerical analysis - aeronautic and aerospace design

- Among others we mention the talks of J. Peters (University of Florida, USA), J. Zhang (Carnegie Mellon University, USA), T. Lyche (University of Oslo, Norway).

Probability theory and statistics - data analysis in cosmology

- Among others we mention the talks of A. Lerario (SISSA, Trieste), D. Marinucci (University of Rome "Tor Vergata"), M. Gordina (University of Connecticut).

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 – "INdAM Workshop: Geometric Challenges in Isogeometric Analysis"**
   Link: https://www.mat.uniroma2.it/~speleers/indam2020/
   Venue and Period: INDAM ROMA, Italy 27-31/01/2020
   Keynote Speakers
   - Tor Dokken (SINTEF, Norway)
   - Bert Jüttler (Johannes Kepler University, Austria)
   - Jörg Peters (University of Florida, USA)
   - Xiaoping Qian (University of Wisconsin-Madison, USA)
   - Ulrich Reif (Darmstadt University of Technology, Germany)
   - Giancarlo Sangalli (University of Pavia, Italy)
   - Tatyana Sorokina (Towson University, USA)
   - Jessica Zhang (Carnegie Mellon University, USA)

   Scientific and Organising Committee: 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 scheduled seminars has been held on January 9, 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

- Thanks to MATH@TOV, the department was able to react promptly to the Covid-19 emergency, whose related lockdown started in early March 2020. For example, some funds from MATH@TOV were used to quickly purchase essential goods, such as graphics tablets and webcams, to rapidly implement online education and learning activities.

- MATH@TOV provides funds for students enrolled in the Master's Curriculum of Excellence in pure and applied mathematics at Tor Vergata. The following students have been admitted to the Curriculum of Excellence during the 2019/2020 academic year:
  - Francesco MALIZIA,
  - Roberto VACCA.
  In addition, students Denis DELL'ARA and Giacomo GIORGIO have successfully completed the first year of the Curriculum of Excellence and are now enrolled in the second year. Conversely, due to the Covid-19 emergency, the student Roberta RELLA was unable to take the exam of some additional credits, as required by the Curriculum of Excellence, so the transition to the second year is postponed.

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"
- Prof. R. Schwartz (Brown University)
  - "Hyperbolic Geometry and Discrete Groups"
- Prof. A. Procacci (Belo Horizonte)
  - "A connection between the Lovász local lemma in combinatorics and the abstract polymer system in Statistical Mechanics"

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 two years 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 activated in Lab 25.

- The contract with Asystel has been extended in regard to its services of assistance, installation and training aimed at the extension of the Computer Room. The extension of the contract includes that Dr. A. Grandi will continue to work alongside our technicians two days a week (one, where he will be physically present, when possible, and the rest in telework) to carry out the services described by the contract, until the end of November 2020. The extension will be subject to ratification during the April CdD.

- The expansion and compliance work on the electrical system of the entire department has started.

- The video projection system has been renewed in the following rooms: 17, 25, D'Antoni, Dal Passo, 1200 and De Blasi.

- The modernization and renovation of the Dal Passo conference room and other common rooms have been performed.

Third mission
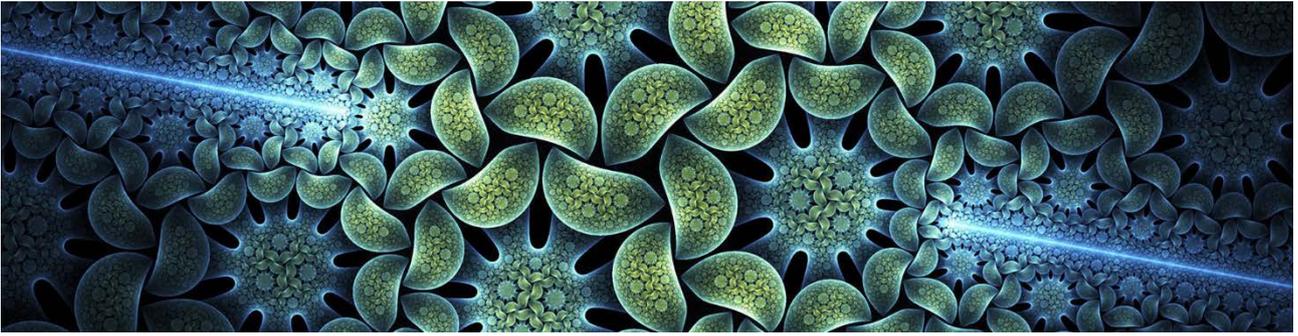
- In collaboration with the other Departments of the Macroarea, two days of meetings and activities were organized for fourth and fifth year high school students. The activities were coordinated by Andrea Iannuzzi and Giambattista Marini. The conferences were held by Leandro Arosio and Gerardo Morsella.

- The training courses for teachers carried out in collaboration with the Accademia dei Lincei and curated by Prof. Ciliberto, called "Con la mente e con le mani" and "Curriculum verticale", continued. Daniele Pasquazi, Benedetto Scoppola, Francesca Tovena are currently involved.

- Within the "Piano Nazionale Lauree Scientifiche", the activities of the "Liceo Matematico", related to the current school year, have been started. It has been completed a PCTO course addressed to a third class of the "Liceo Scientifico Bertrand Russell" in Rome. In coordination with the University, further initiatives are also being carried out for interested students from various schools, both at the University of Rome Tor Vergata and within different schools.