



Department of Mathematics
University of Rome Tor Vergata



MATH@TOV

Excellence Project 2018-2022

NEWSLETTER

N°5 - April - June 2019



Edited by: M. Abundo, L. Arosio, D. Bartolucci, L. Caramellino, T. D'Aprile, F. Flamini, E. Gandola.

Presentation

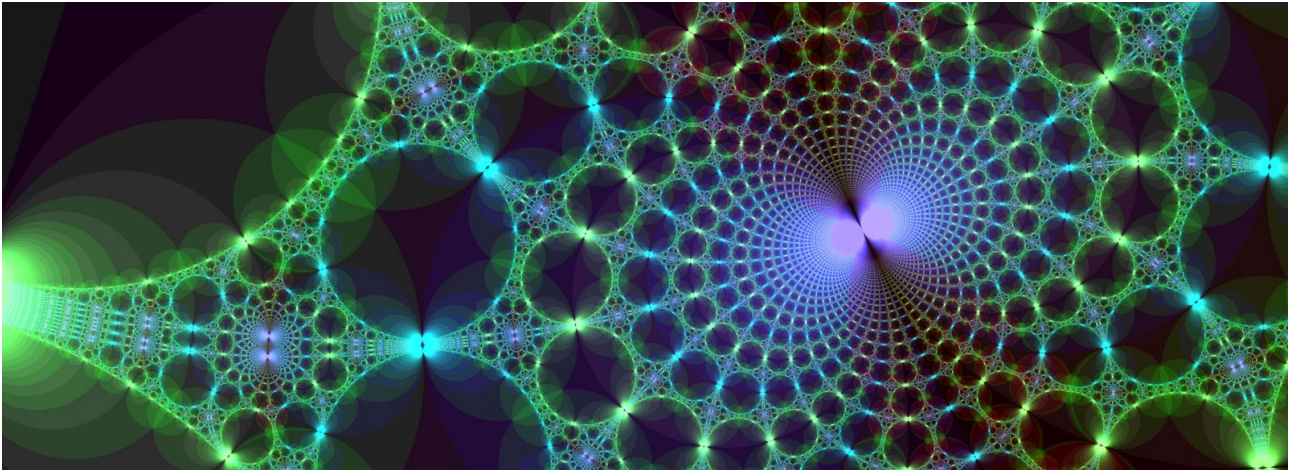
The Department of Mathematics of the University of Rome Tor Vergata is distinguished by first class research, often motivated by applications from theoretical physics, astronomy, aerospace, finance, technology and medical science, a high level educational system, and the organization of events in the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

In January 2019, the Central Administration of the University confirmed 2 “Tenure-Track” Assistant Professorships (RTD-B) as follows:

- 1 position in Probability and Mathematical Statistics (Settore concorsuale 01/A3-Settore Scientifico Disciplinare MAT/06); http://www.uniroma2.it/ammin/cda/2019/29-01-19/10_8.pdf
- 1 position in Mathematical Physics (Settore concorsuale 01/A4-Settore Scientifico Disciplinare MAT/07) http://www.uniroma2.it/ammin/cda/2019/29-01-19/10_9.pdf

Both positions are for three years and, after evaluation, can be converted in tenured Associate Professorships; they will be opened soon and will be awarded through a public competition. Applicants must have at least three years of experience after PhD completion or have the Abilitazione for Associate Professor

<http://abilitazione.miur.it/public/index.php?lang=eng>

and an already established research record. More information will appear on

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

The following 2 Associate Professor selection procedures are in progress:

- 2 positions in Mathematical Analysis (Settore concorsuale 01/A3-Settore Scientifico Disciplinare MAT/05)

http://web.uniroma2.it/module/name/Content/newlang/italiano/action/showpage/navpath/CON/content_id/72482/section_id/6225

http://web.uniroma2.it/module/name/Content/newlang/italiano/action/showpage/navpath/CON/content_id/71038/section_id/6225

The position will be awarded through a public competition. Applicants should have an established track-record of publications in top international journals and evidence of leadership and recognition in the international academic community, including grant applications and project management. Standards of excellence in teaching are also expected.

More information will appear on <http://www.mat.uniroma2.it/Progetto/recruitment.php>

We also congratulate:

Dr. Leandro Arosio, winner of the “Tenure-Track” Assistant Professorships (RTD-B) position in Geometry (Settore concorsuale 01/A2-Settore Scientifico Disciplinare MAT/03);

Dr. Carlo Garoni, winner of the “Tenure-Track” Assistant Professorships (RTD-B) position in Numerical Analysis (Settore concorsuale 01/A5-Settore Scientifico Disciplinare MAT/08).

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

Early stage researcher positions

As part of the Marie Curie Initial Training Network, STARDUST-R, the Department of Mathematics of the University of Rome Tor Vergata offers 2 fully funded ESR positions on the following subjects:

- UTV-ESR 1: Dynamics of space debris within different orbital elements regions;
- UTV-ESR 2: Proper elements for Space Debris.

We congratulate with

- Mauricio Misquero Castro from the University of Granada (Spain) recruited for UTV-ESR 1;
- Tudor Vartolomei from the University of Iasi (Romania) recruited for UTV-ESR 2.

Postdoc positions

The following Postdoc selection position (Assegni di Ricerca - III Fascia) is in progress:

- 1 position (one-year) in Mathematical Analysis (Settore Scientifico Disciplinare MAT/05)
Title: "P.D.E." ;

We also congratulate:

- Dr. Espen Sande, winner of the (one - year) Postdoc position (Assegni di Ricerca - III Fascia) in Numerical Analysis (Settore Scientifico Disciplinare MAT/08);

Research



Thematic Semesters

During the period October 2018 - March 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 Gwyn Bellamy (Scotland), Pierre Bieliavsky (Louvain, Belgium), Detlev Buchholz (Göttingen, Germany), Ken Dykema (Texas, USA), Ghislain Fourier (Germany), Klaus Fredenhagen (Hamburg, Germany), Benoit Fresse (France), Michael Magee (UK), Ryszard Nest (Copenhagen, Denmark), Nicola Pinamonti (Genova, Italy), Wolfgang Soergel (Germany), Layla Sorkatty (Sudan).

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

- Among others, we mention the talks of Marco Abate (Pisa, Italy), Alberto Abbondandolo (Germany), Cinzia Bisi (Ferrara, Italy), Manuel Contreras (Spain), Eleonora Di Nezza (France), Hakan Samuelsson Kalm (Sweden), Łukasz Kosinski (Poland), Frank Kutzschebausch (Switzerland), Fulvio Ricci (SNS Pisa, Italy), Tatsuo Suwa (Japan), Adriano Tomassini (Parma, Italy), Erlend Wold (Norway), Andrew Zimmer (USA).

Mathematical techniques for Earth and Space Science

- Among others, we mention the talks of Anna Maria Cherubini (Italy), Cistel Chandre (France), Guido Ciruolo (France), Yabebal Fantaye (South Africa), Helene Frankowska (France), Catalin Gales (Romania), M. Patrick Martinez (France), Sokol Ndreca (Brazil), Rocio Isabel Paez (Italy), Alicia Simon-Petit (France), Espen Sande (Norway), Giovanna Tinetti (UK), Albert Fathi (Georgia Institute of Technology, USA).

PDE's of Liouville type in Physics and Geometry

- Among others, we mention the talks of Marcello Lucia (CUNY New-York, USA), Zheng Huang (CUNY New-York, USA), Masayasu Mimura (Japan), Jingang Xiong (Beijing Normal Univ.), Alberto Farina (Université de Picardie). They delivered seminars on the immersion problem for minimal surfaces and P.D.E.'s.

Algebraic Geometry

- Among others, we mention the talks of Samuel Boissiere (University of Poitiers, France), Barbara Bolognese (University of Sheffield, UK), Sylvain Cappell (New York University, USA), Alessandra Sarti (University of Poitiers, France). They delivered seminars and lectures on Bridgeland stability, Characteristic classes for singular varieties, Hyperkaehler manifolds, K3 surfaces: moduli and non-symplectic automorphisms.

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) Conference - " A Tribute to Maryam Mirzakhani"

Venue and Period: Accademia Nazionale dei Lincei, Sala delle Scienze Fisiche, Palazzo Corsini, Via della Lungara 10, 3/6/2019

Speaker: Corinna Ulcigrai, Università di Bristol, UK

Scientific and Organising Committee

A. Celletti, A. Sorrentino, E. Strickland

2) Workshop – “DINAMICI VI”

Venue and Period: Centro De Giorgi, SNS Pisa, 4-7/6/2019

Speakers: <http://www.crm.sns.it/event/450/>

Scientific and Organising Committee

Claudio Bonanno, Paolo Giulietti, Marco Lenci, Alfonso Sorrentino

3) Workshop – Incontro INdAM: "Interactions of Symplectic Topology and Dynamics"

Venue and Period: Il Palazzone, Cortona, Italia 17-21/6/2019

Speakers: <https://sites.google.com/view/cortona2019/home>

Scientific and Organising Committee

A.Sorrentino, Viktor Ginzburg, Basak Gurel, Marco Mazzucchelli

4) Workshop – “New Trends in Celestial Mechanics”

Venue and Period: Val D'Aosta, Italia 24-28/6/2019

Speakers: <https://sites.google.com/view/ntcm2019/speakers>

Scientific and Organising Committee

Vivina Barutello, Alberto Boscaggin, Alessandra Celletti, Walter D'ambrosio, Susanna Terracini

5) Workshop – “CR Geometry and beyond”

Venue and Period: Dipartimento di Matematica Roma Tor Vergata, Italia 24-25/10/2019

Speakers: Giuseppe Tomassini (SNS, PISA), Egmon Porten (Mid Sweden University), Vincenzo Ancona (Firenze), Denny Hill (Sony Brook), Nikolai Tarkhanov (Potsdam), Antonio Lotta, Andrea Siro (Camerino), Dmitri Zaitsev (Trinity College, Dublin)

Scientific and Organising Committee

Filippo Bracci, Giuseppe Pareschi, Costantino Medori

6) 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

The conference will start after lunch on Friday and end around lunch time on Saturday.

The deadline for registration is the 15th of October, 2019. To register, send an email to artsinrome2019@gmail.com. Due to the venue capability, a limited number of places is available. Registration is compulsory and it might be closed before the 15th of October, once the limit has been reached.

Scientific and Organising Committee

Fabio Gavarini, Eugenio Giannelli, Martina Lanini

7) Workshop – "INdAM Workshop: Geometric Challenges in Isogeometric Analysis"

Venue and Period: INDAM ROMA, Italia 27-31/01/2020

Speakers: Annalisa Buffa (EPFL, Svizzera), Tor Dokken (SINTEF, Norvegia), Bert Jüttler (Johannes Kepler University, Austria), Jorg Peters (University of Florida, Stati Uniti), Ulrich Reif (TU Darmstadt, Germania), Giancarlo Sangalli (Università degli Studi di Pavia, Italia), Yongjie Jessica Zhang (Carnegie Mellon University, Stati Uniti)

Scientific and Organising Committee

Carla Manni, Hendrik Speleers

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 has financed up to 10 degree prizes, for an amount of 2,000.00 euros each, for master's graduates in Pure and Applied Mathematics from Tor Vergata in the period July 2018 - May 2019. Applicants must have produced a master thesis that contains at least one of the following requirements: a relevant original result; an efficient implementation and/or a particularly significant numerical experimentation; a clear and in-depth presentation of highly relevant results.

Deadline: September 30, 2019

Information at: http://www.mat.uniroma2.it/~dida2/Borse/premi_Laurea_magistrale.pdf

Scholarships

- MATH@TOV has financed 3 additional scholarships for the winners of the research competition organised by the National Institute of High Mathematics (INdAM) "Francesco Severi" and reserved for students enrolled in the first year of the Master Programme in Pure and Applied Mathematics at Tor Vergata (such students will automatically be enrolled in the Curriculum of Excellence).

Deadline: September 13, 2019

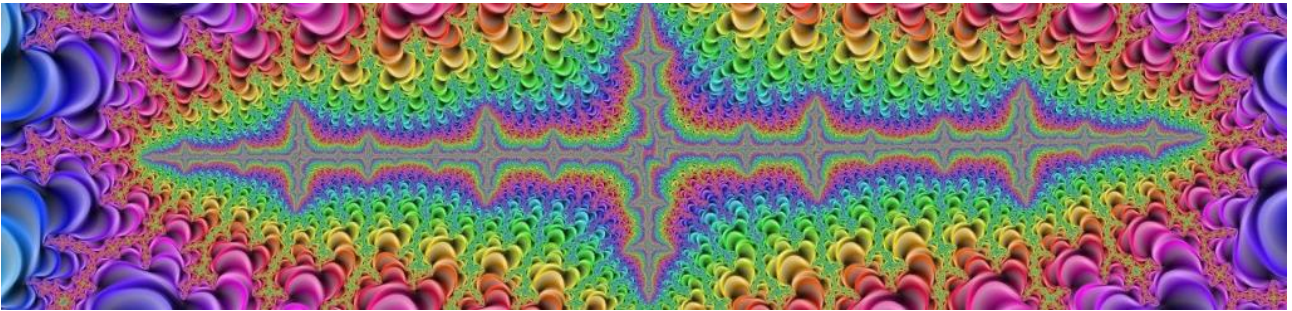
Information at: <https://www.altamatematica.it/wp-content/uploads/2019/05/BANDO-8-borse-di-studio-laurea-magistrale-19-20.pdf>

PhD School in Mathematics - Courses

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

- Vlad Bally (Université Paris-Est, France)
 - o Title: "Malliavin calculus and regularity properties" (Probability theory and Statistics, PDE)
- Barbara Bolognese (University of Sheffield, UK)
 - o Title: "Introduction to Bridgeland stability and applications" (Algebraic Geometry)
- Sylvain Cappell (New York University, USA)
 - o Title: "Theories of characteristic classes for singular varieties and their roles and computations in geometrical topology and algebraic geometry" (Algebraic Geometry)
- Dejan Slepcev (Carnegie-Mellon University, USA)
 - o Title: "Variational problems of Machine Learning and their continuum limits" (PDE)

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.

- BUILDING:
 - "Computing Center Area" renovation, where the multi-core "Single System Image" will be located for CPU parallel computing;
 - Realization of a "Department Common Room".

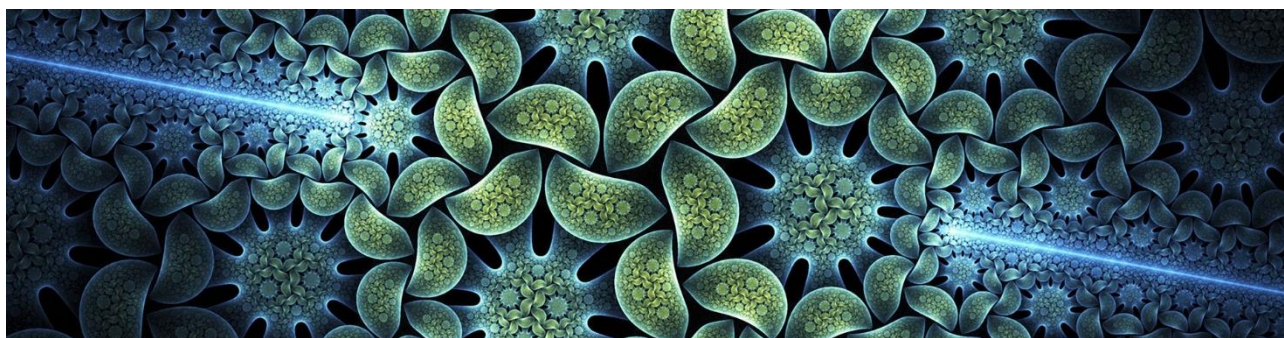
- SOFTWARE:

it is now possible to install and use *Mathematica* on desktops or laptops connected to the University network. The procedure is still under experimental evaluation, however installation on PCs of an IT laboratory classroom have been worked.

- COMPUTATIONAL EQUIPMENT:

2 chassis, each of which equipped with 4 processors, for a total of 144 cores, which can be used in parallel. The architecture of the "single system image" machine is absolutely modular and can be expanded in the future by purchasing other chassis with similar characteristics of the first two.

Third mission



- The Department of Mathematics also confirms participation in the Eureka initiative for 2019! promoted by the Department of Cultural Growth of Rome Capital. The initiative included different activities from 8 April to 2 June 2019, in various locations, for the promotion and dissemination of the sciences, to celebrate the special bond between the city of Rome and scientific culture. The meetings organized by Prof. A. Porretta for the Department of Mathematics took place at the Foyer of the Valle Theater. Prof. B. Scoppola discussed air traffic congestion: the mathematics of a complex problem, Prof. U. Locatelli gave a presentation on Order and chaos in the solar system, while Prof. D. Pasquazi illustrated the intuitive geometry of Leonardo da Vinci. On May 2, 2019, at the Aula Magna of the Macrorea of Sciences of the Tor Vergata University, the final day of the Ludi Geometrici Training Course was held, aimed at school teachers. The students and their teachers set up and animated an exhibition entitled "The intuitive geometry of Leonardo da Vinci". The date was chosen on the occasion of the 500th anniversary of the death of Leonardo da Vinci.
- In the first week of April the second (and last) race (only online) was held, prepared by our Department for the activities connected to the Olympiads of Mathematics. 186 teams participated, from 107 different schools (also one of Budapest) involving more than a thousand's students. The race report, complete with ranking and list of participating schools, is:
http://www.phiquadro.it/2018_2019_Urbi_et_Orbi.php
The text of the tender can be found at the link
<http://www.problemisvolti.it/Docu/GaSquadre/DisfidaTVG19testo.pdf>
- On 12 April 2019 a ceremony was held for the signing of the memorandum of understanding between the Ufficio Scolastico Regionale of Lazio and the Mathematics Departments of Sapienza, Tor Vergata and Roma 3 for the promotion of the activities of the Mathematical High School. The Mathematical High School is an initiative carried out jointly by universities and schools, increasing the number of curricular hours devoted to mathematics (and, in general, to physics) to allow a didactic approach through activities that actively involve students. The ceremony was accompanied by a workshop, with the presentation, by students and teachers, of the activities carried out by 20 schools. About 600 people participated in the initiative.
- As part of the Natural Geographic Festival of Sciences, which this year had the theme of the invention, the Departments of Biology, Physics, Mathematics and of Sciences and Chemical Technologies of the University of Rome Tor Vergata collaborated in the realization of a series of meetings at the libraries of Rome. In particular, for mathematics, 2 meetings were organized: Prof. C. Ciliberto discussed about inventions in mathematics, while Prof. D. Pasquazi curated an educational activity on Leonardo and Geometry.

- From 10 to 14 June, a 5-day internship took place, aimed at students who finished their fourth year of high school. The students, coming from different schools, worked in groups tackling a topic through laboratory activities and short illustrations; each group summarized the work done in a to the other groups.
- Comitato Unico di Garanzia (CUG) of the University of Rome Tor Vergata has organized the series of conferences and laboratory activities "*STEM UP!*", dealing with approach to secondary school of children, with particular attention to gender issues. Schools involved are Liceo Lucrezio Caro and Liceo Augusto in Rome. Part of the activities are structured in a project of "*Alternanza Scuola-Lavoro*" with Liceo Augusto in Rome, started on December 19, 2018 with interventions on the professional career in Mathematics and Biology.
The activities "*Alternanza scuola lavoro*" with Liceo Scientifico Gullace Talotta, Liceo Classico Orazio and Liceo Scientifico Levi Civita in Rome started on February 2019.