



Department of Mathematics  
University of Rome Tor Vergata



MATH@TOV  
Excellence Project 2018-2022  
NEWSLETTER  
N°16 January – March 2022



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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

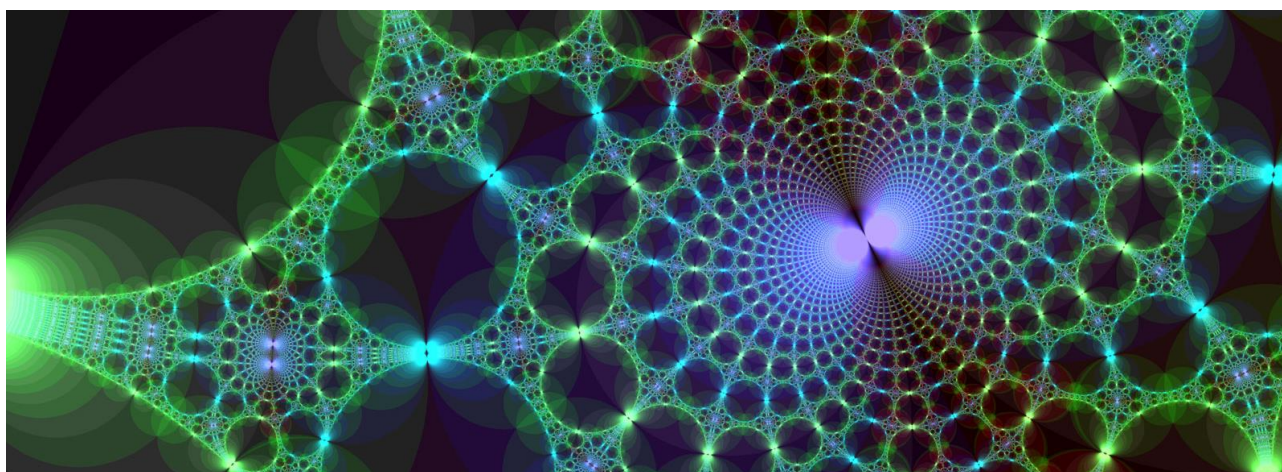
The Department of Mathematics of the University of Rome Tor Vergata is distinguished by first class research, often motivated by applications from theoretical physics, astronomy, aerospace, finance, technology and medical science, a high level educational system, and the organization of events in the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

We congratulate:

- Dr. Andrea Santi, winner of the “Tenure-Track” Assistant Professorships (RTD-B) position in Algebra (Settore concorsuale 01/A2 - Settore Scientifico Disciplinare MAT/02).

## Postdoc positions

The following Postdoc positions selection procedures are in progress:

- 1 (two-years) Postdoc position (Assegni di Ricerca - IV Fascia) in Mathematical Physics (Settore concorsuale 01/A4 - Settore Scientifico Disciplinare MAT/07) – Title: “Sistemi dinamici”
- 1 (one-year) Postdoc position (Assegni di Ricerca - III Fascia) in Mathematical Analysis (Settore concorsuale 01/A3 - Settore Scientifico Disciplinare MAT/05) – Title: “Metodi variazionali e PDE per lo studio di sistemi Hamiltoniani e dell'equazione di Hamilton-Jacobi”
- 1 (one-year) Postdoc position (Assegni di Ricerca - III Fascia) in Numerical Analysis (Settore concorsuale 01/A5 - Settore Scientifico Disciplinare MAT/08) – Title: “Metodi Isogeometrici veloci e accurati basati su discretizzazioni compatibili”
- 1 (one-year) Postdoc position (Assegni di Ricerca - II Fascia) in Mathematical Analysis (Settore concorsuale 01/A3 - Settore Scientifico Disciplinare MAT/05) – Title: “Equazioni di reazione-diffusione e applicazioni: modellistica matematica e simulazione numerica”
- 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. Davide Cordella, winner of the (one-year) Postdoc position (Assegni di Ricerca - II Fascia) in Geometry (Settore concorsuale 01/A3 - Settore Scientifico Disciplinare MAT/03) – Title: “Semigrupperi di Funzioni Olomorfe”

# Research



## **RoMaDS** (Rome Center on Mathematics for Modeling and Data ScienceS)

Recently founded by MATH@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 courses (<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>

## **Inauguration Colloquium**

- **Lorenzo Rosasco**  
Title: A guided tour of machine learning (theory)  
Date: May 9<sup>th</sup> 2022

## **Thematic Semesters**

During the period January 2022 - March 2022, MATH@TOV organized a series of seminar talks on the following main areas (cf. also <http://www.mat.uniroma2.it/Progetto/short-visit.php>):

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

- Among others, we mention the talks of E. Di Nezza (Ecole Polytechnique de Paris).

### **Mathematical techniques for Earth and Space Science**

- Among others, we mention the talks of N. Augier (CNRS-LAAS, Toulouse), C. Mendico (University of Rome "La Sapienza") P. Cardaliaguet (Université Paris Dauphine).

### **PDE's of Liouville type in Physics and Geometry**



- Among others, we mention the talks of R. Ruggiero (PUC Rio De Janeiro), A. Della Torre (University of Rome “La Sapienza”), A.M. Candela (University of Bari), P. Montecchiari (Università Politecnica delle Marche), D. Cassani (Università degli Studi dell’Insubria).

### **Algebraic Geometry**

- Among others, we mention the talks of J. Eberhardt (University of Bonn), A. Bianchi (University of Copenhagen), R. Fioresi (University of Bologna), M. A. de Cataldo (Stony Brook).

### **Numerical analysis - aeronautic and aerospace design**

- Among others, we mention the talk of L. De Feo (IBM Research Europe).

## **Conferences and Workshops**

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

- **Algebraic Combinatorics and Mathematical Physics**  
Date: January 13<sup>th</sup> and 14<sup>th</sup> 2022  
Organizer: F. Brenti  
<http://www.mat.uniroma2.it/progetto/Eventi/2022/Acamp/acamp.php>
- **Calcolo scientifico e modelli matematici**  
Date: April 6<sup>th</sup> - 8<sup>th</sup> 2022  
Organizers: M. Falcone (Roma La Sapienza), L. Lopez (Bari), C. Manni (Roma Tor Vergata), R. Natalini (IAC-CNR, Roma).  
<https://www1.mat.uniroma1.it/ricerca/convegni/2022/CS2022/>
- **May12: Celebrating women in mathematics**  
Date: May 13<sup>th</sup> 2022  
Organizers: M. Lanini, D. Marinucci, A. Sorrentino, E. Strickland (Roma Tor Vergata).  
<http://www.mat.uniroma2.it/may12.php>
- **A day on Random Graphs**  
Date: May 30<sup>th</sup> 2022  
Organizers: A. Clementi, D. Marinucci, M. Salvi, S. Vigogna (Roma Tor Vergata).  
<https://www.mat.uniroma2.it/~rds/graphs.php>

## **Colloquia dei XL**

- **R. Longo**  
Title: Frammenti nel dialogo tra Matematica e Fisica  
Date: February 22<sup>th</sup> 2022

## **Colloquium LEVI-CIVITA**

- **Slava Rychov**  
Title: “Bootstrap” method in physics and mathematics  
Date: September 10<sup>th</sup> May 2022

## 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

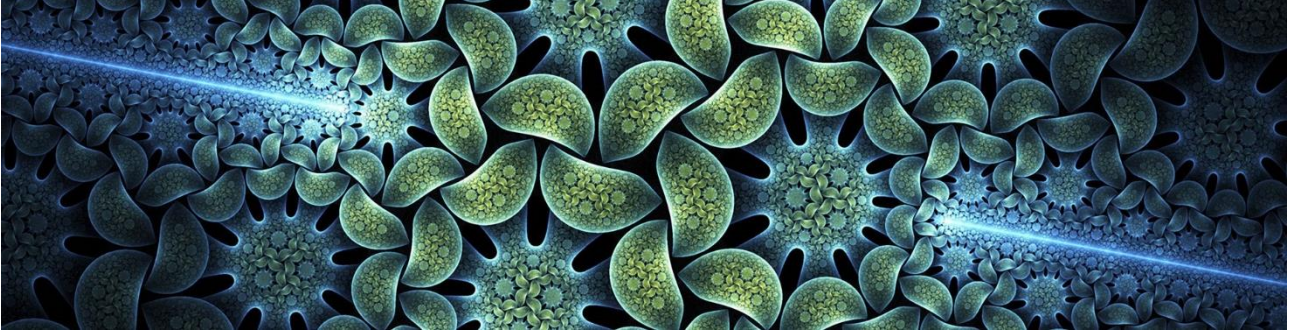
- **Pluripotential theory in Kähler geometry**  
E. Di Nezza (École Polytechnique, Paris)  
Period: December 21, 2021 - January 10, 2022  
<http://www.mat.uniroma2.it/~dott/DiNezza-2021.pdf>
- **Isogeny based cryptography**  
L. De Feo (IBM Research Europe)  
Period: February 14 - February 19, 2022  
[http://www.mat.uniroma2.it/dottorato/Docs/DE\\_FEO.pdf](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>
- **On some classes of nonlinear and nonlocal elliptic PDE's in  $\mathbb{R}^N$**   
R. Molle (University of Rome "Tor Vergata"), C. Mercuri (Swansea University).  
Period: May 15 – June 09, 2022  
<https://www.mat.uniroma2.it/dottorato/Docs/MERCURI-MOLLE.pdf>
- **Stability spaces from an algebraic viewpoint**  
J. Woolf (University of Liverpool)  
Period: June 06 – June 09, 2022  
[http://www.mat.uniroma2.it/dottorato/Docs/Woolf\\_course.pdf](http://www.mat.uniroma2.it/dottorato/Docs/Woolf_course.pdf)
- **Introduction into Neural Networks and Deep Learning**  
D. Koroliouk (National Academy of Sciences of Ukraine)  
Period: May 11 – June 30, 2022  
[http://www.mat.uniroma2.it/dottorato/Docs/Woolf\\_course.pdf](http://www.mat.uniroma2.it/dottorato/Docs/Woolf_course.pdf)



## Master's 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 2020/2021 academic year, Lucia CELLI has been admitted to the Curriculum of Excellence.
- In addition, students Gabriele SALVADEI, Edoardo SCRIMA, Alessandro TRASATTI and Arianna VICARI have successfully completed the first year of the Curriculum of Excellence and are now enrolled in the second year.

## Third mission



Organized in collaboration with “Centro Studi di Antichità Matematica Filosofia”:

- Presentation of the book:  
“Il tracollo culturale. La conquista Romana del mediterraneo.”  
meeting with the author Prof. Lucio Russo, April 28 2022  
<http://sapereantico.uniroma2.it/eventi/>

- Conference:  
“Perché la matematica bizantina è più interessante di quella Greca Antica”  
Prof. Fabio Acerbi Lucio Russo, June 09 2022  
<http://sapereantico.uniroma2.it/eventi/>