Marco Castronovo – CV

Personal	Italian citizenship, USA green card
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Employment

2021-   **Ritt Assistant Professor - Columbia University, USA**
Parental leaves: Spring 2022, Spring 2024

Education

2016-2021   **PhD in Mathematics - Rutgers University, USA**
Thesis advisor: Chris Woodward

2012-2015   **Laurea Magistrale in Matematica - Università di Pisa, Italy**
Final grade: 110/110 cum laude

2009-2012   **Laurea Triennale in Matematica - Università di Pisa, Italy**
Final grade: 110/110

Visits

August 2015 - May 2016
Indiana University, Bloomington (IN), USA
Main scientific advisor: **Dylan Thurston**
Funding: Indiana University Graduate Fellowship

September 2014 - June 2015
Max Planck Institute for Mathematics, Bonn, Germany
Main scientific advisor: **Peter Teichner**
Funding: International Max Planck Research School for Moduli Spaces Fellowship

Awards and grants

- **2022**   AMS-Simons Travel Grant

- **2021**   Rutgers Outstanding Doctoral Student Award

- **2019**   Rutgers TA Teaching Excellence Award

Publications and preprints

- **Cluster deep loci and mirror symmetry**
  https://arxiv.org/abs/2402.16970
  with M. Gorsky, J. Simental, D. Speyer
  Submitted.

- **Curved Fukaya algebras and the Dubrovin spectrum**
  https://arxiv.org/abs/2401.13603
  Submitted.

- **Lagrangian cobordism of positroid links**
  https://arxiv.org/abs/2305.16232
  with J. Asplund, Y. Bae, O. Capovilla-Searle, C. Leverson, A. Wu
  Submitted.

- **Liouville domains from Okounkov bodies**
  http://arxiv.org/abs/2201.01864
  Submitted.

- **Exotic Lagrangian tori in Grassmannians**
  https://ems.press/journals/qt/articles/9397541
  Quantum Topology 14 (2023), no. 1, 65-99.

- **Fukaya category of Grassmannians: rectangles**
  https://doi.org/10.1016/j.aim.2020.107287
  Advances in Mathematics 372 (2020), 107287, 40 pp.

Code

- **DubrovinDynamics**
  https://gitlab.com/castronovo/dubrovindynamics

- **Posetroids**
  https://gitlab.com/castronovo/posetroids

- **ClusterExplorer**
  https://gitlab.com/castronovo/clusterexplorer

Talks

Conferences:

- **Algebraic Geometry Northeastern Series**
  Rutgers University. 05/2022
- **Recent developments in Lagrangian Floer theory**
  Simons Center for Geometry and Physics. 03/2022

Seminars:

- **Northwestern University**
  Geometry & Physics Seminar. 05/2024
- **CUNY**
  Topology, Geometry, and Physics Seminar. 03/2024
- **University of North Carolina - Chapel Hill**
  Physically inspired mathematics Seminar. 02/2024
- **CUNY**
  Differential Geometry, Topology, and special structures Seminar. 02/2024
- **Stony Brook University**
  Symplectic geometry seminar. 01/2024
- **Rutgers University**
  Symplectic seminar. 10/2023
- **Columbia University**
  Informal mathematical physics seminar. 10/2023
- **Princeton University / IAS**
  Symplectic Seminar. 10/2022
- **Columbia University**
  Algebraic Geometry Seminar. 04/2022
- **Symplectic Zoominar (CRM-Montréal, Princeton/IAS, Tel Aviv, Paris)**
  03/2022
- **IBS Center for Geometry and Physics**
  Symplectic Monday Seminar. 03/2022

- **Texas A&M University**
  Topology Seminar. 02/2022
- **Columbia University**
  Enumerative Geometry Seminar. 10/2021
- **Western Hemisphere Virtual Symplectic Seminar**
  06/2021
- **Hebrew University of Jerusalem**
  Topology and Geometry Seminar. 06/2021
- **University of Southern California**
  Geometry, Topology, and Categorification Seminar. 04/2021
- **Institut de Mathématiques de Jussieu**
  Séminaire de Géométrie Enumérative. 01/2021
- **Universität Bonn**
  Oberseminar Darstellungstheorie. 01/2021
- **Stony Brook University**
  Symplectic geometry seminar. 02/2020
- **University of Cambridge**
  Differential geometry & topology seminar. 01/2020
- **University of Birmingham**
  Geometry and mathematical physics seminar. 01/2020
- **Columbia University**
  Informal mathematical physics seminar. 10/2019
- **University of Pennsylvania**
  Math-Physics joint seminar. 09/2019
- **Columbia University**
  Symplectic geometry, gauge theory and categorification seminar. 02/2019

Teaching

- *Instructor at Columbia: (∼25 lectures of 75 minutes per section + 2 weekly office hours)*

  - Fall 2023: **Linear algebra**, 1 section of ∼80 students
  - Spring 2023: **Calculus I**, 1 section of ∼40 students
  - Fall 2022: **Linear algebra**, 2 sections of ∼60 students
  - Fall 2021: **Linear algebra**, 2 sections of ∼50 students

- *Teaching Assistant at Rutgers: (∼10 workshops of 80 minutes per section + 1 weekly office hour)*

  - Spring 2021: **Real analysis**, 2 sections of ∼20 students
  - Fall 2020: **Real analysis**, 1 section of ∼20 students
  - Spring 2020: **Real analysis**, 1 section of ∼20 students
  - Fall 2019: **Real analysis**, 2 sections of ∼20 students
  - Spring 2019: **Calculus of many variables**, 3 sections of ∼25 students
  - Fall 2018: **Real analysis**, 2 sections of ∼20 students
  - Spring 2018: **Calculus of one variable**, 3 sections of ∼25 students

- *Grader at Rutgers: (∼10 problem sheets per course)*

  - Summer 2017: **Number theory**
  - Spring 2017: **Introduction to proofs**, **Abstract algebra**
  - Fall 2016: **Linear algebra**, **Combinatorics**

Broader impact

- *Targeting undergraduates at Columbia:*

  - Summer 2022: **Columbia College Scholars Program**.
    https://urf.columbia.edu/urf/research/programs
    Students Erica Yousol Choi, Karina Dovgodko, Xincheng Zhang, 10 meetings of ∼1-2 hours each. We learned about recent developments on the geometry of positroid strata of Grassmannians, then extended the Python code of a random walk I created to explore the cluster structure of these spaces.

- *Targeting undergraduates at Rutgers:*

  - Summer 2020: **DIMACS Research Experience for Undergraduates**.
    https://reu.dimacs.rutgers.edu/
    Students Anna Antal and Samuel Panitch, 16 meetings of ∼60 minutes, mentoring done jointly with Prof. Woodward. We related different notions of "mutation" existing in recent literature: for two-variable Laurent polynomials, convex polygons, and quivers. Anna and Samuel later continued with a PhD in mathematics at Yale.

  - Spring 2017: **Math Department Directed Reading Program**.
    https://www.math.rutgers.edu/academics/undergraduate/directed-reading-program
    Student Daniel Solano, 6 meetings of ∼60 minutes, coaching for final 15 minutes presentation. We read parts of Arnold-Khesin "Topological methods in hydrodynamics". Daniel later continued with a PhD in applied mathematics at Brown.

- *Targeting students in New York City middle schools:*

  - Fall 2023, contributed an activity to the **Sonia Kovalevsky Day**
    https://www.math.columbia.edu/diversity/skday/

  - Fall 2022, contributed an activity to the **Girls Science Day**
    https://www.girlsscienceday.com/

- *Targeting students in Harlem primary schools:*

  - Spring 2024, volunteered for the after school program **Reading Team Math**
    https://sites.google.com/view/readingteammath

Service

- *Referee for:*

  - Advances in Mathematics
  - Compositio Mathematica
  - Selecta Mathematica

- *At Columbia University:*

  - 2022-23, member of a committee that overhauled the PhD program in mathematics
  - 2021-24, co-organizer of the research seminar on Symplectic Geometry and Gauge Theory
  - Fall 2021, organizer of one reading group for graduate students and postdocs

- *At Rutgers University:*

  - Spring 2019, organizer of the Symplectic Literature reading group
  - Spring 2018, organizer of the Junior Geometry seminar