

Ana MARGARIDA Mascarenhas MELO

Curriculum Vitae

Departmento di Matematica e Fisica, Università Roma Tre
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PRINCIPAL INTERESTS Algebraic geometry. Moduli theory: moduli of curves, sheaves on curves, abelian varieties and its compactifications. Tropical geometry and applications of combinatorics on the study of (compactified) algebraic moduli spaces.

EMPLOYMENT HISTORY *Full Professor* 2024 - present day
Dipartimento di Matematica e Fisica, Università degli studi di Roma Tre, Italy.

Associate Professor 2017 - 2024
Dipartimento di Matematica e Fisica, Università degli studi di Roma Tre, Italy.

Tenure track position (Ricercatore RTDb) 2014 - 2017
Dipartimento di Matematica e Fisica, Università degli studi di Roma Tre, Italy.
This position was awarded by a “[Rita Levi Montalcini](#)” grant, directly funded by MIUR.

Lecturer (tenure track position) 2009 - 2014
Mathematics Department of the University of Coimbra (Portugal).

Post-doc 2013 - 2014
Dipartimento di Matematica, Università degli studi di Roma Tre
This position was awarded by a [FCT](#) fellowship.

Junior Lecturer (teaching assistant) 2002 - 2009
Mathematics Department of the University of Coimbra (Portugal).

ACADEMIC BACKGROUND *PhD in Mathematics* 2009
Dipartimento di Matematica, Università degli studi di Roma Tre

- Specialization in Algebraic Geometry, supervised by Prof. Lucia Caporaso.
- Title of PhD thesis: “Compactified Picard stacks over the moduli space of curves with marked points”.
- Phd Thesis consists of a stack theoretical construction of algebraic stacks yielding a compactification of the universal Picard stack parametrizing smooth curves endowed with distinct points and a line bundle.
- My PhD thesis was awarded with the [Michele Cuzzo](#) 2009 grant, which distinguished a thesis in Mathematics discussed in Italy in 2009.

Master Degree in Pure Mathematics 2004
Mathematics Department of the University of Coimbra (Portugal).

- Specialisation in Algebra under the supervision of Prof. Manuela Sobral.
- Msc dissertation consists of a survey on the categorical approach to Grothendieck descent theory and its relation with monadicity of certain fibrations.

Undergraduate degree in Pure Mathematics 2002
Mathematics Department of the University of Coimbra (Portugal)

- First class with distinction (18 out of 20).

PUBLICATIONS See also [my google scholar](#) page and my publications at [arXiv](#).

Books

1. GIT for polarized curves (with Gilberto Bini and Filippo Viviani). 160 p. Lecture Notes in Mathematics 2122. Springer, 2014.

Research articles

1. Combinatorial aspects of nodal curves (with S. Busonero and L. Stoppino), *Le Matematiche* 61 (2006), no. 1, 109-141.
2. Compactified Picard stacks over $\overline{\mathcal{M}}_g$, *Mathematische Zeitschrift* 263 (2009), no. 4, 939-957.
3. Compactified Picard stacks over the moduli stack of stable curves with marked points, *Advances in Mathematics* 226 (2011), no. 1, 727-763.
4. On the complexity group of stable curves (with Simone Busonero and Lidia Stoppino), *Advances in Geometry* 11 (2011), no. 2, 241-272.
5. On the Tropical Torelli map (with Silvia Brannetti and Filippo Viviani), *Advances in Mathematics* 226 (2011), no. 3, 2546-2586.
6. Fine compactified Jacobians (with Filippo Viviani). *Mathematische Nachrichten* 285 (2012), no. 8-9, 997-1031.
7. Comparing Perfect and Voronoi decompositions: the matroidal locus (with Filippo Viviani). *Mathematische Annalen* 2012, Volume 354, Issue 4, pp 1521-1554.
8. On GIT quotients of Hilbert and Chow schemes of curves (with Gilberto Bini and Filippo Viviani). *Electronic Research Announcements in Mathematical Sciences* 19 (2012), 33-40.
9. Tropical Teichmüller and Siegel Spaces (with Melody Chan and Filippo Viviani). *Contemporary Mathematics* 589 (2013), 45-85.
10. Picard group of the compactified universal Picard stack (with Filippo Viviani). *Documenta Math.* 19 (2014), 457-507.
11. Algebraic and combinatorial rank of divisors on finite graphs (with L. Caporaso and Y. Len). *Journal des Mathématiques Pures et Appliquées* (9) 104 (2015), no. 2, 227-257.
12. Fine compactified Jacobians of reduced curves (with Antonio Rapagnetta and Filippo Viviani). *Trans. Amer. Math. Soc.* 369 (2017), no. 8, 5341-5402.
13. Universal Néron models for curves with marked points. *Boll. Unione Mat. Ital.* 10 (2017), no. 3, 321-334.
14. Fourier-Mukai and Autoduality for Compactified Jacobians. I (with Antonio Rapagnetta and Filippo Viviani). *Journal für die reine und angewandte Mathematik.* 755, 1-65 (2019).
15. Fourier-Mukai and Autoduality for Compactified Jacobians. II. (with A. Rapagnetta and F. Viviani). *Geom. Topol.* 23, No. 5, 2335-2395 (2019).
16. Universal compactified Jacobians. *Port. Math. (N.S.)* 76, No. 2, 101-122 (2019).
17. Tropicalizing the moduli space of spin curves. (with L. Caporaso and M. Pacini) *Sel. Math. New Ser.* 26, 16 (2020).
18. Tropicalization of the universal Jacobian. (with S. Moulcho, M. Ulirsch and F. Viviani). *Épjournal de Gom. Algèbr., EPIGA* 6, Article 15, 51 p. (2022).

19. Theta characteristics on tropical curves. (with L. Caporaso and M. Pacini). Journal of Pure and Applied Algebra, Volume 227, Issue 5, May 2023.
20. On the Top-weight rational cohomology of A_g . (with M. Brandt, J. Bruce, M. Chan, G. Moreland and C. Wolfe). Geometry & Topology. 28, No. 2, 497-538 (2024).
21. Clifford representatives via the uniform algebraic rank. (with M. Barbosa and K. Christ, Karl). J. Lond. Math. Soc., II. Ser. 111, No. 6, (2025).
22. Tropicalizing moduli spaces and applications. Bol. Soc. Port. Mat. 83, 109-123 (2025).
23. Tropical trigonal curves. (with A. Zheng). Algebr. Comb. 9, No. 1, 95-130 (2026).

Preprints

1. Compactifications of the universal Jacobian over curves with marked points. Preprint arXiv:1509.06177.
2. Tropical trigonal curves: the general case. (with A. Zheng). Preprint arXiv:2509.09502.

In preparation

1. Roots of line bundles on the Universal Curve, with T. Poiret.
2. Tropicalization of the Universal Jacobian II: LogPic and TroPic, with S. Molcho, M. Ulirsch, F. Viviani and J. Wise.
3. Tropical Compactifications of the Moduli Space of Curves, with L. Lang, J. Rau and F. Viviani.

**EDITORIAL
ACTIVITY**

Editorial Board of International Journals

- Since 2022, I serve as managing editor of the journal “Moduli”, owned by Foundation Compositio Mathematica and published by LMS-CUP, first volume appeared in 2024.

Edition of special Volumes

- **Moduli of curves.** (L. Brambila Paz, C. Ciliberto, E. Esteves; M. Margarida; C. Voisin - editors) CIMAT Guanajuato, Mexico 2016. Lecture notes of a CIMPA-ICTP school, Guanajuato, Mexico, February 22 – March 4, 2016. Lecture Notes of the Unione Matematica Italiana 21. Cham: Springer.
- Special volume “Moduli Spaces and Vector Bundles – new trends”, following up the conference **VBAC 2022**(P. Gothen; M. Melo; M. Teixidor i. Bigas - editors) Contemporary Mathematics 803. Providence, RI: American Mathematical Society (AMS), 370 p. (2024).

**FELLOWSHIPS
AND GRANTS**

Fellowships

- 2000/2001: Fundação Calouste Gulbenkian’s research fellow in “Novos talentos em Matemática”.
- October 2005/May 2009 : PhD student at the Mathematics Department of the University of Rome 3, financially supported by a Fundação Calouste Gulbenkian fellowship and by a Fundação para a Ciência e Tecnologia fellowship.
- February 2013- January 2014: post-doc position at Roma TRE/CMUC awarded by a FCT fellowship.

Grants - Principal Investigator

- November 2009: “Michele Cuozzo” award by the Mathematics department of the University of Rome Tor Vergata (research grant of 12.000 euros)
- February 2010: Principal investigator of the [Fundação Calouste Gulbenkian](#) program “Estímulo à investigação” (research grant of 12.500 euros).
- November 2014: Principal investigator of the research project EXPL/MAT-GEO/1168/2013 “Geometry of moduli spaces of sheaves on curves and abelian varieties”, funded by [FCT](#) (portuguese governmental Foundation for Science and Tecnology) with 37.500 euros.
- February 2014: “Programma giovani ricercatori Rita Levi Montalcini 2013” award by MIUR, financing my RTDb position at Roma Tre and a research grant of 17.000 euros.
- June 2021: funded by the Roma Tre program to support the participation in international competitive research calls (2.500 euros).
- September 2021: co-PI of the FCT project “Mirror symmetry on moduli spaces of Higgs Bundles” funded with 50.000 euros.

Other grants - team member

- Member of PRIN 2022: “Moduli Spaces and Birational Geometry”.
- Member of PRIN 2020: “Curves, Ricci Varieties and their Interactions (CuRVI)”.
- Member of PRIN 2018: “Advances in Moduli Theory and Birational Classification”.
- Member of PRIN 2017: “Geometria delle varietà algebriche”.
- FCT project “Comunidade Portuguesa de Geometria Algébrica” (PTDC/MAT-GEO/0675/2012);
- FCT project “Espaços de Moduli em Geometria Algébrica” (PTDC/MAT/111332/2009) (core CV);
- FCT project “Geometria Algébrica em Portugal” (PTDC/MAT/099275/2008).

**RESEARCH
VISITOR
POSITIONS**

- 2008/2009 Spring semester: Program Associate of the MSRI special semester in Algebraic Geometry, Berkely, USA.
- July 2009: Research visitor in IMPA (Instituto de Matemática Pura e Aplicada), Rio de Janeiro, Brasil.
- September-December 2010: Research visitor at the Mathematics Department of the University of Rome “Tor Vergata” awarded by the “Michele Cuozzo” 2009 grant.
- July 2011: Research member of the Park City Mathematical Institute of the Institute for Advanced Studies for the special program on “Moduli of Riemann Surfaces”.
- August 25-September 4 2011: Research visitor in the University of Texas Austin, USA.
- July 7-September 6 2013: Visitor Professor grant of the foundation CAPES-Brasil for Visitor Professor at the University *Federal Fluminense*, Rio de Janeiro, Brasil.
- April 2017: invited research member at the AIM workshop on “Tropical schemes”, held at San Jose, California, (USA).

INVITED LECTURES

Advanced courses on research schools

11. [Trieste Algebraic Geometry Summer School \(TAGSS\) 2024](#), 2-6 September, 2024, ICTP, Trieste. Invited to lecture a mini-course on “Tropical moduli spaces of curves and Jacobians”.
10. [Journées Louis Antoine 2023](#): Géométries tropicales et applications. Rennes, 9-10 November, 2023. Invited to lecture a mini-course on “Tropicalization of moduli spaces of curves, Jacobians and Abelian varieties”.
9. [VBAC 2023](#): Recent applications to the geometry of moduli spaces. Essen, August 28 - September 1, 2023. Invited to lecture a mini-course on “Compactified Jacobians”.
8. [School on Mirror Symmetry and Moduli Spaces \(SMSMS\)](#), 22 June - 1 July 2022, Lisbon, Portugal. Lectured a mini-course on “Compactified Jacobians and Fourier-Mukai transforms”.
7. School on Mirror Symmetry and Moduli Spaces 2021 (SMSMS), 29-30 June 2021, “On the top weight cohomology of the moduli space of abelian varieties” (<https://www.math.tecnico.ulisboa.pt/efranco/SMSMS/2021.html>, [video](#))
6. EWM-EMS Mittag Leffler summer school on Tropical Moduli Spaces, 28 June - 2 July 2021, lectured a course on “Compactifications vs Tropicalizations of moduli spaces” (<https://sites.google.com/view/ewmems-mittag-leffler-summer-s/>)
5. together with Melody Chan (Brown university), guided a research group on the workshop “Women in algebraic geometry”, organized by ICERM (Providence-USA) July 27-31, 2020. The meetings were held online and the group focused on computing *Top weight cohomology of the moduli space of abelian varieties A_g* .
4. ATOM (Algebraic and Tropical Online meetings), (July 13-16, 2020). Lectured on the VI week of the meeting on *Tropical moduli spaces*. (lectures are available on [youtube](#)).
3. Post-graduation course at CIMAT, Guanajuato, Mexico, February 2014. Lectured a 5 hours course on *GIT and Chow stability and the construction of moduli spaces of curves*.
2. Post-graduation course of UFF (Universidade Federal Fluminense), Niterói, Rio de Janeiro, Brasil, July- August 2013. Lectured a 10 hours course on *Moduli spaces of tropical curves*.
1. School and conference “[LEGAL: Liberdade em Geometria Algébrica](#)” 2012, Teresópolis (Brasil), February 5-11, 2012. Lectured a 5 hours course on *Moduli problems and stacks*.

Invited lectures at international conferences

61. [VBAC 2026: Curves, Surfaces and Moduli](#), January 19 - 23, Merida, Mexico, 2026. Talk: Ranks for divisors on graphs and Clifford’s inequality for nodal curves.
60. [Algebraic and tropical geometry of moduli spaces of curves](#), September 8-12, Bologna, Italy. Talk: Ranks for divisors on graphs and Clifford’s inequality for nodal curves.
59. [2025 Summer Research Institute in Algebraic Geometry](#), July 14 - August 1, 2025, Fort Collins, Colorado, USA. Invited lecture at the session [Geometry of Moduli](#): Compactified spaces of roots over the moduli of curves.

58. [Harmonies in Moduli Spaces](#), in occasion of Lucia Caporaso's birthday, June 9-13, 2025, Roma Tre. Talk: Compactified spaces of roots over the space of curves.
57. [Recent trends in Algebraic Geometry](#), June 15 - 20, 2025, Oberwolfach, Germany. Talk: On the top weight rational cohomology of the moduli space of abelian varieties and universal Jacobians.
56. [Workshop Enumerative geometry in logarithmic, tropical and real world](#), SwissMAP Research Station, Les Diablerets, April 14-18, 2025. Talk: Compactified spaces of roots over the space of curves.
55. [Woman in Number Theory and Geometry \(WINGS\) 2025](#), March 31- April 3, 2025, UK. Talk: Tropicalizing moduli spaces and applications.
54. [AGaFe 2024](#), Ferrara, 12-14 February 2024. Talk: Tropicalizing moduli spaces and applications.
53. [Topology and arithmetic of the Moduli space of curves](#), Montpellier, France; 13-17 May, 2014. Talk: Tropicalizing moduli spaces and applications.
52. [STEW: Oslo Stability and Enumerative Geometry Workshop](#), Oslo, 11 - 15 December, 2023. Talk: Compactified and Tropicalized Universal Jacobians.
51. [Algebraic Geometry session](#) of the conference of the Italian Mathematical Union (UMI), Pisa, September 4-9, 2023. Talk: "Tropicalizing moduli spaces and applications".
50. [Curves: algebraic, tropical and logarithmic](#), Banff International Research station, Canada, August 6-11, 2023. Talk: "Tropical Universal Jacobians".
49. [Global Portuguese Mathematicians](#), Coimbra, July 26-28, 2023. Talk: "Tropicalizing moduli spaces and applications".
48. [Refined invariants in Moduli Theory](#), SISSA, Trieste, May 2-5, 2023. Talk: "Tropicalization of the universal Jacobian: logarithmic and non-archimedean view points".
47. [Non-commutative geometry meets topological recursion](#), Erwin Schrödinger Institute for Mathematics and Physics, Wien, Austria, April 24-28, 2023. Talk: "Tropicalization of the universal Jacobian: logarithmic and non-archimedean view points".
46. [Mini-Workshop on Complex and Tropical Geometry](#), October 26, 2022, Università di Padova. Talk: "Tropical Universal Jacobians".
45. Workshop in [Combinatorial Algebraic Geometry](#), Bath, UK, August 1-5 2022. Talk: "Tropicalizing Universal Jacobians".
44. "Algebraic geometry conference - Christmas in Rome 2021", December 20-21, 2021. Talk: "Compactified Jacobians for families of curves: classical and tropical view points".
43. "Riposte Armonie, Algebraic Geometry in Cetraro 2021, together with Ciro Ciliberto", September 21-21, 2021, Cetraro (Italy). Talk: "On the top weight cohomology of the moduli space of Abelian varieties."
42. "ENSPM21: National meeting of the Portuguese Mathematical Society, 2021", July 13th, 2021. Main speaker of the geometry section. Talk: "Understanding the geometry of a (compactified) moduli space via tropical geometry" (online).
41. Women in Mathematics meeting, 22-24 July, 2019, Lisbon, Portugal. Talk: "Compactifications of algebro-geometric moduli spaces and tropicalizations".

40. GQT Geometry and Quantum theory colloquium, 3-5 July 2019, Den Dolder (The Netherlands). Talk: “Tropicalizing the moduli space of stable spin curves and applications”.
39. VBAC 2019: GIT, wall-crossings and moduli spaces, 24-28 June 2019, QGM Aarhus (Danmark). Talk: “Tropicalizing the moduli space of stable spin curves and applications”.
38. Tropical Geometry in Frankfurt, 7 June 2019, Goethe University, Frankfurt (Germany). Talk: ‘Combinatorics and moduli of line bundles on stable curves”.
37. School: Curves and groups in families, 13-17 May 2019, Rennes (France). Talk: “(Universal) Compactified Jacobians”.
36. Recent progress in moduli theory, 6-10 May 2019, MSRI, Berkeley (USA). Talk: “Tropicalizing the moduli space of stable spin curves and applications”.
35. Aeneas Conference: migrating Algebraic Geometry, 20- 21 December 2018, Rome (Italy). Talk: “Universal compactifications for bundles over curves”.
34. National Meeting of the Portuguese Mathematical Society (ENSPM 2018), IPB, July 9-11, 2018, Bragança, Portugal. Talk: “Tropicalizing vs compactifying moduli spaces”.
33. Birational Geometry and Moduli Spaces, 11-15 June 2018, Roma (Italy). Talk: “The tropicalization of the moduli space of spin curves”.
32. Mini-Workshop of Algebraic Geometry, 10-11 May 2018, Milan (Italy). Talk: “The tropicalization of the moduli space of spin curves”.
31. Algebraic Geometry with Fancy coefficients, 13-17 November 2017, Caen (France). Talk: “The tropicalization of the moduli space of spin curves”.
30. Recent advances on the Geometry of valuations, 8-11 November 2017, Frankfurt. Talk: “The tropicalization of the moduli space of spin curves”.
29. Moduli of curves in Gothenburg, 13-16 October 2017. Talk: “Universal compactified Jacobians and applications”.
28. Algebraic Geometry session of the “Coloquio Brasileiro de Matematica”, 30 July- 5 August 2017, IMPA, Rio de Janeiro (Brasil). Talk: “Universal compactified Jacobians and applications”.
27. Workshop on Combinatorial moduli spaces and intersection theory, The fields institute for research in mathematical sciences, Toronto, December 5-9 2016. Talk: “Combinatorics and moduli of tropical linear series on curves”.
26. National meeting of the Portuguese Mathematical Society 2016, Barreiro School of Technology, Portugal, July 11-13, 2016. Talks at the combinatorics session: “Matroides regulares: espaço de moduli e teorema de Torelli” and at the Algebraic Geometry session: “Stacks de Picard universais compactificados sobre curvas marcadas e aplicações”.
25. Moduli and Automorphic Forms: a Meeting for Women in Mathematics, Berlin, May 12-14, 2016. Talk: “Universal compactified Jacobians and applications”.
24. British Algebraic Geometry seminar, Edinburgh, April 13-15 2016. Talk: “Universal compactified Jacobians over curves with marked points and applications”.
23. Tropical Geometry in Europe Seminar, Toulouse, November 19, 2015. Talk: “Combinatorial aspects of universal compactified Jacobians over curves with marked points”.
22. Conference of the Italian Mathematical Union (UMI), Siena, September 7-13, 2015. Talk: “Tropicalizations of moduli spaces and applications”.

21. Conference “VBAC 2015: Fourier-Mukai: 34 years on”, Warwick, June 15-19, 2015. Talk: “Autoduality and Fourier-Mukai for compactified Jacobians”.
20. Conference “Tropical Geometry in the tropics”, IMPA, Rio de Janeiro, May 11-15, 2015. Talk: “Regular matroids: Torelli theorem and moduli space”.
19. Geometry and Topology session of the National Meeting of the Mathematical Portuguese Society (SPM), Universidade Nova de Lisboa, July 14-16, 2014. Talk: “Autoduality and Fourier-Mukai for compactified Jacobians”.
18. “Georgia Algebraic Geometry Symposium”, University of Georgia, Athens (USA), October 18-20, 2013. Talk: “Comparing Toroidal compactifications of the moduli space of Abelian varieties: the matroidal locus”.
17. Conference “Classification of algebraic varieties and related topics”, Cetraro, Italy, September 9-15, 2013. Talk: “Autoduality and Fourier-Mukai for compactified Jacobians of singular curves”.
16. Conference “JOGA: Jornadas em Geometria Algébrica 2013”, Universidade Federal do Rio de Janeiro, Brasil, August 22-23, 2013. Talk: “Classical vs Tropical Brill-Noether theory”.
15. Conference Geometria Algebraica nella capitale, University of Rome 3, Italy, July 4-6, 2013. Talk: “Algebraic vs combinatorial Brill-Noether theory”.
14. CIME-CIRM Course on Combinatorial Algebraic Geometry, Levico Terme, Trento, Italy, June 10-14, 2013. Talk: “Comparing toroidal compactifications of the moduli space of abelian varieties”.
13. Oberwolfach workshop “Moduli Spaces in Algebraic Geometry”, February 4, 2013. Talk: “Tropical versus classical Brill-Noether theory”.
12. Workshop “Tropical Geometry”, International Center for Mathematical Sciences, Edimburgh, April 2-6, 2012. Talk: “Moduli spaces of tropical curves and tropical abelian varieties: the Teichmüller point of view”.
11. Workshop of the FCT project “Geometria Algébrica em Portugal” (PTDC/MAT/099275/2008), Porto, February 25, 2012. Talk: “Moduli spaces of tropical curves and tropical abelian varieties”.
10. Conference “[ELGA 2011](#)”, La Cumbre, Cordoba, Argentina, August 8, 2011. Talk: “Moduli spaces of tropical curves and tropical Abelian varieties”.
9. Workshop on “Tropical and Classical Geometry”, Università degli Studi di Milano, Italy, December 3, 2010. Talk: “Moduli spaces of tropical curves and tropical Abelian varieties”.
8. Conference “O gosto pela Matemática”, Fundação Calouste Gulbenkian, Lisbon, July 15-17, 2010. Talk: “Compactified Jacobians of singular curves”.
7. Geometry and Topology session of the National Meeting of the Mathematical Portuguese Society (SPM), Leiria, July 8-10, 2010. Talk: “Compactified Jacobians of singular curves”.
6. Conference “Giornate di Geometria Algebraica e argomenti correlati X”, Gargnano del Garda, Italy, May 25-29, 2010. Talk: “Compattificazioni di jacobiane di curve singolari”.
5. Algebra, Number Theory and Geometry session of the “Latin American Algebra Colloquium”, São Pedro (Brasil), August 3-8, 2009. Talk: “Compactified Picard stacks over the moduli space of curves with marked points”.
4. Conference “Géométrie algébrique et géométrie complexe”, CIRM, Luminy (France), 12-16 January 2009. Talk: “Compactified Picard stacks over $\overline{\mathcal{M}}_{g,n}$ ”.

3. School and workshop “On the Geometry of Algebraic stacks”, Trento (Italy), 1-6 September 2008. Talk: “Compactified Picard stacks over the moduli stack of stable curves with marked points.”
2. School and conference “GAeL: Géométrie Algébrique en Liberté”, Aranjuez (Madrid), from 21 to 25 April of 2008. Talk: “Compactified Picard stacks over \mathcal{M}_g ”.
1. Workshop of the “Centro de Matemática da Universidade de Coimbra”, from 12 to 15 of September of 2006. Talk: “Compactifying moduli spaces of curves”.

Seminar talks (invited)

49. Algebra and Geometry seminar of the University of Pavia, July 1, 2025. Talk: Tropicalizing moduli spaces and applications.
48. Research seminar of Topology, University of Münster, February 18, 2025. Talk: Tropicalizing moduli spaces and applications.
47. Geometry and Topology seminar of the University of Porto, January 6, 2023. Talk: “Tropicalization of the universal Jacobian: logarithmic and non-archimedean view points”.
46. Coimbra-Porto PhD program in Mathematics, January 4, 2024. Talk: “Tropicalizing Moduli Spaces”.
45. Geometry and Algebra Seminar of the University of Roma Sapienza, June 22, 2022. Talk: ”On the top weight rational cohomology of the moduli space of abelian varieties.”
44. Brazilian Algebraic geometry seminar (BRAG) , November 2021. Talk: “Tropicalization of the Universal Jacobian: tropical and non-archimedean viewpoints”. (online, [youtubevideo](#))
43. Geometry session of the University of Roma 2 Tor Vergata, November 2021. Talk: “On the top weight rational cohomology of \mathcal{A}_g ”.
42. Tropical geometry in Zoom seminar (TGIZ), May 28, 2021. Talk: “On the top weight cohomology of the moduli space of abelian varieties” (online, [video](#)).
41. Latin American Geometría Algebraica Real y Tropical Online Seminar (Lagartos), March 26, 2021. Talk: “On the top weight cohomology of the moduli space of abelian varieties” (online).
40. Leeds Algebra Seminar, February 16, 2021. Talk: “On the top weight cohomology of the moduli space of abelian varieties” (online).
39. Geometry seminar of the Faculty of sciences of the University of Lisbon, October 18, 2019. Talk: “ (Universal) compactified Jacobians”.
38. Algebra and Combinatorics seminar of the University of Coimbra (Portugal), January 15, 2020. Talk: ”Combinatorics and moduli of line bundles on stable curves”.
37. Algebraic Geometry and foliations seminar of the Universidade Federal Fluminense, Niterói, Brasil, August 10, 2018. Talk: “The tropicalization of the moduli space of stable spin curves”.
36. Algebraic Geometry and Number Theory seminar of the University of Padova, Italy, May 28, 2018. Talk: “On the tropical Torelli map”.
35. Geometry and Topology seminar of the University of Porto, January 27, 2017. Talk: “Autoduality and Fourier-Mukai for compactified Jacobians”.

34. Algebraic Geometry and Moduli seminar of the ETH, Zurich, May 18, 2016. Talk: “Universal compactified Jacobians over curves with marked points and applications”.
33. Algebra and Geometry seminar of the University of Genova, February 3, 2016. Talk: “Universal compactified Jacobians over curves with marked points and applications”.
32. Algebra and Combinatorics seminar of the University of Coimbra, November 4, 2015. Talk: “A tropical approach to spin curves”.
31. MIT- Harvard Algebraic Geometry seminar, Boston, USA, October 29, 2013. Talk: “Comparing the perfect and the 2nd Voronoi toroidal compactifications of Ag : the matroidal locus”.
30. Algebraic Geometry seminar of Stony Brook University (NY), USA, October 23, 2013. Talk: “Autoduality and Fourier-Mukai for compactified Jacobians.”
29. Algebraic Geometry Seminar of the Courant Institute, New York, USA, October 22, 2013. Talk: “Autoduality and Fourier-Mukai for compactified Jacobians.”
28. Algebra and Geometry seminar of the Mathematics Department of the University of Porto, Portugal, March 7, 2013. Talk: “Moduli spaces of tropical curves, tropical Abelian varieties and beyond”.
27. Geometry seminar of the University of Roma Tre, Italy, February 28, 2013. Talk: “Autoduality and Fourier-Mukai for compactified Jacobians.”
26. Algebraic Geometry seminar of the Mathematics Department of the University of Montpellier 2, June 25, 2012. Talk: ”On GIT quotients of Hilbert and Chow schemes of curves”.
25. Algebraic Geometry seminar of the university of Tor Vergata, Rome, Italy, May 25, 2012. Talk: ”Autoduality and the Fourier-Mukai transform for compactified Jacobians of singular curves”.
24. Algebra and Geometry seminar of IMPA (Instituto de Matemática Pura e Aplicada), Rio de Janeiro (Brasil), February 1, 2012. Talk: “The Picard group of the compactified universal Picard stack”.
23. Algebraic Geometry and foliations seminar of the Universidade Federal Fluminense, Niterói, Brasil, January 31, 2012. Talk: “Moduli spaces of tropical curves and tropical abelian varieties”.
22. Algebra and Combinatorics seminar of the University of Coimbra, October 26, 2011. Talk: “Geometric Invariant Theory for polarized curves”.
21. Geometry seminar of the University of Texas, Austin, USA, September 1, 2011. Talk: “GIT for curves of low degree”.
20. ”Mathematics Colóquio” of the Universidade de Minas Gerais, Belo Horizonte, Brasil, August 18, 2011. Talk: “The tropical Torelli map”.
19. Algebraic Geometry and foliations seminar of the Universidade Federal Fluminense, Niterói, Brasil, August 16, 2011. Talk: “GIT for curves of low degree”.
18. Algebra and combinatorics seminar of the University of Coimbra, February 9, 2011. Talk: “Compactified Jacobians of singular curves.”
17. Algebraic Geometry Seminar of the University of Rome “Tor Vergata”, Italy, January 19, 2011. Talk: “The tropical Torelli map.”
16. Geometry seminar of the Università della Calabria, Italy, December 13, 2010. Talk: “Compactified Jacobians of singular curves”.
15. Algebraic Geometry Seminar of the University of Rome “Tor Vergata”, Italy, November 24, 2010. Talk: “Compactified Jacobians of singular curves.”

14. Algebra and Geometry Seminar of the “Institut Fourier” of the University of Grenoble, France, November 5, 2010. Talk: “Compactified Jacobians of singular curves.”
13. Algebra Seminar of the “Colorado State University”, Fort Collins, USA, October 28, 2010. Talk: “Compactified Jacobians of singular curves.”
12. Geometry seminar of Università di Roma Tre, December 3, 2009. Talk: “The tropical Torelli map.”
11. Algebraic Geometry Seminar of Università di Roma “Sapienza”, December 1, 2009. Talk: “Compactified Picard stacks over the moduli space of curves with marked points”.
10. “New entries day” of Università di Roma “Tor Vergata”, November 19, 2009. Talk: “Compactified Picard stacks over the moduli space of curves with marked points”.
9. Algebra and Geometry seminar of IMPA (Instituto de Matemática Pura e Aplicada), Rio de Janeiro (Brasil), July 22, 2009. Talk: “Compactified Picard stacks over the moduli space of curves with marked points”.
8. Graduate students seminar of the MSRI jumbo semester in algebraic geometry, Berkeley (USA), March 18, 2009. Talk: “Compactified Picard stacks over $\overline{\mathcal{M}}_{g,n}$ ”.
7. Workshop “Connections for Women: Algebraic Geometry and Related Fields”, MSRI, Berkeley (USA), January 22-24.
Participation in the poster session with a poster entitled “Compactified Picard stacks over the moduli space of curves with marked points”.
6. Geometry Seminar of the Mathematics Department of the “Instituto Superior Técnico”, Lisbon, Portugal, January 6, 2009. Talk: “Compactified Picard stacks over the moduli space of curves with marked points”.
5. Algebra and Topology seminar of the Mathematics Department of the University of Coimbra, Portugal, December 22, 2008. Talk: “Compactified Picard stacks over the moduli space of curves with marked points”.
4. Algebraic Geometry seminar of the Mathematical Physics sector of SISSA-ISAS, Trieste (Italy), November 20, 2008. Talk: “Compactified Picard stacks over $\overline{\mathcal{M}}_{g,n}$ ”.
3. Algebra and Geometry Seminar of the Mathematics Department of the University of Pavia (Italy); September 25, 2008. Talk: “Compactified Picard stacks over $\overline{\mathcal{M}}_{g,n}$ ”.
2. Algebraic Geometry seminar of the Mathematics Department of the Humboldt University of Berlin, Germany; April 29, 2008. Talk: “Compactified Picard stacks over the moduli stack of stable curves”.
1. Seminar of PhD students of Algebra and Geometry, Mathematics Department of the University of Rome 3, October 11, 2007. Talk: “Compactified Picard stacks”.

Colloquium or outreach talks (invited)

2. [Colloquium of Mathematics the University of Trento](#), April 15, 2026. Talk: Handling degenerations with tropical geometry.
1. [Tè di Matematica di Roma Tre](#). June 4, 2025. Talk: Tropicalizing curves and divisors.

ORGANIZATION OF SCIENTIFIC CONFERENCES

- Organizer of “GAEL XVII: Géométrie Algébrique en Liberté”. Leiden, Netherlands, June 2009.
- Organizer of “GAEL XVII: Géométrie Algébrique en Liberté”. Coimbra, Portugal, June 2010.
- 2010- 2011: Organizer of the [Coimbra-Salamanca Algebraic Geometry seminar](#).
- Organized the spring school [Minicourses on Stability](#), April 10-12, 2014, Coimbra, Portugal.
- Together with Alberto Lopez, organized the special session “Enumerative and combinatorial methods in moduli theory” of the AMS-EMS-SPM joint meeting at Porto, June 10-13, 2015.
- CIMPA-ICTP school on “Moduli of curves”, held at Guanajuato in February 2016, by taking part of the scientific committee. Together with the other members of the scientific committee she edited the volume [Moduli of curves](#).
- Together with Oliver Lorscheid (IMPA - Rio de Janeiro), Johannes Nicaise (Imperial- London) and Sam Payne (Yale), is organizing the ICM satellite workshop “Tropical Geometry and Moduli Spaces”, at Cabo Frio, Rio de Janeiro, August 13-17, 2018.
- Since the academic year of 2018/2019 I was invited to take part of the scientific committee for the research group VBAC: Vector bundles on Algebraic Curves, which organizes the conference VBAC and more recently the VBAC webinars.
- 2021 - present day: organizer of the international online Algebraic Geometry Zoom seminar ZAG.
- I take part of the scientific board for the conference “Global Portuguese Mathematicians”, held at Coimbra from 26 to 28 July, 2023.
- Organizer of the conference [Algebraic Geometry in Roma Tre, on the occasion of Sandro Verra’s 70th birthday](#), Roma 14-18 June, 2022.
- Organizer of the conference [VBAC 2022: Moduli Spaces and Vector Bundles - New Trends, on the occasion of Peter Newstead’s 80th birthday](#), Warwick, 25-29 July, 2022.
- Organizer of the [VBAC webinars](#) on Tropical Geometry (January 24, 2022), on Stacks and Good Moduli Spaces (March 28, 2022) and on Birational Geometry (January 23, 2023).
- Organizer of the conference [Harmonies in Moduli Spaces](#), in occasion of Lucia Caporaso’s birthday, June 9-13, 2025, Roma Tre.
- Organizer of the conference [VBAC 2026: Curves, Surfaces and Moduli](#), January 19 - 23, Merida, Mexico, 2026.

TEACHING

University of Coimbra (Portugal) - teaching assistant 2002-2005

- Exercise sections on courses of Analysis I, II, III and IV in different engineering/science degrees, such as civil engineering, geological engineering, computer science, chemistry and physics.
- Exercise sessions of Analytical Mechanics to students in the degree of Mathematics (pure and applied).

University of Coimbra (Portugal) - junior lecturer 2009-2014

- Exercise sections and lectures of courses of Analysis I, II, III and IV in many different engineering/science degrees, such as civil engineering, mechanical engineering, geological engineering, computer science, biochemistry, physics.
- lectured the courses of Algebraic Geometry and Algebraic topology to students in the Master degree in Pure Mathematics.
- supervised different students within the “research mathematical seminar”, a course meant to initiate undergraduate students to learn and teach more advanced mathematics.
- My lectures were highly evaluated by students attending my courses, which were frequently rated above 4.5/5.

Università degli studi di Roma Tre - Ricercatore RtDb

2014 - 2017

- 2015/2016: Complements of Mathematics (degree in civil engineering)
<http://ricerca.mat.uniroma3.it/users/melo/ComplMat.html>
- 2016/2017: GE220: Geometry 3 (degree in mathematics).
<http://ricerca.mat.uniroma3.it/users/melo/GE220.html>

Università degli studi di Roma Tre - Associate Professor

2017 - 2024

- 2017/2018: AC310: Complex Analysis (degree and master degree in mathematics).
<http://ricerca.mat.uniroma3.it/users/melo/AC310/AC310.html>
- 2017/2018: GE460: Graph Theory (master degree in computer science and mathematics)
<http://ricerca.mat.uniroma3.it/users/melo/GE460/GE460.html>
- 2018/2019: GE410: Algebraic Geometry 1 (master degree in mathematics).
http://ricerca.mat.uniroma3.it/users/melo/GE410/GE410-18_19.html
- 2018/2019: GE220: Geometry 3 (degree in mathematics).
http://ricerca.mat.uniroma3.it/users/melo/GE220/GE220-18_19.html
- 2019/2020: AC310: Complex Analysis (degree and master degree in mathematics).
http://ricerca.matfis.uniroma3.it//users/melo/AC310_20/AC310.html
- 2019/2020: GE460: Graph Theory (master degree in computer science and mathematics)
http://ricerca.matfis.uniroma3.it//users/melo/GE460_20/GE460.html
- 2020/2021: Geometry (degree in Mechanical Engineering)
<http://ricerca.matfis.uniroma3.it//users/melo/Geometria/Geometria.html>
- 2020/2021: GE460: Graph Theory (master degree in computer science and mathematics)
http://ricerca.mat.uniroma3.it/users/melo/GE460_2021/GE460_2021.html
- 2021/2022: Geometry (degree in Mechanical Engineering)
<http://ricerca.matfis.uniroma3.it//users/melo/Geometria21/Geometria21.html>
- 2021/2022: GE460: Graph Theory (master degree in computer science and mathematics)
http://ricerca.matfis.uniroma3.it//users/melo/GE460_21/GE460.html
- 2021/2022: Stacks and Moduli (PhD program in Mathematics)
<http://ricerca.mat.uniroma3.it/users/melo/Stacks/Stacks.html>

- 2022/2023: ME420: Foundations and history of geometry (master degree in Mathematics)
http://ricerca.mat.uniroma3.it/users/melo/ME420_2023/ME420_2023.html
- 2022/2023: GE460: Graph Theory (master degree in computer science and mathematics)
http://ricerca.mat.uniroma3.it/users/melo/GE460_2023/GE460_2023.html
- 2023/2024: Geometria (L-Z) (corso di laurea in Ingegneria Meccanica).
<http://ricerca.mat.uniroma3.it/users/melo/Geometria23/Geometria23.html>
- 2023/2024: GE460: Teoria dei Grafi (Corsi di laurea magistrale in Scienze Computazionali e Matematica.)
http://ricerca.mat.uniroma3.it/users/melo/GE460_2024/GE460_2024.html

Università degli studi di Roma Tre - Full Professor

2024 - Present day

- 2024/2025: GE450: Algebraic Topology (Corsi di laurea magistrale in Scienze Computazionali e Matematica.)
http://ricerca.mat.uniroma3.it/users/melo/GE450_2024/GE450_2024.html
- 2024/2025: AC310: Analisi Complessa (Corsi di laurea magistrale in Scienze Computazionali e Matematica.)
http://ricerca.mat.uniroma3.it/users/melo/AC310_25/AC310_2025.html
- 2025/2026: ME420: Fondamenti e Storia della Geometria (Corsi di laurea magistrale in Matematica.)
http://ricerca.mat.uniroma3.it/users/melo/ME420_2025/ME420_2025.html
- 2025/2026: GE310: Istituzioni di Geometria Superiore (Corsi di laurea magistrale in Scienze Computazionali e Matematica.)
http://ricerca.mat.uniroma3.it/users/melo/GE310_2026/GE310_2026.html

Courses on PhD programs

- Post-graduation course at CIMAT, Guanajuato, Mexico, February 2014. Lectured a 5 hours course on *GIT and Chow stability and the construction of moduli spaces of curves*.
- Post-graduation course of UFF (Universidade Federal Fluminense), Niterói, Rio de Janeiro, Brasil, July- August 2013. Lectured a 10 hours course on *Moduli spaces of tropical curves*.
- PhD program in Mathematics o the University of Rome Three, Spring 2022, 30 hours course on “Stacks and Moduli”:
<http://ricerca.mat.uniroma3.it/users/melo/Stacks/Stacks.html>

**STUDENTS
SUPERVISION**

Post-docotoral students

- Ethan Cotteril (CMUC- University of Coimbra), 2012-2013;
- Bashar Dudin (CMUC- University of Coimbra), 2014-2015;
- Luca Tasin (Roma Tre), 2016-2017;
- Barbara Bolognese (Roma Tre), 2019-2021.

PhD students

- Myrta Barbosa (Roma Tre), 2018-2022. Thesis “Algebraic and combinatorial properties of ranks of divisors on finite graphs” (March 2022).
- Stefano Serpente (Roma Tre), 2019 - 2023. “Moduli spaces of Algebraic and Tropical curves with Hassett Stability Conditions”.

- Giusi Capobianco, 2022 - 2026 (expected).

Undergraduate and master students (Mathematics)

- Ricardo Campos (Coimbra, 2011);
- Claudia del Chiaro (Roma Tre, 2019). Thesis: “Introduzione alla geometria tropicale e applicazioni alla filogenetica”;
- Gaudenzio Falcone (Roma Tre, 2019). Thesis: “On algebraic and tropical Brill-Noether theory”;
- Stefano Serpente (Roma Tre, 2019). Thesis: “Comparing Moduli Stacks of Algebraic and Tropical Curves”;
- Lorenzo Bottiglione (Roma Tre, 2019), Thesis: “The Lebesgue dimension and other topological notions of dimension”.
- Beatrice Cinque (Roma Tre, 2020). Thesis: “Divisori e serie lineari sui grafi”;
- Roberta Pagliaro (Roma Tre, 2020). Thesis: “Toric varieties: lattices, polytopes and fans”;
- Francesca Sardella (Roma Tre, 2021). Thesis: “Algebraic geometry over hyper-rings”;
- Lorenzo Bottiglione (Roma Tre, 2022). Thesis: “Thuillier’s retraction”.
- Giusi Capobianco (Roma Tre, 2022). Thesis: “On the birational geometry of the moduli space of curves”.
- Filippo Casagrande (Roma Tre, 2023). Thesis: “On some classes of 2-dicolorable graphs”.
- Michele Matteucci (Roma Tre, 2023). Thesis: “On the tropical Torelli map from moduli spaces of pointed metric graphs”.
- Chiara Palomba (Roma Tre, 2024), Thesis: “Chromatic polynomial”.
- Elisa Scattone (Roma Tre, 2024). Thesis: “On Hodge theory for combinatorial matroids”.
- Sara Ferranti (Roma Tre, 2025): Thesis: “Algoritmi greedy e Matroidi: Dalla teoria alle applicazioni ottimali”.
- Paolo Grimaldi (Roma Tre, 2026): Thesis: “I quattro colori della teoria dei grafi”.

**PROFESSIONAL
ACTIVITIES**

- 2003 to present day: Effective Research member of [CMUC](#), Centro de Matemática da Universidade de Coimbra.
- 2003 to 2016: Member of the problem committee of the Portuguese Mathematical Olympiads.
- 2004 to 2015: member of the “Delfos” project of Mathematical Department of the University of Coimbra, training highschool students for high Mathematics and the participation of international Mathematics competition.
- September 2013 to October 2015: Coordinator of the Algebra and Combinatorics group of CMUC (Center for Mathematics of the University of Coimbra).
- 2016 - present day: member of the committee for the PhD program in Mathematics (coleggio docente del dottorato in matematica).
- 2018 - present day: member of the committee for the undergraduate and master degree in Mathematics, representing the geometry area (commissione didattica della laurea in Matematica e Scienze Computazionali).

- 2024 - present day: President of the committee for the undergraduate and master degree in Mathematics (commissione didattica della laurea in Matematica e Scienze Computazionali).
- 2018 - present day: member of the scientific committee of [VBAC: Vector bundles on algebraic curves](#).
- 2023 - present day: member of the scientific committee of the Conference [“Global Portuguese Mathematicians”](#).
- I took part at the evaluation committee for the PhD discussion of the thesis of
 - Flávio Rocha, IMPA (Rio de Janeiro, Brasil), August 2013. Thesis: “On autoduality for tree like curves, Abel maps for stable curves and translations for the compactified Jacobian”
 - Marta Panizzut, KU Leuven (Belgium), October 2016. Thesis: “Linear systems on metric graphs, gonality and lifting problems”.
 - Raffaele Carbone, Roma Tre, May 2020. Thesis: “The norm map on the compactified Jacobian, the Prym stack and spectral data for G-Higgs pairs”.
 - Sally Andria, August 2020, Universidade Federal Fluminense, Rio de Janeiro, Brasil. Thesis: ‘Abel maps for nodal curves via tropical geometry?’.
 - Simon Schirren, Roma Tre, January 2025. Thesis: “A perfect obstruction theory for $SU(2)$ -Higgs sheaves.”
 - Luca Dragone, Roma Tor Vergata, July 2025. Thesis: “Le rappresentazioni bi- e tridimensionali dei poliedri nell’insegnamento-apprendimento della geometria: un approccio storico-laboratoriale”.
- September 2019, I integrated the committee for a call for RtDb at SISSA (Trieste), SSD 01/A2 Geometry and Algebra.
- March 2022, I integrated the committee for a call for RtDa at Università di Pisa, SSD 01/A2 Geometry and Algebra.
- October 2022, I integrated the committee for a call for RtDb at Università di Padova, SSD 01/A2 Geometry and Algebra.
- May 2024, I integrated the committee for a call for RTT at Università di Milano, SSD 01/A2 Geometry and Algebra.
- November 2024, I integrated the committee for a call for RTT at Università di Roma Tor Vergata, SSD 01/A2 Geometry and Algebra.
- January 2025, I integrated the committee for a call for Full Professor at Università di Bari, SSD 01/A2 Geometry and Algebra.
- October 2025, I integrated the committee for a call for RTT at Università di Pisa, SSD 01/A2 Geometry and Algebra.
- January 2026, I integrated the committee for a call for Associate Professor at Università di Palermo, SSD 01/A2 Geometry and Algebra.

OUTREACH ACTIVITIES

- 2003 - 2014 Collaborated with SPM (Portuguese Mathematical Society) for training highschool students high Mathematics and the participation of international Mathematics competition (within the Delfos project).
- February 2015, presented the talk “O que fazem os Matemáticos? Um olhar sobre a Geometria Algébrica” at “Jornadas das Ciências 2015”, organized at Seia (Portugal), for training highschool teachers.

- April 2017, gave the introductory seminar talk “Compactificar vs tropicalizar espaços de moduli em geometria algébrica” aimed for STEM students at “Jornadas de matemática do IST (Instituto Superior Técnico), Lisbon, Portugal.
- March 2019, presented my research in the introductory talk “Grafı e geometria tropicale” for highschool students selected at the Mathematics contest “Gare di Matematica” 2019.

HONOURS

- **1994** and **1998** Silver medal in the Portuguese Mathematical Olympiads.
- **1995** and **1996** Bronze medal in the 1995 and 1996 Portuguese Mathematical Olympiads.
- **1998** Contestant of the World Mathematical Olympiads (IMO), Taiwan.
- **1998** Mention of honour in the Ibero-American Mathematical Olympiads, Dominican Republic.
- **2000** and **2001** Honours scholarship from the Universidade de Coimbra, distinguishing the top 10 STEM students in the university.
- **2003** José Anastácio da Cunha award, from Departamento de Matemática of Universidade de Coimbra, distinguishing the best student in Mathematics.
- **2009** “Michele Cuzzo” award, from Dipartimento di Matematica- Università di Roma “Tor Vergata”, distinguishing a PhD thesis in Mathematics in Italy discussed in 2009.
- **2010** “Seeds of science” award for STEM, awarded by the online newspaper “Ciência Hoje”.
- **2011** “Estmulo à investigação” award from Foundation Calouste Gulbenkian, financing a research project for a young researcher in geometry.
- **2014** “Abilitazione scientifica nazionale, Professore de seconda fascia”.
- **2014**: “Programma giovani ricercatori Rita Levi Montalcini 2013” awarded by MIUR.
- **2018** “Abilitazione scientifica nazionale, Professore de prima fascia”.

Roma, 2026

(Ana Margarida Mascarenhas Melo)