Curriculum vitae

Guardo Elena Maria
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Academy

- From March 1st, 2022 to present

Full Professor SSD MATH-02/B (ex Mat/03) Geometria

- 2014 - 2022

Associate Professor Mat/03 Geometry (Scientific sector 01/A2 Algebra and Geometry)

- 01/March/2002 – 31/October 2014 Permanent Researcher Mat03 – Geometria Engineering Facolty - Università di Catania

Education

- 2000: Ph.D in Mathematics at Università di Messina, Italy.

Thesis Title: *Schemi di Fat Points* , Supervisor: Prof. Alfio Ragusa.

- 1994/95: Fellowship "Mino Bontempelli 1994", Accademia Nazionale dei Lincei - Rome, Italy
- 1995/96: Fellowship from Università di Catania, Outgoing Visiting researcher at Queen's University - Kingston - ON – Canada for one year
- 1993: Graduation in Mathematics with marks 110/110 cum laude - Università di Catania, Italy.

Thesis Title*:* *Ideali con Numeri di Betti Massimi* , Supervisor: Prof. Alfio Ragusa;

- Scientific national Habilitation March, 30 2017 to March 2027 National Scientific Habilitation for full professor Mat/03 Geometry (Scientific sector 01/A2 Algebra and Geometry)

Fellowships

- 1996, March/June - Visiting at Università di Genova, Italy, Supervisor: Prof. A.V. Geramita.
- 1996/2000: PhD student in Mathematics at Università di Catania. Administrative University: Messina - Italy.
- 2001-2003: post-doc Research Associate, Department of Mathematics, Università di Catania.
- April 2005 to May 2005 – Fellowship from University of Catania - Visiting researcher at Department of Mathematics, University of Nebraska, Lincoln USA under the supervision of prof. B. Harbourne

Teaching activities

From AA 2015/16 until present - Geometria 1 Corso di Laurea Triennale in Matematica
From AA2019/2020 until present - Teoria dei Grafi - Corso di Laurea Triennale in Matematica
From AA 2022/23 until present - Graphs and Hypergraphs (co-teacher)- Corso di Laurea Magistrale in Matematica
From AA 2010/11 to AA2019/20 and AA 2022/23 - Geometria - Corso di laurea magistrale in Ingegneria edile-architettura.
A.A. 2002/03 - Algebra e Geometria - Ingegneria Classe dell'Informazione dell'Università di Catania
From AA 2001/02 to AA 2008/09 (excluding parental leaves) - Algebra e Geometria per Ingegneria per l'Ambiente e Territorio ed Ingegneria Telematica, Facoltà di Ingegneria, sede di Enna

Institutional activities

1. From October2024, Responsible of the Mathematical Section of Dipartimento di Matematica e Informatica (2024/2028)
2. From January 2019 to October 23, President of the bachelor's degree in mathematics.
3. A.A. 2016/17, 2017/18, 2023/24 until present, Vice president Bachelor degree in Mathematics.
4. From November 1st 2016 to 28 January 2019, Member of "Commissione Paritetica" del Dipartimento di Matematica e Informatica – quadriennio 2016-2020
5. From AA 2017/18 – present, Member of "Collegio dei Docenti del Dottorato Matematica e Scienze Computazionali" Sedi consorziate Catania – Messina - Palermo

GRANTS for research activities

- 2003 Grant from GNSAGA- to Lincoln Nov/Dic 2003 to visit Prof. B. Harbourne at il Department of Mathematics, University of Nebraska, USA and Prof. A. Van Tuyl at Lakehead University, Thunder Bay, Canada.
- 2004 Grant 1.300,00Euro from Indam - GNSAGA to Lincoln 19/7-6/8/2004 to visit Prof. B. Harbourne at il Department of Mathematics, University of Nebraska, Lincoln, USA.
- 2005 Grant 5000 Euro from Università di Catania to visit Prof. B. Harbourne, Department of Mathematics, University of Nebraska, USA.
- 2009 Grant 1.450,00 Euro from Indam- GNSAGA, to invite prof. Adam Van Tuyl, Lakehead University, Thunder Bay, Canada at il Dipartimento di Matematica e Informatica di Catania (PI: E. Guardo, co-PI: Prof. A.V. Geramita – Queen's University, Canada/ Università di Genova, Italy)
- 2012, Grant 1.750,00 Euro from Indam- GNSAGA to invite prof. Adam Van Tuyl, Lakehead University, Thunder Bay, Canada at Dipartimento di Matematica e Informatica di Catania (PI: Dott. E. Carlini, Politecnico di Torino, co-PI E. Guardo)
- 2016, Grant Euro 1100,00 from Indam- Gnsaga to visit il Prof. A. Van Tuyl at McMaster University – Hamilton - Canada and to partecipate workshop at Field Institute di Toronto - Canada on Combinatorial Algebraic Geometry in Agosto 2016 (three weeks)
- 2017 Grant 900,00Euro to partecipate at CMO workshop 2017 – Oaxaca (MX)

PI of funded research Projects

- National Project
  Local PI of the funded PRIN 2022, 0-Dimensional Schemes, Tensor Theory, and Applications, Local PI Prof. E. Guardo
  - PI of the funded project "GEometry, Topology TOwards COMBinatorics and APPlications", two years. – Progetto Piaceri 24/26 - Università di Catania
  - PI of the funded project "New Trends in Combinatorics, Geometry and Topology towards applications", two years. – Progetto Piaceri 20/22 - Università di Catania
- PI of the funded project "New Trends in Geometry, Topology and Combinatorics" finanziato, two years. – Piano di Ricerca 2016-18 - Università di Catania
- PI of the funded project: "Potenze simboliche (fat points) e regolari di ideali di punti in P^n ed in $P^n_{1X}\ldots xP^n_{k.}$ -PRA Università di Catania - Ripartizione risorse destinate al finanziamento dei ricercatori - 2012

Member of national scientific programs:

- From 1994 - present, member GNSAGA.
- 1994, member del Progetto Nazionale ex 40%, responsabile: Prof. R. Strano;
- 1994, member del Progetto ex 60%, responsabile: Prof. A. Ragusa;
- PRIN 2003 Member Programma di ricerca cofund "Algebra commutativa e computazionale" - Coord. scient. Prof. G. Valla, Resp. scient. Prof. R. Strano.
- PRIN 2005 Member Programma di ricerca cofund "Algebra commutativa, combinatoria e computazionale" - Coord. scient. Prof. G. Valla, Resp. scient. Prof. R. Strano.
- PRIN 2007: Member del PROGETTO DI RICERCA cofund ",Algebra Commutativa e Combinatorica con applicazioni alla Geometria Algebrica", PI Prof. G. Valla,
- PRIN 2010-11: Member del PROGETTO DI RICERCA cofund " Geometria delle Varietà algebriche" PI. Prof. A. Verra, Resp. prof. F. Russo.

- Member del Progetto GNSAGA - INDAM : “Numeri di Betti di Algebre graduate". PI. Prof. A. Ragusa. Sedi: Catania - Messina – Reggio Calabria.
- PRA 2000 2011, Member del PROGETTO DI RICERCA FINANZIABILE CON FONDI DI ATENEO, Resp. Scient.: Prof. A. Ragusa "Metodi algebrici, omologici e computazionali nello studio delle varietà algebriche.
- Fir 2014, Member, Main PI. Prof. F. Russo.
- PRIN 2015: Member PROGETTO DI RICERCA cofund "Geometria delle Varietà algebriche" Coord. Prof. A. Verra, Resp. prof. F. Russo
- Prin 2020 Member, Local PI. Prof. F. Russo
- SATURN – Smart Manufactoring (May 2019 to May 2023)– Main Resp. ST Microelectronics – Local PI prof. S. Battiato
- Water 4.0 - "Tecnologie per la convergenza tra industria 4.0 e ciclo idrico integrato", resp. Prof. S. Cavalieri

PhD Students/Post doc/research grants supervisor

1) From December 2024 supervisor PHD Student dott. G. M. Rizzo, XL Ciclo
2) Sept 1st, 2024 – 30 Aug 2025 Supervisor Désirée Basile, research grant Water 4.0, “Modelli matematici per la modellazione di water supply systems”, D.R. n. 3544 del 27.08.2024
3) 23 Nov 24/ 22 nov 2025 Supervisor dott. Graham Keiper, post doc research project “PRIN 2022”, dal titolo: 0-Dimensional Schemes, Tensor Theory, and Applications
4) 23 Nov 23/ 22 nov 2024 Co-Supervisor dott. Graham Keiper, Post doc “Razionalità versus unirazionalità di intersezioni complete lisce di dimensione 3 o 4 e di grado basso. Varietà ACM, problemi di contenimento e proprietà combinatorie in spazi proiettivi e multiproiettivi. Singolarità di curve e semigruppi numerici”, D.R n. 2025 del 19 Maggio 2023
5) October 1-29, 2022 Co-Supervisor of PhD Student Paulina Wisniewska, "Asymptotic invariants of configurations of points determined by complex reflection groups" Supervisor Prof. Szemberg Tomasz (Poland)
6) 2021/22 Supervisor dott. Bahami Jafarloo Iman, “Borsa di ricerca Hadamard product and symbolic powers, bando D.R. n. 3158 del 17 Settembre 2021. Scientific Responsible Prof.ssa E. M. Guardo;
7) November 2016 to August 2020 Supervisor Post Doc “Weak Lefschezt Property, Interpolation Problem in multiprojective spaces and connection with Algebraic Combinatorics”, dott. G. Favacchio.
8) AA 2015 - 2018 - Supervisor PhD XXXI Ciclo, dott.ssa M. C. B. Picone: “Homological invariants of some special varieties” Supervisor Relatore Prof.ssa E. Guardo, Co Supervisor: Prof. A. Van Tuyl (McMaster University – Canada)
9) September 2017 Referee/committee PhD Thesis in Mathematics "The effect of points fattening del Pezzo surfaces" -Magdalena Lampa - Baczynska - Supervisor: Prof. Tomasz Szemberg
10) October 2015 – Second referee/co supervisor PhD Thesis "Kahler Differential Algebras for 0-dimensional Schemes and Applications" Mrs Tran Nguyen Khanh Linh. Erstgutachter: Prof. Dr. Martin Kreuzer - Zweitgutachter: Prof. Dr. Elena Guardo - Mundliche Prufer: Prof. Dr. Tobias Kaiser, Prof. Dr. Brigitte Forster-Heinlein Der Fakultat fur Informatik und Mathematik der Universit at Passau (Germany).
11) Supervisor of many theses for the first and second level students in Mathematics.

Refereeing and Reviews

- Reviewer for Mathematical Reviews and Zentralblatt Math. (since 2004).
- Referee for NSA-AMS Proposals, for several journals and conference proceedings:
- Referee for National Science Centre (Narodowe Centrum Nauki - NCN; http://www.ncn.gov.pl).
- Editorial Board Member for some math journals

(Main) Conferences organizations

- Pragmatic 2025 Summer School - Pragmatic 2025 Dipartimento di Matematica e Informatica – Catania - Organizers: E. Guardo, M. D’Anna, A. Ragusa, F. Russo, G. Zappalà

- Séminaire de Mathématiques Supérieures (SMS) 2025 : An Introduction to Recent Trends in Commutative Algebra, Field Institute, Toronto Séminaire de Mathématiques Supérieures (SMS) 2025 : An Introduction to Recent Trends in Commutative Algebra | Fields Institute for Research in Mathematical Sciences
- Italian Network for Applied and Birational Algebraic Geometry INABAG, with a day in honor of Alessandro Gimigliano's retirement, Trento, Italy, from June 30 to July 2, 2025 INABAG Conference
- Mathematics in the Strret 2025 www.dmi.unict.it/guardo

• AMS_UMI 2024 Palermo 23-26 Luglio 2024 Configurations in projective spaces and related research in commutative algebra and algebraic geometry Special Session A8

• Mathematics in the Street, 10 march, 2024 Mathematics in the street | Dipartimento di Matematica e Informatica

• Pragmatic 2023 Summer School - Pragmatic 2023 - First Announcement (unict.it) Dipartimento di Matematica e Informatica – Catania - Organizers: E. Guardo, M. D'Anna, A. Ragusa, F. Russo, G. Zappalà

• Mathematics in the Street, 12 march, 2023¸ Mathematics in the street | Dipartimento di Matematica e Informatica (unict.it)

• Organizzazione Pi Day 14 marzo 2022 web.dmi.unict.it/it/notizie/pi-day-giornata-internazionale-del-pi-greco-e-della-matematica

• September 7-9, 2022 Workshop on Commutative Algebra and Algebraic Geometry, dedicated to Saro Strano, Dipartimento di Matematica e Informatica, Catania https://sites.google.com/view/workshop-ca-ag-catania-2022/home

• March 2018 workshop "IPPI 2018 – Post Pragmatic 2017" - Politecnico di Torino, organizers: E. Carlini, G. Casnati, E. Guardo, A. Oneto, A. Ragusa

• Pragmatic 2017 – Summer school – Catania Organizers: E. Guardo, A. Ragusa, F. Russo, G. Zappalà

• September 2016 – Workshop "Algebra and Geometry in Catania" in onore del 70.mo compleanno del Prof. A. Ragusa. Organizers: E. Guardo, M. D'Anna, F. Russo, G. Zappalà

• February 2015 - Mathematisches Forschungsinstitut Oberwolfach - Organizers Mini-Workshop: Ideals of Linear Subspaces, Their Symbolic Powers and Waring Problems joint with E. Carlini, C. Bocci, B. Harbourne

Main Attended International Schools

• 24 Luglio / 27 Agosto 1994: International Summer School "Corso Estivo di Matematica di Perugia - 1994", Algebra and Differential Geometry;

• 13/26 Agosto 1995: International Summer School "Corso Estivo di Matematica di Cortona" Algebraic Geometry;

• 12 Maggio / 14 Giugno 1997: International summer school Pragmatic '97 - Proff. D. Einsebud e S. Popescu – Dipartimento di Matematica di Catania;

• 12/30 Gennaio 1998 The Intensive Course on Groebner Bases - Research Institute for Symbolic Computation - Linz (Austria);

• 5 Giugno / 2 Luglio 1998: International summer school Pragmatic '98 on "Linear System and Vanishing Theorems" Prof. L. Ein - Dipartimento di Matematica di Catania;

• 7/23 Giugno 2000: International School Pragmatic 2000 - Proff. A.V. Geramita, J. Migliore - A. Bigatti - C. Peterson. - Dipartimento di Matematica di Catania

• Giugno 2001: Interntional School Pragmatic 2001 - Proff. C. Ciliberto - R. Miranda - Dipartimento di Matematica di Catania

• Agosto 2016: Introductory workshop on Combinatorial Algebraic Geometry, Field Institute, Toronto – Canada.

Conferences, invited talks, posters selected last 5 years

2025

1) August 18-22,2025 Coleader at Womens in Numbers Europe 5 (WINE 5) with Paola Supino (University of Roma 3), project 2 Taylor varieties Women In Numbers Europe 5
2) June 30, July 2, 2025 Italian Network for Applied and Birational Algebraic Geometry INABAG, with a day in honor of Alessandro Gimigliano's retirement, Trento, Italy, INABAG Conference
3) March 11-18, 2025, Invited visitor at University of Essex, Colchester, UK for research collaboration and co-organization of Women in Commutative Algebra 2026 at UK with prof. Sema Gunturkun (Univ. of Essex, Colchester, UK)

4) January 21-24, 2025, Invited visitor at Department of Mathematics of University of Warwick collaboration for research with Maryam Nowroozi and seminar Algebraic Geometry

2024

1) Joint Meeting UMI-AMS Palermo 2024, 23-26 Luglio, Configurations in projective spaces and related research in commutative algebra and algebraic geometry Special Session A8
2) Invited Speaker at Istanbul Algebraic Geometry, Computational Commutative Algebra and their effectiveness applications 20-22 June 2024, Galatasaray University, İstanbul, Turkey
3) Invited speaker at CAAG 2024 April 11-12 2024 Messina
4) Leader at The workshop Women in Commutative Algebra III will be held at the BIRS research center located in Oaxaca, Mexico on June 2-7, 2024. Women in Commutative Algebra II
5) IPM 19th seminar on Commutative Algebra and related topics 31 gennaio - 1 febbraio 2024 virtual talk *Expecting the unexpected: quantifying the persistence of unexpected hypersurfaces*"

2023

1. "Women in Commutative Algebra and Algebraic Geometry", Virtual Workshop for Women in Commutative Algebra and Algebraic Geometry | Fields Institute for Research in Mathematical Sciences (utoronto.ca) virtual workshop on February 4-5, 2023 sponsored by the Fields Institute
2. Invited speaker at "Discrete Optimization Conference in Veszprem, Hungary, June 5-9, 2023" - online talk "Steiner systems and configurations of points" on June 7, 2023.
3. BrianFest – invited plenary speaker – 11-13 August 2023, University of Nebraska USA , Talk *Steiner systems and configurations of points*
4. Invited speaker AMS, October 7-8, 2023 – Omaha (USA) online talk "*Expecting the unexpected: quantifying the persistence of unexpected hypersurfaces*"
5. Group Leader at Women in Commutative Algebra II (WICA II) at CIRM Trento(Italy) on October 16-20, 2023. Leader
6. Invited speaker at CMS Winter meeting December 1-4, Montreal, talk "*Expecting the unexpected: quantifying the persistence of unexpected hypersurfaces*"

2022

- 5th Catania Combinatorial Conference, HyGraDe 2022, Catania 6-8 Luglio 2022.http://ccc2022.dmi.unict.it/
- September 7-9, 2022 Workshop on Commutative Algebra and Algebraic Geometry, dedicated to Saro Strano, Dipartimento di Matematica e Informatica, Catania https://sites.google.com/view/workshop-ca-ag-catania-2022/home
- Talk online - Mini-Workshop: Subvarieties in Projective Spaces and Their Projections. 27 Nov. – 3 Dec 2022- Organizers Bauer T., Favacchio G., Migliore J, Szpond

2021(many activities postponed since Covid19)

Luglio 2021 Eunice Symposium on Pure and Applied Mathematics - Combinatorics and geometry towards applications – Speaker at http://web.dmi.unict.it/it/content/simposio-1st-eunice%E2%80%93-symposium-pure-applied-mathematics-2021 (Guardo)

2020 (many activities postponed since Covid19)

Visiting at Politecnico di Torino for research collaboration with E. Carlini e M.V. Catalisano 30 Gen-4 Feb 2020

Publications last 5 years

1. Causa, A., Gionfriddo, M., Guardo, E.M., *Construction of 3-Helix Systems of any index*, Matematiche, 2024, 79(2), pp. 469–476
2. Causa, A., Gionfriddo, M., Guardo, E., *Construction of $S^{(3)}(2, 3)$-Designs of Any Index*, Mathematics, 2024, 12(13), 1968.
3. Bahmani Jafarloo, I., Bocci, C., Guardo, E., *Hadamard Product of Monomial Ideals and the Hadamard Package*, Mathematics, 2024, 12(7), 1113
4. Catalisano, M.V., Favacchio, G., Guardo, E., Shin, Y.-S., *The Waldschmidt constant of a standard k-configuration in P^2* , Revista Matematica Complutense (2024)

5. Bahmani Jafarloo, I., Bocci, C., Guardo, E., Malara, G., *Hadamard products of Symbolic Powers and Hadamard Fat Grids*, Mediterranean Journal of Mathematics, 2023, 20(3), 162
6. Ballico E., Guardo E. *Finite 0-dimensional multiprojective schemes and their ideals.* Journal of Algebra and its Applications, ISSN: 0219-4988, doi: 10.1142/S0219498823501864 (2022)
7. Carlini E., Catalisano M. V., Favacchio G, Guardo E., *"Rational normal curves and Hadamard products"* Mediterranean Journal of Mathematics, ISSN: 1660-5446, doi: 10.1007/s00009-022-02050-1 (2022)
8. Favacchio G., Guardo E., Harbourne B., Migliore J., *Expecting the unexpected: quantifying the persistence of unexpected hypersurfaces* Adv. Math 2021, 388,107857
9. Bujtás Cs., Gionfriddo M., Guardo E., Milazzo L., Milici S., Tuza Sz., *Complex uniformly resolvable decompositions of* K_v, (2021) Ars Math. Contemp. ISSN 1855-3966 (printed edn.), ISSN 1855-3974 (electronic edn.) https://doi.org/10.26493/1855-3974.2288.a20 (Also available at http://amc-journal.eu)

10. Ballico E., Favacchio G., Guardo E., Milazzo L., Thomas A.C., *Steiner configurations ideals: Containment and colouring*, Mathematics, Open Access Volume 9, Issue 3, Pages 1 - 15January 2021 Article number 210
11. Ballico E., Favacchio G., Guardo E., Milazzo L. *Steiner Systems and configurations of points* Des. Codes Cryptogr, Open Access Volume 89, Issue 2, Pages 199 – 219 February 2021
12. Guardo E., Kreuzer M., Tran L., Le Ngoc L. *Kaehler Differentials for Fat Point Schemes $P^1 XP^1$*. J. Commut. Alg. 13(2), pp. 179-207 (2021)
13. Gionfriddo M., Guardo E. *A short proof of Erdos-Straus Conjecture for every n = 13 mod 24* J. Interdisc. Math 24(8), pp 2307-2312 (2021).
14. Cooper S., Fatabbi G., Guardo E., Lorenzini A., Migliore J., Nagel U., Seceleanu A., Szpond J., Van Tuyl A. *Symbolic powers of codimension two Cohen-Macaulay ideals* Comm. Algebra, Vol 11(1), 1 Nov 2020, pp 4663- 4680
15. Catalisano M. V., Guardo E., Shin Y.S. *The Waldschmidt constant of special k-configuration*, J. of Pure and Applied Algebra (2020), Vol. 224(10), 106341
16. Carlini E., Catalisano M. V., Guardo E., Van Tuyl A., *Hilbert functions of schemes of double and reduced points*, J. Pure Appl. Algebra, (2020), Vol. 224(6), 106187
17. Cooper S.M., Guardo E. *Fat points, partial intersections and Hamming distance.* J. Algebra Appl., (2020), 19(4), 2050071 DOI**:**10.1142/S0219498820500711

List of published papers available at
https://www.scopus.com/authid/detail.uri?authorId=6507958419
or
https://arxiv.org/search/?searchtype=author&query=Guardo%2C+E