CURRICULUM VITAE

FEDERICO GALETTO

1. BACKGROUND INFORMATION

Contact Information.

Name Federico Galetto

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U.S.A

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Education.

2009 - 2013	Ph.D. in Mathematics, Northeastern University
2007 - 2009	M.S. in Pure Mathematics, Northeastern University
2005 - 2008	Laurea Magistrale in Matematica (equivalent to M.S.), Università degli Studi di Torino
2001 - 2005	Laurea in Scienze Matematiche (equivalent to B.S.), Università degli Studi di Torino

Academic Positions.

2018 - present	Assistant Professor, Cleveland State University, Cleveland, OH
2015 - 2018	Postdoctoral Fellow, McMaster University, Hamilton, ON
Fall 2016	Visiting Researcher, Fields Institute, Toronto, ON
2013 - 2015	Coleman Postdoctoral Fellow, Queen's University, Kingston, ON
2007 - 2013	Teaching Assistant, Northeastern University, Boston, MA

Grants and Awards.

2022 - 2025	NSF Standard Grant DMS-2200844, Finite Group Actions on Free Resolutions, \$123,410
	(PI)
2020 - 2022	NSF Conference Grant DMS-2003883, Macaulay2 Workshop at Cleveland State Univer-
	sity, \$19,973 (PI)
2020	Undergraduate Summer Research Award, Jets of graphs, Cleveland State University, Office
	of Research, \$3,937.50

Research Interests.

Commutative and homological algebra, algebraic geometry Computational methods and mathematical software

2. Publications

Refereed Papers.

- 2022 14. F. Galetto. Finite group characters on free resolutions. *Journal of Symbolic Computation*, 113:29–38, 2022.
- 2021 13. F. Galetto, E. Helmick, and M. Walsh. Jet graphs. *Involve*, 14(5):793–812, 2021.
- 2020 12. J. Biermann, H. de Alba, F. Galetto, S. Murai, U. Nagel, A. O'Keefe, T. Römer, and A. Seceleanu. Betti numbers of symmetric shifted ideals. *Journal of Algebra*, 560:312–342, 2020.
 - 11. F. Galetto. On the ideal generated by all squarefree monomials of a given degree. *Journal of Commutative Algebra*, 12(2):199–215, 2020.
- 2019 10. F. Galetto, J. Hofscheier, G. Keiper, C. Kohne, A. Van Tuyl, and M. E. Uribe-Paczka. Betti numbers of toric ideals of graphs: a case study. *Journal of Algebra and its Applications*, 18(12):1950226, 14, 2019.
 - 9. F. Galetto, A. V. Geramita, Y.-S. Shin, and A. Van Tuyl. The symbolic defect of an ideal. *Journal of Pure and Applied Algebra*, 223(6):2709–2731, 2019.
 - 8. F. Galetto, A. V. Geramita, and D. L. Wehlau. Degrees of regular sequences with a symmetric group action. *Canadian Journal of Mathematics*, 71(3):557–578, 2019.
- 7. H. Abe, L. DeDieu, F. Galetto, and M. Harada. Geometry of Hessenberg varieties with applications to Newton-Okounkov bodies. *Selecta Mathematica (New Series)*, 24(3):2129–2163, 2018.
 - 6. F. Galetto, A. V. Geramita, and D. L. Wehlau. Symmetric complete intersections. *Communications in Algebra*, 46(5):2194–2204, 2018.
- 5. F. Galetto, Y.-S. Shin, and A. Van Tuyl. Distinguishing k-configurations. *Illinois Journal of Mathematics*, 61(3-4):415–441, 2017.
 - 4. F. Galetto. Generators of truncated symmetric polynomials. *Journal of Pure and Applied Algebra*, 221(2):276–285, 2017.
- 2016 3. F. Galetto. Propagating weights of tori along free resolutions. *Journal of Symbolic Computation*, 74:1–45, 2016.
- 2015 2. F. Galetto. Free resolutions and modules with a semisimple Lie group action. *Journal of Software for Algebra and Geometry*, 7(1):17–29, 2015.
- 2014 1. F. Galetto. Computational methods for orbit closures in a representation with finitely many orbits. *Experimental Mathematics*, 23(3):310–321, 2014.

Preprints.

- 2021 3. F. Galetto and N. Iammarino. Computing with jets, arXiv:2108.06350.
 - 2. F. Galetto. Setting the scene for Betti characters, arXiv:2106.16062.
- 2020 1. L. Ferraro, F. Galetto, F. Gandini, H. Huang, M. Mastroeni, and X. Ni. The InvariantRing package for Macaulay2, arXiv:2010.15331.

Unpublished Papers.

2012 1. F. Galetto. Free resolutions of orbit closures for the representations associated to gradings on Lie algebras of type E_6 , F_4 and G_2 , arXiv:1210.6410 (preprint of doctoral dissertation; excerpt published in *Experimental Mathematics*, 23(3):310–321, 2014)

Expository Papers.

2018 1. F. Galetto. Betti numbers with a dash of representations. *Canadian Mathematical Society Notes*, 50(1):16, 2018.

Dissertations and Theses.

- 2013 Free resolutions of orbit closures for representations with finitely many orbits, Ph.D. Thesis, Northeastern University, supervised by J. Weyman
- 2008 *Metodi omologici con applicazioni alla teoria degli anelli locali*, Tesi di Laurea Magistrale, Università degli Studi di Torino, supervised by M. Roggero
- 2005 Curve ellittiche, Tesi di Laurea, Università degli Studi di Torino, supervised by M. Roggero

3. TALKS AND CONFERENCE ATTENDANCE

Invited Talks.

- 2023 Jan Finite group actions on free resolutions, Joint Mathematics Meetings, AMS Special Session on The Combinatorics and Geometry of Jordan Type and Lefschetz Properties, Boston, MA
 - Jan *Jet graphs*, Joint Mathematics Meetings, AMS Special Session on Topological and Combinatorial Methods in Commutative Algebra, Boston, MA
- 2022 Oct *Finite group actions on free resolutions*, AMS Sectional Meeting, Special Session on The Combinatorics and Geometry of Jordan type and Commuting Varieties, University of Massachusetts-Amherst
 - Sep *Equivariant resolutions of some squarefree monomial ideals*, Algebra and Discrete Mathematics Seminar, Clemson University
 - May *Jet graphs*, AMS Sectional Meeting, Special Session on Commutative Algebra, University of Denver
 - Mar Finite group actions on free resolutions, AMS Sectional Meeting, Special Session on Homological Methods in Commutative Algebra, Tufts University
- 2021 Apr *Jets of graphs*, Department of Mathematics and Statistics Colloquium, James Madison University
- 2020 Oct Star configurations and symmetric shifted ideals, Geometry, Algebra, Singularities, and Combinatorics Seminar, Northeastern University
 - Oct Finite group actions on free resolutions, AMS Sectional Meeting, Special Session on Commutative Algebra and Connections to Algebraic Geometry and Combinatorics, Pennsylvania State University, University Park Campus
 - May Representations with finitely many orbits and free resolutions, Algebra Seminar, Jagiellonian University
 - Mar Betti numbers and equivariant free resolutions of star configurations, Algebra/Combinatorics/Geometry Seminar, University of Pittsburgh
- 2019 Dec *Tangent schemes of determinantal varieties*, CMS Meeting, Scientific Session on Commutative Algebra, Toronto, ON
- 2018 Dec Betti numbers of symbolic powers of star configurations, CMS Meeting, Scientific Session on Symbolic and Regular Powers of Ideals, Vancouver, BC
 - Mar Towards Newton-Okounkov bodies of Hessenberg varieties, AMS Sectional Meeting, Special Session on Convex Bodies in Algebraic Geometry and Representation Theory, Ohio State University

- Mar *The symbolic defect of an ideal*, AMS Sectional Meeting, Special Session on Commutative and Combinatorial Algebra, Ohio State University
- 2017 Dec *Distinguishing k-configurations*, CMS Meeting, Scientific Session on Applications of Combinatorial Topology in Commutative Algebra, Waterloo, ON
 - Oct Distinguishing k-configurations, Mathematics Colloquium, Dalhousie University
 - Apr Towards Newton-Okounkov bodies of Hessenberg varieties, AMS Sectional Meeting, Special Session on Combinatorial and Computational Commutative Algebra and Algebraic Geometry, Washington State University
- 2016 Sep *Equivariant resolutions of De Concini-Procesi ideals*, AMS Sectional Meeting, Special Session on Combinatorial Aspects of Nilpotent Orbits, Bowdoin College
 - May Symmetric complete intersections, Algebra & Geometry Seminar, Università degli Studi di Genova
 - Apr Symmetric complete intersections, AMS Sectional Meeting, Special Session on Commutative Algebra and Its Interactions with Combinatorics and Algebraic Geometry, North Dakota State University
 - Apr Equivariant resolutions of De Concini-Procesi ideals, Algebra Seminar, University of Nebraska Lincoln
 - Apr An introduction to equivariant free resolutions, Algebra Seminar, University of Nebraska Lincoln
 - Mar Symmetric complete intersections, AMS Sectional Meeting, Special Session on Combinatorial and Computational Algebra, University of Georgia
- 2015 Jan *On a family of equivariant resolutions*, Joint Mathematics Meetings, AMS Special Session on Syzygies, San Antonio, TX
- 2014 Dec *Equivariant resolutions of De Concini-Procesi ideals*, Welcome Home Workshop, Università degli Studi di Torino
 - Nov Equivariant resolutions of De Concini-Procesi ideals, Geometric Methods in Representation Theory, University of Iowa
 - Oct Equivariant resolutions of De Concini-Procesi ideals, AMS Sectional Meeting, Special Session on Commutative Algebra and Its Interactions with Algebraic Geometry, Dalhousie University
 - Aug An algorithm for determining actions of semisimple Lie groups on free resolutions, Applications of Computer Algebra, Fordham University
 - Jan An algorithm for determining actions of semisimple Lie groups on free resolutions, Department Colloquium, Queen's University
- 2013 Feb Representations with finitely many orbits and free resolutions, Representation Theory, Homological Algebra, and Free Resolutions, MSRI
 - Jan Representations with finitely many orbits and free resolutions, Geometry Seminar, Texas A&M University
- 2012 Nov Representations with finitely many orbits and free resolutions, Commutative Algebra & Algebraic Geometry Seminar, City University of New York, Graduate Center
 - Nov Representations with finitely many orbits and free resolutions, Geometric Methods in Representation Theory, University of Missouri, Columbia
- 2011 Dec *Risoluzioni libere di ideali determinantali*, Welcome Home Workshop, Università degli Studi di Torino

Conference and Seminar Talks.

2021 Mar Finite group actions on free resolutions, Topology, Algebra, & Geometry Seminar, Cleveland State University

- 2020 Sep Jets of graphs, Topology, Algebra, & Geometry Seminar, Cleveland State University
 - Jan Symmetric shifted ideals, Combinatorial Algebra meets Algebraic Combinatorics, Dalhousie University
- 2019 Oct *Betti numbers, linear quotients, and star configurations*, Topology, Geometry & Algebra Seminar, Cleveland State University
 - Apr The symbolic defect of an ideal, Topology, Geometry & Algebra Seminar, Cleveland State University
- 2017 Oct Equivariant resolutions of De Concini-Procesi ideals, Dalhousie University
 - Sep Distinguishing k-configurations, Algebra Seminar, McMaster University
 - Mar Regular sequences and symmetric group actions, Algebra Seminar, McMaster University
- 2016 Oct *Geometric technique for syzygies*, Thematic Program on Combinatorial Algebraic Geometry, Fields Institute
 - Oct An example of an equivariant free resolution of a monomial ideal, Thematic Program on Combinatorial Algebraic Geometry, Fields Institute
- 2015 Nov An overview of Boij-Soederberg theory, Algebra Seminar, McMaster University
 - Oct Tangent schemes of determinantal varieties, Geometry & Topology Seminar, McMaster University
- 2014 Nov *Equivariant resolutions of De Concini-Procesi ideals*, Algebra Seminar, Loyola University Chicago
 - Jan An algorithm for determining actions of semisimple Lie groups on free resolutions, Combinatorial Algebra meets Algebraic Combinatorics, Dalhousie University
- 2013 Sep Free resolutions and representations with finitely many orbits, Algebraic Geometric Seminar, Queen's University
- 2012 Nov Representations with finitely many orbits and free resolutions, Cornell Workshop on Syzygies, Cornell University
 - Feb Algorithms for irreducible decomposition of monomial ideals, Graduate Student Seminar, Northeastern University
 - Feb Equivariant criteria for exactness and reducedness, Quivers and Invariant Theory Seminar, Northeastern University
 - Jan Free resolutions of orbit closures for representations with finitely many orbits, Combinatorial Algebra meets Algebraic Combinatorics, Université du Québec à Montréal
- 2011 Sep Free resolutions of orbit closures for representations with finitely many orbits, Route 81, Cornell University
 - Apr Orbit closures for the representations associated to graded Lie algebras: an interactive approach, Maurice Auslander International Conference, Woods Hole Marine Biology Laboratory
 - Feb Generalized Tanisaki Ideals and the Cohomology of Hessenberg Varieties, Graduate Student Seminar, Northeastern University
- 2009 Dec Grassmannians and Cluster Algebras, Topics in Representation Theory, Northeastern University
 - May An Introduction to Hodge Algebras, Tapas Seminar, Northeastern University

Conference Attendance.

- 2022 Aug MAA MathFest, Philadelphia, PA
 - Jul Spec($\overline{\mathbb{Q}}$), Fields Institute
 - May Macaulay2 Conference at Cleveland State University
 - Jan Combinatorial Algebra meets Algebraic Combinatorics, Fields Institute
- 2021 Dec CMS Winter Meeting

AMS Fall Western Sectional Meeting, University of New Mexico, Albuquerque Oct Aug MAA MathFest Combinatorial Algebra meets Algebraic Combinatorics, Université du Québec à Montréal Jan Joint Mathematics Meetings Jan LGBTQ+ Math Day 2020 Nov Free Resolutions and Representation Theory Workshop, ICERM Aug Macaulay2 Workshop at Cleveland State University Apr CAZoom Structure of length 3 resolutions workshop, University of California San Diego 2019 Aug Jul SageMath and Macaulay2 - An Open Source Initiative, IMA Conference on Commutative Algebra and its Interaction with Algebraic Geometry In Honor Jun of Bernd Ulrich, University of Notre Dame Route 81, Syracuse University 2018 Sep Combinatorial Algebraic Geometry Retrospective Workshop, Fields Institute Jun Graduate Summer School in Algebraic Group Actions, McMaster University Jun Macaulay2 Workshop at Wisconsin, University of Wisconsin - Madison Apr Combinatorial Algebra meets Algebraic Combinatorics, McMaster University Jan Joint Mathematics Meetings, San Diego, CA Jan 2017 May Ordinary and Symbolic Powers of Ideals, BIRS-CMO Joint Mathematics Meetings, Atlanta, GA 2016 Dec CMS Meeting, Scientific Session on Recent Advances in Commutative Algebra, Niagara Falls, ON Thematic Program on Combinatorial Algebraic Geometry, Fields Institute Fall Free Resolutions, Representations, and Asymptotic Algebra, BIRS Apr Combinatorial Algebra meets Algebraic Combinatorics, University of Western Ontario Jan 2015 Oct Route 81, Queen's University AMS Fall Central Sectional Meeting, Loyola University Chicago Oct Combinatorial Algebra meets Algebraic Combinatorics, Queen's University Jan Symbolic and Numerical Methods for Tensors and Representation Theory, Simons Institute, 2014 Nov University of California Berkeley Macaulay2 Research Meeting and School, University of Illinois at Urbana-Champaign Jun 2013 Nov Route 81, Syracuse University Maurice Auslander International Conference, Woods Hole Oceanographic Institute Mav Joint Mathematics Meetings, San Diego, CA Jan Macaulay2 Developer's Workshop, Wake Forest University 2012 Aug MRC: Geometry and Representation Theory Related to Geometric Complexity and Other Jun Variants of P v. NP, Snowbird, UT PASI: Commutative Algebra and Its Interactions with Algebraic Geometry, Representation Theory, and Physics, CIMAT Maurice Auslander International Conference, Woods Hole Oceanographic Institute Apr Interactions between Commutative Algebra and Representation Theory, Syracuse Univer-Apr 2011 Nov Commutative Algebra and Algebraic Geometry Conference, University of Illinois at

Urbana-Champaign

Commutative Algebra Summer Graduate School, MSRI

Geometry of Orbit Closures, Università degli Studi di Roma "Tor Vergata"

Scuola Matematica Interuniversitaria, Università degli Studi di Perugia

Jun

2006 Aug

May

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4. TEACHING EXPERIENCE

Courses Taught.

Year	Term	Course No.	Title	Enrolled	Institution
2022-2	3 Fall	MTH 220	Introduction to Discrete Mathematics	-	CSU
	Fall	MTH 358	Abstract Algebra	-	CSU
2021-2	2 Spring	MTH 482/582	Topics in Number Theory	9	CSU
	Spring	MTH 358	Abstract Algebra	24	CSU
	Fall	MTH 434/534	Differential Geometry	9	CSU
	Fall	MTH 301	Introduction to Number Theory	15	CSU
2020-2	1 Spring	MTH 415/515	Real Analysis	36	CSU
	Spring	MTH 220	Introduction to Discrete Mathematics	34	CSU
	Fall	MTH 301	Introduction to Number Theory	30	CSU
	Fall	MTH 220	Introduction to Discrete Mathematics	30	CSU
2019-2	O Spring	MTH 493/593	Computational Commutative Algebra	16	CSU
	Spring	MTH 220	Introduction to Discrete Mathematics	34	CSU
	Fall	MTH 358	Abstract Algebra	13	CSU
	Fall	MTH 220	Introduction to Discrete Mathematics	35	CSU
2018-1	9 Spring	MTH 482/582	Topics in Number Theory	13	CSU
	Spring	MTH 220	Introduction to Discrete Mathematics	34	CSU
	Fall	MTH 333	Geometry	25	CSU
	Fall	MTH 514	Linear Algebra/Functions of Several	11	CSU
			Variables		
2017-1	8 Winter	MATH 3V03	Graph Theory	48	McMaster
	Winter	MATH 1AA3	Calculus for Science II (joint with 1ZB3)	55	McMaster
	Winter	MATH 1ZB3	Engineering Mathematics II-A	82	McMaster
	Fall	MATH 3B03	Geometry	26	McMaster
2016-1	7 Summer	MATH 2R03	Linear Algebra II	46	McMaster
	Winter	MATH 702	Algebra II (graduate)	10	McMaster
2015-1	6 Summer	MATH 2R03	Linear Algebra II	55	McMaster
	Fall	MATH 1A03	Calculus for Science I	206	McMaster
2014-1	5 Winter	MATH 281	Introduction to Real Analysis	110	Queen's
	Winter	APSC 171-900	Calculus I	63	Queen's
2013-1	4 Winter	MATH 281	Introduction to Real Analysis	108	Queen's
	Fall	APSC 171	Calculus I	233	Queen's
2012-1	3 Spring	MATH 1215	Mathematical Thinking	38	NEU
	Fall	MATH 1215	Mathematical Thinking	23	NEU
2011-1	2 Spring	MATH 1215	Mathematical Thinking	32	NEU
	Fall	MATH 1215	Mathematical Thinking	47	NEU
2010-1	1 Summer II	MATH 1215	Mathematical Thinking	23	NEU
	Fall	MATH 1341	Calculus I for Sci/Engr	20	NEU
2009-1	Summer I	MATH 1215	Mathematical Thinking	15	NEU
	Spring	MATH 1341	Calculus I for Sci/Engr	21	NEU
	Fall	MATH 1341	Calculus I for Sci/Engr	30	NEU
2008-0	9 Spring	MTH U241	Calculus I for Sci/Engr	28	NEU
	Fall	MTH U241	Calculus I for Sci/Engr	25	NEU
2007-0	8 Summer I	MTH U131	Calculus for Business and Economics	23	NEU
	Spring	MTH U241	Calculus I for Sci/Engr	28	NEU
	Fall	MTH U341	Calculus III for Sci/Engr (Recitations)	N/A	NEU

Student Mentoring.

2022	Spring	J.S. Richard	Honors Project, A Graphical Explanation of the Todd-Coxeter Algorithm
		M. Lysyj	Graduate Exit Project, <i>The Four Color Theorem</i>
2021	Fall	C. Scott	Senior Project, A Mathematical Approach To Digital Signature
			Schemes
		N. Iammarino	Graduate Exit Project, The Principal Component of the Jets of a Graph
	Spring	N. Iammarino	Research Assistant, Macaulay2 Jets package
		K. Sammon	Honors Project, Proofs of the root and ratio tests
		N. Benedict	Senior Project, Elliptic Curves Cryptography
		N. Nunez	Senior Project, The Poincaré Model of Hyperbolic Geometry
		C. Hyer	Graduate Exit Project, Tropical Geometry
2020	Fall	C. Hyer	Independent Study, Projective Geometry
		N. Iammarino	Independent Study, Projective Geometry
	Summer	E. Helmick	Undergraduate Summer Research Award, Jets of Graphs
		M. Walsh	Undergraduate Summer Research Award, Jets of Graphs
2019	Spring	A. Ellis	Senior Project, Conics

5. SERVICE AND PROFESSIONAL DEVELOPMENT

Internal Service.

2022 - 2024	Nominating Committee, College of Arts and Sciences, CSU
2021 - 2023	
2021 - 2022	Nominating Committee, College of Science and Health Professions, CSU
2021	Chair Search Advisory Committee, Department of Mathematics and Statistics, CSU
2020 - 2022	Undergraduate Program Committee, Department of Mathematics and Statistics, CSU
2020 - 2022	Topology/Algebra/Geometry Seminar Organizer, CSU
2020 - 2021	LGBTQ+ Student Services Advisory Team, CSU
2019 - 2022	Undergraduate Assessment Committee, Department of Mathematics and Statistics, CSU
2019 - 2022	CSU Freshman-Sophomore Mathematics Competition
2018 - 2022	Search Committee - Lecturer, Department of Mathematics and Statistics, CSU
2018 - 2020	Graduate Program Committee, Department of Mathematics and Statistics, CSU
2012 - 2013	Mathematics Graduate Student Association, NEU
2012 - 2013	Teaching Committee, Department of Mathematics, NEU

External Service.

2022	Macaulay2 Conference at Cleveland State University (organizer with C. Gibbons,
	H. Lopez, and B. Stone)
2021	Special Session on Hyperplane arrangements in connection with commutative algebra at
	the 2021 AMS Fall Western Sectional Meeting (organizer with KN. Lin)
2021	Michigan Research Experience for Graduates (project leader with F. Gandini)
2020	Virtual Macaulay2 Workshop at Cleveland State University (organizer with C. Gibbons,
	H. Lopez, and B. Stone)
2019 - present	Reviewer for AMS Mathematical Reviews (x3)
2016	Scientific Session on Recent Advances in Commutative Algebra at the 2016 CMS Winter
	Meeting in Niagara Falls, ON (organizer with S. Faridi and A. Van Tuyl)

Referee Service.

Algebra & Number Theory

Communications in Algebra

CUBO

Journal of Algebra and its Applications (x3)

Journal of Algebraic Combinatorics

Journal of Commutative Algebra (x2)

Journal of Pure & Applied Algebra

Journal of Software for Algebra and Geometry (x2)

Journal of Symbolic Computation

La Matematica

Proceedings of the American Mathematical Society

Rocky Mountain Journal of Mathematics (x2)

The Electronic Journal of Combinatorics

Affiliations.

2021 - present Member of the Mathematical Association of America

2015 - present Member of the American Mathematical Society

Professional Development.

- 2021 MAA Project NExT, Gold 21 Cohort
- 2020 Write Winning Grant Proposals Seminar

AMS Webinars, Teaching Math Online: Theory Into Practice

Faculty Online Teaching and Design Course, Center for eLearning, Cleveland State University

REMOTE: The Connected Faculty Summit

LockDown Browser & Respondus Monitor Training

- 2019 Safe Space Program, Cleveland State University
- 2017 Human rights, Equity, Accessibility, Respect Toolkit Workshop Series, McMaster University
- 2013 Positive Space Program, Queen's University