

# CURRICULUM VITAE

FEDERICO GALETTO

## 1. BACKGROUND INFORMATION

### Contact Information.

Name Federico Galetto  
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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.

2020 - 2021 NSF conference grant DMS-2003883, *Macaulay2 Workshop at Cleveland State University*, \$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.**

- 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.
- 2018 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.
- 2017 5. F. Galetto, Y.-S. Shin, and A. Van Tuyl. Distinguishing  $\mathbb{k}$ -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.**

- 2020 2. L. Ferraro, F. Galetto, F. Gandini, H. Huang, M. Mastroeni, and X. Ni. The InvariantRing package for Macaulay2, [arXiv:2010.15331](https://arxiv.org/abs/2010.15331).
- 1. F. Galetto, E. Helmick, M. Walsh. Jets of graphs (in preparation).

**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](https://arxiv.org/abs/1210.6410) (preprint of my doctoral dissertation; an excerpt of this paper was published in my 2014 article “Computational methods for orbit closures in a representation with finitely many orbits”)

**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.**

- 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, 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 determinantal*, Welcome Home Workshop, Università degli Studi di Torino

### Conference and Seminar Talks.

- 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.

- 2020 May Macaulay2 Workshop at Cleveland State University  
 Apr CAZoom  
 2019 Aug Structure of length 3 resolutions workshop, University of California San Diego  
 Jul SageMath and Macaulay2 - An Open Source Initiative, IMA  
 Jun Conference on Commutative Algebra and its Interaction with Algebraic Geometry In Honor of Bernd Ulrich, University of Notre Dame  
 2018 Sep Route 81, Syracuse University  
 Jun Combinatorial Algebraic Geometry Retrospective Workshop, Fields Institute  
 Jun Graduate Summer School in Algebraic Group Actions, McMaster University  
 Apr Macaulay2 Workshop at Wisconsin, University of Wisconsin - Madison  
 Jan Combinatorial Algebra meets Algebraic Combinatorics, McMaster University  
 Jan Joint Mathematics Meetings, San Diego, CA  
 2017 May Ordinary and Symbolic Powers of Ideals, BIRS-CMO  
 Jan Joint Mathematics Meetings, Atlanta, GA  
 2016 Dec CMS Meeting, Scientific Session on Recent Advances in Commutative Algebra, Niagara Falls, ON  
 Fall Thematic Program on Combinatorial Algebraic Geometry, Fields Institute  
 Apr Free Resolutions, Representations, and Asymptotic Algebra, BIRS  
 Jan Combinatorial Algebra meets Algebraic Combinatorics, University of Western Ontario  
 2015 Oct Route 81, Queen's University  
 Oct AMS Sectional Meeting, Loyola University Chicago  
 Jan Combinatorial Algebra meets Algebraic Combinatorics, Queen's University  
 2014 Nov Symbolic and Numerical Methods for Tensors and Representation Theory, Simons Institute, University of California Berkeley  
 Jun Macaulay2 Research Meeting and School, University of Illinois at Urbana-Champaign  
 2013 Nov Route 81, Syracuse University  
 May Maurice Auslander International Conference, Woods Hole Oceanographic Institute  
 Jan Joint Mathematics Meetings, San Diego, CA

2012	Aug	Macaulay2 Developer's Workshop, Wake Forest University
	Jun	MRC: Geometry and Representation Theory Related to Geometric Complexity and Other Variants of P v. NP, Snowbird, UT
	May	PASI: Commutative Algebra and Its Interactions with Algebraic Geometry, Representation Theory, and Physics, CIMAT
	Apr	Maurice Auslander International Conference, Woods Hole Oceanographic Institute
	Apr	Interactions between Commutative Algebra and Representation Theory, Syracuse University
2011	Nov	Commutative Algebra and Algebraic Geometry Conference, University of Illinois at Urbana-Champaign
	Jun	Commutative Algebra Summer Graduate School, MSRI
	May	Geometry of Orbit Closures, Università degli Studi di Roma "Tor Vergata"
2006	Aug	Scuola Matematica Interuniversitaria, Università degli Studi di Perugia

#### 4. TEACHING EXPERIENCE

##### Courses Taught.

Year	Term	Course No.	Title	Enrolled	Institution
2020-21	Spring	MTH 415/515	Real Analysis	-	CSU
	Spring	MTH 220	Introduction to Discrete Mathematics	-	CSU
	Fall	MTH 301	Introduction to Number Theory	30	CSU
	Fall	MTH 220	Introduction to Discrete Mathematics	30	CSU
2019-20	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
2018-19	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 Variables	11	CSU
2017-18	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
2016-17	Summer	MATH 2R03	Linear Algebra II	46	McMaster
	Winter	MATH 702	Algebra II (graduate)	10	McMaster
2015-16	Summer	MATH 2R03	Linear Algebra II	55	McMaster
	Fall	MATH 1A03	Calculus for Science I	206	McMaster
2014-15	Winter	MATH 281	Introduction to Real Analysis	110	Queen's
	Winter	APSC 171-900	Calculus I	63	Queen's
2013-14	Winter	MATH 281	Introduction to Real Analysis	108	Queen's
	Fall	APSC 171	Calculus I	233	Queen's
2012-13	Spring	MATH 1215	Mathematical Thinking	38	NEU
	Fall	MATH 1215	Mathematical Thinking	23	NEU
2011-12	Spring	MATH 1215	Mathematical Thinking	32	NEU
	Fall	MATH 1215	Mathematical Thinking	47	NEU
2010-11	Summer II	MATH 1215	Mathematical Thinking	23	NEU

	Fall	MATH 1341	Calculus I for Sci/Engr	20	NEU
2009-10	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
2008-09	Spring	MTH U241	Calculus I for Sci/Engr	28	NEU
	Fall	MTH U241	Calculus I for Sci/Engr	25	NEU
2007-08	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.

2021	Spring	N. Benedict	Senior Project, <i>Elliptic Curves and Cryptography</i>
	Spring	N. Nunez	Senior Project, <i>Models of Hyperbolic Geometry</i>
2020	Fall	C. Hyer	MTH 597 Independent Study, <i>Projective Geometry</i>
	Fall	N. Iammarino	MTH 597 Independent Study, <i>Projective Geometry</i>
	Summer	E. Helmick	Undergraduate Summer Research Award, <i>Jets of Graphs</i>
	Summer	M. Walsh	Undergraduate Summer Research Award, <i>Jets of Graphs</i>
2019	Spring	A. Ellis	Senior Project, <i>Conics</i>

## 5. SERVICE AND PROFESSIONAL DEVELOPMENT

### Internal Service.

2020 - 2022	Undergraduate Program Committee, Department of Mathematics and Statistics, CSU
2020 - 2021	Topology/Algebra/Geometry Seminar Organizer, CSU
2020 - 2021	Undergraduate Assessment Committee, Department of Mathematics and Statistics, CSU
2020	Ad Hoc Committee on Preferred Name Policy, LGBTQ+ Student Services, CSU
2019 - 2021	CSU Freshman-Sophomore Mathematics Competition
2018 - 2022	PRC - Appointments 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.

2020	Organizer of Macaulay2 Workshop at Cleveland State University
2019 - present	Reviewer for AMS Mathematical Reviews (x2)
2016	Co-organizer (with S. Faridi and A. Van Tuyl) of the Scientific Session on Recent Advances in Commutative Algebra at the 2016 CMS Winter Meeting in Niagara Falls, ON

### Referee Service.

Algebra & Number Theory  
 Journal of Algebra and its Applications (x2)  
 Journal of Commutative Algebra  
 Journal of Software for Algebra and Geometry (x2)  
 Journal of Symbolic Computation

Proceedings of the American Mathematical Society  
Rocky Mountain Journal of Mathematics  
The Electronic Journal of Combinatorics

**Affiliations.**

2015 - present    Member of the American Mathematical Society

**Professional Development.**

2020    Faculty Online Teaching and Design Course, Center for eLearning, Cleveland State University  
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