

# 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.**

- 2021 13. F. Galetto, E. Helmick, and M. Walsh. Jet graphs, [arXiv:2104.08933](#). Accepted in *Involve, a Journal of Mathematics*.
- 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.**

- 2021 4. F. Galetto and N. Iammarino. Computing with jets, [arXiv:2108.06350](#).
- 3. F. Galetto. Finite group characters on free resolutions, [arXiv:2106.14071](#).
- 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.**

- 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, 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.

- 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.

- 2021 Oct AMS Fall Western Sectional Meeting, University of New Mexico, Albuquerque
- Aug MAA MathFest
- Jan Combinatorial Algebra meets Algebraic Combinatorics, Université du Québec à Montréal
- Joint Mathematics Meetings
- 2020 Nov LGBTQ+ Math Day
- Aug Free Resolutions and Representation Theory Workshop, ICERM
- 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 Fall Central 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	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
2019-20	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	Fall	N. Iammarino	Exit Project, <i>Components of Jet Schemes of Edge Ideals of Graphs</i>
	Fall	C. Scott	Senior Project, <i>Digital Signature Schemes</i>
	Spring	N. Iammarino	Research Assistant, <i>Macaulay2 Jets package</i>
	Spring	N. Benedict	Senior Project, <i>Elliptic Curves Cryptography</i>
	Spring	N. Nunez	Senior Project, <i>The Poincaré Model of Hyperbolic Geometry</i>
	Spring	C. Hyer	Graduate Exit Project, <i>Tropical 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.

2021 - 2023	PRC - Appointments Tenure Track, Department of Mathematics and Statistics, CSU
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 - 2022 Undergraduate Assessment Committee, Department of Mathematics and Statistics, CSU
- 2020 - 2021 Chosen Name Policy Expansion Committee, LGBTQ+ Student Services, CSU
- 2019 - 2022 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.**

- 2021 Special Session on Hyperplane arrangements in connection with commutative algebra at the 2021 AMS Fall Western Sectional Meeting (organizer with K.-N. Lin)
- 2021 Michigan Research Experience for Graduates (project leader with F. Gandini)
- 2020 Macaulay2 Workshop at Cleveland State University (organizer)
- 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  
 Journal of Algebra and its Applications (x2)  
 Journal of Commutative Algebra  
 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