

Alessandro De Stefani

Curriculum Vitæ

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Main research areas

- Characteristic $p > 0$ methods and uses of the Frobenius endomorphism. Study of numerical invariants such as F -thresholds, Hilbert-Kunz multiplicities, F -signature and Frobenius Betti numbers, mainly in relation to the singularities of a ring.
- Homological methods, such as the index of a Gorenstein ring, local cohomology.
- Symbolic powers and differential operators.
- Macaulay's inverse system, Hilbert functions and Betti numbers.

Professional experience

- 2017-present **Dale Jensen Postdoctoral Faculty Fellow**, *University of Nebraska-Lincoln*.
2016-2017 **Postdoctoral Fellow**, *Royal Institute of Technology (KTH), Sweden*.

Education

- 2013-2016 **PhD in Mathematics**, *University of Virginia*.
Thesis advisor: Craig Huneke
Thesis title: Homological methods, singularities, and numerical invariants
- 2011-2012 **Master's Degree**, *University of Kansas*.
- 2008-2010 **Laurea Specialistica**, *Università degli Studi di Genova*.
Thesis advisor: Maria Evelina Rossi
Thesis title: Artinian level local rings
- 2005-2008 **Laurea Triennale**, *Università degli Studi di Genova*.
Thesis advisor: Maria Evelina Rossi
Thesis title: Anelli di valutazione e chiusura integrale di ideali

List of publications

1. **Symbolic powers of ideals**, (with H. Dao, C. Huneke, E. Grifo, and L. Núñez-Betancourt), To appear in Springer Proceedings in Mathematics and Statistics. [arXiv: 1708.03010].
2. **On the existence of F -thresholds and related limits**, (with L. Núñez-Betancourt, and F. Pérez), To appear in Trans. Amer. Math. Soc. [arXiv: 1605.03264].
3. **Generalizing Serre's Splitting Theorem and Bass's Cancellation Theorem via free-basic elements**, (with T. Polstra, and Y. Yao), Proc. Amer. Math. Soc. 146 (2018), no. 4, 1417-1430. [arXiv: 1608.08591].
4. **F -thresholds of graded rings**, (with L. Núñez-Betancourt), Nagoya Math. J. 229 (2018), 141-168. [arXiv: 1507.05459].

5. **Frobenius Betti numbers and modules of finite projective dimension**, (with C. Huneke, and L. Núñez-Betancourt), *J. Commut. Algebra* 9 (2017), no. 4, 455-490. [arXiv: 1412.4266].
6. **A counterexample to a conjecture of Ding**, *J. Algebra* 452 (2016), 324-337. [arXiv: 1506.09168].
7. **Products of ideals may not be Golod**, *J. Pure Appl. Algebra* 220 (2016), no. 6, 2289-2306. [arXiv: 1506.09129].
8. **A sufficient condition for strong F -regularity**, (with L. Núñez-Betancourt), *Proc. Amer. Math. Soc.* 144 (2016), no. 1, 21-29. [arXiv: 1411.7078].
9. **An algorithm for constructing certain differential operators in positive characteristic**, (with A. F. Boix, and D. Vanzo), *Matematiche (Catania)* 70 (2015), no. 1, 239-271. [arXiv: 1503.01419].
10. **Artinian Level Algebras of Low Socle Degree**, *Comm. Algebra* 42 (2014), no. 2, 729-754. [arXiv: 1208.3506].
11. **Appendix to: On the behavior of singularities at the F -pure threshold**, by E. Canton, D. Hernández, K. Schwede, and E. Witt. (with J. Jeffries, Z. Kadyrsizova, R. Walker, and G. Whelan), *Illinois J. Math* 60 (2016), no. 3-4, 669-685. [arXiv: 1508.05427].

Articles submitted to journal

- *Globalizing F -invariants* (with T. Polstra, and Y. Yao). [arXiv: 1608.08580]
- *A Zariski-Nagata theorem for smooth \mathbb{Z} -algebras* (with E. Grifo and J. Jeffries). [arXiv: 1709.01049]
- *Local cohomology and Lyubeznik numbers of F -pure rings* (with E. Grifo, and L. Núñez-Betancourt). [arXiv: 1710.00462]

Other articles and notes

- *Commutative algebra notes*: taken from several commutative algebra courses taught by C. Huneke at the University of Kansas. <https://www.math.unl.edu/~adestefani2/notes/>

Research funding and awards

- Jun 2015 **Mathematics Research Communities**, *American Mathematical Society*.
Selected participant of the 2015 MRC program
- Oct 2015 **Graduate Student Travel Grant**, *American Mathematical Society*.
- Jun-Jul 2014 **Research School in Algebraic Geometry and Commutative Algebra**, *Catania*.
Selected participant of the 2014 Pragmatic program
- 2013-2016 **Graduate Research Assistant**, *University of Virginia*.
Fall 2013, Fall 2015
- 2011-2012 **Graduate Research Assistant**, *University of Kansas*.
Summer 2012, Spring 2012, Spring 2011
- 2005-2008 **Italian National Fellowship**, *INDAM (Istituto Nazionale di Alta Matematica)*.

Teaching experience

- Spring 2018 **Instructor**, *University of Nebraska-Lincoln*.
Math 417: Group Theory
- Fall 2017 **Instructor**, *University of Nebraska-Lincoln*.
Math 221: Differential equations
- Fall 2016 **Mini-course**, *Royal Institute of Technology (KTH)*.
Title: Measuring singularities with Frobenius
- 2013-2016 **Graduate Teaching Assistant**, *University of Virginia*.
Calculus I, Calculus II, Applied Calculus I with Algebra
- 2011-2012 **Graduate Teaching Assistant**, *University of Kansas*.
Kansas Algebra Program (KAP), Applied Calculus I
- Fall 2010 **Department tutor**, *Università degli Studi di Genova*.
Mathematics for students majoring in Statistics

Professional services

- 2012-present **Reviewer for Zentralblatt Math**.

Professional memberships

- 2011-2016 **American Mathematical Society (AMS)**.

Upcoming talks and other events

- Nov 2018 **University of Arkansas, USA**, *AMS Sectional Meetings*.
- Jun, 2018 **Banff International Research Station (BIRS), Canada**, *New Trends in Syzygies*.
- May, 2018 **Università degli Studi di Genova, Italy**, *Giornate di Geometria Algebrica ed Argomenti Correlati XIV*.
- Apr, 2018 **Northeastern University, USA**, *AMS Sectional Meetings*.
- Mar, 2018 **University of Virginia**, *Mini-workshop*.

List of talks

- Dec 20, 2017 **Università degli Studi di Genova, Italy**, *Algebra Seminar*.
- Oct 22, 2017 **University of Kansas, USA**, *KUMUNU 2017*.
- Sep 13, 2017 **University of Nebraska-Lincoln, USA**, *Commutative Algebra Seminar*.
- Jun 15, 2017 **Umeå University, Sweden**, *Meeting of the Catalan, Spanish, Swedish Mathematical Society*.
- Mar 29, 2017 **Royal Institute of Technology, Sweden**, *Algebra and Geometry Seminar*.
- Mar 12, 2017 **College of Charleston, USA**, *AMS Sectional Meetings*.
- Mar 7, 2017 **CIMAT, Guanajuato, Mexico**, *Algebra and Geometry Seminar*.
- Dec 16, 2016 **Université de Neuchâtel, Switzerland**, *InterCity Seminar*.
- Oct 28, 2016 **University of Utah, USA**, *Commutative Algebra Seminar*.
- Oct 26, 2016 **Purdue University, USA**, *Commutative Algebra Seminar*.

Oct 20, 2016 **University of Michigan, USA**, *Commutative Algebra Seminar*.
Oct 18, 2016 **University of Kansas, USA**, *Algebra Seminar*.
Jul 20, 2016 **Università degli Studi di Genova, Italy**, *Algebra Seminar*.
Apr 24, 2016 **University of Nebraska-Lincoln, USA**, *KUMUNUjr 2016*.
Apr 19, 2016 **Clemson University, USA**, *Algebraic Geometry and Number Theory Seminar*.
Mar 5, 2016 **University of Georgia, Athens, USA**, *AMS Sectional Meeting*.
Jan 8, 2016 **Seattle, USA**, *AMS Joint Mathematics Meetings*.
Dec 3, 2015 **University of Kansas, USA**, *Algebra Seminar*.
Nov 18, 2015 **Georgia State University, USA**, *Algebra Seminar*.
Nov 14, 2015 **Rutgers University, USA**, *AMS Sectional Meetings*.
Oct 23, 2015 **Università degli Studi di Genova, Italy**, *Incontro di Algebra Commutativa*.
Oct 9, 2015 **University of Utah, USA**, *Commutative Algebra Seminar*.
Oct 3, 2015 **Loyola University, Chicago, USA**, *AMS Sectional Meetings*.
Sep 30, 2015 **University of Virginia, USA**, *Algebra Seminar*.
Jul 3, 2015 **Università degli Studi di Genova, Italy**, *Algebra Seminar*.
Apr 16, 2015 **University of Michigan, USA**, *Commutative Algebra Seminar*.
Jun 19, 2013 **Università degli Studi di Genova, Italy**, *Algebra Seminar*.
Feb 15, 2013 **MSRI (Berkeley), USA**, *Representation Theory, Homological Algebra, and Free Resolutions*.
Nov 10, 2012 **Cornell University, USA**, *Workshop on Syzygies*.
Sep 22, 2012 **University of Missouri-Columbia, USA**, *KUMUNU 2012*.
Apr 21, 2012 **University of Nebraska-Lincoln, USA**, *KUMUNUjr 2012*.