

# Alessandro De Stefani

## Curriculum Vitæ

University of Nebraska, Lincoln  
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### Main research areas

- Methods in characteristic  $p > 0$ , and Frobenius singularities. Study of numerical invariants such as  $F$ -thresholds, Hilbert-Kunz multiplicities,  $F$ -signature and Frobenius Betti numbers.
- 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

- 2018-present **Postdoc**, *University of Nebraska-Lincoln*.  
2017-2018 **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 **PhD in Mathematics (transfer in 2012)**, *University of Kansas*.  
Followed my advisor to the University of Virginia
- 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

12. **A Zariski-Nagata theorem for smooth  $\mathbb{Z}$ -algebras**, (with E. Grifo and J. Jeffries), To appear in *J. Reine Angew. Math.* [arXiv: 1709.01049].
11. **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].
10. **Symbolic powers of ideals**, (with H. Dao, C. Huneke, E. Grifo, and L. Núñez-Betancourt), *Springer Proceedings in Mathematics and Statistics*, vol. 222 (2018), 387-432. [arXiv: 1708.03010].

9. **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].
8.  **$F$ -thresholds of graded rings**, (with L. Núñez-Betancourt), Nagoya Math. J. 229 (2018), 141-168. [arXiv: 1507.05459].
7. **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].
5. **Products of ideals may not be Golod**, J. Pure Appl. Algebra 220 (2016), no. 6, 2289-2306. [arXiv: 1506.09129].
4. **A sufficient condition for strong  $F$ -regularity**, (with L. Núñez-Betancourt), Proc. Amer. Math. Soc. 144 (2016), no. 1, 21-29. [arXiv: 1411.7078].
3. **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].
2. **Artinian Level Algebras of Low Socle Degree**, Comm. Algebra 42 (2014), no. 2, 729-754. [arXiv: 1208.3506].
1. **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].

### Preprints and articles submitted to journal

- *Cohomologically full rings* (with H. Dao, and L. Ma). [arXiv: 1806.00536]
- *$F$ -signature function of quotient singularities* (with A. Caminata). [arXiv: 1804.01281]
- *Local cohomology and Lyubeznik numbers of  $F$ -pure rings* (with E. Grifo, and L. Núñez-Betancourt). [arXiv: 1710.00462]
- *Globalizing  $F$ -invariants* (with T. Polstra, and Y. Yao). [arXiv: 1608.08580]

### 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

- 2018-2020 **AMS-Simons Travel Grant**, *American Mathematical Society*.
- 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

- 2018-present **Reviewer for Mathscinet**.
- 2012-present **Reviewer for zbMATH**.

## 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*.

## List of talks

- May 31, 2018 **Università degli Studi di Genova, Italy**, *Giornate di Geometria Algebrica ed Argomenti Correlati XIV*.
- Apr 21, 2018 **Northeastern University, USA**, *AMS Sectional Meetings*.
- Apr 19, 2018 **University of Nebraska-Lincoln, USA**, *Commutative Algebra Seminar*.
- Apr 19, 2018 **University of Nebraska-Lincoln, USA**, *Commutative Algebra Seminar*.
- Mar 27, 2018 **University of Virginia**, *Mini-workshop*.
- 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*.