Eloísa Grifo | CV

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Appointments

University of Nebraska – Lincoln — **Lincoln, Nebraska**
Assistant Professor — *August 2021 – present*

University of California, Riverside — **Riverside, California**
Assistant Professor — *July 2020 – June 2021*
Visiting Assistant Researcher — *July 2019 – June 2020*

University of Michigan — **Ann Arbor, Michigan**
Postdoctoral Assistant Professor — *August 2018 – May 2019*

Education

University of Virginia — **Charlottesville, VA, USA**
PhD, Advisor: Craig Huneke — *August 2013 – May 2018*
Thesis: *Symbolic powers and the Containment Problem*

Instituto Superior Técnico — **Lisboa, Portugal**
Mestrado em Matemática e Aplicações (MS in Mathematics) — *2011–2013*
Licenciatura em Matemática Aplicada e Computação (BS in Mathematics) — *2008–2011*

Publications

Published or accepted research papers

1 *A uniform Chevalley theorem for direct summands of polynomial rings in mixed characteristic*, with Alessandro De Stefani and Jack Jeffries, accepted in *Math. Z.*.

2 *Demailly's conjecture and the containment problem*, with Sankhaneel Bisui, Huy Tài Hà, and Thái Thành Nguyễn, J. Pure Appl. Algebra 226 (2022), no. 4.

3 *Constructing non-proxy small test modules for the complete intersection property*, with Benjamin Briggs and Josh Pollitz, to appear in the *Nagoya Mathematical Journal*.

4 *Expected resurgence of ideals defining Gorenstein rings*, with Craig Huneke and Vivek Mukundan, to appear in the *Michigan Math Journal*.

5 *Chudnovsky's Conjecture and the stable Harbourne–Huneke containment*, with Sankhaneel Bisui, Huy Tài Hà, and Thái Thành Nguyễn, to appear in *Trans. Amer. Math. Soc.*.

6 *Symbolic power containments in singular rings in positive characteristics*, with Linquan Ma and Karl Schwede, to appear in *Manuscripta Mathematica*.

7 *Local cohomology and Lyubeznik numbers of F-pure rings*, with Alessandro De Stefani and Luis Núñez-Betancourt, *J. Algebra* 571 (2021), 316–338.

8 *A stable version of Harbourne's Conjecture and the containment problem for space monomial curves*, *J. Pure Appl. Algebra*, Volume 224, Issue 12, 2020.

9 *Expected resurgences and symbolic powers of ideals*, with Craig Huneke and Vivek Mukundan, J. London Math. Soc. (2) 102 (2020) 453-69.

10 *A Zariski-Nagata Theorem for smooth $\mathbb{Z}$-algebras*, with Alessandro De Stefani and Jack Jeffries, *J. Reine Angew. Math.* 2020 (761), 123-140.

11 *Symbolic powers of ideals defining F-pure and strongly F-regular rings*, with Craig Huneke, *Int. Math. Res. Not. (IMRN)* 2019, no. 10, 2999–3014.

12 *Calculations involving symbolic powers*, with Ben Drabkin, Alexandra Seceleanu, and Branden Stone, J. Softw. Algebra Geom. 9 (2019), no. 1, 71–80.

13 *Lower bounds on projective levels of complexes*, with Hannah Altmann, Jonathan Montaño, William Sanders, and Thanh Vu, *Journal of Algebra*, 491C (2017), pp. 343–356.

14 *On the growth of deviations*, with Adam Boocher, Alessio D'Alì, Jonathan Montaño, and Alessio Sammartano, *Proc. Amer. Math. Soc.*, 144 (2016), pp. 5049–5060.

15 *Edge ideals and DG algebra resolutions*, with Adam Boocher, Alessio D'Alì, Jonathan Montaño, and Alessio Sammartano, *Le Matematiche* 70 (2015), no. 1, 215–237.

Refereed papers that are largely expository

16 *Lower bounds on betti numbers*, with Adam Boocher. In: Peeva I. (eds) *Commutative Algebra*. Springer, Cham.

17 *Symbolic Rees algebras*, with Alexandra Seceleanu. In: Peeva I. (eds) *Commutative Algebra*. Springer, Cham.

18 *Symbolic powers*, CIM Bulletin 43 (2021), 3-10.

19 *Symbolic powers of ideals*, with Hailong Dao, Alessandro De Stefani, Craig Huneke, and Luis Núñez Betancourt, *Advances in Singularities and Foliations: Geometry, Topology and Applications*, 2018, 387–432.

Preprints

20 *The software package SpectralSequences*, with Adam Boocher and Nathan Grieve, arXiv:1610.05338, submitted.

Other

- *Números, cirurgias e nós de gravata* (book), co-edited with João Pedro Boavida, Luís Cruz-Filipe, Rui Pedro Carpentier, Pedro S. Gonçalves, David Henriques, Ana Rita Pires, IST Press, December 2012.
- *Da plasticina às equações de 5°grau* in *Números, cirurgias e nós de gravata*, pp. 12-25, IST Press, December 2012.

Awards and Fellowships

Research and travel grants

- NSF standard grant DMS-2001445, now DMS-2140355, *Symbolic powers and p-derivations*, 2020–2023.
- AMS–Simons Travel Grant 2018–2020.

- Research grant by *Fundação para a Ciência e Tecnologia*, October 2012 - April 2013, under the supervision of Maria Cristina Câmara.

Fellowships

- William and Carolyn Polk Jefferson Fellowship, 2013–2018, by the Jefferson Scholars Foundation.
- *Novos Talentos em Matemática*, awarded by Fundação Calouste Gulbenkian, 2008–09 and 2009–10.

Awards

- 2022 Roger Weigand Award for contributions to the Nebraska Math Graduate Program.
- Honorable Mention in the International Mathematical Olympiads, 2008.
- Member of the portuguese team in the Ibero-american Mathematical Olympiads, 2007.
- Bronze (2003) and Gold (2008) medals in *Olimpíadas Portuguesas de Matemática*
- Gold (2004, 2006), Silver (2007) and Bronze (2005) medals in *Olimpíada Paulista de Matemática*
- Bronze Medal in *Olimpíada de Mayo* 2003 (international mathematical olympiad)
- Winner of *Campeonato Nacional da Língua Portuguesa* 2007, Category B (grammar competition)

Teaching

University of Nebraska – Lincoln

- Topics in Algebra (Math 918): Spring 2022
- Introduction to Modern Algebra (Math 310): Fall 2021
- Linear Algebra (Math 314): Fall 2021

University of California, Riverside

- Introduction to Homological Algebra (Math 224): Spring 2021
- Commutative Algebra (Math 225): Winter 2021
- Calculus for the Life Sciences II (Math 7B): Fall 2020

University of Michigan

- Introduction to Modern Algebra (Math 412): Winter 2019
- Calculus I (Math 115): Fall 2018

University of Virginia

- Calculus II (instructor): Fall 2016
- Applied Calculus II (instructor): Spring 2015, Fall 2015

- Applied Calculus II (assistant to the coordinator): Spring 2016
- Calculus III (TA): Fall 2014

Instituto Superior Técnico

- Análise Complexa e Equações Diferenciais (TA): Fall 2011, Spring 2012

Invited Talks

Lecture series

- *Symbolic Powers*, BRIDGES, University of Utah, July 2021.
- *Potencias simbólicas*, *Escuela de Outoño en Álgebra Conmutativa*, CIMAT, Mexico, November 2019.
- *Symbolic Powers*, in *Topics in commutative algebra*, RTG Mini-course, University of Utah, May 2018.

Seminars and conference talks

- *Symbolic powers in mixed characteristic*, BIRS-CMO workshop (05/10/2022)
- *Cohomological support varieties*, KUMUNU, UNL (05/07/2022)
- *Cohomological support varieties*, CA+, Iowa State (05/01/2022)
- *Cohomological support varieties*, CUNY virtual CAAG Seminar (04/01/2022)
- *Bounding higher degree vanishing*, UCR Algebraic Geometry Seminar (01/25/2022)
- *Symbolic powers*, Combinatorial Algebra meets Algebraic Combinatorics (01/22/2022)
- *Chudnovsky's Conjecture beyond points*, Albuquerque Virtual AMS Sectional Meeting (10/23/2021)
- *Symbolic powers in mixed characteristic*, Omaha Virtual AMS Sectional Meeting (10/09/2021)
- *A survey of Harbourne's Conjecture*, IIT Bombay Virtual Commutative Algebra Seminar (09/03/2021)
- *Symbolic powers in Mixed Characteristic*, D-modules, group actions, and Frobenius, ICERM (08/12/2021)
- *Differential powers in Mixed Characteristic*, Differentials Operators in CA and AG, MCA 2021 (07/15/2021)
- *Symbolic powers in Mixed Characteristic*, Special Month On Singularities & K-Stability (06/07/2021)
- *Test modules for the complete intersection property*, Virtual Notre Dame AG/CA Seminar (04/27/2021)
- *Test modules for the complete intersection property*, Virtual AMS Meeting Cincinnati (04/17/2021)
- *Constructing non-proxy small modules*, Virtual AMS Sectional Meeting at Brown (03/20/2021)
- *Symbolic Powers*, Mulheres Matemáticas: uma tarde de encontro
- *Constructing (non-)proxy small modules*, Virtual AMS Sectional Meeting at Penn State (10/04/2020)
- *Symbolic powers, stable containments, and degree bounds*, Fellowship of the ring (online seminar 05/20)
- *Symbolic Powers and the (stable) containment problem*, Bern/Fribourg/Neuchâtel Seminar (05/15/2020)

- *Symbolic Powers*, Tulane Colloquium (02/13/2020)
- *Symbolic powers and the (stable) containment problem*, Tulane Algebra Seminar (02/12/2020)
- *Symbolic Powers*, UNL Colloquium (01/13/2020)
- *A stable version of Harbourne's Conjecture*, UIC Commutative Algebra seminar (01/11/2019).
- *Symbolic powers / Two versions of Harbourne's Conjecture*, UNL CA seminar (09/2019).
- *Symbolic powers and the (stable) containment problem*, University of Wisconsin Alg and AG Seminar
- *A Fedder-like criterion over Gorenstein rings*, Morgantown Algebra Days (04/2019)
- *Symbolic powers and the containment problem*, Central Michigan Alg & Combinatorics Sem (03/29/2019)
- *Symbolic powers*, UC Riverside Colloquium (02/21/2019)
- *A Fedder-like criterion over Gorenstein rings*, MFO Workshop (10/02/2019)
- *Symbolic powers*, Oklahoma State University Colloquium (02/04/2019)
- *A Fedder-like criterion over Gorenstein rings and symbolic powers*, Frobenius Actions in Commutative Algebra: Recent Developments, Barcelona, Spain (01/2019)
- *A stable version of Harbourne's Conjecture*, CMS Winter Meeting, Vancouver, Canada (12/09/2019)
- *Symbolic powers and free resolutions*, AMS Sectional Meeting Ann Arbor (10/21/2018)
- *Symbolic powers of ideals defining F-pure rings*, AMS Sectional Meeting Ann Arbor (10/20/2018)
- *A stable version of Harbourne's Conjecture*, MFO Mini-workshop on Asymptotic Invariants of Homogeneous Ideals (10/03/2018)
- *Symbolic powers and the containment problem*, Univ. of Nottingham Algebra Seminar (07/05/2018)
- *Homological algebra vs symbolic powers*, Kumunujr (4/30/2018)
- *Applying homological algebra to a problem on symbolic powers*, AMS Sectional Boston (4/22/2018)
- *Symbolic powers and the Containment Problem*, AMS Sectional Meeting Portland (4/15/2018)
- *The Zariski-Nagata Theorem in mixed characteristic*, AMS Sectional Meeting Columbus (3/18/2018)
- *Symbolic Powers: the Containment Problem and Harbourne's Conjecture*, Joint Math Meetings 2018
- *Symbolic powers and differential operators*, George Mason University CAG Seminar (12/08/2017)
- *Symbolic powers and the Containment Problem*, University of Kansas Algebra Seminar (11/30/2017)
- *Symbolic powers and the Containment Problem*, University of South Carolina AG Seminar (11/13/2017)
- *Symbolic powers and differential operators*, New Mexico State University (10/23/2017)
- *A stable version of Harbourne's Conjecture*, AMS Sectional Meeting Orlando (9/23/2017)
- *A stable version of Harbourne's Conjecture*, AMS Sectional Meeting Denton (9/9/2017)
- *Symbolic powers of ideals defining F-pure rings*, AMS Sectional Meeting New York (5/6/2017)

- *Symbolic powers of ideals defining F-pure rings*, University of Utah CA Seminar (4/21/2017)
- *Symbolic powers in characteristic p*, University of Nebraska CA Seminar (3/29–30/2017)
- *Symbolic powers of ideals defining F-pure rings*, AMS Sectional Meeting Charleston (3/12/2017)
- *Symbolic powers of ideals defining F-pure rings*, Clemson University ADM Seminar (3/9/2017)
- *Symbolic powers of ideals defining F-pure rings*, University of Michigan CA Seminar (1/12/2017)
- *Symbolic powers of prime ideals*, AMS Sectional Meeting SLC (4/10/2016)

Talks aimed at undergraduate students

- *Symbolic powers and a story of algebra vs geometry*, Undergraduate Math Symposium, UIC (02/11/2019)
- *Slicing a square pizza*, University of Michigan Math Club (March 2019)
- *Slicing a square pizza*, UVa Math Club (2018)
- *Slicing a square pizza*, Math & CS Seminar, Adelphi University (11/10/2017)

Conferences

Conferences and seminars organized

- Commutative and Homological Algebra Market Presentations, a weekly virtual seminar series in commutative algebra, co-organized with Keri Sather-Wagstaff since Fall 2020.
- UNL Commutative Algebra Seminar, co-organized with Jack Jeffries and Mark Walker, since Fall 2021.
- Virtual Special Session on *Commutative Algebra* at the Joint Math Meeting 2022, co-organized with Keri Sather-Wagstaff and Janet Vassilev.
- Virtual Special Session on *Women in Commutative Algebra – One hundred years of Idealtheorie in Ringbereichen* at the AMS Western Sectional Meeting, May 2021, co-organized with Alessandra Costantini.
- UCR Commutative Algebra Seminar, co-organized with Alessandra Costantini, 2020–2021.
- Zoom session on *commutative algebra*, co-organized with Keri Sather-Wagstaff. Session originally planned for the 2020 AMS Sectional Meeting in Charlottesville, which was canceled due to COVID.
- Special session on *developments in commutative algebra*, AMS Sectional Meeting in Auburn, 2019, co-organized with Patricia Klein.
- Commutative Algebra Seminar at the University of Michigan, co-organized with Mel Hochster.
- *Forum for Interdisciplinary Dialogue 2015 – Ethics and Development*, co-organized with the Jefferson Scholars Foundation.
- *Seminário Diagonal*, co-organizer, Math students seminar, Instituto Superior Técnico, 2010–2013.

Selected conferences, summer schools, and workshops attended

- BIRS workshop *Women in Commutative Algebra*, October 2019

- Mathematisches Forschungsinstitut Oberwolfach Mini-workshop on Asymptotic Invariants of Homogeneous Ideals, October 2018.
- Macaulay 2 Workshop, Berkeley, CA, July 2017.
- CMO-BIRS Workshop 17w5027 on Symbolic Powers, Oaxaca, Mexico, May 2017.
- Macaulay 2 Workshop, Salt Lake City, Utah, May 2016.
- Mathematics Research Communities 2015 – Commutative Algebra. Salt Lake City, Utah.
- Pragmatic – Local cohomology and syzygies of affine algebras. June 23–July 11, 2014, Catania, Italy.

Software

Macaulay2 packages

- **SpectralSequences**
  developed with David Berlekamp, Adam Boocher, Nathan Grieve, Gregory G. Smith, and Thanh Vu
- **SymbolicPowers**
  with contributions from Ben Drabkin, Alexandra Seceleanu, and Branden Stone

Service and outreach

Service

- **commalg.org**
  with Graham Leuschke, Moira McDermott, and Branden Stone *Since 2020*
- **AWM Student Chapter at UVa**
  Chapter president and founding member *2016–2017*
- Reviewer for Mathematical Reviews
- Referee for various mathematics journals

Math Outreach

- **Wolverine Pathways**
  Math enrichment activities with middle school and highschool students *Fall 2018*
- **UVa Math Ambassadors**
  Classroom activities with 5th and 6th grade students *2014–2018*