




Javier A. Carvajal-Rojas

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RESEARCH INTERESTS Algebraic geometry and commutative algebra in positive characteristic, with a focus on invariants, objects, and concepts defined and determined by the Frobenius morphism. For instance, I am interested in F -singularity theory and F -invariants such as test ideals and F -signature. I am also interested in their interaction with characteristic zero algebraic geometry, e.g. singularities in the Minimal Model Program and multiplier ideals.

EDUCATION **University of Utah**
Ph.D., Mathematics, August 2018
Advisor: Karl Schwede
Dissertation: Arithmetic aspects of strong F -regularity

Universidad de Costa Rica

B.S. in Mathematics, April 2013

- *Graduación de Honor*
- *Diploma de Excelencia Académica, 2012*
- *Diploma de Excelencia Académica, 2011*

PROFESSIONAL EXPERIENCE **École Polytechnique Fédérale de Lausanne (EPFL)**
Collaborateur Scientifique (Postdoc), September 2018-

- PUBLICATIONS
1. *Bertini Theorems for F -signature and Hilbert–Kunz multiplicity*, w/ K. Schwede and K. Tucker. *Mathematische Zeitschrift* (2021).
 2. *The uniform symbolic topology property for diagonally F -regular algebras*, w/ D. Smolkin. *Journal of Algebra* 548 (2020) 25–52.
 3. *Étale fundamental groups of strongly F -regular schemes*, w/ B. Bhatt, P. Graf, K. Schwede and K. Tucker. *International Mathematics Research Notices*, Volume 2019, Issue 14, July 2019, Pages 4325–4339, rnx253.
 4. *Fundamental groups of F -regular singularities via F -signature*, w/ Karl Schwede and Kevin Tucker. *Ann. Sci. Éc. Norm. Supér.* (4) 51 (2018), no. 4, 993–1016.

5. *On the monotonicity of the correction term in Ramanujan's factorial approximation*, w/ Mark B. Villarino and Daniel Campos Salas. *Mathematical Gazette*; July 2013, Vol. **97** Issue 539, p. 274

SUBMITTED
PAPERS &
PREPRINTS

1. *On the behavior of stringy motives under Galois quasi-étale covers*, w/ T. Yasuda. [arXiv2105.05214](#),
2. *On the local étale fundamental group of KLT threefold singularities*, w/ A. Stäbler and with an appendix by J. Kollár. [arXiv2004.07628](#).
3. *Tame fundamental groups of pure pairs and Abhyankar's lemma*, w/ A. Stäbler. [arXiv1910.02111](#).
4. *Covers of rational double points in mixed characteristic*, w/ L. Ma, T. Polstra, K. Schwede, and K. Tucker. [arXiv:1908.01416](#)
5. *On the behavior of F -signatures, splitting primes, and test modules under finite covers*, w/ A. Stäbler. [arXiv1904.10382](#).
6. *Finite torsors over strongly F -regular singularities*. [arXiv:1710.06887](#).

TALKS

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|---|---------------|
| Yale University, Online Algebraic Geometry Seminar | May 2020 |
| The University of Oklahoma, Algebra and Representation Theory Seminar (ARTS) (via ZOOM) | May 2020 |
| Tohoku University, Conference "Singularities and Arithmetics" | February 2020 |
| Institut de Matemàtica Universitat de Barcelona, FAC-ARD 2019 Workshop | January 2019 |
| Johannes Gutenberg-Universität Mainz, SFB/TRR45 Kolloquium | December 2018 |
| Université de Neuchâtel, Intercity BeNeFri Seminar | November 2018 |
| Institut de Mathématiques de Bourgogne-Dijon, Basel-Dijon-EPFL Joint Seminar | October 2018 |
| EPFL, Groups, Arithmetic & Algebraic Geometry Seminar | October 2018 |
| Universidad de Costa Rica, Grupo de Trabajo en Geometría y Topología | August 2018 |
| University of Michigan, Commutative Algebra Seminar | October 2017 |

TALKS
(CONTINUED)

Universität Osnabrück, Algebra Seminar	October 2017
Johannes Gutenberg-Universität Mainz, SFB/TRR45 Colloquium	September 2017
Colorado State University, FRAGMENT Seminar	April 2017
University of Illinois at Chicago, Algebraic Geometry Seminar	March 2017
University of Utah, Commutative Algebra Seminar	September 2016
Universidad de Costa Rica, Departmental Colloquium	June 2016

CONFERENCE
POSTERS

1. *Fundamental groups of strongly F -regular singularities via F -signature* (PDF), presented at:
 - Western Algebraic Geometry Symposium, Colorado State University, October 2016.
 - KUMUNU Conference, University of Kansas, October 2016.
 - Summer School and Conference in Higher Dimensional Algebraic Geometry, University of Utah, July 2016.
 - Commutative Algebra Conference in honor of Craig Huneke's 65th birthday, University of Michigan, July 2016.
2. *Finite torsors over strongly F -regular singularities* (PDF), presented at:
 - Western Algebraic Geometry Symposium, University of California at Los Angeles, October 2017.
 - Local Cohomology in Commutative Algebra and Algebraic Geometry Conference in honor of Gennady Lyubeznik's 60th birthday, University of Minnesota, August 2017.

TEACHING EXPERIENCE	Fall	2020	Teaching Assistant, MATH-510 Modern Algebraic Geometry EPFL
	Spring	2020	Teaching Assistant, MATH-105(b) Analyse avancée II EPFL
	Fall	2018	Teaching Assistant, MATH-333 Chapitre choisi de géométrie: surfaces minimales EPFL
	Summer	2018	Instructor, MATH 2270 Linear Algebra University of Utah
	Spring	2018	Instructor, MATH 2270 Linear Algebra University of Utah
	Spring	2017	Teaching Assistant, MATH 1210 Calculus I University of Utah
	Fall	2016	Instructor, MATH 1210 Calculus I University of Utah
	Fall	2015	Instructor, MATH 1090 Business Algebra University of Utah
	Spring	2015	Instructor, MATH 1030 Intro. to Quantitative Reasoning University of Utah
	Fall	2014	Teaching Assistant, MATH 1210 Calculus I University of Utah
	Spring	2014	Teaching Assistant, MATH 1310 Engineering Calculus II University of Utah
	Fall	2013	Teaching Assistant, MATH 1310 Engineering Calculus I University of Utah
	I Ciclo	2013	Instructor, MA1004-Álgebra Lineal (two sections) Universidad de Costa Rica

RELEVANT SKILLS Languages: Spanish, English