

Roi Docampo Álvarez

University of Oklahoma ■ Department of Mathematics ■ 601 Elm Avenue, Room 423 ■ Norman, OK 73019
roi@ou.edu ■ (405) 325-6711 ■ <http://roi.docampo.xyz>

BIOGRAPHICAL	Born May 22, 1978, in Ourense (Spain).
EMPLOYMENT	Assistant Professor, University of Oklahoma, Sep. 2016 – present Contratado Severo Ochoa (Post-doc), ICMAT, Madrid, Feb. 2015 – Sep. 2016 Bolsista Ciência sem Fronteiras (Post-doc), Univ. Federal Fluminense, Feb. 2013 – Nov. 2014 Wylie Assistant Professor/Lecturer (Post-doc), University of Utah, July 2009 – June 2012 Research/Teaching Assistant (Grad. Student), Univ. of Illinois at Chicago, Aug. 2003 – July 2009
VISITING POSITIONS	Université Paris Diderot (France), March 2016 Universidade de Santiago de Compostela (Spain), December 2014 – January 2015 National Center for Theoretical Sciences, Taipei Office, NCTS/TPE (Taiwan), July – August 2013
EDUCATION	University of Illinois at Chicago, Ph. D. in Mathematics, 2009 Ph. D. Thesis: <i>Arcs on determinantal varieties</i> . Thesis Advisor: Lawrence Ein Universidade de Santiago de Compostela, Diploma de Estudios Avanzados, 2003 Master Thesis: <i>Noether-Fano Inequalities, Sarkisov Program, and Noether-Castelnuovo Thm</i> . Academic Advisor: Manuel Pedreira Pérez Universidade de Santiago de Compostela, Licenciatura en Matemáticas, 2001
RESEARCH INTERESTS	Algebraic geometry, singularity theory, and valuation theory: birational geometry, multiplier ideals, arc spaces, jet schemes, Nash problem, motivic integration, Berkovich spaces.
PUBLICATIONS	[1] <i>Arcs on determinantal varieties</i> , Transactions of the American Mathematical Society 365 (2013), no. 5, 2241–2269. arXiv:1011.1930, doi:10.1090/S0002-9947-2012-05564-4. [2] <i>Jacobian discrepancies and rational singularities</i> , Journal of the European Mathematical Society 16 (2014), no. 1, 165–199. With Tommaso de Fernex. arXiv:1106.2172, doi:10.4171/JEMS/430. [3] <i>Comparing multiplier ideals to test ideals on numerically \mathbb{Q}-Gorenstein varieties</i> , Bulletin of the London Mathematical Society 47 (2015), no. 2, 359–369. With Tommaso de Fernex, Shunsuke Takagi, and Kevin Tucker. arXiv:1401.7946, doi:10.1112/blms/bdv006. [4] <i>Terminal valuations and the Nash problem</i> , Inventiones mathematicae 203 (2016), no. 1, 303–331. With Tommaso de Fernex. arXiv:1404.0762, doi:10.1007/s00222-015-0597-5. [5] <i>The arc space of the Grassmannian</i> , Advances in Mathematics 306 (2017), 1269–1332. With Antonio Nigro. arXiv:1510.08833, doi:10.1016/j.aim.2016.10.036. [6] <i>Differentials on the arc space</i> , Duke Math. J. 169 (2020), no. 2, 353–396. With Tommaso de Fernex. arXiv:1703.07505, doi:10.1215/00127094-2019-0043. [7] <i>Nash blow-ups of jet schemes</i> , Annales de l’Institut Fourier 69 (2019), no. 6, 2577–2588. With Tommaso de Fernex. arXiv:1712.00911, doi:10.5802/aif.3302. [8] <i>Embedding codimension of the space of arcs</i> , Forum Math. Pi 10 (2022), Paper No. e4, 37 pp. With Christopher Chiu and Tommaso de Fernex. arXiv:2001.08377, doi:10.1017/fmp.2021.19.
PREPRINTS	[9] <i>On arc fibers of morphisms of schemes</i> . With Christopher Chiu and Tommaso de Fernex. arXiv:2206.08060.

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BOOKS EDITED

[10] *Local and global methods in algebraic geometry*, Contemporary Mathematics, vol. 712, American Mathematical Society, Providence, RI, 2018. With Nero Budur, Tommaso de Fernex, and Kevin Tucker. doi : 10.1090/conm/712.

GRANTS AND AWARDS

Collaboration Grant for Mathematicians, 09/2019 – 08/2024, Simons Foundation
Junior Faculty Fellowship, 2018, Research Council, Univ. of Oklahoma
CAS Junior Faculty Summer Fellowship, 2017, College of Arts and Sciences, Univ. of Oklahoma
Bolsista Ciência sem Fronteiras (Atração Jovens Talentos), 02/2013 – 11/2014, CNPq, Brasil
Fulbright Fellowship, 08/2003 – 05/2005, Spanish-American Fulbright Commission
Master's Thesis Travel Grant, 02/2003 – 05/2003, Caixa Galicia Foundation
Scholarship for the Realization of Graduate Studies, 10/2001 – 08/2003, Xunta de Galicia
Premio Nacional de Fin de Carrera de Educación Universitaria (Mención Especial)
(National Award of University Education, Honorable Mention)
2001 – Granted by the Ministry of Education and Culture of Spain
Undergraduate Research Scholarship, 2000 – 2001, Ministry of Education and Culture of Spain

ORGANIZED CONFERENCES

AMS Special Session on Advances in Birational Geometry (at the Fall Southeastern AMS Sectional Meeting), November 3–4, 2018, Univ. of Arkansas. With Lance Edward Miller and Wenbo Niu.
Local and Global Methods in Algebraic Geometry, May 12–15, 2016, Univ. of Illinois at Chicago. With Nero Budur, Tommaso de Fernex, and Kevin Tucker.
Workshop on Higher Dimensional Algebraic Geometry, May 18–22, 2015, IMPA, Rio de Janeiro. With Carolina Araujo and Sándor Kovács.

INVITED TALKS (CONFERENCES)

Workshop on Singularities in Algebraic Geometry, UIB (Spain)
05/16/2022, *On arc fibers of morphisms of schemes*
Workshop on Topological and Analytical Methods in Singularity Theory, CIMAT (Mexico)
11/14/2019, *Embedding codimension of spaces of arcs*
Workshop on Nash Blow-up and Semple Tower II, Leuven (Belgium)
06/2019, *Jet schemes and Nash–Semple modifications*
Singularities and Algebraic Geometry, Da Nang (Vietnam)
01/11/2018, *Differentials on the arc space*
2nd Joint Conference of the Belgian, Royal Spanish, and Luxembourg Math. Soc., Logroño (Spain)
06/2016, *The Arc Space of the Grassmannian*
Young Researchers in Singularities, Nice (France)
04/26/2016, *Terminal valuations and the Nash problem*
3er Congreso de Jóvenes Investigadores de la RSME (Plenary Speaker), Murcia (Spain)
09/11/2015, *El problema de Nash para espacios de arcos*
Workshop on Higher Dimensional Algebraic Geometry, IMPA (Brazil)
05/20/2015, *Terminal valuations and the Nash problem*
Congreso de la RSME 2015, Sesión de Singularidades, Granada (Spain)
02/05/2015, *Terminal valuations and the Nash problem*

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INVITED TALKS (CONFERENCES, CONT.)

FRG Special Month in Ann Arbor (Birational Geometry and Singularities), University of Michigan
06/13/2014, *Nash problem II*

Liberdade em Geometria Algébrica (LEGAL) 2014, Teresópolis (Brazil)
02/17/2014, *Schubert varieties, arc spaces, and LCT's*

2° Congreso de Jóvenes Investigadores de la RSME, Sesión de Singularidades, Sevilla (Spain)
09/18/2013, *Jacobian discrepancies and rational singularities*

Colóquio de Geometria e Aritmética (COLGA), Universidade Federal Fluminense (Brazil)
08/30/2013, *Jacobian discrepancies and rational singularities*

14th ALGA Meeting, Teresópolis (Brazil)
07/04/2013, *Jacobian discrepancies and rational singularities*

Western Algebraic Geometry Symposium (WAGS), University of Washington
04/14/2012, *Jacobian discrepancies and rational singularities*

AMS Sectional Meeting, Utah 2011, Special Session on Algebraic Geometry
10/23/2011, *Jacobian discrepancies and rational singularities*

AMS Sectional Meeting, Notre Dame 2010, Special Session on Singularities in Algebraic Geometry
11/07/2010, *Geometry of arcs under birational maps*

INVITED TALKS (COLLOQUIA)

The Nash problem for arc spaces, 02/05/2016, Louisiana State University

The Nash problem for arc spaces, 01/21/2016, University of Oklahoma

The Nash Problem for spaces of arcs, 11/26/2015, Albert Ludwigs University of Freiburg

El problema de Nash para espacios de arcos, 11/12/2015, Universitat Jaume I

INVITED TALKS (SEMINARS)

Embedding codimension and spaces of arcs, 10/01/2021, University of Oklahoma

O problema de Nash para espaços de arcos, 07/19/2018, Universidade de Santiago de Compostela

Differentials on the arc space, 06/13/2018, University of Vienna

Differentials on the arc space, 04/27/2018, University of Arkansas

Differentials on the arc space, 03/06/2018, Princeton University

Differentials on the arc space, 02/23/2018, University of Oklahoma

Differentials on the arc space, 10/17/2017, Ohio State University

Arcs and jets in algebraic geometry, 08/25/2017 and 09/01/2017, University of Oklahoma

Differentials on the arc space, 03/28/2017, University of Utah

The Nash problem for arc spaces, 03/15/2016, Inst. de Mathématiques de Jussieu-Paris Rive Gauche

The Arc Space of the Grassmannian, 03/08/2016, École polytechnique, Paris

The Arc Space of the Grassmannian, 11/27/2015, Albert Ludwigs University of Freiburg

Terminal valuations and the Nash problem, 11/18/2015, KU Leuven

Valoraciones terminales y el problema de Nash, 04/16/2015, Universidad de Valladolid

Valorizações terminais e o problema de Nash II, 09/16/2014, Universidade Federal Fluminense

Valorizações terminais e o problema de Nash, 09/09/2014, Universidade Federal Fluminense

Terminal valuations and the Nash problem, 05/14/2014, IMPA

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INVITED TALKS (SEMINARS, CONT.)

Discrepancies on non- \mathbb{Q} -Gorenstein varieties, 02/25/2014, Univ. of Illinois at Chicago
Jacobian discrepancies and rational singularities, 10/31/2013, Univ. Federal do Rio de Janeiro
Inversion of adjunction, arc spaces and Jacobian discrepancies, 08/02/2013, NCTS/TPE, Taiwan
Jacobian discrepancies and rational singularities, 07/29/2013, NCTS/TPE, Taiwan
Jacobian discrepancies and rational singularities, 04/17/2013, IMPA
Arcs on determinantal varieties II — Motivic integration, 04/02/2013, Univ. Federal Fluminense
Arcs on determinantal varieties, 03/26/2013, Universidade Federal Fluminense
Singularities in birational geometry and multiplier ideals, 03/08/2013, University of Oklahoma
Discrepancies, 03/14/2012, University of Illinois at Chicago
Jacobian discrepancies and rational singularities, 02/21/2012, Ohio State University
Discrepancies and Nash blowing-ups, 02/08/2012, Purdue University
Jacobian discrepancies and rational singularities, 02/08/2012, Purdue University
Arcs on determinantal varieties, 04/15/2011, Brown University
Arcs on determinantal varieties, 09/18/2009, University of Notre Dame
Arcs on determinantal varieties, 09/08/2009, University of Utah
Arcs on determinantal varieties, 12/10/2008, University of Michigan
Jet schemes, contact loci and singularities, 03/03/2005, Universidad de Valladolid

LECTURE SERIES

Arc spaces, birational geometry, and the Nash problem, 03/2015 – 05/2015, ICMAT, Madrid
Course on valuation theory and Berkovich spaces, 01/2011 – 05/2011, University of Utah

EXPOSITORY TALKS

Introduction to Invariant Theory, 02/2017 – 03/2017, University of Oklahoma
Total Positivity, 02/2017, University of Oklahoma
Algebraic Geometry: A crash course for differential geometers, 01/2015, Univ. of Santiago de Comp.
Introduction to Python and Sage for mathematicians, 07/2014, Univ. of Toronto
The dual complex of singularities (after de Fernex, Kollár, Xu), 11/2013, IMPA
Arakelov Geometry: Green Currents, 05/2013, IMPA
Dynamics of automorphisms of compact complex surfaces, 05/2013, Univ. Federal Fluminense
The cohomology of p -adic symmetric spaces, 02/2011, University of Utah
Introduction to Berkovich spaces, 04/2010, University of Utah
Introduction to G.I.T., 11/2008, University of Illinois at Chicago
Toric varieties, 01/2008 – 05/2008, University of Illinois at Chicago
Complete conics, 11/2007, University of Illinois at Chicago
The proof of resolution of singularities, 09/2006 – 12/2007, University of Illinois at Chicago
Intersection theory, 08/2005 – 01/2006, University of Illinois at Chicago
Tropical algebraic geometry and Bernstein's theorem, 04/2005, University of Illinois at Chicago
Positivity in algebraic geometry, 09/2004 – 03/2005, University of Illinois at Chicago
D-Modules and derived categories, 03/2003 – 05/2003, University of Illinois at Chicago

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TEACHING EXPERIENCE

Introduction to Abstract Algebra II, Lecturer, Spring 2022 University of Oklahoma
Introduction to Topology, Lecturer, Spring 2022 University of Oklahoma
Algebra Literacy Course (topics course for graduate students, “ p -adic and Motivic Integration”),
Lecturer, Spring 2022 University of Oklahoma
Introduction to Abstract Algebra I, Lecturer, Fall 2021 University of Oklahoma
Calculus and Analytic Geometry III, Lecturer, Fall 2021 University of Oklahoma
Applied Modern Algebra (cryptography), Lecturer, Spring 2021 University of Oklahoma
Algebra Literacy Course (topics course for graduate students, “Singularities and links”),
Lecturer, Spring 2021 University of Oklahoma
Graph Theory, Lecturer, Fall 2020 University of Oklahoma
Introduction to Number Theory, Lecturer, Fall 2020 University of Oklahoma
Calculus and Analytic Geometry II, Lecturer, Spring 2020 University of Oklahoma
Senior Mathematics Seminar (capstone course for undergraduate majors; topic: Game Theory),
Lecturer, Fall 2019, University of Oklahoma
Commutative Algebra, Lecturer, Fall 2019, University of Oklahoma
Differential and Integral Calculus II, Lecturer, Fall 2018, University of Oklahoma
Abstract Algebra I, Lecturer, Fall 2018, University of Oklahoma
Algebraic Geometry, Lecturer, Spring 2018, University of Oklahoma
Commutative Algebra, Lecturer, Fall 2017, University of Oklahoma
Discrete Math Structures, Lecturer, Fall 2017, University of Oklahoma
Differential and Integral Calculus II, Lecturer, Spring 2017, University of Oklahoma
Algebra Literacy Course (topics course for graduate students, “Invariant Theory”),
Lecturer, Spring 2017, University of Oklahoma
Linear Algebra I, Lecturer, Fall 2016, University of Oklahoma
Foundations of Analysis II, Lecturer, Spring 2012, University of Utah
Foundations of Analysis II, Lecturer, Fall 2011, University of Utah
Special Topics in Algebraic Geometry: Course on Valuation Theory and Berkovich Spaces,
Lecturer, Spring 2011, University of Utah
Partial Differential Equations for Engineering Students, Lecturer, Spring 2011, University of Utah
Introduction to Complex Variables, Lecturer, Fall 2010, University of Utah
Calculus II, Lecturer, Spring 2010, University of Utah
Calculus I, Lecturer, Fall 2009, University of Utah
Calculus III Lab (Maple), Teaching Assistant, Fall 2008, University of Illinois at Chicago
Differential Equations, Teaching Assistant, Summer 2008, University of Illinois at Chicago
Calculus III, TA Lecturer, Spring 2008, University of Illinois at Chicago
Emerging Scholars Workshop for Calculus I, Instructor, Spring 2007, University of Illinois at Chicago
Precalculus, Teaching Assistant, Spring 2006, University of Illinois at Chicago
Precalculus, Teaching Assistant, Fall 2005, University of Illinois at Chicago

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CONFERENCES ATTENDED

Dynamical Systems and Singularities Meeting, 05/2022, UIB (Spain)
Workshop on Singularities in Algebraic Geometry, 05/2022, UIB (Spain)
Workshop on Topological and Analytical Methods in Singularity Theory, 11/2019, CIMAT
Workshop on Nash Blow-up and Simple Tower II, 06/2019, Leuven (Belgium)
Recent Progress in Moduli Theory, 05/2019, MSRI
Derived algebraic geometry and its applications, 03/2019, MSRI
Intro. Workshop: Derived Alg. Geom. and Birational Geo. and Moduli Spaces, 01/2019, MSRI
Berkovich spaces – 30 years, 07/2018, Institut Henri Poincaré, Paris (France)
Conférence en l'honneur de François Loeser, 05/2018, Banyuls-sur-Mer (France)
Singularities and Algebraic Geometry, 01/2018, Da Nang (Vietnam)
2nd Joint Conference of the Belgian, Royal Spanish, and Lux. Math. Soc., 06/2016, Logroño (Spain)
Young Researchers in Singularities, 04/2016, Nice (France)
3er Congreso de Jóvenes Investigadores, RSME, 09/2015, University of Murcia
Workshop on Higher Dimensional Algebraic Geometry, 05/2015, IMPA, Rio de Janeiro.
Congreso de la RSME 2015, 02/2015, University of Granada
FRG Special Month in Ann Arbor, 05/2014, University of Michigan
Positive Characteristic Algebraic Geometry Workshop, 03/2014, Univ. of Illinois at Chicago
Liberdade em Geometria Algébrica, LEGAL 2014, 02/2014, Teresópolis, Brasil
New Aspects on Singularity Theory, 09/2013, ICMAT, Madrid
2º Congreso de Jóvenes Investigadores, RSME, 09/2013, University of Seville
Algebra and Geometry and Topology of Singularities, Luengo 60th, 09/2013, Miraflores de la Sierra
13th ALGA Meeting, 06/2013, Teresópolis, Brasil
YMIS 13: Seventh Meeting for mathematicians in Segovia, 02/2013, University of Valladolid
Western Algebraic Geometry Symposium, 04/2012, University of Washington
Singularities in Com. Algebra and Alg. Geometry, AMS Sectional Meeting, 03/2012, Univ. of Kansas
Special Session on Algebraic Geometry, AMS Sectional Meeting, 10/2011, University of Utah
Western Algebraic Geometry Symposium, 10/2011, Colorado State University
AIM Workshop: Relating test ideals and multiplier ideals, 08/2011, AIM
2nd International Conference and Workshop on Valuation Theory, 07/2011, Segovia/El Escorial
Western Algebraic Geometry Symposium, 04/2011, Stanford University
Singularities in Algebraic Geometry, AMS Sectional Meeting, 11/2010, Univ. of Notre Dame
Summer School “Berkovich spaces”, 06/2010, Institut de Mathématiques de Jussieu, Paris
School on Birational Geometry and Moduli Spaces — VIGRE Mini-course, 06/2010, Univ. of Utah
Western Algebraic Geometry Symposium, 05/2010, University of British Columbia
Combinatorial, Enumerative and Toric Geometry, 03/2009, MSRI
Modern Moduli Theory, 02/2009, MSRI
Classical Algebraic Geometry Today, 01/2009, MSRI
Michigan-Ohio State-UIC Workshop on Algebraic Geometry, 10/2008, University of Michigan
Alg. Geometry and Commutative Alg. (Hartshorne’s 70th), 04/2008, Univ. of Illinois at Chicago
Michigan-Ohio State-UIC Workshop on Algebraic Geometry, 10/2007, University of Michigan
Algebraic Geometry Session, AMS Meeting, 10/2007, DePaul University

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CONFERENCES ATTENDED (CONT.)

Hot Topics: Minimal and Canonical Models in Algebraic Geometry, 04/2007, MSRI
UIC-Purdue Workshop on Alg. Geom. and Comm. Alg., 12/2006, Purdue Univ., West Lafayette
International Congress of Mathematicians, 08/2006, Madrid
Satellite Conference on Algebraic Geometry, 08/2006, University of Valladolid (Segovia Campus)
Moduli Spaces and Arcs in Algebraic Geometry, 08/2006, University of Cologne
Recent Developments in Higher Dimensional Alg. Geom. (JAMI), 03/2006, Johns Hopkins Univ.
AMS Summer Institute in Algebraic Geometry, 07/2005 and 08/2005, University of Washington
Graduate Student Workshop for AMS Summer Inst. in Alg. Geom., 07/2005, Univ. of Washington
YMIS 2005: First Meeting for Young Mathematicians in Sedano, 02/2005, University of Valladolid
PRAGMATIC 2004: Hyperbolicity of Complex Varieties, 08/2004 and 09/2004, Univ. of Catania
Midwest Comm. Alg. and Geom. Meeting (Lipman's fest), 05/2004, Purdue Univ., West Lafayette
Asymptotic and Effective Results in Complex Geom. (JAMI), 03/2004, Johns Hopkins University
Cohomological Methods in Algebraic Geometry, 09/2002, University of Santiago de Compostela
Seminar on Higher Algebraic Geometry, 07/2002, University of Santiago de Compostela

ADVISING AND MENTORING

PhD. Students:

- Steven Lin — Univ. of Oklahoma — 2020–present
- Chih-Kuang Lee — Univ. of Oklahoma — 2021–present
- Shравan Saoji — Univ. of Oklahoma — 2022–present

Postdocs:

- Mario Morán Cañón — Univ. of Oklahoma — 2021–present
- Daniel Smolkin — Univ. of Oklahoma — 2019–2020 — Now postdoc at Univ. of Michigan.

SERVICE

Referee for *Advances in Mathematics*, *Annales de l'institut Fourier*, *Bulletin of the LMS*, *Communications in Algebra*, *Compositio Mathematica*, *Journal of Algebra*, *Journal of Algebraic Geometry*, *Journal of Pure and Applied Algebra*, *Journal of Singularities*, *Manuscripta Mathematica*, and *Pacific Journal of Mathematics*.

Co-organizer of the Putnam Problem-solving Seminar at University of Oklahoma.

Co-organizer of the Algebra and Representation theory Seminar at the University of Oklahoma, the Algebra Seminar at the Universidade Federal Fluminense, and the Algebraic Geometry Seminar at the University of Utah.

Webmaster of the Department of Mathematics at the University of Oklahoma.

TECHNICAL SKILLS

Operating Systems: Unix, Linux, OS X, Microsoft Windows.
Programming Languages: Python, FORTRAN, C, C++, HTML, PHP.
Others: Sage, Mathematica, Maple, Singular, Macaulay2, $\text{T}_\text{E}_\text{X}$, $\text{L}_\text{A}_\text{T}_\text{E}_\text{X}$.

LANGUAGES

Native Speaker of Spanish and Galician
Fluent in English and Portuguese
Reading skills in French and Italian