

César Lozano Huerta

Universidad Nacional Autónoma de México
Instituto de Matemáticas
Calle Leon #2, altos.
Centro Histórico,
Oaxaca, OAX. 6800
México.

Email: lozano@im.unam.mx
Homepage: www.matem.unam.mx/lozano
Citizenship: Mexican.

Appointments

CONACYT Research Fellow, Universidad Nacional Autónoma de México, 2014- .

Postdoctoral Fellow, Harvard University, 2014-2015.

Education

Ph.D. Mathematics, The University of Illinois at Chicago, 2010-2014.

Advisor: Izzet Coşkun.

M.S. Mathematics, University of Utah, 2008-2010.

Advisor: Aaron Bertram.

M.S. Mathematics, CINVESTAV-IPN, México 2008.

Advisor: Ernesto Lupercio.

B.S. Physics and Mathematics, Instituto Politécnico Nacional, México 2006.

Research

I am an algebraic geometer who specializes in birational geometry and the theory of moduli spaces, with a view towards applications in enumerative geometry, representation theory and combinatorics. Currently, my research focuses on using techniques from the Minimal Model Program in order to understand different compactifications of moduli spaces as well as symmetric spaces.

Publications – research

1. On the position of nodes of plane irreducible curves
Join with T. Ryan.
To appear in *Bulletin of the Australian Mathematical Society*, 2020.
2. The Lefschetz principle in birational geometry: birational twin varieties.
Joint with Alex Massarenti.
Birational Geometry and Moduli spaces, Springer INdAM Series 39, 2020.
https://doi.org/10.1007/978-3-030-37114-2_7
3. Birational geometry of the Hilbert scheme and the Severi divisors.
Joint with T. Ryan.
To appear in *Communications in Algebra*, 2020.
4. Families of elliptic curves in P^3 and Bridgeland stability.
Joint with B. Schmidt y P. Gallardo.
Michigan Math Journal, 2018.
doi:10.1307/mmj/1538705132
5. Extremal higher codimension cycles of the space of complete conics.
Contemporary Mathematics, Vol. **709**, 87–99, 2018.
6. Birational geometry of the space of complete quadrics.
International Mathematics Research Notices (2015), Vol. 2015, 12563-12589.
doi: 10.1093/imrn/rnv043
7. Birational geometry of the space of complete quadrics.
PhD Thesis, University of Illinois at Chicago, 2014.

Publications – literacy

1. Tres medallas para la geometría birracional.
Motivos Matemáticos, Instituto de Matemáticas, UNAM. 2018.
2. Curvas algebraicas y la pregunta de Halphen.
Miscelánea Matemática de la SMM, (62) 2016, 1-15.
3. Clases Características (Autores: J.W. Milnor y J.D. Stasheff).
Princeton University Press and Tokio University Press, 1974.
Colección Papirhos, Serie Textos, Num 7.
Universidad Nacional Autónoma de México, 2017.
Translation from English into Spanish, join with Mauricio Bustamante.

Work in progress

1. On the Lefschetz principle in birational geometry.
Notices of the American Mathematical Society, invited article, 2019. Contacted by Editor in Chief E. Flapan.
2. Syzygies and the stable base locus decomposition.
Join with T. Ryan and M. Leal. 2018.

Students

1. Monserrat Vite, *UNAM*. PhD, *2nd year PhD student*. June 2019.
2. Manuel Leal Camacho, *UNAM*. Masters, *2nd year Master's student*. June 2019.
3. Emilio Montes de Oca, *U. de Guanajuato*. Undergraduate student. *Graduated June 2019*. Currently, graduate student at *Berlin Freie Universität*, Germany.
4. Miguel Prado, *U. de Guanajuato*. Undergraduate student. *Graduated Aug 2019*. Currently, PhD student at *Boston College*, USA. “Boston College Presidential scholarship” awardee.
5. Alfredo Sanchez Peña, *UABJO*. Undergraduate student. *Graduated with honors*, October 2019.
6. Marco Flores, *U. de Guanajuato*. Undergraduate student. *Graduated in August, 2017*. “Sotero Prieto Award” honorable mention awardee. Currently a graduate student at *Berlin Freie Universität*.

Research visits

IMPA - Instituto Nacional de Matemática Pura e Aplicada (Brazil). 4 – 22 February 2020. (Host: Carolina Araujo and Eduardo Esteves).

Harvard University, Department of mathematics (USA). 6 – 21 de July 2017. (Host: Joe Harris).

ROMA Tre, Dipartimento di matematica e fisica (Italia). 26 September – 14 October 2016. (Host: Edoardo Sernesi).

IMPA - Instituto Nacional de Matemática Pura e Aplicada (Brazil). 6 January – 11 February 2016. (Host: Carolina Araujo).

Distinctions and Awards

International Union of Mathematicians.
Open Arms Grad (ICM 2018), 2018, Brazil.

CONACYT – Grant for Young Researchers, No. 253061.
Investigación Científica Básica, 2016.

Sistema Nacional de Investigadores. Level: Candidato.
Period: Jan 2016 - Dec 2020. México.

Unión Matemática de América Latina y el Caribe (UMALCA).
Travel award to attend II Latin American School of Algebraic Geometry and Applications,
June 2015, Brazil.

Fellowships

Postdoctoral Fellowship sponsored by CONACYT, under Profs. Joseph Harris and Dawei Chen. 2014.

Research Assistantship, under Prof I. Coşkun. University Of Illinois at Chicago, Fall 2013.

Research Assistantship, under Prof I. Coşkun. University Of Illinois at Chicago, Fall 2012.

Research Assistantship, under Prof I. Coşkun. University Of Illinois at Chicago, Spring 2012.

Teaching Assistantship, University Of Illinois at Chicago, 2010-2014.

Doctoral Fellowship to conduct PhD studies abroad. CONACYT, México , 2008-2010 .

Fellowship to study a semester abroad. CONACYT, México 2007.

Fellowship to conduct M.S. studies. CONACYT, México, 2006-2008.

Teaching

1. Clasificación birracional de variedades algebraicas II, graduate program UNAM. Fall 2019.
2. Clasificación birracional de variedades algebraicas, graduate program UNAM. Spring 2019.
3. Teoría de números, Fall 2018. UABJO.
4. Variable compleja, Spring 2018. UABJO.
5. Álgebra Moderna III, Fall 2017. UABJO.
6. Álgebra Moderna II, Spring 2017. UABJO
7. Introducción a la geometría algebraica, Spring 2016. UABJO.
8. Variable compleja II, Fall 2015. UABJO.
9. Algebra moderna II, Spring 2015. UABJO.
10. MATH 180 Calculus I, Spring 2013. University of Illinois.
11. MATH 572 Graduate algebra (asistente), Fall 2010. University of Illinois.
12. MATH 179 ESP-Calculus I, Fall 2012. University of Illinois.
13. MATH 180 Calculus I, Spring 2011. University of Illinois.
14. MATH 181 Calculus II, Fall 2010. University of Illinois.

Seminar talks

1. *U Nacional*, Seminario de geometría. Feb 2020, Bogotá, Colombia.
2. *U Zacatecas*, Seminario de geometría. Dec 2019, México.
3. *Universidad de Guanajuato*, Seminario Junior. Oct 2019, México.
4. *CIMAT*, Seminario de geometría. Oct 2019, México.
5. *Colegio Nacional*, Coloquio Latinoamericano de Álgebra. August 2019, México.
6. *CIMAT*, Seminario de geometría algebraica. July 2019, México.
7. *UNAM*, Seminario de geometría. November 2018, México.
8. *CIMAT*, Seminario de espacios moduli. December 2017, México.
9. *UNAM*, Seminario de geometría. February 2017, México.
10. *Universidad de Guanajuato*, Seminario Junior. August 2016, México.

11. *Roma tre*, Seminario di geometria. October 2016, Italia.
12. *Universidad de Colima*, Seminario de geometría. November 2016, México.
13. *Universidad de GTO*, Junior seminar, March 2016. México.
14. *IMPA*, Seminario de Algebra, Jan 2016. Brazil.
15. *UFF*, Seminario Salomonico, Jan 2016. Brazil.
16. *Brown University*, Algebraic Geometry Seminar, April 2015. USA.
17. *Colorado State University*, FRAGMENT Seminar, April 2015. USA.
18. *Northeastern University*, Geometry, Algebra, Singularities Combinatorics, Jan 2015. USA.
19. *Tufts University*, Algebra and Geometry Seminar, Nov. 2014. USA.
20. *Harvard University*, BAGS, Oct. 2014. USA.
21. *Universidad de los Andes*, Seminario de Combinatoria, Oct. 2014. Colombia.
22. *Harvard University*, BAGS, Oct. 2014. USA.
23. *Harvard University*, Harvard/MIT Algebraic Geometry Seminar, April 2014. USA.
24. *Johns Hopkins University*, Algebraic Geometry and Number Theory Seminar, Feb. 2014. USA.
25. *Rice University*, Algebraic Geometry Seminar, Jan 2014. USA.
26. *University of Chicago*, Farb and Friends Seminar, Feb. 2012. USA.

Invited Colloquia

1. *Instituto de Matemáticas, UNAM*, Abril 2016. Oaxaca, México.
2. *Instituto de Matemáticas, UNAM*, Abril 2016. Cuernavaca, México.
3. *Centro de Ciencias Matemáticas UNAM*, Nov. 2015. Morelia, México.
4. *Instituto de matemáticas UNAM*, August 2015. Oaxaca de Juárez, México.
5. *Universidad de los Andes*, Departamento de matemáticas, Oct. 2014. Botogá, Colombia,
6. *Northern Illinois University*, Departamento de matemáticas, Feb. 2014. USA.
7. *University of Illinois at Chicago*, Graduate Student Colloquium, Sep. 2013. Chicago, USA.
8. *University of Illinois at Chicago*, Graduate Student Colloquium, Sep. 2012. Chicago, USA.
9. *University of Illinois at Chicago*, Graduate Student Colloquium, Feb. 2012. Chicago, USA.

Lecture Series

1. 35 Seminario Interinstitucional de geometría algebraicas (SIGA).
Mini-course (2hrs), January 2018.
Centro de investigación en matemáticas. México.
2. 3ra Escuela de Invierno en Oaxaca.
Mini-course (8 hrs), December, 2017.
Instituto de Matemáticas, UNAM. Unidad Oaxaca. México.
3. Taller de Geometría Algebraica.
Mini-course (4hrs), 30 Nov - 4 Dec, 2015.
Centro de Ciencias Matemáticas - UNAM, Morelia. México.
4. Clubes de Ciencia México.
Mini-course (40hrs), 1-8 August, 2015. Oaxaca de Juárez, México.
Funded by Fundación Mexicanos en Harvard and CONACYT.
5. Encuentro de Geometría Algebraica (EGA).
Mini-course (3hrs), 18-21 May, 2015. CIMAT, GTO, México.
6. Clubes de Ciencia México.
Mini-course (40hrs), July 27th-August 2nd, 2014. UNAM-Ensenada, México.
Funded by Fundación Mexicanos en Harvard and COMEXUS-SEP.

Conference Talks

1. Transguanabara school of algebraic geometry.
Feb 2020, Rio de Janeiro, Brazil.
2. Winter school on Cremona Groups, Geometric Topology and Algebraic Geometry.
Jan 2020, Cuernavaca, México.
3. 52 Congreso Nacional de la Sociedad Matemática Mexicana.
Oct. 2019, Monterrey, México.
4. XIII Congreso de Ciencias Exactas.
Oct 2018, Aguascalientes, México.
5. Moduli spaces in Algebraic Geometry, (Satellite conference, ICM)
July 2018, Campinas, Brasil. (Poster)
6. Join Meeting SMM-SMC,
May 2018, Barranquilla, Colombia.
7. National Congress of Algebraic Geometry,
Feb 2018, Oaxaca, México.
8. Algebraic geometry in Mexico,
Nov 2017, Oaxaca, México.
9. PRIMA. Sesión de geometría algebraica,
August 2017, Oaxaca, México.
10. Sesión de geometría algebraica. Joint meeting SMM-RSME,
June 2017, Valladolid, España.

11. Algebraic Geometry in Mexico, Nov. 2016, Los Cabos, México.
12. 49 Congreso Nacional de la Sociedad Matemática Mexicana. Oct. 2016, Aguascalientes, México.
13. CIMPA-CIMAT-ICTP School on Moduli of Curves, Feb 22-Mar 4, CIMAT, México.
14. Encuentro Nacional de Jóvenes Investigadores en Matemáticas Dec. 2015, Instituto de Matemáticas UNAM, México.
15. XLVIII Congreso Nacional de la Sociedad Matemática Mexicana. Oct. 2015, Sonora, México.
16. II Latin American School of Algebraic Geometry and Applications (II ELGA), Jun. 2015, Cabo Frio, Brazil.
17. Reunión de Jóvenes, Casa Matemática Oaxaca Jun. 2015, Oaxaca, México.
18. II Reunión de Matemáticos Mexicanos en el Mundo, Dec. 2014, Gto, México
19. Midwest Algebraic Geometry Graduate Conference, Feb. 2014, Chicago, EUA.

1 Service

1. Founder and organizer: “Jornadas de geometría algebraica en Oaxaca”. Oaxaca, UNAM. September- 2017, September - 2018, March y April - 2019. Funding: Grant for Young Researchers, No. 253061. Investigación Científica Básica, CONACYT.
2. Founder and organizer: “Coloquio de matemáticas en Oaxaca”. Oaxaca, UNAM. September- 2015, Partial Funding: Grant for Young Researchers, No. 253061. Investigación Científica Básica, CONACYT.
3. Co-organizer: “4ta Reunión de Matemáticos Mexicanos en el Mundo”, Casa Matemática Oaxaca, Oaxaca de Juárez, Oax. June - 2018.
4. Co-organizer: “2do Encuentro nacional de jóvenes investigadores en matemáticas”. Ciudad de México, UNAM. February - 2018.
5. Co-organizer: sesión de geometría algebraica. 50 Congreso Nacional de la SMM. Ciudad de México, UNAM. Octubre - 2017.
6. Co-organizer: “3ra Escuela latinoamericano de geometría algebraica (ELGA3)”. CIMAT, Gto. August - 2017.
7. Founder and organizer: “Seminario de geometría”. Oaxaca, UNAM. September- 2016, Partial Funding: Grant for Young Researchers, No. 253061. Investigación Científica Básica, CONACYT.
8. Co-organizer: “3ra Reunión de Matemáticos Mexicanos en el Mundo”, Instituto de Investigación en Matemáticas (CIMAT), Guanajuato, Gto. Agosto - 2016.

REFEREE

PhD Thesis Reader *Angeu Barbosa*, Universida Federal Fluminense, (Brasil) 2020.
Adviser: Alex Massarenti.

Referee, *Boletín de la Sociedad Matemáticas Mexicana*, 2019.

Referee, *Premio Sotero Prieto*, UNAM, 2018.

PhD Thesis Reader *Andrés Piedra Charco*, UAM, 2018.
Adviser: Felipe Zaldívar.

Referee: *International Journal of Computer Mathematics*, 2016.

Referee: *Revista colombiana de matemáticas*, 2016.

Conferences and Workshops Attended

CIMPA-CIMAT-ICTP School on Moduli of Curves,
Feb 22-Mar 4, CIMAT, México.

II Latin American School of Algebraic Geometry and Applications (II ELGA),
June 2015. Cabo Frio, Brazil.

Macaulay2 Workshop, May 2015. Boise University, USA.

Algebraic Geometry, new connections for recent PhDs. Aug 3–10, 2014. Seattle, USA.

Compactifying Moduli Spaces, March 27–31, 2013. CRM, Spain.

A celebration of Algebraic Geometry, (Joe Harris' 60th birthday)
August 25–28, 2011. Harvard University, USA.

Summer School on Riemann surfaces, July 02–22, 2011. Park City, USA.

School on Moduli Spaces, January 04–14, 2011. Cambridge University, United Kingdom.

School on Birational Geometry and Moduli spaces, June 01–11, 2010. Salt Lake City, USA.

Recent Progress on Moduli Space of Curves, March 16–21, 2008. Banff, Canada.

Topological Methods in Quantum Field Theory, July 2–21, 2008. Villa de Leyva, Colombia.

Languages

Spanish: Native.

English: Fluent.

COMPUTER SKILLS

C, C++, Linux, html, \LaTeX , Macaulay2.

References

Izzet Coşkun
Professor of Mathematics
University of Illinois at Chicago

Dawei Chen
Professor of Mathematics
Boston College

Xavier Gomez-Mont
Professor of Mathematics
CIMAT-Gto

Joe Harris
Higgins Professor of Mathematics
Harvard University

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