

Algebraic, complex and birational geometer. Research outputs on K-stability, canonical metrics, moduli of log pairs, geometric invariant theory, algebraic surfaces, Fano varieties, singularity theory, classification problems, computational algebraic geometry and positivity of line bundles.

## Employment Record

- From Aug 2019 Lecturer in Pure Mathematics. University of Essex. Colchester, UK.
- 2017–Jul 2019 Research Associate and member of the Simons Collaboration on Special Holonomy in Geometry, Analysis, and Physics. University of Bath. Bath, UK.
- 2016–2017 Postdoctoral fellow. Max Planck Institute for Mathematics. Bonn, Germany.
- Summer 2015 Adjunct Professor. Korea University. Seoul, Korea
- 2013–2016 J.J. Sylvester Assistant Professor (postdoctoral position). Johns Hopkins University. Baltimore, MD, USA.
- 2009–2013 Tutor. University of Edinburgh. Edinburgh, UK.
- 2007–2008 Research Intern. Networking Research Group (UAM). Madrid, Spain.
- Summer 2007 Intern Programmer. Disney Interactive Studios: Black Rock. Brighton, UK.

## Education

- 2009–2013 Ph.D. in Mathematics. University of Edinburgh, UK.  
Supervisor: Prof. Ivan Cheltsov. Thesis title: *Dynamic alpha-invariants of del Pezzo surfaces with boundary*.
- 2008–2009 Master of Advanced Study in Mathematics. University of Cambridge, UK.
- 2003–2008 Licenciatura en Matemáticas (equivalent to MSci in Mathematics). Universidad Autónoma de Madrid, Spain.
- 2003–2008 Ingeniería Informática (equivalent to MEng in Computer Engineering). Universidad Autónoma de Madrid, Spain.
- 2006–2007 Erasmus Student (4th year B.A./B.Eng.). University of Sussex, UK.
- 1999–2003 SciTech Baccalaureat. IES Perez Galdos. Madrid, Spain.  
Summa Cum Laude.

## Publications

1. **J. Martinez-Garcia**, C. Spotti, *Some observations on the dimension of Fano K-moduli*. Submitted December 2020.
2. P. Cascini, **J. Martinez-Garcia**, Y. Rubinstein, *Some remarks on asymptotically log Fano varieties*. Submitted August 2020. Preprint: arXiv:2007.15595
3. P. Gallardo, **J. Martinez-Garcia**, C. Spotti, *Applications of the moduli continuity method to log K-stable pairs*. Accepted for publication in *J. Lond. Math. Soc. (2)*. September 2020. Preprint: arXiv:1811.00088
4. **J. Martinez-Garcia**, *Constant scalar curvature Kähler metrics on rational surfaces*. Accepted for publication in *Math. Nachr.* May 2020. Preprint: arXiv:1712.04857
5. P. Gallardo, **J. Martinez-Garcia**, Z. Zhang, *Compactifications of the moduli space of plane quartics and two lines*. *Eur. J. Math.*, **4(3)**, 1000–1034, 2018. Preprint: arXiv:1708.08420

6. I. Cheltsov, **J. Martinez-Garcia**, Unstable polarized del Pezzo surfaces. *Trans. Amer. Math. Soc.* **372**, 7255–7296 (2019). Preprint: arXiv:1707.06177
7. P. Gallardo, **J. Martinez-Garcia**, Moduli of cubic surfaces and their anticanonical divisors. *Rev. Mat. Complut.* **32**, no. 2, pp 853–873 (2019). Preprint: arXiv:1607.03697.
8. I. Cheltsov, **J. Martinez-Garcia**, Stable polarized del Pezzo surfaces, *Int. Math. Res. Not. IMRN* no. **18**, 5477–5505 (2020). Preprint: arXiv:1606.04370
9. P. Gallardo, **J. Martinez-Garcia**, Variations of geometric invariant quotients for pairs, a computational approach, *Proc. Amer. Math. Soc.* **146**, 2395–2408 (2018). Preprint: arXiv:1602.05282.
10. I. Cheltsov, **J. Martinez-Garcia**, Dynamic alpha-invariants of del Pezzo surfaces, *Int. Math. Res. Not. IMRN* no. **10**, 2994–3028 (2016). Preprint: arXiv:1405.5161.
11. **J. Martinez-Garcia**, Log canonical thresholds of del Pezzo surfaces in characteristic  $p$ , *Manuscripta Math.* **145**, 89–110 (2014). Preprint: arXiv:1203.0995.
12. E. Lopez de Vergara, J. Aracil, **J. Martinez**, et. al., Application of ontologies for the integration of network monitoring platforms, in *Proc. 1st European Workshop on Mechanisms for the Future Internet*, 10-11 July 2008, Salzburg, Austria.
13. I. Gutierrez, **J. Martinez**, P. Santiago, et. al., Analisis de la relacion entre la intensidad del trafico de datos y el numero de alumnos en universidades españolas (Analysis of the relationship among the data flow traffic intensity and the number of students in Spanish universities), *JITEL 2007 Proceedings*.

## Software Packages

1. P. Gallardo, **J. Martinez-Garcia**, Variations of GIT quotients package v0.6.13. (2017) Python. DOI: 10.15125/BATH-00458.

## Research Funding, Awards and Grants

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|-----------|--|
| 2020      | London Mathematical Society Scheme 1 Conference Grant to support ‘EDGE Days 2020: Explicit K-stability And Moduli Problems’ (co-PI).   |
| 2020      | Glasgow Mathematical Journal Trust grant to support ‘EDGE Days 2020: Explicit K-stability And Moduli Problems’ (co-PI).  |
| 2020      | Compositio Foundation grant to support ‘EDGE Days 2020: Explicit K-stability And Moduli Problems’ (co-PI).   |
| 2020      | Edinburgh Mathematical Society grant to support ‘EDGE Days 2020: Explicit K-stability And Moduli Problems’ (co-PI).  |
| 2020      | Heilbronn Institute for Mathematical Research Focused Research workshop grant (co-PI). Project ‘K-stability of smooth Fano 3-folds’. Withdrawn, due to CoVid-19 pandemic.  |
| 2019      | London Mathematical Society Scheme 9 Celebrating New Appointments (PI).  |
| 2019      | London Mathematical Society Scheme 4 Research in Pairs (PI).   |
| 2018      | Seal of Excellence to my application for a Horizon 2020 Marie Skłodowska-Curie action. This is awarded by the EU’s Horizon 2020 to high-quality project proposals scoring 85% or more in excellence, impact, quality and efficiency of implementation, but which are not funded due to budget constraints. |
| 2018–2021 | American Institute for Mathematics. SQuaRE program (co-PI). <i>Computational aspects of GIT with a view toward geometry of moduli spaces</i> .   |
| 2017      | ICERM Collaborate@ICERM (co-PI). <i>Interplay among hypersurface singularities, Hodge theory and the moduli of hypersurfaces and their hyperplane sections</i> .   |
| 2016      | Hausdorff Research Institute for Mathematics Research in Groups (co-PI). <i>Moduli spaces of log del Pezzo pairs and K-stability</i> .   |

- 2013 Alice Margaret Campbell Bequest Fund Award on completion of PhD.
- 2013 London Mathematical Society Invited Lectures 2013 (conference organisation, co-PI).
- 2013 London Mathematical Society Scheme 8 (conference organisation, co-PI).
- 2010–2013 MTEM student scholarship for PhD in Mathematics (School of Mathematics, University of Edinburgh).
- 2012 Dr Laura Wisewell Travelling Scholarship. (School of Mathematics, University of Edinburgh).
- 2011 University of Edinburgh Small Project Grant (University of Edinburgh).
- 2011 London Mathematical Society Young British and Russian Mathematicians Scheme.
- 2010 London Mathematical Society Travel Grants for 2010 International Congress of Mathematics.
- 2008–2010 Scholarship for Postgraduate Studies in the United Kingdom. (Fund. Caja Madrid).
- 2008–2009 Honorary Scholar. (Cambridge European Trust).
- 2007–2008 Stipend (part-time Research Intern in the Networking Research Group). (UAM).
- 2004–2008 4 Research Scholarships for Proficiency University students. (Madrid Regional Government).
- 2003 Madrid Government Scholarship for Proficiency A-Levels. (Madrid Regional Government; Univ. fees).

## Supervision Experience

1. Theodoros S. Papazachariou. PhD student. University of Essex. Started 2019.
2. Undergraduate Final Year Projects. University of Essex 4 in 2019–2020, 7 in 2020–2021
3. Conor Shackle. Undergraduate Year Long Project student. University of Bath. 2018–2019. Project: *The geometry of complex algebraic curves*.
4. Muhammad Sohaib Khalid. Undergraduate research summer student. University of Bath. 2018. Project: *Canonical metrics and automorphism groups of surfaces*.

## Invited Talks at Conferences

- Sep 2020 *Asymptotically log del Pezzo Surfaces*. ZAG Marathon (online conference), worldwide.
- Nov 2019 *The moduli continuity method for log Fano pairs*. Bayes Centre. EDGE Days 2019. University of Edinburgh, Edinburgh, United Kingdom.
- Jun 2019 *K-stable polarised del Pezzo surfaces*. Birational Geometry, Kähler-Einstein metrics and Degenerations, Institute of Mathematical Sciences, ShanghaiTech University, Shanghai, China.
- Apr 2019 *The moduli continuity method for log Fano pairs*. Conference “Birational Geometry, Kähler-Einstein Metrics And Degenerations, Laboratory of Mirror Symmetry, Higher School of Economics, Moscow, Russia.
- Feb 2019 *The moduli continuity method for log Fano pairs*. GLEN Seminar, University of Manchester, UK.
- Feb 2018 *K-Stability, Canonical Metrics, and Calabi Dream Rational Surfaces*. COW Seminar. City, University of London, UK.
- Dec 2017 *Compactification of the moduli space of certain K3 surfaces*. The Shokurovs. Center for Geometry and Physics, Institute for Basic Science. Pohang, Korea.
- Sep 2017 *Métricas de Kähler con curvatura escalar constante en superficies de del Pezzo*. Sesión paralela de Geometría Algebraica. IV Congreso de Jóvenes Investigadores, Real Sociedad Matemática Española, Universitat de València, Spain.
- Aug 2017 *Stability and cscK metrics on polarised del Pezzo surfaces*. Stability, Boundedness and Fano Varieties. Beijing International Centre for Research Mathematics, China.

- Aug 2017 *Moduli of Fano hypersurfaces and anti-canonical sections via computational algebraic geometry.* Experimental Classification of Fano Varieties. University of Tübingen, Germany.
- Jun 2017 *Stability and cscK metrics on polarised del Pezzo surfaces.* EDGE Days 2017. University of Edinburgh, UK.
- Apr 2017 *Positivity of the twisted CM line bundle for log pairs.* Positivity in algebraic and complex geometry. International Centre for the Mathematical Sciences, Edinburgh, UK.
- Jun 2016 *K-stability of Polarized del Pezzo surfaces.* Edge Days. University of Edinburgh, Scotland, UK.
- Jul 2013 *Lectures in Kähler-Einstein metrics and algebraic geometry. Computing Tian's alpha-invariant.* Graduate workshop on Kähler Geometry, Simons Center for Geometry and Physics. Stony Brook, NY. USA.
- Jun 2013 *Kähler-Einstein metrics with cone singularities and Donaldson's programme.* London Mathematical Society Invited Lectures 2013 (support talk). University of Edinburgh. Edinburgh, UK.
- May 2013 *Kähler-Einstein metrics with cone singularities and birational geometry.* NCTS/TPE Workshop. Taipei, Taiwan.
- May 2010 *Introduction to algebraic topology.* With Nir Avni. Sheaves in Representation Theory. Skye, UK.
- Feb 2010 *Stiefel-Whitney classes and classification of real projective spaces.* SMSTC. Scotland, UK.

### Invited Talks at Department Seminars

- May 2020 *The moduli continuity method for log Fano pairs* (delivered remotely due to CoVid-19 pandemic). University of Nottingham, Nottingham, United Kingdom.
- May 2019 *Revisiting Hilbert's work on invariants of polynomials to study cubic surfaces.* Mathematical Sciences Departmental Seminar, University of Essex, Colchester, UK.
- Apr 2018 *Asymptotically log del Pezzo surfaces.* Algebra and Number Theory seminar, University of Maryland, College Park, MD, USA.
- Mar 2018 *Strong Calabi dream surfaces and K-stability of polarised del Pezzo surfaces.* Algebraic Geometry Seminar, Johns Hopkins University, Baltimore, MD, USA.
- Apr 2017 *Stability and cscK metrics on polarised del Pezzo surfaces.* University of Bath, UK.
- Mar 2017 *Existence of constant scalar curvature Kähler metrics on polarised del Pezzo surfaces.* University of Versailles-St. Quentin, France.
- Feb 2017 *Geometric Invariant Theory and Moduli of log Pairs.* University of Düsseldorf, Germany.
- Feb 2017 *On the moduli space of log K-polystable pairs formed by a hypersurface and a hyperplane section.* University of Cambridge, UK.
- Dec 2016 *Moduli space of cubic surfaces and their anticanonical divisors.* Centre for Quantum Geometry of Moduli Spaces, Aarhus University, Denmark.
- Dec 2016 *Moduli space of cubic surfaces and their anticanonical divisors.* University of Duisburg-Essen, Germany.
- Oct 2016 *Moduli space of cubic surfaces and their anticanonical divisors.* University of Basel, Switzerland.
- Oct 2016 *Moduli space of cubic surfaces and their anticanonical divisors.* EDGE Seminar. University of Edinburgh, UK.
- Aug 2015 *On the moduli space of cubic surfaces and their anticanonical divisors.* Simons Center for Geometry and Physics. University of Stony Brook, NY. USA.
- Jul 2015 *Singular Kähler-Einstein metrics of small angles.* Centre for Geometry and Physics. Postech. Pohang, Korea.
- Jun 2015 *On the moduli space of cubic surfaces and their anticanonical divisors.* University of California, San Diego. San Diego, CA. USA.

- Mar 2015 *On the moduli space of cubic surfaces and their anticanonical divisors.* University of Harvard. Cambridge, MA. USA
- Feb 2015 *On the moduli space of cubic surfaces and their anticanonical divisors.* University of Notre Dame. Notre Dame, IN. USA.
- Dec 2014 *On the moduli space of cubic surfaces and their anticanonical divisors.* MAGIC Seminar. Imperial College London. London, UK.
- Oct 2014 *Singular Kähler-Einstein metrics of small angles.* JHU-UMD Complex Geometry Seminar. University of Maryland. College Park, MD. USA.
- Sep 2014 *Asymptotically log del Pezzo surfaces.* Algebraic Geometry Seminar. University of Georgia. Athens, GA. USA.
- Mar 2014 *Kähler-Einstein edge metrics on log del Pezzo surfaces.* Algebraic Geometry Seminar. Johns Hopkins University. Baltimore, MD. USA.
- Nov 2013 *Kähler-Einstein edge metrics on Fano varieties via birational geometry.* Algebraic Geometry Seminar. University of Missouri-Columbia, MI. USA.
- Apr 2013 *Kähler-Einstein metrics with cone singularities and birational geometry.* MAGIC Seminar. Imperial College London. London, UK.
- Jan 2013 *Kähler-Einstein metrics meet Birational Geometry on a del Pezzo surface.* Junior Geometry Seminar. Imperial College London. London, UK.
- Dec 2012 *Donaldson's program to solve the Yau-Tian-Donaldson conjecture from an algebraic viewpoint.* Kuznetsov's seminar. Steklov Mathematical Institute. Moscow, Russia.
- Nov 2012 *Minimal Model Programme for dummies.* Geometry Club. Edinburgh, UK.
- Nov 2012 *Intersection Theory and classification of surfaces for the layman.* Geometry Club. Edinburgh, UK.
- Feb 2012 *Degenerations of del Pezzo surfaces after Hacking and Prokhorov.* Edinburgh Geometry Seminar. University of Edinburgh. UK.
- Jan 2012 *The Tale of the Minimal Model Program.* 6th Edinburgh-Heriot-Watt Colloquium. UK.
- Dec 2011 *Log canonical thresholds of del Pezzo surfaces, computation and applications.* Iskovskikh Seminar. Steklov Mathematical Institute, Moscow, Russia.
- Apr 2010 *Chords of Alexander Grothendieck's mathematics.* PG Colloquium. University of Edinburgh. Edinburgh, UK.
- Feb 2010 *What is a toric variety?* Geometry Club. University of Edinburgh. Edinburgh, UK.
- May 2010 *Introduction to algebraic topology.* With Nir Avni. Sheaves in Representation Theory. Skye, UK.
- Mar 2009 *Yau's solution to the Calabi conjecture.* Part III seminar series. University of Cambridge. Cambridge, UK.
- Dec 2008 *Parallelizable manifolds.* Part III seminar series. University of Cambridge. Cambridge, UK.

## Contributed Talks

- Oct 2020 *Strong calabi dream rational surfaces.* Simons's conference on K-stability. Higher Dimensional Geometry in NYC, Simons Foundation/Simons Center for Geometry and Physics. Online (worldwide).
- Apr 2011 *Log canonical thresholds of del Pezzo surfaces in characteristic  $p$ .* Young Researchers in Mathematics. University of Warwick, UK.

## Poster Presentations

- Sep 2016 *Moduli space of cubic surfaces and their anticanonical divisors.* Cremona Conference 2016. University of Basel, Switzerland.
- Nov 2014 *Kähler-Einstein metrics and birational geometry.* AGNES. University of Pennsylvania. Philadelphia, PA. USA.



- Apr 2014 *Dynamic alpha-invariants of del Pezzo surfaces*. Texas Algebraic Geometry Symposium. Rice University. Houston, TX. USA.
- Oct 2013 *Kähler-Einstein metrics and birational geometry*. AGNES. Boston College, MA. USA.
- Sep 2013 *Log canonical thresholds, tigers and cats*. Foliation Theory in Algebraic Geometry. Simons Foundation, NY. USA.
- Oct 2012 *Log canonical thresholds, tigers and cats*. Groups of Automorphisms in Birational and Affine Geometry. Levico, Italy.

## Short Research Visits

- Jun 2019 American Institute of Mathematics. San Jose, CA, USA.
- Jun 2018 American Institute of Mathematics. San Jose, CA, USA.
- Mar-Apr 2018 University of Maryland. College Park, MD, USA.
- Dec 2016 Centre for Quantum Geometry of Moduli Spaces, Aarhus University. Aarhus, Denmark.
- Oct 2016 University of Edinburgh. Edinburgh, UK.
- Jun-Jul 2016 *Hausdorff Research Institute for Mathematics*. University of Bonn, Bonn. Germany.
- Jan 2016 *Mathematical Sciences Research Institute*. Berkeley, CA. USA.
- Fall 2015 *Simons Center for Geometry and Physics*. Stony Brook University, NY. USA.
- Jul 2013 *Simons Center for Geometry and Physics*. Stony Brook, NY. USA.
- May 2013 *NCTS-TPE*. Taipei, Taiwan.
- Dec 2012 *Bogomolov's Laboratory of Algebraic Geometry, HSE/Steklov Mathematical Institute*. Moscow, Russia.
- Dec 2011 *Bogomolov's Laboratory of Algebraic Geometry, HSE/Steklov Mathematical Institute*. Moscow, Russia.
- May 2011 *Moduli Spaces Program*. Cambridge, UK.
- Aug 2010 Indian Association for the Cultivation of Science. Kolkata, India.

## Conferences Organised

- Dec 2020 EDGE Days 2020: Explicit K-stability And Moduli Problems. University of Edinburgh (online), UK.
- Apr 2020 AGGITATE: Algebraic Groups and Geometric Invariant Theory at Essex Days (postponed to 2022 due to CoVid-19 pandemic). University of Essex, UK.
- Jan 2020 CoDiMa Workshop - Tools for Discrete Computational Mathematics. University of Essex, UK.
- Jun 2013 London Mathematical Society Lecture Series by Prof Bogomolov. University of Edinburgh. UK.
- Apr 2013 Workshop: Characteristic p methods in Birational Geometry. Imperial College London. UK.
- Feb 2010 SMSTC Seminar Series 2009/2010. Scotland. UK.

## Regular Seminars Organised

- 2020–21 MESS (Mathematics Essex Seminar Series). University of Essex, UK.
- 2020– ZAG (Zoom Algebraic Geometry) Seminar. Co-organiser and host. Online/worldwide.
- May–Jun 2020 Essex Mathematics Seminar. University of Essex, UK.
- 2014–16 Algebraic Geometry Seminar. Johns Hopkins University. USA.
- 2013–14 JHU-UMD Complex Geometry Seminar. Maryland, USA.

2010–11      Geometry Club (student weekly seminar). University of Edinburgh. UK.

## Teaching Experience

2020–2021      Linear Algebra. Group Theory. Graph Theory. (University of Essex, UK).  
2019–2020      Numerical Methods and Computation. Group Theory. (University of Essex, UK).  
2015–2016      Calculus II for Engineers. Complex Analysis. (Johns Hopkins University, USA).  
Summer 2015    Linear Algebra and Engineering Mathematics (Korea University, Korea)  
2014–2015      Calculus II for Engineers. Differential Geometry. (Johns Hopkins University, USA).  
2013–2014      Methods of Complex Analysis. Linear Algebra. (Johns Hopkins University, USA).  
2009–2013      Summer introductory course to Mathematics. Occasional lecture covers and wide tutoring experience (University of Edinburgh, UK).

## Outreach - Talks and Activities

Nov 2020      *Veni, codi, vinci: learn to send coded messages like Julius Caesar did while trying to decrypt your friends.* Online activity for year 0 and year 1 mathematical sciences students. University of Essex, UK.

## Outreach - Published Articles

1. **J. Martínez-García**, A Visit to Moscow. *LMS Newsletter* **416**, p. 22 (2012).
2. **J. Martínez-García**, Indian Summer. *LMS Newsletter* **400**, 25–26 (2012).

## Professional Service

2021–??      Department Adjudicator. University of Essex, UK.  
2019–21      Department Library Link. University of Essex, UK.

## Other Skills

Professional Membership    London Mathematical Society (associate member 2009–2016, ordinary member 2019 onwards), American Mathematical Society (2013–2016). EPSRC Associate Peer Review College (2020 onwards).  
Referee for                  Invent. Math., Springer INdAM series, Int. Math. Res. Not. IMRN, Sb. Math., Proc. Edinb. Math. Soc. (2), Eur. J. Math., Math. Nachr., Mathematics, Int. J. Math.  
Reviewer for                Mathematical Reviews, Zentralblatt Math.  
Languages                  Spanish (Native), English (Proficiency. Qualifications: **Cambridge First Certificate in English, Cambridge Proficiency Certificate in English**), French(Intermediate), Italian (Basic), German (Basic).  
Programming                SageMath, Maple, Matlab, Macaulay2, Mathematica, Object-Oriented Programming, Java, Python, C++,  $\LaTeX$ , UNIX API.