# Josué Tonelli-Cueto

*Curriculum Vitae*

ⓘ **0000-0002-2904-1215**
✉ *josue.tonelli.cueto@bizkaia.eu*
🖰 *tonellicueto.xyz*

---
## Areas of mathematical interest

- Numerical algorithms
- Computational algebraic geometry
- Condition-based complexity
- Random geometry

---
## Positions

| | |
|---|---|
| Sep/2022 Aug/2023 | **Postdoctoral Associate**, *The University of Texas at San Antonio*, San Antonio, United States. Mentor: Alperen A. Ergür |
| Oct/2020 Sep/2022 | **FSMP Postdoctoral Fellow**, *OURAGAN team, Inria Paris & IMJ-PRG*, Paris, France. Mentors: Fabrice Rouillier, Elias Tsigaridas |
| Feb/2020 Sep/2020 | **Postdoctoral researcher**, *OURAGAN team, Inria Paris & IMJ-PRG*, Paris, France. Mentors: Fabrice Rouillier, Elias Tsigaridas |

---
## Education

| | |
|---|---|
| Jan/2017 Nov/2019 | **Dr. rer. nat. Mathematik**, *Technische Universität Berlin*, Germany, *Summa Cum Laude*. Thesis *Condition and Homology in Semialgebraic Sets* Supervised by Peter Bürgisser and Felipe Cucker in the framework of the Berlin Mathematical School With 3rd Prize in the *Tiburtius Prizes 2020 of the Berlin Universities* and *MATH+ Dissertation Award 2020* |
| Oct/2014 Mar/2017 | **M.Sc. Mathematik**, *Technische Universität Berlin*, Germany, *1.0*. Thesis *On the Complexity of some Null-Cone Membership Problems* supervised by Peter Bürgisser In the framework of the Berlin Mathematical School |
| Oct/2009 Jul/2014 | **Licenciatura en matemáticas**, *University of the Basque Country*, Spain, *9.86*. With *Best Student Record* and *First Prize in the End of Studies Spanish National Awards* |

---
## Grants & Awards

### Research fellowships and scholarships

| | |
|---|---|
| Oct/2020 Sep/2022 | **FSMP Postdoctoral Fellowship**, *2020 Call*, "Interactions" program. Awarded by the Fondation Sciences Mathématiques de Paris |
| Jan/2017 Dec/2019 | **BMS Doctoral Fellowship**. Funded by the Einstein Foundation Berlin withing F. Cucker's Einstein Visiting Fellowship |
| Oct/2014 Jul/2017 | **Scholarship of "la Caixa" for graduate studies in Europe**, *2014 Call*. Funded also by the German Academic Exchange Service (DAAD) |
| Nov/2013 Jun/2014 | **Collaboration Scholarship for the academic year 2013-2014**. Funded by the Basque Government Working with Gustavo Adolfo Fernández Alcober on *pro-$p$ groups and $p$-adic analytic groups* at University of the Basque Country |
| Jul/2013 Sep/2013 | **Research Introduction Scholarship of the JAE Program**. Funded by the Consejo Superior de Investigaciones Científicas (CSIC) Working with Andrei Jaikin-Zapirain on *Class Field Theory* at Instituto de Ciencias Matemáticas (ICMAT) |

### Awards

| | |
|---|---|
| Dec/2021 | **MATH+ Dissertation Award 2020**, *Berlin Mathematics Research Center MATH+, Berlin Mathematical School & Einstein Foundation Berlin*. |

| | |
|---|---|
| Oct/2020 | **3rd Prize in the 2020 Tiburtius Prizes of the Berlin Universities**, *State Conference of Rectors and Presidents of Berlin Universities (LKRP)*. |
| Jul/2019 | **SIAM Student Travel Award**, *SIAM Conference on Applied Algebraic Geometry 2019*. |
| Jun/2019 | **Special Award to Young Researchers presenting Posters**, *MEGA2019*.<br>One out of three awards |
| Jul/2018 | **First Prize in the End of Studies Spanish National Awards**, *Spanish Government*. |
| Jun/2015 | **End of Degree Extraordinary Award of the Licenciatura en matemáticas**, *University of the Basque Country*. |
| Oct/2013 | **Honor Mention in the modality "Popular science work. Media"**, *14th* Ciencia en Acción.<br>Together with Ricardo Grande for the Mathematics Students' Magazine $\pi kasle$ |
| 29/Nov/2012 | **III Awards to students who best spread the image of the University of the Basque Country**.<br>1st prize in the category of science with Ricardo Grande for the Mathematics Students'Magazine $\pi kasle$<br>1st prize in the category of social sciences and legal studies with my fellow teammates for winning the IV University Debate League of the G9 Group |
| Feb-Mar/2012 | **Winner in the IV University Debate League of the G9 Group**, *Oviedo*, Spain.<br>As part of the team of the University of the Basque Country |
| Jun/2011 | **Special Mention in the Contests of Works about Sophia Kovalevskaya**, *University of the Basque Country*.<br>For doing a calligram about Sophia Kovalevskaya |

## Publications

### On progress

[1] J. Tonelli-Cueto. (n.d.). A numerical algorithm for zero counting. IV: An adaptive speedup. On progress. Presented at MEGA2020.

[2] J. Tonelli-Cueto & E. Tsigaridad. (n.d.). Condition-based bounds on the size of a polynomial zero set. On progress.

### Preprints

[3] M. Radons & J. Tonelli-Cueto. (2022b, June). Generalized Perron Roots and Solvability of the Absolute Value Equation. Journal version of (Radons & Tonelli-Cueto, 2022a). arXiv:1912.08157.

[4] J. G. Suchen & J. Tonelli-Cueto. (2022, June). Ultrametric Smale's $\alpha$-theory. arXiv:2206.08392.

[5] J. Tonelli-Cueto. (2022, March). A $p$-adic Descartes solver: the Strassman solver. arXiv:2203.07016.

[6] Kh. Kozhasov & J. Tonelli-Cueto. (2022, January). Probabilistic bounds on best rank-one approximation ratio. arXiv:2201.02191.

[7] F. Cucker, A. A. Ergür, & J. Tonelli-Cueto. (2021, February). Functional norms, condition numbers and numerical algorithms in algebraic geometry. Accepted to *Forum of Mathematics, Sigma*. arXiv: 2102.11727.

### Journal papers

[8] J. Tonelli-Cueto & E. Tsigaridas. (2023, March). Condition Numbers for the Cube. I: Univariate Polynomials and Hypersurfaces. *Journal of Symbolic Computation*, *115*, 142–173. doi:https://doi.org/10.1016/j.jsc.2022.08.013. In the Special Issue of ISSAC '20. Journal version of (J. Tonelli-Cueto & Tsigaridas, 2020). arXiv:2006.04423.

[9] Josué Tonelli-Cueto. (2022, September). A geometric summation of the geometric series. *The American Mathematical Monthly*. doi:10.1080/00029890.2022.2115825. hal-03779492.

[10] F. Cucker, A. A. Ergür, & J. Tonelli-Cueto. (2022, August). On the Complexity of the Plantinga-Vegter Algorithm. *Discrete & Computational Geometry*. doi:10.1007/s00454-022-00403-x. Journal version of (Cucker, Ergür, & Tonelli-Cueto, 2019). arXiv:2004.06879.

[11] P. Bürgisser, F. Cucker, & J. Tonelli-Cueto. (2021, October). Computing the Homology of Semialgebraic Sets. II: General formulas. *Foundations of Computational Mathematics*, *21*(5), 1279–1316. On-line from January of 2021. doi:10.1007/s10208-020-09483-8. arXiv:1903.10710.

[12] P. Bürgisser, F. Cucker, & J. Tonelli-Cueto. (2020, February). Computing the Homology of Semialgebraic Sets. I: Lax Formulas. *Foundations of Computational Mathematics*, *20*(1), 71–118. On-line from May of 2019. doi:10.1007/s10208-019-09418-y. arXiv:1807.06435.

[13] P. Bürgisser, A. A. Ergür, & J. Tonelli-Cueto. (2019, December). On the Number of Real Zeros of Random Fewnomials. *SIAM J. Appl. Algebra Geom. 3*(4), 721–732. doi:10.1137/18M1228682. arXiv:1811.09425.

### Conference papers

[14] A. Chalkis, Ch. Katsamaki, & J. Tonelli-Cueto. (2022, July). On the Error of Random Sampling: Uniformly Distributed Random Points on Parametric Curves. In *Proceedings of the 2022 international symposium on symbolic and algebraic computation* (pp. 273–282). ISSAC '22. Villeneuve-d'Ascq, France. ACM. doi:10.1145/3476446.3536190. arXiv:2203.02832..

[15] A. A. Ergür, J. Tonelli-Cueto, & E. Tsigaridas. (2022, July). Beyond Worst-Case Analysis for Root Isolation Algorithms. In *Proceedings of the 2022 international symposium on symbolic and algebraic computation* (pp. 139–148). ISSAC '22. Villeneuve-d'Ascq, France. ACM. doi:10.1145/3476446.3535475. arXiv:2202.06428..

[16] M. Radons & J. Tonelli-Cueto. (2022a, July). Generalized Perron roots and solvability of the absolute value equation. In L. F. Tabera Alonso (Ed.), *Discrete mathematics days 2022* (pp. 237–242). Santander, Spain. Editorial Universidad de Cantabria. doi:10.22429/Euc2022.016

[17] J. Tonelli-Cueto & E. Tsigaridas. (2020, July). Condition Numbers for the Cube. I: Univariate Polynomials and Hypersurfaces. In *Proceedings of the 2020 on International Symposium on Symbolic and Algebraic Computation* (pp. 434–441). ISSAC '20. Kalamata, Greece. ACM. doi:10.1145/3373207.3404054. arXiv:2006.04423v1.

[18] F. Cucker, A. A. Ergür, & J. Tonelli-Cueto. (2019, July). Plantinga-Vegter Algorithm Takes Average Polynomial Time. In *Proceedings of the 2019 on International Symposium on Symbolic and Algebraic Computation* (pp. 114–121). ISSAC '19. Beijing, China. ACM. doi:10.1145/3326229.3326252. arXiv:1901.09234.

### Other

[19] J. Tonelli-Cueto. (2019, December). *Condition and Homology in Semialgebraic Geometry* (Doctoral thesis, Technische Universität Berlin). doi:10.14279/depositonce-9453

## Talks and other presentations

### Conference presentations

| | |
|---|---|
| Jul/2022 | **The Grid Method in Numerical Real Algebraic Geometry**, *XXI Lluís Santaló School:* Random and Deterministic Point Configurations, Santander, Spain. |
| Jul/2022 | **Beyond Worst-Case Analysis for Root Isolation Algorithms**, *ISSAC 2022*, Lille, France. |
| Jun/2022 | **Probabilistic bounds on best rank-one approximation ratio**, *MEGA 2022*, Kraków, Poland. |
| Jan/2022 | **New bounds for the number of real zeros of a random polynomial system**, *Congreso Bienal de la Real Sociedad Matemática Española 2022*, Ciudad Real, Spain. |
| Nov/2021 | **Reacciones químicas, polinomios y sus ceros reales**, *Jornada SIEF y Asamblea General 2021*, Colegio de España, Cité internationale universitaire de Paris, France. |
| Oct/2021 | **Metric restrictions on the number of real zeros**, *Workshop "Real Polynomials: Counting and Stability"*, Casa Matemática Oaxaca, Mexico (On-line poster due to the COVID-19 pandemic). |
| Aug/2021 | **Breaking the Curse of Infinite Average Run-Time in Numerical Real Algebraic Geometry, can the Adaptive Grid Method do the Job?**, *SIAM Conference on Applied Algebraic Geometry 2021*, College Station, Texas, USA. (On-line poster due to the COVID-19 pandemic). |
| | Contributed talk, submitted as poster |

Aug/2021 **What's new in Computational Real Algebraic Geometry? (Introductory Talk for the Minisymposium _Computational Real Algebraic Geometry_)**, _SIAM Conference on Applied Algebraic Geometry 2021_, College Station, Texas, USA. (On-line talk due to the COVID-19 pandemic). Together with C. Riener.

Aug/2021 **Symbolic vs. Numerical: Allies or Enemies? (Introductory Talk for the Special Session _Symbolic and Numerical Computation with Polynomials_)**, _Mathematical Congress of the Americas 2021_, Buenos Aires, Argentina. (On-line talk due to the COVID-19 pandemic). Together with M. Bender.

Jun/2021 **A Numerical Algorithm for Zero Counting. IV: An Adaptive Speedup**, _MEGA 2021_, Tromsø, Norway. (On-line talk due to the COVID-19 pandemic).

Jun/2021 **Functional norms, condition numbers and numerical algorithms in algebraic geometry**, _MEGA 2021_, Tromsø, Norway. (On-line talk due to the COVID-19 pandemic). Together with F. Cucker and A.A. Ergür

Jul/2020 **Condition Numbers for the Cube. I: Univariate Polynomials and Hypersurfaces**, _ISSAC 2020_, Kalamata, Greece. (On-line talk due to the COVID-19 pandemic).

Feb/2020 **Beyond Gaussians in the probabilistic analysis of condition numbers in algebraic geometry**, _Milestones Conference of the Thematic Einstein Semester on Algebraic Geometry_, Berlin, Germany.

Jan/2020 **Computing the homology of semialgebraic sets in weak single exponential time**, _V Congreso de Jóvenes Investigadores la RSME_, Castelló, Spain.

Jan/2020 **Real zeros of random fewnomials**, _V Congreso de Jóvenes Investigadores la RSME_, Castelló, Spain.

Oct/2019 **On zeros of random fewnomials (2 talks)**, _Research Workshop on Random Real Algebraic Geometry_, Güzelyurt, Northern Cyprus.

Oct/2019 **What is the probabilistic analysis of a condition number?**, _Opening Conference of the Thematic Einstein Semester on Algebraic Geometry_, Berlin, Germany.

Aug/2019 **Average minus Weak Complexity equals Adaptive algorithms**, _Complexity of numerical computation: A conference in honor of Felipe Cucker_, Berlin, Germany.

Jul/2019 **Plantinga-Vegter takes average polynomial time**, _ISSAC 2019_, Beijing, China.

Jul/2019 **Farewell to Weyl: Condition-based analysis with a Banach norm in numerical algebraic geometry**, _SIAM Conference on Applied Algebraic Geometry 2019_, Bern, Switzerland.

Jun/2019 **Numerical Computation of Homology Groups of Closed Semialgebraic Sets**, _Workshop MEGAR 2019: Effective Methods in Real Algebraic Geometry_, Madrid, Spain.

May/2019 **How many zeros does a random fewnomial system have?**, _2nd BYMAT Conference_, Madrid, Spain.

Feb/2019 **How many zeros does a random fewnomial system have?**, _7th BMS Student Conference_, Berlin, Germany.

Jan/2019 **On Zeros of Random Fewnomials (5 talks)**, _Random Real Algebraic Geometry Workshop_, Nesin Matematik Köyü, Turkey.

May/2018 **Computing the Homology of Closed Semialgebraic Sets**, _1st BYMAT Conference_, Madrid, Spain.

Feb/2018 **The Niyogi-Smale-Weinberger Approximation Theorem**, _6th BMS Student Conference_, Berlin, Germany.

Nov/2017 **Computing the Homology of General Semialgebraic Sets**, _Workshop "Algebra meets Numerics: Condition and Compleity"_, Berlin, Germany.

Jul/2017 **Random real Schubert Calculus and lines on surfaces**, _Workshop "Reading Group on Real Algebraic Geometry"_, Leipzig, Germany.

Feb/2017 **The shadow of the hidden combinatorics of completely positive operators on Polynomial Identity Testing**, _5th BMS Student Conference_, Berlin, Germany.

## Invited seminar talks

**6/Sep/2022**   **Condition Numbers and Probability for Explaining Algorithms in Computational Geometry**, *MINDS & CIS Seminar Series*, MINDS and CIS at John Hopkins University.

**16/Jun/2022**   **A $p$-adic Descartes solver: the Strassman solver**, *Séminaire Calcul Formel*, Institut de Recherche XLIM.

**05/May/2022**   **On the complexity of sampling from parametric curves**, *Seminar on Geometry, Probability, and Computing*, UTSA, TAMU & Mizzou. On-line..

**12/Apr/2022**   **A $p$-adic Descartes solver: the Strassman solver**, *Seminar of the LFANT project-group*, Institut de Mathématiques de Bordeaux.

**08/Dec/2021**   **What does the condition number of a real polynomial system tell us? Unexpected answers in the real world**, *Seminar of the "Algorithmic Algebra" Group*, Technische Universität Berlin.

**02/Dec/2021**   **New condition-based bounds for the number of real zeros**, *Applied Algebra and Analysis Online Seminar*, Technische Universität Braunschweig & Universität Osnabrück. (On-line).

**28/Oct/2021**   **A sequel for a famous trilogy: accelerating the grid method by adaptive grids**, *Algebra Seminar*, UiT The Artic University of Norway.

**09/Jul/2021**   **Finding real zeros a lot faster through an adaptive grid**, *Coloquio de Matemática Aplicada del Insituto de Matemática*, Universidade Federal do Rio de Janeiro. (On-line).

**06/May/2021**   **A Numerical Algorithm for Zero Counting. IV: An Adaptive Speedup**, *Seminar of the OURA-GAN team*, Inria Paris & IMJ-PRG. (On-line).

**10/Feb/2021**   **Towards Finite Expectation in the Numerical Computation of the Homology of Semialgebraic Sets**, *Seminar of the "Algorithmic Algebra" Group*, Technische Universität Berlin. (On-line).

**30/Jun/2020**   **Condition Numbers for the Cube. I: Univariate Polynomials and Hypersurfaces**, *Seminar of the OURAGAN team*, Inria Paris & IMJ-PRG. (On-line).

**02/May/2019**   **Computing the Homology of Semialgebraic Sets in Weak Exponential Time**, *Algebra Seminar of the "Groups, Topology and Applications" Research Group*, U. of the Basque Country.

**11/Apr/2019**   **Condition meets Computational geometry: The Plantinga-Vegter algorithm case**, *Colloquium of the Graduiertekolleg "Facets of Complexity" (GRK 2434)*, Freie Universität Berlin.

**16/Jan/2018**   **Computing the Homology of Semialgebraic Sets**, *Oberseminar des Institut für Algebra und Geometrie*, Otto von Guericke Universität Magdeburg.

**09/Jan/2017**   **Sobre la complejidad de algunos problemas de pertenencia al cono nulo**, *Seminario del Departamento de Matemáticas*, University of the Basque Country. [In Spanish].

## Posters

**Jul/2022**   **Ultrametric Smale's $\alpha$-theory**, *ISSAC 2022*, Lille, France.

**Apr/2021**   **Computing the Homology of Semialgebraic Sets via TDA**, *Topological Data Analysis Workshop*, Chicago, Illinois, USA. (On-line poster due to the COVID-19 pandemic).

**Jun/2019**   **Computing the Homology Groups of Closed Semialgebraic Sets in Weak Exponential Time**, *MEGA 2019: Effective Methods in Algebraic Geometry*, Madrid, Spain.
Awarded one of the three Special Awards to Young Researchers presenting Posters

**Feb/2019**   **Computing the Homology Groups of Semialgebraic Sets**, *2nd Graduate meeting on Applied Algebra and Combinatorics*, Leipzig, Germany.

**Feb/2019**   **Computing the Homology Groups of Semialgebraic Sets in Weak Exponential Time**, *Congreso Bienal de la Real Sociedad Matemática Española 2019*, Santander, Spain.

**Aug/2018**   **Computing the Homology Groups of Semialgebraic Sets**, *Summer School on Numerical Computing in Algebraic Geometry*, Leipzig, Germany.

**Jun/2018**   **Polynomial Identity Testing and the Combinatorics of Completely Positive Operators**, *Qmath Masterclass on "Tensors: Geometry and Quantum Information"*, Copenhagen, Denmark.

**Jun/2018**   **Computing the "Shape" of Semialgebraic Sets**, *Symposium "Bridging European Science II"*, Berlin, Germany.

## Others

Mar/2021 **The Niyogi-Smale-Weinberger Theorem & its relatives**, *tutorial-a-thon*, Applied Algebraic Topology Network.

07/Dec/2018 **What is the best voting system?**, *"What is...?" Seminar*, Berlin Mathematical School.

29/Jun/2018 **What are semialgebraic sets in context?**, *"What is. . . ?" Seminar*, Berlin Mathematical School.

30/Jun/2017 **What are** BPP, RP **and the other probabilistic complexity classes?**, *"What is. . . ?" Seminar*, Berlin Mathematical School.

27/Jan/2017 **What is the length of a potato?**, *"What is. . . ?" Seminar*, Berlin Mathematical School.

05/Feb/2016 **What is an Origami Constructible Number?**, *"What is. . . ?" Seminar*, Berlin Mathematical School.

## Organized activities

4-7/Jan/2023 **AMS Special Session on *Data Science at the Crossroads of Analysis, Geometry, and Topology* (a Mathematics Research Communities session)**, *Joint Mathematics Meetings 2023*.
Co-organizer with Hitesh Gakhar and Harlin Lee

12-16/Dec/2022 **Sesión Especial *Computación y Aplicaciones en Geometría Algebraica***, *II Encuentro RSME-UMA*.
Co-organizer with Alicia Dickenstein, Gabriela Jerónimo and Beatriz Pascual Escudero

4-6/Nov/2022 **Mini-Symposium *Applications and Computation in Algebraic Geometry***, *5th Annual Meeting of the SIAM Texas-Louisiana Section*.
Co-organizer with Jordy Lopez and Thomas Yahl

17-21/Jan/2022 **Sesión Especial *Geometría Algebraica: la Aplicada, la Computacional y la Numérica***, *Congreso Bienal de la Real Sociedad Matemática Española 2022*.
Co-organizer with Laura Brustenga i Moncusí and Roser Homs

16-20/Aug/2021 **Minisymposium *Computational Real Algebraic Geometry***, *SIAM Conference on Applied Algebraic Geometry 2021*.
Co-organizer with Cordian Riener

19-24/Jul/2021 **Special Session *Symbolic and Numerical Computation with Polynomials***, *Mathematical Congress of the Americas 2021*.
Co-organizer with Diego Armentano, Matías Bender and Alperen A. Ergür

1-3/Dec/2020 **3rd BYMAT Conference**, *Universitat de València & Universitat Politècnica de València*, (On-line).
Memeber of the Scientific Committee together with A. Hinojosa-Calleja (Coordinator), M. de León-Contreras, C. Parreño-Torres, T. Sanz-Perela, A.V. Ponce-Bobadilla, E. Sarrión-Pedralva and J.C. Cortés López
Member of the Poster Committee together with C. Burgos Simón, A. Capel, D. Martínez, J. Muñoz-Matute, E. Primo Tárraga and E. Sarrión-Pedralva,

May/2016 **"What is. . . ?" Seminar**, *Berlin Mathematical School*.
Dec/2019 Student organized seminar where a new concept, idea or object is introduced each week
Co-organizer, web-design and video management

21-26/Oct/2019 **Research Workshop on Random Real Algebraic Geometry**, *Güzelyurt*, Northern Cyprus.
Co-organizer with Alp Bassa, Turgay Bayraktar, Özgür Kiisel and Ferit Öztürk

9-12/Jul/2019 **Minisymposium *Numerical methods for structured polynomial system solving***, *SIAM Conference on Applied Algebraic Geometry 2019*.
Co-organizer with Alperen A. Ergür, Pierre Lairez and Gregorio Malajovich

21-23/Feb/2018 **6th BMS Student Conference**, *Berlin Mathematical School*.
Co-organizer with Héctor Andrade Loarca, Qiao Luo, Brent Moran and Yuya Tokuta

## Teaching experience

Oct/2021 **3rd year Bachelor Research Project "Topological Data Analysis in Computational Real Algebraic Geometry"**, *École polytechnique*, Paris, France.
Dec/2021 Supervised the student Aurèle Bohbot together with Elias Tsigaridas

| | |
|---|---|
| Apr/2018 | **Effective Algebraic Geometry** Seminar, *Technische Universität Berlin*, Berlin, Germany. |
| Jul/2018 | Organized together with Peter Bürgisser and Alperen Ali Ergür |
| Oct/2013 | **Private Remedial Teacher**, *Centro de Estudios INTEC*, Bilbao, Spain. |
| May/2014 | Linear algebra to math undergraduates and mathematics to non-math undergraduates |
| | Approx. 156 hours of teaching |
| 11-14/Feb/2014 | **"Groups of units in complete discrete valuation rings" Course**, *University of the Basque Country*, Leioa, Spain. |
| | 4 hours of teaching |
| Nov/2012 | **"P vs. NP and related topics" Seminar**, *University of the Basque Country*, Leioa, Spain. |
| May/2013 | Organized together with Luis Martínez |
| | 30 hours of teaching |

## Communication/Popularization of Mathematics and Science

### Projects and organized activities

| | |
|---|---|
| 2-7/May/2022 | **Fête de la Science 2022**, *Colegio de España*, Cité Internationale Universitaire de Paris, France. |
| | Science week, with daily activities in English, French or Spanish for the general public, organized by the Colegio de España, its Comité de Residentes and SIEF. Co-organizer in representation of SIEF. |
| Sep/2011 | **Revista $\pi$kasle Aldizkaria**, *Mathematics Students' Magazine* [Basque & Spanish]. |
| Jul/2014 | ISSN: 2174-9027 (digital, at `pikasle.com`) and 2255-5714 (printed). |
| | Founder, together with Ricardo Grande |
| | Member of the Editorial Committee. Cover designer and desktop publisher. Social media manager. |
| 09&30/May/2014 | $\pi kasle$**'s Mathematics, Magic and Mystery Workshop** [Spanish], *U. of the Basque Country*, Leioa, Spain. |
| | Co-organizer, together with Ricardo Grande |
| 23/Oct/2013 | $\pi kasle$**'s Martin Gardner Celebration of Mind** [Spanish], *U. of the Basque Country*, Leioa, Spain. |
| | Organizer |

### Activities

| | |
|---|---|
| 08/May/2022 | **Radio Interview "Sistemas de ecuaciones, ¿cómo resolverlas?" by Antonio G. Armas** [Spanish], *Program "Investigadores por el Mundo" (number 159)*, Radio Libertad FM. |
| 07/May/2022 | **Magic & Mathematics Stand** [English & Spanish] **at Fête de la Science 2022**, *Colegio de España*, Cité internationale universitaire de Paris, France. |
| | Stand open to the general public in which I performed and explained magic tricks based on mathematics |
| May/2021 | **Divulgative video "Semi... ¿qué? Las múltiples formas de lo semialgebraico y cómo determinarlas" about my research** [Spanish], *Congreso Online Divulga NextGen ($1^a$ edición)*, On-line. |
| | Divulgative vide about my research |
| 06/Oct/2011 | **Astronomia Emakunde/Con 'A' de Astrónomas Exhibition**, *U. Basque Country*, Bilbao, Spain. |
| 11/Nov/2011 | Tour guide in Spanish |
| 05-26/May/2011 | **RSME-IMAGINARY BILBAO Exhibition**, *U. of the Basque Country*, Bilbao, Spain. |
| | Tour guide in Spanish |

### Articles

| | |
|---|---|
| [20] | J. Tonelli-Cueto. (2021, May). Semi... ¿qué? Las múltiples formas de lo semialgebraico y cómo determinarlas [Spanish] (Semi... what? The multiple shapes of the semialgebraic and how to determine them). In *Libro de Resúmenes de Divulga NextGen I (26, 27 y 28 de mayo de 2021)* (pp. 42–43). Zenodo. doi:$10.5281/zenodo.4718329$ |
| [21] | J. Tonelli-Cueto. (2015, October). Emmy Noether, un retrato alfabético [Spanish] (Emmy Noether, an alphabetic portrait). *Blog "mujeres con ciencia"*. 2015-10-05. |

### Taken formative activities and courses

| | |
|---|---|
| 04/May/2022 | **IMSI's MathComms Bootcamp *1: Storytelling and Narrative*; *2: How to Write for a General Audience* & *3: Job Talks & Stage Presence***, *Institute for Mathematical and Statistical Innovation*, On-line. |
| 11/Mar/2022 | |
| 04/Feb/2022 | |

## Service work

**Referee/Reviewer** *(Current and past reviews in alphabetical order)*.

| | |
|---|---|
| *Journal:* | Journal of Complexity; Mathematics of Computation; Forum of Mathematics, Sigma; Foundations of Computational Mathematics |
| *Conference:* | ISSAC 2020; MEGA2019 |
| *Other:* | MathSciNet |

| | |
|---|---|
| Apr/2015 Mar/2018 | **Student Vocal at the Committee of Evaluation of Degrees in the Area of Science**, *Agency for Quality of the Basque University System (UNIBASQ)*, Vitoria, Spain. |
| Jan-Dec/2017 | **BMS Student Representative**, *Berlin Mathematical School*, Berlin, Germany. |
| Sep/2012 May/2013 | **Secretary**, *Mathematics Students' Association Epsilon-Delta*, Leioa, Spain. Association of mathematics students of the University of the Basque Country |

## Activities

### Research stays and visits

| | |
|---|---|
| Oct-Nov/2021 | **Research visit to Cordian Riener**, *Tromsø*, Norway. (25/Oct-2/Nov). |
| Jan/2020 | **Research visit to Elias Tsigaridas**, *Paris*, France. (19-25/Jan). |
| Dec/2019 | **Research visit to Elias Tsigaridas**, *Paris*, France. (8-12/Dec). |
| May/2019 | **Research visit to Elias Tsigaridas**, *Paris*, France. (12-17/May). |
| Mar-Apr/2019 | **Research stay with Felipe Cucker**, *Hong Kong*, China. (15/Mar-01/Apr). |
| Oct-Nov/2018 | **Research visit to Nicolai Vorobjov**, *Bath*, England. (27/Oct-03/Nov). |
| Oct/2018 | **Research stay with Felipe Cucker**, *Tuleries d'Affiac*, France. (01-15/Oct) |
| Apr/2018 | **Research stay with Felipe Cucker**, *Hong Kong*, China. (10-28/Apr). |
| Nov-Dec/2017 | **Research stay with Felipe Cucker**, *Hong Kong*, China. (21/Nov-08/Dec). |
| Jan/2017 | **Research stay with Felipe Cucker**, *Hong Kong*, China. (13-26/Jan). |

### Attended conferences

| | |
|---|---|
| 4-7/Jan/2023 | **Joint Mathematics Meetings 2023**, *Boston*, USA. |
| 12-16/Dec/2022 | **II Encuentro RSME-UMA**, *Universidad de Málaga*, Ronda, Spain. |
| 9-11/Nov/2020 | **4th BYMAT Conference**, *Universitat de València & Universitat Politècnica de València*, On-line. |
| 4-6/Nov/2022 | **5th Annual Meeting of the SIAM Texas-Louisiana Section**, *Houston University*, Houston, USA. |
| 5-7/Oct/2022 | **8th Iberian Mathematical Meeting**, *Universidad de Sevilla*, Sevilla, Spain. |
| 30/Sep-2/Oct/2022 | **2022 Texas Algebraic Geometry Symposium**, *Texas A&M University*, College Station, USA. |
| 11-15/Jul/2022 | **XXI Lluís Santaló School: *Random and Deterministic Point Configurations***, *Universidad Internacional Menéndez Pelayo*, Santander, Spain. |
| 4-7/Jul/2022 | **47th International Symposium on Symbolic and Algebraic Computations (ISSAC 2022)**, *Université de Lille*, Lille, France. |
| 20-24/Jun/2022 | **MEGA 2022: Effective Methods in Algebraic Geometry**, *Pedagogical University of Krakow*, Kraków, Poland. |
| 29/May/2022 4/Jun/2022 | **2022 Mathematical Research Communities Conference *Data Science at the Crossroads of Analysis, Geometry, and Topology***, *Beaver Hollow Conference Center*, Java Center, USA. |
| 17-21/Jan/2022 | **Congreso Bienal de la Real Sociedad Matemática Española 2022**, *Universidad de Castilla-La Mancha*, Ciudad Real, Spain. |
| 18-22/Oct/2021 | **Workshop "Real Polynomials: Counting and Stability"**, *Banff International Research Station for Mathematical Innovation and Discovery*, Casa Matemática Oaxaca (On-line). |
| 16-20/Aug/2021 | **SIAM Conference on Applied Algebraic Geometry 2021**, *Texas A&M University*, College Station, USA (On-line). |
| 19-23/Jul/2021 | **Mathematical Congress of the Americas 2021**, *Buenos Aires*, Argentina. (On-line). |

| | |
|---|---|
| 07-11/Jun/2021 | **MEGA 2021: Effective Methods in Algebraic Geometry**, *UiT The Arctic University of Norway*, Tromsø, Norway (On-line). |
| 26-28/May/2021 | **Congreso Online Divulga NextGen (1$^a$ edición)**, *On-line*. |
| 26-30/Apr/2021 | **Topological Data Analysis Workshop**, *Institute for Mathematical and Statistical Innovation*, On-line. |
| 1-3/Dec/2020 | **3rd BYMAT Conference**, *Universitat de València & Universitat Politècnica de València*, On-line. |
| 14-25/Sep/2020 | **CO@Work 2020**, *Technische Universität Berlin & Zuse Institut Berlin*, On-line. |
| 20-23/Jul/2020 | **45th International Symposium on Symbolic and Algebraic Computations (ISSAC 2020)**, *Kalamata*, Greece. (On-line). |
| 27-28/Feb/2020 | **Milestones Conference of the Thematic Einstein Semester on Algebraic Geometry**, *Zuse Institut Berlin*, Berlin, Germany. |
| 27-31/Jan/2020 | **V Congreso de Jóvenes Investigadores de la RSME**, *Universitat Jaume I*, Castelló, Spain. |
| 21-26/Oct/2019 | **Research Workshop on Random Real Algebraic Geometry**, *Güzelyurt*, Northern Cyprus. |
| 07-11/Oct/2019 | **Opening Conference of the Thematic Einstein Semester on Algebraic Geometry**, *Freie Universität Berlin*, Berlin, Germany. |
| 19-23/Aug/2019 | **Complexity of numerical computation: A conference in honor of Felipe Cucker**, *Berlin-Brandenburgische Akademie der Wissenschaften*, Berlin, Germany. |
| 15-18/Jul/2019 | **44th International Symposium on Symbolic and Algebraic Computations (ISSAC 2019)**, *Beihang University*, Beijing, China. |
| 09-13/Jul/2019 | **SIAM Conference on Applied Algebraic Geometry 2019**, *Universität Bern*, Bern, Switzerland. |
| 21-22/Jun/2019 | **Workshop MEGAR 2019: Effective Methods in Real Algebraic Geometry**, *Universidad Complutense de Madrid*, Madrid, Spain. |
| 17-21/Jun/2019 | **MEGA 2019: Effective Methods in Algebraic Geometry**, *Universidad Complutense de Madrid*, Madrid, Spain. |
| 03-05/Jun/2019 | **Noether Konferenz 2019: Wie kommt das Neue in die Welt?**, *Berlin Mathematics Research Center MATH+*, Berlin, Germany. |
| 20-24/May/2019 | **2nd BYMAT Conference**, *Instituto de Ciencias Matemáticas*, Madrid, Spain. |
| 20-22/Feb/2019 | **7th BMS Student Conference**, *Berlin Mathematical School*, Berlin, Germany. |
| 18-20/Feb/2019 | **2nd Graduate Meeting on Applied Algebra and Combinatorics**, *Max-Planck-Institut für Mathematik in der Naturwissenschaften*, Leipzig, Germany. |
| 04-08/Feb/2019 | **Congreso Bienal de la Real Sociedad Matemática Española 2019**, *Universidad de Cantabria*, Santander, Spain. |
| 21-27/Jan/2019 | **Random Real Algebraic Geometry Workshop**, *Nesin Matematik Köyü*, Turkey. |
| 23-28/Sep/2018 | **6th Heidelberg Laureate Forum**, *Heidelberg*, Germany. |
| 13-17/Aug/2018 | **Summer School on Numerical Computing in Algebraic Geometry**, *Max-Planck-Institut für Mathematik in der Naturwissenschaften*, Leipzig, Germany. |
| 18-22/Jun/2018 | **QMath Masterclass on "Tensors: Geometry and Quantum Information"**, *University of Copenhagen*, Copenhagen, Denmark. |
| 04-08/Jun/2018 | **Workshop "Optimization, Complexity and Invariant Theory"**, *Institute for Advance Studies*, Princeton, USA. |
| 02/Jun/2018 | **Symposium "Bridging European Science II"**, *Spanish Embassy*, Berlin, Germany. |
| 07-09/May/2018 | **1st BYMAT Conference**, *Instituto de Ciencias Matemáticas*, Madrid, Spain. |
| 21-23/Feb/2018 | **6th BMS Student Conference**, *Berlin Mathematical School*, Berlin, Germany. Co-organizer with Héctor Andrade Loarca, Qiao Luo, Brent Moran and Yuya Tokuta |
| 06-07/Nov/2017 | **Workshop "Algebra meets Numerics: Condition and Complexity"**, *Technische Universität Berlin*, Berlin, Germany. |
| 13-19/Jul/2017 | **FoCM 2017 Conference (Blocks B and C)**, *Universitat de Barcelona*, Barcelona, Spain. |

| | |
|---|---|
| 03-07/Jul/2017 | **Workshop "Reading Group on Real Algebraic Geometry"**, *Max-Planck-Institut für Mathematik in der Naturwissenschaften*, Leipzig, Germany. |
| 10/Jun/2017 | **Workshop "Polynomial and Polytopes"**, *Technische Universität Berlin*, Berlin, Germany. |
| 22-24/May/2017 | **Chow Lectures 2017**, *Max-Planck-Institut für Mathematik in der Naturwissenschaften*, Leipzig, Germany. |
| 13-17/Mar/2017 | **BCAM Course "Quantum Information Theory"**, *Basque Center for Applied Mathematics*, Bilbao, Spain. |
| 22-24/Feb/2017 | **5th BMS Student Conference**, *Berlin Mathematical School*, Berlin, Germany. |
| 12-14/Dec/2016 | **Workshop "Tensors: Algebra meets Numerics"**, *Max-Planck-Institut für Mathematik in der Naturwissenschaften*, Leipzig, Germany. |
| 18-22/Jul/2016 | **7th European Congress of Mathematics**, *Teschnische Universität Berlin*, Berlin, Germany. |
| 17-19/Feb/2016 | **4th BMS Student Conference**, *Berlin Mathematical School*, Berlin, Germany. |
| 26/Jul/2015 01/Aug/2015 | **Hilbert Bernays Summer School on Logic and Computation**, *Geor-August-Universität Göttingen*, Göttingen, Germany. |
| 13-17/Jul/2015 | **2015 Santaló Summer School on "Number theory and arithmetic geometry"**, *Universidad Internacional Menéndez Pelayo*, Santander, Spain. |
| 29/Jun/2015 10/Jul/2015 | **BMS Summer School 2015 on "Convex Geometry – discrete and computational"**, *Berlin Mathematical School*. |
| 02-06/Mar/2015 | **Homological Algebra Workshop**, *Instituto de Ciencias Matemáticas*, Madrid, Spain. |
| 18-20/Feb/2015 | **3rd BMS Student Conference**, *Berlin Mathematical School*, Berlin, Germany. |
| 07-11/Jul/2014 | **10th AIMS Conference on Dynamical Systems, Differential Equations and Applications**, *Universidad Autónoma de Madrid & Instituto de Ciencias Matemáticas*, Madrid, Spain. Attended as student volunteer |
| 30/Jun/2014 04/Jul/2014 | **First International Meeting of the Italian and Spanish Mathematical Societies**, *University of the Basque Country*, Leioa, Spain. Attended as student volunteer |
| 19-21/Feb/2014 | **2nd BMS Student Conference**, *Berlin Mathematical School*, Berlin, Germany. |
| 01-26/Jun/2013 | **VI Edición de la Escuela JAE de Matemáticas**, *Instituto de Ciencias Matemáticas (ICMAT)*. |
| 23-29/Jul/2012 | **XIII Encuentro Nacional de Estudiantes de Matemáticas**, *Murcia*, Spain. |
| 01-21/Jul/2012 | **2012 PCMI Summer Session "Geometric Group Theory"**, *IAS/Park City Mathematic Institute*, Park City, USA. |
| 03-23/Jul/2011 | **2011 PCMI Summer Session "Moduli Spaces of Riemann Surfaces"**, *IAS/Park City Mathematic Institute*, Park City, USA. |
| 24/Jun/2011 | **Coloquio RSME 2011: Las dos ideas de Sofía Kovalevskaya**, *University of the Basque Country*, Bilbao, Spain. |
| 01-03/Jun/2011 | **Jornadas RSME 2011: Los Problemas del Milenio**, *Universitat de Barcelona*, Barcelona, Spain. |

## Other

| | |
|---|---|
| 20/Sep/2022 | **10th Annual San Antonio Postdoctoral Research Forum**, *UT Health SA*, San Antonio, USA. |
| 30/Jun/2022 | **dramaTOURgia: un viaje teatral a través de España**, *Comédie Oberkampf*, Paris, France. End-of-course representation showing scenes worked during the course *Teatro Español à Paris* by Luzía Eviza |
| Oct/2020 Jun/2022 | **Teatro Español à Paris**, Paris, France. Once-a-week theater classes in Spanish by Luzía Eviza |
| 8-10/Jun/2022 | **Arctic MSCA Symposium**, *UiT The Artic University of Norway*, Tromsø, Norway. |
| 11/May/2022 | **Taller "Baterías: Presente y Futuro"**, *EHUalumni*, On-line. Course by Jon Serrano-Sevillano about the state of the art of batteries |
| 27/Nov/2021 | **Jornada SIEF y Asamblea General 2021**, *Sociedad de Investigadores Españoles en Francia (SIEF)*, Paris, France. |

| | |
|---|---|
| 28/Nov/2020 | **Jornada y Asamblea Anual 2020 de la Sociedad de Investigadores Españoles en Francia**, France (On-line). |
| 18-20/Sep/2017 | **Science+ 2017, ERA Career Day Bilbao**, *University of the Basque Country*, Bilbao, Spain. |
| 06/Jun/2016 | **Slam the library #2 - Poetry Slam**, *University Library of the TU Berlin and UdK*, Berlin, Germany. Participant under pseudonym *Iasafro Maesman* ending at 2nd place |
| 10-04/Nov/2014 | **Exhibition *Reflejos. Proyecto experimental entre artistas y poestas***, *Biblioteca Central de Cantabria*, Santander, Spain. Participation with *Reflejo de Palabras* (Reflection of words) together with María Jesús Cueto Puente |
| 25-27/Jun/2014 | **Curso H.1 ¿Qué hay que enseñar hoy en la escuela?**, *XXXIII Summer Courses of the University of the Basque Country*, Donostia, Spain. |
| 23-24/Jun/2014 | **Workshop 6.1 "Once upon a time..." Techniques for Storytelling in English**, *XXXIII Summer Courses of the University of the Basque Country*, Donostia, Spain. |
| 09/May/2014 | **Curso "Cognición comprada entre chimpancés y humanos"**, Bilbao, Spain. Course by Miquel Llorente Espino on compared cognition between primates |
| Jan-Jun/2014 | **Talentia Programme 2013-2014 of Bizkaia Talent**, Province of Biscay, Spain. |
| 16/Oct/2013 | **II. Simposio UNIBASQ. La Calidad del Sistema Universitario Vasco: La Perspectiva de los Usuarios**, Bilbao, Spain. |
| 31/Aug/2012 | **Poetry Recital at the opening of the exhibition *Proyecto Trait D'Union***, *Observatorio del Arte*, Arnuero, Spain. |
| Sep-Dec/2011 | **Curso de Teoria de Grafos aplicando el método de Moore**, *University of the Basque Country*. Course on graph theory by Luiz Martínez using Moore's Method |

## Scientific Olympiads

| | |
|---|---|
| Oct/2009 | **Gold Medal in the XIV Iberoamerican Olympiad of Physics**, *Santiago de Chile*, Chile. |
| Apr/2009 | **Silver Medal and Special McGraw-Hill Prize to the best resolution of the theoretical part in the XX Spanish Mathematical Olympiad**, *Pamplona*, Spain. |
| Mar/2009 | **Bronze Medal in the XLV Spanish Mathematical Olympiad**, *Sant Feliu de Guíxols*, Spain. |

## Languages

| | |
|---|---|
| Spanish | **Native** |
| English | **C1** |
| Basque | **A2-B1** |
| German | **A2** |
| French | **A2** |

## References

- Peter Bürgisser, pbuerg@math.tu-berlin.de, Technische Universität Berlin.
- Felipe Cucker, macucker@cityu.edu.hk, CityU Hong Kong.
- Alperen Ali Ergür, alperen.ergur@utsa.edu, UT San Antonio.
- Marta Macho-Stadler, marta.macho@ehu.eus, University of the Basque Country.
- Elias Tsigaridas, elias.tsigaridas@inria.fr, Inria Paris & IMJ-PRG.